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Land Value Capture and Urban Public Transport

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1. Introduction

This secretariat paper on international approaches to 'Land Value Capture and Urban Public Transport' is one of two secretariat papers prepared as part of a NESC study on 'Land Use, Land Value and Urban Development'. The other secretariat paper is on 'Housing, Land Use and Urban Development'.

Ireland's housing system is facing a crisis. While there are many aspects to this crisis, the issue of how to provide affordable rental and owner-occupied housing for a growing proportion of the population remains paramount. It is also accepted that Ireland needs to achieve a substantial and sustained increase in the level of investment in public transport, particularly in urbanised settings.

The effective availability of land for housing development in appropriate locations, in a way that is consistent with housing affordability, has long been an important policy issue in Ireland. The supply of housing is often constrained by insufficient investment in servicing of land and infrastructure. Public decisions on zoning, planning and investing in infrastructure typically confer disproportionately large benefits on landowners. Land may be serviced and allocated for housing, but not necessarily made available by the owners for this purpose, or used by its owners for actual development. If land is not reliably available at an appropriate price, it undermines the ability to provide housing that is affordable. The high upfront cost of land is often a barrier to entry to builders and thus a constraint on building capacity. The land issue is part of the boom-bust cycle in housing. Borrowing for land, in expectation of higher land values, was central to the boom and subsequent collapse.

Servicing land and providing infrastructure to support sustainable housing development is costly. At the same time, there is often a large difference in the value of land in its existing use and the value of serviced building land supported by infrastructure. This difference in value, when garnered appropriately, has the potential to pay for some or all of the costs of the servicing of land and infrastructure.

In seeking to identify how Ireland might address the twin policy challenges of housing supply and infrastructure funding, we have examined effective approaches to providing affordable housing and transport infrastructure internationally. These examples reflect the complexity of the challenge created by the combination of

land, housing systems, planning, urban development, infrastructure and the building industry.

This paper describes international approaches to land value capture and investment in public transport. Effective international experiences of addressing the challenges of housing and urban development are addressed in the accompanying paper.

This paper considers how a number of cities, including New York, Washington, Paris, London, Hong Kong, Montreal and Copenhagen/Ørestad, have sought to use land value capture mechanisms to address the challenge of funding and financing necessary investment in strategic, high-quality public transport infrastructure. This overview also highlights how land value capture, when combined with a range of supportive polices including land-use policies, can serve to support the supply of affordable housing and more sustainable urban development. The paper includes a particular focus on London's evolving approach to the use of land value capture to support investment in public transport and also, more recently, affordable housing. The paper concludes with a discussion of the factors that contribute to the adoption and implementation of effective land value capture policy instruments.

2. Value Capture

Investment in infrastructure is a major influence on the supply of land that is available for housing development. First, bringing land into development requires upfront investment in necessary infrastructure services such as water, sewerage, roads, electricity and other utilities. When land has all the necessary utilities, it become serviced land and is suitable for housing development. Secondly, investment in rapid, quality public transit infrastructure, by enhancing access and increasing labour mobility, can also facilitate the development of new land for housing around this transport infrastructure (Crossrail 2 Growth Commission, 2016; McKinsey Global Institute, 2014).

Although there are strong economic, social and environmental arguments for increasing investment in major public transit infrastructure, the sheer scale of the costs associated with building, operating and maintaining such systems has ensured that many national and sub-national governments struggle to fund and finance this necessary infrastructure despite increased demand for quality sustainable transport, particularly in urbanised settings. This funding and financing challenge has been exacerbated by the constraints imposed on public expenditure in the wake of the global financial crisis. This, however, has also served to focus attention on alternative and/or innovative mechanisms for funding core infrastructure, in particular major public transport projects (European Commission, 2014). Internationally, this has included a renewed interest in the potential of land value capture—which has a long tradition in both economic theory and public policy discourse—to function as a viable, innovative and complementary funding source for providing infrastructure (see for example: Australian Government, 2016;

Crossrail 2 Growth Commission, 2016; Dunne, 2003; Modelewska & Medda, 2015; Suzuki *et al.*, 2015; TfL, 2017; Aubrey, 2016; Walters, 2013).

The following quote highlights the key principles underpinning the concept of land value capture:

> The unearned increment resulting from the rise in land values resulting from change in use of land, from public investment or decision or due to the general growth of the community must be subject to appropriate recapture by public bodies (the community) (United Nations 1976, cited in Walters, 2013: 2).

The original meaning of 'value capture' and indeed its usage in practice often tends to focus on ways to capture increases in land value that are due to public capital investment. Salon (2014) suggests that value capture should be considered as a broader concept that encapsulates a range of policy instruments designed to, first, capture any locational-based value that is created by a particular public investment and/or policy decision and, secondly, aim to use this new revenue stream to fund the initial and/or future public capital investment. In particular, there is clearly a strong emphasis within value capture on designing policy instruments that ensure that those stakeholders whose wealth is enhanced as a result of a particular public investment in infrastructure and also other beneficiaries contribute directly to the funding of that investment.

3. Value Capture and Urban Development

Land value capture mechanisms are an integral feature of active land management systems in Germany, Scandinavia, the Netherlands and France.[1] Although different mechanisms for land value capture have been used within and between these states—sale or lease of land, sale or lease of development rights, joint development, development fees, etc—the underlying principle is the same. That is, the relevant public authority has the capacity to capture a proportion of the increase in land values that is attributable to investment in public infrastructure and/or changes in land-use policy or zoning, and this 'captured value' then contributes to the initial cost of the infrastructure investment, improvements in the public realm and, in some cases, initial site acquisition also.

In Hamburg, a city-owned development company is responsible for managing Hafen City, a dockland redevelopment project that is one of the largest urban regeneration initiatives in Europe. The cost of the infrastructure for developing this 157-hectare site is financed by the sale of sites, while the project also received federal government funding. A feature of this ambitious project is that it has

[1] See NESC Secretariat Paper, 'International Approaches to Land Use, Housing and Urban Development'.

enabled the supply of housing for ownership and rent at affordable prices (Hall, 2014: 101). The use of land value capture has also been central to the successful urban development in the environmentally friendly city of Freiburg (*ibid.*).

In the recently published draft London Housing Strategy, the city's mayor commits to increasing land supply for housing through more intensive use of available land and proactively intervening in the land market through greater use of new and existing powers of land assembly, promoting projects and investing in infrastructure (GLA, 2017b).

4. Value Capture and Transport Infrastructure

The issue of using value capture financing mechanisms to support public investment in infrastructure and in particular urban transport systems has received notable academic and practitioner interest in recent years (Salon, 2014; Suzuki *et al.*, 2015). There is in fact nothing new in using value capture mechanisms in this manner. Hong Kong's Mass Transit Railway Corporation (MTRC) has developed over several decades its highly sophisticated 'Rail + Property' model (see 6.1). Even in countries such as Australia and Canada, where there has been a renewed policy focus on the potential of value capture to support infrastructure investment, there are both historical and contemporary examples of using value capture to part-fund transport infrastructure (Australian Government, 2016; National Bank, 2014).

Despite this, and the rationale underpinning this policy approach, it is accepted that in countries such as Australia and Canada it has not to date emerged as a central and integral element of either the national or sub-national government's capital expenditure strategies for transport infrastructure (Australian Government, 2016; (Metrolinx, 2013); National Bank, 2016).

Table 1 provides a list of examples from four cities where specific large-scale transport infrastructure projects have been or are planned to be financed partly using location (land) value capture mechanisms (Salon, 2014).[2]

Five of the six projects listed in Table 1 are multi-billon transport schemes; the level of funding that is expected to be generated by value capture mechanisms in these cases is substantial, ranging from $400m to €21.8bn.

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[2] Salon's (2014) case-study work also included Montreal and San Francisco. The former is planning to begin raising funds for infrastructure using value capture in the near future (see also National Bank of Canada, 2016). San Francisco raises more than 25 per cent of its budget from locational-based value capture mechanisms, but these funds are pooled rather than being dedicated to a specific large transport project.

Table 1: Value Capture-Financed Transport Projects

City	Value Capture Financed Project	Funds Raised or Projected	VC Mechanism	% of Cost Budget
London	Crossrail	£4.1bn BRS £0.6bn*	Business Rate Supplement & Community Infra Levy	32%
London	Crossrail 2	£12.9bn	BRS; MCIL; Property/Land sales and development	43%
Paris	Grand Paris Express	€21.8*bn		80%
Washington DC	NY Avenue Metro	$25m	Special Assessment District	28%
Washington DC	Dulles Metrorail Expansion	$400m	Special Assessment Districts	14%
New York	7-line extension	$2.1bn	TIF (version)	88%

Source: Salon, 2014: 102 *Project funds maybe less than anticipated.

Although in some cases the level of funding from value capture may have been overestimated, the potential contribution to core transport infrastructure investment remains substantial. This is especially important given the prevailing constraints on public capital expenditure at both the national and sub-national levels in all of the countries listed in the table.

The proportion of the overall project budget that will be covered by value capture funding in the cases outlined in Table 1 varies considerably, from 14 to 88 per cent. In relation to the Grand Paris Express, it has been argued that attempts to capture the vast majority of value uplift to fund the project may actually serve to depress the level of expected development.

One of the challenges of using location/land value capture mechanisms is the potential for revenue stream volatility due to the cyclical nature of the real-estate development. This was particularly evident in the case of the Hudson Line Extension (see Box 1). In the case of Crossrail, the revenues from the development-based CIL instrument were also lower than expected, although the Business Rate Supplement

has performed better than expected. This suggests the need to adopt within the overall scheme multiple tiers of value mechanisms that work to complement each other (Petretta, 2014). It also highlights the need for the relevant institutions to invest in building their financial management capacity and to have in place risk-management strategies (Petretta, 2014; Salon, 2014; Schlickman *et al.*, 2016).

It is interesting to note that using value capture mechanisms was a relatively new phenomenon in a number of the cites listed in Table 1. Indeed, Salon (2014) contends that it was an ongoing financing crisis with regard to necessary investment in public transport that was a key catalyst in forcing these cities and their transport agencies to look at new financing and funding solutions.

Box 1: New York Metropolitan Transportation Authority (NYMTA) and Hudson Yards 7 Line Extension.

The NYMTA owns and operates two commuter rail systems, the NY subway system, NYC buses and Staten Island Railroad. Since 2010 two tax/fee-based value capture mechanisms have been adopted that contribute to the NYMTA's overall operational budget:

- **Payroll-based Tax: The Payroll Mobility Tax, introduced on a state-wide basis in 2010, generates $1.6bn a year for the NYMTA, which represents 1/5th of the total government subsidy provided to the agency.**
- **Transit-Focused Property Transaction Tax: A Mortgage Recording Tax is collected when properties are sold. In 2012 this measure raised $300m for the transit agency.**

A major project undertaken by the NYMTA is the regeneration of the Hudson Yards District, which encompasses an area of 45 square blocks on the west side of Midtown Manhattan. The first attempt to regenerate this location in the 1990s was based on rezoning which would allow development at a higher than standard floor area ratio (FAR). However, this failed to stimulate significant development activity. Following a series of studies, it was recognised that, in addition to supportive land-use policies, enhancing transit access was key to unlocking the commercial and residential potential in and around the Hudson Yards District. Consequently a project was designed to extend the No. 7 New York City Flushing Subway line to this location. This project was strongly championed by the Bloomberg administration and it was in effect City Hall that promoted the use of land value capture mechanisms to develop the Hudson Yards site in Lower Manhattan.

In 2004 the Hudson Yards Infrastructure Corporation (HYIC) was established to issue bonds, make payments and collect revenues related to the area's redevelopment. The HYIC have issued a total of $3bn of bonds—backed by the expected revenue from new value capture mechanisms—to finance their investment in new infrastructure. A Hudson Yards Development Corporation (HYDC) was established to manage the redevelopment plan and build strong working relationships with key public agencies and private-sector developers.

The main value capture instruments they have put in place are:

- **Property Tax Equivalent (PTE) payments for residential and hotel development; this is a TIF-like financing scheme, although all of the revenue raised will go towards the construction of a new line and platform;**
- **Payments in Lieu of Taxes (PILOT) for commercial office development;**
- **A District Improvement Bonus (DIB) where developers can pay a premium to develop at a higher than standard FAR, and**
- **Sale or lease of the development rights available in the Hudson rail yards area.**

In practice, the expected revenue returns from these value capture schemes were greatly overestimated. The 2008 recession greatly slowed construction and development activity, further exacerbating the situation and causing delays in cash flow. Critically, the City Council had agreed to make payments to HIYC if its revenues fell short of its annual debt-service payments. By 2015 the city had already contributed $374m to cover costs. The NYC Independent Budget Office estimates that the total cost to taxpayers of this arrangement will be $947m through to 2019. Liabilities from debt service are also scheduled to rise from $153m to $765m in 2020.

Despite these problems, the seven-line extension opened in late 2015. Construction and development activity has also increased and 2015 was the first year that the City will not have to contribute to the HYIC. The HYDC has also played a key role in building positive relationships with private developers.

The revenue stream volatility created by the cyclical nature of the targeted real-estate market highlights one of the potential challenges of adopting a development-based value capture model. The manner in which the financial arrangements exposed the City Council to this risk is also considered to be a critical flaw in this particular example. There is also a view that the financing mechanisms overly favour developers and that in some instances they have encouraged major corporations to relocate from the Manhattan area.

5. Land Value Capture and Urban Public Transport: Issues, Challenges and Opportunities

This section focuses on some of the main issues, challenges and opportunities associated with using value capture to finance urban public transport.

5.1 Types of Value Capture Mechanisms

With regard to public transport, value capture is the capacity of the government and/or transport agency to capture a proportion of the economic value generated by investment in transport systems and to use these 'funds' to contribute to the financing of these systems. While quite a range of different land (locational) value

capture instruments can be used for the funding of transport infrastructure (see Table 2), these can be categorised as being either:

- Tax or Fee-based Policy Instruments, or
- Development-Based Policy Instruments (see Table 2).

As one can see from Table 2, a range of policy instruments are available to policymakers in seeking to capture the economic value generated by investment in transport systems. Medda and Modelewska (2009) contend that there is no standardised model of land value finance that can simply be replicated across cities. Rather, in practice, the relevant actors should consider a range of potential financing options before deciding which tools and instruments are most appropriate to a particular project. This highlights the importance of both content (the type of infrastructure project being developed) and context (the economic and social characteristics of the location) in guiding what value capture instruments should be adopted in any particular urban setting.

Drawing on a series of six case studies, Salon (2014) notes that five of the cities studied have introduced five or six different value capture policy instruments to support the funding of major public transport projects. Thus, rather than choosing one instrument from a menu of options, it appears that the authorities in these localities were willing to put together a package of measures designed to contribute to infrastructure investment. As discussed below, Transport for London have proposed that there is potential to use a suite of six land value capture mechanisms to support the funding of their future strategic infrastructure programme.

The fact that value capture was a relatively new phenomenon for these cities does not seem to have been a constraint on innovation and action once it was decided that this was a viable policy approach. In fact Salon *et al.* (2017) contend that capturing the value of location and access is a task that should be approached with creativity.

Finally, since adopting and implementing value capture mechanisms can be politically and socially contentious, it is worth highlighting that Salon's (2014) work reveals that the revenues that capture location are substantial in five of the six cities analysed.

Table 2: Transport-Related Value Capture Mechanisms

Tax, Levy or Fee-Based	Development-Based Land Value Capture
Tax Increment Financing: This mechanism allocates any increases in total property tax revenues, above an agreed baseline, towards public transport investment within a designated TIF zone.	**Direct Public or Joint Development:** Government/public body owns or acquires land and either undertakes development or partners with the private sector to do so. Revenue from the real-estate development contributes to the funding of transport infrastructure.
Land Value Tax/Location Benefit Levy: Tax on the (rental) value of land/commercial buildings in the vicinity of a public transport amenity. This tax/levy is distinct from a conventional property tax.	**Sale or Lease of Land:** Government/public body sells or leases to developers land of which the value has increased relative to the initial public acquisition price as a result of public investment and/or regulatory change, in return for an upfront payment, leasehold charge or annual land rent payment.
Income or payroll tax: Income earners or employers in the region served by the new transport infrastructure pay an extra increment of income or payroll tax, which is allocated to the public transport body.	**Sale or Lease of Development Rights or Air Rights:** Similar to Sale or Lease of Land, but in this instance it is air or development rights that are sold or leased. The added value from the new public transport system is capitalised into the sale or lease price.
Special Assessment Districts: Areas benefiting from improvements in public transport self-impose an additional tax to help finance the infrastructure improvements. Common in the US, special assessment districts are generally subject to a vote by the group who will pay the tax.	**Land Readjustment:** Landowners pool their land and contribute a portion of their land for sale to raise funds and partially defray public infrastructure development costs that will have raised the value of the land in question.
Sales Tax Levy: Increases to existing or new retail sales taxes are allocated to the funding of a particular transport project.	**Transport Company Business Diversification:** The Transport Agency diversifies its business model to generate additional revenue to fund the core business of transport provision.
Transport-focused Development Fees: Developers in the vicinity of a new public transport investment pay extra fees for new building projects	**Rezoning:** Changes in land-use policy to allow commercial and/or residential development. This will often include enabling higher-density housing development.
User Fees: The users of public transport services will pay an additional fee for the new and/or improved services.	**Leasing of Commercial Space:** The public transport agency retains ownership of the commercial space in and around stations and leases it out to businesses at market prices.

Adapted from Salon, 2014; Australian Government, 2016; Suzuki *et al.*, 2015.

Salon (2014) noted that, in the case of Montreal, the potential of land value capture to fund transport infrastructure was only beginning to be explored. CDPQ Infra[3] have suggested that, as the planned construction of Montreal's $6.4bn Metropolitan Electric Network (REM) will generate both real-estate development adjacent to the stations and additional economic value, there is an opportunity to put in place mechanisms to capture part of the value of these new developments in order to contribute to the financing and future development of this mega public infrastructure project (see also National Bank, 2014).[4]

5.2 What Type of Value is Created?

Quality public transport infrastructure can generate benefits for a diverse set of stakeholders: public transport users, businesses and employees, commercial and residential property owners, developers, the general public and government. In the first instance, users of new or improved public transport benefit from improvements in the quality of service, reduced congestion and reduced journey times. Major public transport infrastructure investment, by improving accessibility and connectivity in adjacent areas, can also generate substantial economic value for cities, including:

- increases in the value of commercial and residential properties and land adjacent to new infrastructure;
- increased private investment and development;
- increases in employment and labour market participation;
- enhanced productivity;
- growth in commercial activity;
- the generation of economies of agglomeration, and
- improved connections between individuals and businesses.[5]

The type and scale of value creation and also the beneficiaries will differ from project to project, which again highlights the importance of both context (location) and content (type of project) when considering the appropriateness of value capture instruments.

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[3] CDPQ Infra is a subsidiary of La Caisse de dépôt et placement du Québec. CDPQ Infra aims to generate commercial returns for La Caisse and its partners while limiting the financial impact of infrastructure projects on the government's balance sheet.

[4] The National Bank of Canada Report also notes that the adoption of a more proactive and collaborative approach by Metrolinx to capturing the increases in land value created by future rapid-transit projects has also been recommended for the Greater Toronto and Hamilton Area (National Bank, 2014).

[5] For example, see Cox & Davies, 2014; Rosewell & Venables, 2014; Venables, 2015; Vickerman, 2008; Volterra Partners, 2014; MIER, 2009.

In the literature on value capture, there is a strong focus on the extent to which transport investment can influence increases in land and property prices. This reflects the long-standing view in land value capture theory that this is an 'unearned' increment as the uplift is primarily due to public investment and/or public policy changes. It is also indicative of the fact that the uplift in land and property values can be substantial. It is thus considered both equitable and efficient to capture some of this 'wealth' for the public good. Finally, there is an argument that increases in the real property values can be regarded as a comprehensive index of all the benefits generated by transport development, including improved accessibility and an increase in business opportunities (Medea & Modelewska, 2009).

Smith *et al*. (2017) summarised the findings of approximately one hundred studies concerning the impact of transit services on nearby property values and the feasibility of capturing a proportion of this incremental increase to finance transport improvements. The results indicate that proximity to transit services often increases property values enough to offset some or all of the transit system's capital costs. This review reaffirms earlier work by the RIC Policy Unit (2002), which drew on some 150 studies of the impact of rail-based public transport on land values; it, too, found that rail transport generally had a positive impact on land values. It also highlighted that the rail-based transport's impact on property values is influenced both by the public transport mode and the presence of complementary policies to encourage changes in land use and/or discourage car usage. Indeed, a common theme of the various studies on the impact of public transport on land values is that this impact is dependent on both the location of the land in the city and the adoption of transit-orientated development policies (Salon, 2014; Salon *et al.*, 2017).

Research undertaken by KPMG and Savills indicates that future transport schemes in London are likely to produce large land value uplifts both by increasing the value of existing properties and by inducing new development (TfL, 2017). They estimate that a sample of eight prospective Transport for London (TfL) projects could produce uplifts of approximately £87bn. Box 2 lists some examples of individual studies that have explored the impact of transport infrastructure on land values.

It is, of course, important that whatever value capture mechanisms are put in place do not act as a disincentive to investment or development as this would work against the creation of value and reduce the potential revenue available for funding infrastructure. If, for example, any tax on land is considered too high, it can often freeze the land market and damage either the current and future supply of housing or investment in other types of economic activity. As indicated earlier, attempting to capture the vast majority of the value uplift associated with the Grand Paris Express project was considered to have actually depressed the level of expected investment and development. Conversely in other instances, public bodies have suggested that they were too unambitious in the proportion of value they sought to capture. This suggests the need for a balanced and proportionate approach in which there is sufficient incentive for private-sector investment and sufficient revenue generated for the public body undertaking the financing of the transport project.

Box 2: Studies of Transport Infrastructure and Land Values

Gibbons and Machin's (2005) study of the effect of two new rail lines in London found that the price of residential properties within 2km of the stations grew by 9.3 per cent more than elsewhere in London.

The Southern Railway in Perth is considered to have raised land values in the station precinct by 42 per cent in five years above the base value uplift, with even higher values recorded for commercial land.

The Jubilee Line extension (opened in London in 1979) has been shown to have generated approximately £13bn in total increased land and property value around 10 stations between Waterloo and Stratford against a capital cost of £3.5bn for the project.

A 2011 study in Montreal found that property increased by 13 per cent within 500m of Metro station, 10 per cent within 1km and 5 per cent within 1.5km.

Source: Australian Government, 2016; National Bank, 2014; Salon, 2014.

5.3 The Policy Advantages of Using Value Capture to Finance Transport Infrastructure

A combination of the increasing demand for quality urban transport, the scale of the costs associated with major transport infrastructure and constraints on public expenditure have conspired to increase the potential advantages of adopting new funding sources for capital investment. In this context, value capture mechanisms offer the potential to generate new funding streams by increasing and leveraging the value created for beneficiaries. This can enable national and sub-national governments to deliver new infrastructure which they would not otherwise be able to fund or to bring forward planned infrastructure projects ahead of time (Australian Government, 2016; National Bank, 2014).

Secondly, incorporating value capture mechanisms into the public transport projects can encourage greater discipline in project selection and adoption of a stronger developmental ethos, and facilitate the integration of land-use and transport planning (Australian Government, 2016; National Bank 2014). The Australian Government (2016) contend that the need to focus on leveraging alternative funding sources to complement state funding creates a new policy context that can enhance the technical design, scope and policy ambition of good projects.

Using value capture in the funding of major public transport projects can also facilitate the emergence of a more developmental approach to transport infrastructure. Rather than seeking to address narrowly defined policy problems — alleviating congestion or improving travel times *per se*—the focus shifts to how investment in a particular transport mode can contribute to economic growth,

competitiveness and sustainable urban (re)development (Australian Government, 2016; National Bank, 2014; Suzuki *et al.*, 2015). Facilitating this type of economic and urban development, however, necessitates transport investment being fully integrated into a broader growth strategy that includes a set of policy instruments designed to take advantage of improvements in accessibility and connectivity.

Although designing and implementing a coordinated suite of policy measures is challenging, several authors contend that development-based land capture financing, which is predicated on the integration of transport and land-use planning, can not only deliver long-term investment in public transport infrastructure but also contribute to the achievement of sustainable urban development, affordable housing and inclusive growth (see McKinsey Global Institute, 2014; Suzuki *et al.*, 2015).

A final benefit of value capture is that it is a comparatively equitable policy mechanism. As with any tax, levy or charge, the introduction of value capture raises various theoretical and practical equity issues, for example:

- Who is the group that is actually providing the value capture funds?
- What is their ability to pay and does this vary by income group and types of land use?
- Are those that are paying the same group that will benefit from the new infrastructure?
- Are the location benefits that accrue to certain groups liquid or are the benefits tied up in real property increases? (Salon, 2014)

As Salon (2014) points out, different value capture mechanisms imply different answers to these questions. However, value capture mechanisms are to an extent an attempt to establish clearer and more transparent links between those who benefit from new infrastructure assets and improved services and the source of funding for that infrastructure (Australian Government, 2016; TfL, 2017). The fact that value capture mechanisms tend to be spatially bounded reinforces this linkage between the actual transport project and the generation of benefits.

The National Bank of Canada (2014) highlights that not only is there significant evidence that the improved connectivity supplied by transit services generates increases in land and development value, but that this is recognised by the development industry. It is in their opinion both fair and equitable that a proportion of the additional wealth generated by new transit should go to funding the transportation facility.

It is also important to consider the inequity of not introducing value capture in relation to a major transport investment, thereby facilitating a major transfer to private citizens of wealth created by public policy. The implications of this were cogently described by the beneficiary of this latter situation, Don Riley, a

commercial property owner and developer in London. Although glad of the windfall generated by the building of the new extension to the Jubilee line, this individual has repeatedly argued that part of this wealth creation should be returned to the public purse and that the state should introduce a new property levy to fund transport investment.

> Then, as the millennium was dawning, a miracle happened. The government returned every penny that I had paid in taxes over the previous 40 years. So for four decades I had lived tax free—and I had not dodged the taxman! How was this possible? I 'confessed' in 'Taken for a Ride'. Taxpayers generously funded the extension to the Jubilee Line, one of London's Underground lines. Two of the stations were located close to office properties that I own. Those two stations raised the value of my properties by more than all the taxes that I had paid into the public's coffers over the previous 40 years (Don Riley in Harrison, F (2006), Wheels of Fortune, cited in TfL, 2017: 2).

6. Development-Based Land Value Capture—Supporting Transit-Orientated Development

6.1 The MTRC's 'Rail + Property Model'

As noted above, value capture can be used to support the financing of either urban development or major public transport infrastructure. A third approach, which combines both investment in rail infrastructure and direct real-estate (commercial and residential) development, is also evident; namely, development-based land value capture. Hong Kong's Mass Transport Railway Corporation (MTRC) and the various private transit organisations that operate in Tokyo have adopted what is known as the 'Rail + Property Model'.

The main characteristics of the MTRC's Rail + Property Model are outlined in Box 3. The development of this highly successful rail/metro system has been built on a sophisticated platform of land value capture in which land-use planning and land development are fully integrated with investment in the transit system (Suzuki *et al.*, 2015). The fact that the MTRC is completely self-funding has ensured that it has attracted a lot of attention as national and sub-national governments search for alternative ways of funding investment in strategic infrastructure. As noted in Box 3, the Hong Kong model features a number of unique characteristics that would make it extremely difficult to replicate in other jurisdictions, in particular the extensive state ownership of land and the affording of full development rights to the state Transit Company. This has not prevented transit authorities in other states engaging in development-based land value capture, albeit not on the scale practised in Hong Kong or indeed Tokyo. As outlined in Box 4, the Washington Metropolitan Area Transit Authority has put in place the most advanced form of development-based land value capture in the US, premised on numerous joint development projects with private landowners and developers. Additionally, it is evident that the potential

advantages of adopting a concerted strategy of transit-orientated development are increasingly being championed as a means of not only addressing funding challenges for strategic infrastructure but also of facilitating sustainable urban development (Cervero & Murakami, 2004; Falk, 2017; Hall, 2014; Knowles, 2012; Suzuki *et al.*, 2015).

Box 3: Hong Kong: The MTRC's Rail + Property Model

Hong Kong's Mass Transport Railway Corporation's (MTRC) development strategy is known as the 'Rail + Property Model'. This model is premised on the MTRC being able to acquire and assemble land at pre-development prices. A combination of investments, multiple development activities (commercial and residential) and a large portfolio of real-estate assets with a steady revenue stream has enabled the MTRC to be become completely self-funding; indeed, it actually returns an annual dividend to the Hong Kong Government. All of its capital expenditure, including investment in new infrastructure, comes from internal cash generation. A number of key factors underpin the MTRC's capacity to realise substantial revenue from any real-estate development that is associated with its transport investments.

First, the Hong Kong Special Administrative Region (SAR) Government gives the MTRC exclusive rights over new development in a defined catchment area along the route of any new transport scheme. It is able to do this because all of the land is in public ownership and thus they can lease it to the MTRC at pre-scheme existing-use values.

Secondly, the MTRC retains all of the uplift in land value from rezoning and new development when it sells or leases development rights at post-scheme values to private developers.

Thirdly, the MTRC works closely with the public planning system to maximise the level of value creation (that will be captured by the public) from any new transport and related real-estate development. The planning framework, therefore, is designed to support transit-orientated development around the MTRC's transit hubs. This serves to enhance the value of the land but also creates a market of users for the MTRC's services

Finally, the MTRC acts as an asset manager within this process to both capture the initial uplift in property values and also to secure longer-term recurring revenues from new business developments such as shopping malls.

Although Hong Kong's Rail + Property model is a highly successful land value strategy, this type of direct land value capture is a long-term investment. The profits from land, property and commercial development were built up over a few decades from an initial low base. During the 1980s, when there was considerable investment in the opening of urban lines, the MTRC operated at a loss and the substantial profits from associated property and commercial developments only came on stream from 1999 onwards, thus enabling the company to operate at a profit.

The MTRC development-based value strategy is highly effective and sophisticated. It has garnered much attention from policymakers. It is accepted, however, that it is dependent on unique characteristics that would be extremely difficult to replicate in other advanced liberal economies.

Box 4: The Washington Metropolitan Area Transit Authority (WMATA)—An Entrepreneurial Agency

Since beginning operations in 1976, the WMATA has gradually put in place the most advanced form of development-based land value capture in the US, premised on numerous joint development projects with private landowners and developers. Joint Development is described by the WMATA as a creative programme through which property interests owned and/or controlled by the authority are marketed to developers—office, retail, tourism, commercial and/or residential—with the objective of developing transit-orientated development. In recent years the WMATA's strategy has been increasingly focused on enabling transit-orientated development in order to increase ridership, support long-term system capacity and generate new revenues for transport investment. High-quality, high-density development adjacent to metro stations also creates investment opportunities for the private sector and facilitates local economic development. In 2011 it was estimated that WMATA's joint development projects had been a key catalyst for approximately $235m in economic development at or near its metro stations.

The WMATA has been characterised as an 'entrepreneurial' transit agency, given the strong proactive approach it has adopted over the last thirty years towards joint development. The agency does not have its own tax dedicated to it. It relies on federal appropriations and annual negotiations with Washington DC and the surrounding local governments to complete capital projects and sustain operations. This is considered as a key factor in its willingness to aggressively seek alternative forms of revenue for station construction and rehabilitation.

Land value capture is an integral part of the WMATA's joint development activity. Depending on the nature of the project in question, it has traditionally used one of the following policy instruments:

- **Site leasing**
- **Long-term development agreements on WMATA-owned land adjacent to stations**
- **Air right sales**
- **Connection agreements**

As a result of the numerous projects it has been involved in, the WMATA has built up a strong in-house development team with considerable experience of real-estate and urban development, infrastructure financing and the private-sector development industry in general. The agency places a strong emphasis on early engagement with property owners and developers, and has issued guidelines on Joint Development that are designed to create policy certainty and encourage developer investment.

Suzuki *et al*. (2015) note that the direct benefits in terms of revenue from Joint Development projects is not that significant, although they have led to a steady increase in fare revenue and commuter usage. Rather, the multibillion-dollar benefits that have been generated by transit-supportive land policies near metro stations are captured primarily by local government jurisdictions in the form of rising property taxes and the establishment of special assessment districts in zones related to specific transit projects. The WMATA then benefits indirectly from increased tax revenue in the areas adjacent to stations as it receives sizable operating subsidies from the local governments that are also its owners.

6.2 Smart Transit-Orientated Development

Transit-orientated development (TOD) encapsulates the process of focusing the development of housing, employment activity and public services around existing or new railways stations that are serviced by frequent, high-quality intra-urban services (Cervero & Murakami, 2009). Development around rapid-transit routes has several advantages, including improving labour mobility and potentially providing a mechanism for funding both affordable housing and transportation infrastructure (Falk, 2017; McKinsey Global Institute, 2014).

Ørestad, a new town linked to Copenhagen, is considered to be a good contemporary example of planned sustainable transit-orientated development that incorporates jobs, housing, retail, education and leisure facilities (Falk, 2017; Knowles, 2012; see Box 5).

Box 5: Ørestad—Transit-Orientated Development in Practice

Ørestad is Copenhagen's linear new town that is being built over a thirty-year period around stations on an elevated mini-metro line. Ørestad is considered to be a successful contemporary example of planned sustainable Transit-Orientated Development that incorporates jobs, housing, retail, education and leisure facilities. It was envisaged that the construction of phases 1 and 2 of the Copenhagen Metro along with the trans-commercial business district underground would be financed by a combination of future revenue from ticket sales and the capturing of increased land value through the selling of development sites along the route in Ørestad. In hindsight, this funding model proved to be insufficient due to a doubling of construction costs and a shortfall in the expected passenger numbers. The state was forced to provide additional funding. At the same time, the sale of sites along the route ensured that the cost of building the Ørestad section of the new metro was partly covered by land value capture.

The unique advantages enjoyed by Hong Kong's MTRC have ensured that it can actively pursue a strategy of transit-orientated development that maximises land value capture, enhances labour mobility, increases transit usage and supports high-density compact urban development. As already stated, these advantages cannot be replicated easily in advanced liberal economies. This suggests the need for the policy dialogue in the latter to focus less on these 'unique' enablers and more on the actual key principles or policy characteristics that underpin transit-orientated development.

Drawing on a number of case studies, Suzuki *et al.* (2015) identify transit-orientated development as having two main characteristics:

- proximity to and functional relationship with transit stations and terminals, with service provision provided by high-quality public transport; and

- compact, dense, mixed-use buildings and neighbourhoods designed to encourage the use of public transport, cycling and walking by residents, employees, shoppers and visitors.

Focusing on these key characteristics or policy objectives enables the policy dialogue in different jurisdictions to actively explore the type of institutional, policy and procedural changes needed to achieve a form of transit-orientated development that supports both the financing of key infrastructure and enhances the supply of and access to housing.

In retaining the strong entrepreneurial ethos fostered over thirty years of working with private developers, the WMATA has now identified transit-orientated development as being the strategic goal of this collaborative activity rather than additional economic development *per se*. In highlighting the potential of transit-oriented development to help fund necessary transport infrastructure in Montreal, the National Bank of Canada (2014) recognises the need to put in place appropriate land-use planning policies and a supportive regulatory regime.

As discussed in more detail below, realising the housing potential associated with Crossrail 2, in particular unlocking land for higher-density housing in locations adjacent to railway stations, will necessitate the adoption of a new way of delivering housing that includes changes to planning policies, active land management and land assembly, the establishment of bespoke development institutions and the adoption of new mechanisms for funding key infrastructure.

In the recently published draft London Housing Strategy (GLA, 2017b), the mayor of London highlighted the need to increase the supply of land for housing by supporting more intensive use of existing sites and proactively intervening in the land market. This strategy also recognises the key role that public investment has in sustaining and supporting housebuilding. As part of this approach, the mayor identified the need to ensure that all public investment in transport—from Crossrail 2 to local investment in cycling—will be targeted to support the supply of new homes.

Transit-orientated development is also at the heart of the recently published draft London Transport Strategy (GLA, 2017a) given the emphasis that is placed on:

- reducing car dependency;
- increased investment in quality public transport;
- improving access to public transport;
- encouraging high-density, mixed-use developments;
- supporting carbon free travel, and
- encouraging more cycling and walking.

Furthermore, this strategy aims to ensure that these key transport principles are implemented in a manner that supports the supply of both new jobs and new housing. Indeed, the key role of transport investment in supporting enhanced housing supply is a key theme of this document, both in terms of specific mega-projects such as Crossrail 2 and also with regard to the objectives of the overall transport strategy out to 2040.

Falk (2017) contends that there is growing agreement that meeting housing needs in the UK and creating a more sustainable society requires a substantial increase in infrastructure, in particular public transport. Suzuki *et al.* (2015) argue that, used in the right manner (supporting transit-orientated development), development-based land value capture is not only a potential mechanism for financing necessary transport infrastructure but is also an urban policy and planning instrument that can promote economic competitiveness and more equitable access to housing. McKinsey Global Institute (2014), in highlighting the need to unlock land for higher-density housing development in sites adjacent to public transport, argues that, by capturing a share of the increase in land values generated by new public transport investment (through land sales or 'betterment' assessments), governments can pay for the infrastructure investment and the cost of affordable housing (McKinsey Global Institute, 2014). These same authors use the example of how Hong Kong has concentrated housing development in sites that afford access to public transport; however, there are question marks over whether or not the key concept of affordability has been built into supply in this instance. As discussed in the next section, Transport for London have initiated an innovative new strategy that seeks to combine land value capture, increased housing supply and affordability.

7. London: Land Value Capture and the Funding of Strategic Transport Infrastructure

7.1 Introduction

The UK's experience of using a variety of policy instruments to try to capture the increase in land value resulting from demographic or economic growth, or consent for a change in land use to a more valuable one, has been described as a 'century of unsuccessful attempts' (Grover, 2017; Hall, 2014). Grover (2017) attributes this lack of success to a combination of the failure to foster a national consensus on the issue and the lengthy and complex nature of the legislation used to try to deliver land value capture. This same author indicates that the UK has been able to tax increases in value using taxes that are not directly associated with value capture such as business rates, stamp duty land tax and capital gains tax. Furthermore, the 1990 Planning Act allowed for the imposition of planning obligations and contributions from developers, while in 2008 the Community Infrastructure Levy was introduced to make this process more systematic and predictable, though experience to date suggests that this has not necessarily achieved these objectives. Despite this somewhat chequered history, the idea of using land value capture to fund strategic

transport infrastructure and affordable housing is again at the very centre of the policy dialogue in the UK. This section seeks to provide an overview of how, in the context of London land value capture, policy instruments are now considered by key regional institutions to be an essential element of any new approach to the funding of strategic transport infrastructure in the city region (GLA, 2017a; TfL, 2017).

7.2 Transport for London (TfL)

TfL, which is part of the Greater London Authority and is chaired by the mayor of London, was established in 2000 under the Greater London Authority (GLA) Act 1999. TfL is responsible for enacting the mayor's transport strategy and for managing most of the transport modes in the London city region, including the Underground, TfL rail, bus services, cycle lanes, pedestrian routes and other transport infrastructure. This multi-modal integration enables planning and investment at scale and gives strategic influence on transport investment across all authorities in Greater London (Wilcox & Nohrová, 2014). It is recognised that London requires a sustained programme of investment in public transport network upgrades and extensions to address the growing pressure on transport capacity and housing supply and affordability, and to drive continued economic and employment growth in the capital (Crossrail 2 Growth Commission, 2016; GLA, 2017a; TfL, 2017).

Currently TfL's is funded through a combination of income sources:

- Business Rate Retention (BRR) under mayoral control, which will replace direct government grants for operations and new capital investment from 2017-18
- TfL 'prudential borrowing' against future revenue
- Fare revenue and other user pay sources such as the congestion charge
- Advertising, rental income and property sales
- Contributions from the London boroughs and developer contributions for associated transport investments
- The Business Rate Supplement and Mayoral Community Infrastructure Levy that is ring-fenced for Crossrail 1
- Other project-specific grants

As the funding requirements for infrastructure continues to grow and government grants are being reduced, it is accepted that this funding model will be insufficient to deliver the ambitious transport strategy required to meet the economic, social and environmental needs of London (GLA, 2017a). Rather, what is required is the development of a new, stable and more sustainable approach to funding public transport in London (*ibid.*). The adoption of a range of land value capture instruments along with the acquisition of greater fiscal autonomy and road-user

charging are now considered by the mayor and the GLA as being essential for the delivery of a more efficient and fair funding system for transport infrastructure and services (GLA, 2017a; TfL, 2017). Before considering some of the land value mechanisms that are now being actively considered by the GLA and TfL, it is worth looking at how two mega transport projects, Crossrail 1 and Crossrail 2, have engaged with this issue of land value capture as part of their funding strategy, as this has helped to shape the policy dialogue and learnings around this issue.

7.3 Crossrail 1

Crossrail 1 is a £14.8bn transport infrastructure project that is building a new 118km railway for London. This mega-project, which began in 2009 and is scheduled to be completed in 2019, involves the construction of 42km of new tunnels under central London, the building of 10 new stations and the upgrading of 30 sites. Crossrail Ltd, which was established in 2001 to build this new railway, is a wholly owned subsidiary of TfL and is jointly sponsored by TfL and the Department of Transport. Once Crossrail 1 is completed, it will be renamed as the Elizabeth Line and handed over to TfL to be run as part of London's integrated transport network. Crossrail 1 will increase rail capacity by 10 per cent in central London and serve to alleviate congestion on existing networks, reduce travel times and enhance connectivity across the city, including strengthening the linkages between major commercial and business districts. Despite the uncertainties associated with forecasting the economic benefits of major infrastructure projects, it is argued that Crossrail 1 will add an estimated £42bn to the UK economy and also support the regeneration of key sites in the capital.

In 2007, the GLA and TfL agreed with central government to provide £7.7m towards the funding of the Crossrail transport project and have sought to use a range of land value mechanisms to part-fund this contribution.

The Business Rate Supplement (BRS)

In 2010, the GLA introduced a new land value capture mechanism linked directly to Crossrail 1: the Business Rate Supplement (BRS). The BRS is levied on all commercial buildings that rent for more than £55,000 p.a. in the Greater London Area and is set at 2 per cent per pound of rateable value. In 2017 the mayor of London approved that the rateable value threshold above which the BRS should apply should be increased from £55,000 to £70,000. As of Q1 2017, approximately £1.6bn in revenue had been generated by the BRS and it is estimated that, when the BRS concludes in 2033/34, it will have contributed £4.1m to the building of Crossrail 1, which is approximately 27 per cent of the total project budget. This revenue is being used to service the interest on and repayment of £3.3bn of project borrowing undertaken by the GLA as well as £0.8bn direct contribution to the Crossrail project. Without this key revenue stream, it would not have been possible to deliver the Crossrail project on its agreed route.

The BRS, in terms of revenue generation and social acceptance, has performed better than expected. This outcome is attributable to a number of factors.

First, the BRS is a relatively simple and transparent levy that is directly linked to the delivery of a new infrastructure project. This facilitates a clearer linkage paying a financial contribution and benefiting from the positive transport and economic externalities associated with this project.

Secondly, the fee is relatively small, particularly in the context of the considerable economic benefits associated with the construction of Crossrail 1. In practice, it amounts to an average of only 5 per cent of affected ratepayers' total business rates bill, and generally it is larger business premises rather than SMEs that are paying this additional charge.

Thirdly, the administrative system for enforcement and collection of the BRS was already in place as the various London boroughs performed this function for standard normal business rates, so there was no complicated or expensive establishment process. Businesses are used to paying these rates and, where the levy is applicable, it appears as a supplement on the standard business rate bill.

Fourthly, Crossrail 1 has attracted strong support from the business community and, given the delays that have characterised this project, there was a sense that this community just wanted it to be delivered even if this meant taking on some of the cost.

Fifthly, in order for a land value capture mechanism to be effective, the associated infrastructure investment has to generate additional value. Research undertaken by the commercial property consultants GVA indicates that Crossrail could help create £5.5bn in added value to residential and commercial real estate along its route between 2012 and 2021. Commercial office values around Crossrail stations in central London are expected to increase over the next decade, with an uplift of 10 per cent in capital value above an already rising baseline projection. Similarly, although not covered by the BRS, residential values are projected to increase by 25 per cent around stations in central London and by 20 per cent in suburban locations, again above a rising baseline projection. Furthermore, it appears that the increased transport capacity, new connections and planned enhancements associated with Crossrail are already having a positive impact on investment decisions and development at many locations along the route. For example, GVA's (2014) Development Pipeline Study found that approximately half of all planning applications within a kilometre of future Elizabeth Line[6] stations cited the new railway as a major reason for the development taking place. The growing evidence that Crossrail is generating additional value for land and property owners, in conjunction with the apparent increase in economic activity and development, has arguably served to mitigate potential opposition to the BRS and other associated land value capture mechanisms.

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[6] This is what Crossrail 1 will be called when it is completed.

Roukouni and Meddea (2012), while recognising the effectiveness of the BRS as a land value capture instrument, suggest that the fact that it is levied as a flat rate across all London boroughs raises equity issues as some locations will benefit more than others as a result of the Crossrail project. These authors propose the adoption of two separate taxes combined into one scheme incorporating a modified BRS and a new Stamp Duty Levy on residential property transactions. They suggest that differential tax rates should be applied to each charge depending on location — using the principle that those boroughs that will acquire the most benefits from Crossrail would pay higher rates in both instances. Roukouni and Meddea (2012) contend that their proposal may be a more efficient, equitable, sustainable and feasible financing mechanism. At the same time, they recognise that introducing a differential tax rate would require legislative changes. Additionally, introducing a new charge on residential property transactions would also carry with it high political costs. Even TfL, which have raised the idea of a transport premium charge to capture a proportion of value uplift in residential properties, recognise that such an initiative would be both challenging and complex to deliver (TfL, 2017).

The Mayoral Community Infrastructure Levy and S.106 Agreements

The GLA/TfL's £7.7.bn contribution also includes an expected £600m that will be raised through a combination of the Mayoral Community Infrastructure Levy (MCIL) and developer contributions via negotiated S.106 agreements. The MCIL, which was introduced in 2012, applies to most new building permits and applies across all of London and to most land use (though education and health are exempted). S.106 agreements, which are allowable under the 1990 Planning Act, are in practice a developer contribution fee. With regard to the funding of Crossrail, the negotiation of such agreements applies only to office, retail and hotel developments in three specific locations: Central London, Isle of Dogs and the areas around other Crossrail stations.

Up until 2015, lower than expected levels of construction activity ensured that the MCIL did not generate the anticipated revenue stream, although this did not have any detrimental impact on the funding of the Crossrail project due to the ability to tap into other funding sources such as the BRS (Petretta, 2014). Subsequently, development activity has increased and, as of March 2017, £382m had been generated by the MCIL. In the same period £101m was raised by S.106 contributions. The GLA estimates that the target of £600m will be reached by April 2019, with most of it continuing to be generated by the MCIL.[7] The fact that even the modest target of £300m for S.106 agreements will not be reached highlights the problems with seeking to use this mechanism to part-fund infrastructure. Not only are such agreements time-consuming and complex to negotiate, but there is also growing evidence from across the UK that developers are able to claim unviability in order to substantially reduce their obligation to either make a financial contribution or provide affordable housing (Wainwright, 2014). Local authorities often lack the

[7] In the original funding plan it was expected that each measure would raise £300m each.

capacity to effectively challenge a developer's financial projections and are also under pressure to be seen as being pro-development, leading to reluctance to impose additional charges. Interestingly, TfL still see a role for bespoke S.106 agreements but only in instances where there is an anchor landowner or developer as this facilitates a more straightforward and transparent negotiation.

Commercial Property Developments

Finally, Crossrail Ltd has initiated a further land value capture mechanism linked to property development. In particular, it has integrated the design for 12 major property developments over and around its central London stations, covering approximately 3 million sq. ft. of high-quality office, retail and residential development. Planning consent has been secured for all 12 major sites and private-sector development partners are already collaborating with Crossrail's land and property team on a number of these projects. Receipts from these property developments are targeted to generate an income of £500m, which equates to around 3.4 per cent of the total project budget.

7.4 Crossrail 2

Following on from Crossrail 1, TfL in collaboration with Network Rail are now sponsoring an even larger public transit infrastructure project, the £30bn Crossrail 2. This mega-project involves building a railway linking the national rail networks in Surrey and Hertfordshire via an underground tunnel through London. Replicating the model used for Crossrail 1, a private company wholly owned by Transport for London, Crossrail 2 Ltd, has been established to deliver this transport infrastructure project.

TfL and Network Rail argue that Crossrail 2 will transform travel across London and the wider South-East through additional rail capacity, reductions in journey times and the alleviation of congestion on networks. From an economic perspective, Crossrail 2 is expected to support up to 200,000 new employment opportunities in London and the wider South-East as well as around 60,000 jobs in the construction sector and supply chain across the UK. Analysis undertaken by KPMG suggests that the productivity benefits associated with this mega-project could add up to £102bn in GVA to the UK economy.[8]

A Transport and Land-Use Project

Importantly, the construction of Crossrail 2 is also now viewed as being a key policy initiative for addressing the deepening housing crisis in London and the wider South-East region. By improving transport links to under-developed areas, thus making sites more attractive to developers Crossrail 2 is seen as key to unlocking land for housing development. It is estimated that this, in conjunction with housing

[8] See https://tfl.gov.uk/info-for/media/press-releases/2015/september/research-confirms-benefits-of-crossrail-2

densification around existing and connecting stations, could deliver at least 200,000 additional homes for London and the wider South-East region. This potential contribution to addressing the housing crisis was a key factor in the National Infrastructure Commission's (NIC) conclusion that the strategic case for CR2 was well established and that it should be progressed as soon as possible (National Infrastructure Commission, 2016). The NIC did, however, stipulate that a clearer articulation of the strategy for unlocking potential housing growth was now required.

It is accepted that realising the housing potential of this project necessitates that investment in rail infrastructure be part of a wider integrated growth strategy for jobs and housing. The NIC suggests that Crossrail 2 actually provides an opportunity to rethink how housing is planned and delivered in London and the South-East. Realising this policy opportunity, however, will require not only substantial investment in hard infrastructure but also the implementation of an ambitious and integrated set of policy measures and instruments tailored to reflect local opportunities and context (Crossrail 2 Growth Commission, 2016; National Infrastructure Commission, 2016).

First, there is a need to introduce a series of fundamental changes to current planning policies at both the City and borough/district levels, including:

- an increase in the rate of Strategic Industrial Location (SIL) land release for housing development;

- allowing for higher levels of housing density development, including the densification of existing estates, and

- facilitating densification in and around Crossrail 2 stations, including, where appropriate, the limited release of Metropolitan Open Land and Green Belt Land.

Secondly, as neither the London Plan nor any individual local authority plan covers the entirety of the Crossrail 2 route, it will be necessary to develop a coordinated planning framework involving all the relevant actors—the GLA, London Boroughs, adjoining counties and central government—as this is key to realising the potential of policy instruments for land assembly, delivering development and capturing value.

Thirdly, the CR2 Growth Commission has highlighted the key role that land assembly has to play in ensuring that Crossrail 2 unlocks sufficient land to provide the anticipated 200,000 additional houses. In addition to the GLA making greater usage of their powers of acquisition, the CR2 Growth Commission has proposed that Crossrail 2's powers under compulsory purchase be strengthened to enable the assembly of land beyond that which is required for the delivery of infrastructure works. This would enhance Crossrail 2's capacity to assemble packages of land that are necessary or desirable to support housing and jobs growth.

Finally, both the NIC and CR2 Growth Commission have recommended that new development corporations with the powers to combine plan-making, land assembly and consenting could be the most appropriate vehicle to ensure that this project delivers on its housing potential. The Growth Commission report suggests that there is merit in looking at a number of different types of development institutions, including Mayoral Development Corporations, a Crossrail 2 Development Corporation, New Town Corporations and public/private joint-venture partnerships. Although these various policy proposals are linked to the Crossrail 2 project, the NIC suggests that these measures could be considered as a potential model for improving housing delivery more widely. Increasingly Crossrail 2 is being branded as a 'land-use and transport project', which reflects the increased emphasis on its contribution to improving housing supply in addition to the economic and transport benefits it will generate.[9]

Given the scale of the costs associated with CR2, it is not surprising that the issue of how this project will be financed and funded has been the key policy challenge in securing sign-off from central government to enable the project to begin after a series of ongoing delays. This challenge was recognised by the NIC (2016) which, in stating that the project should be progressed as soon as possible, recommended the need to:

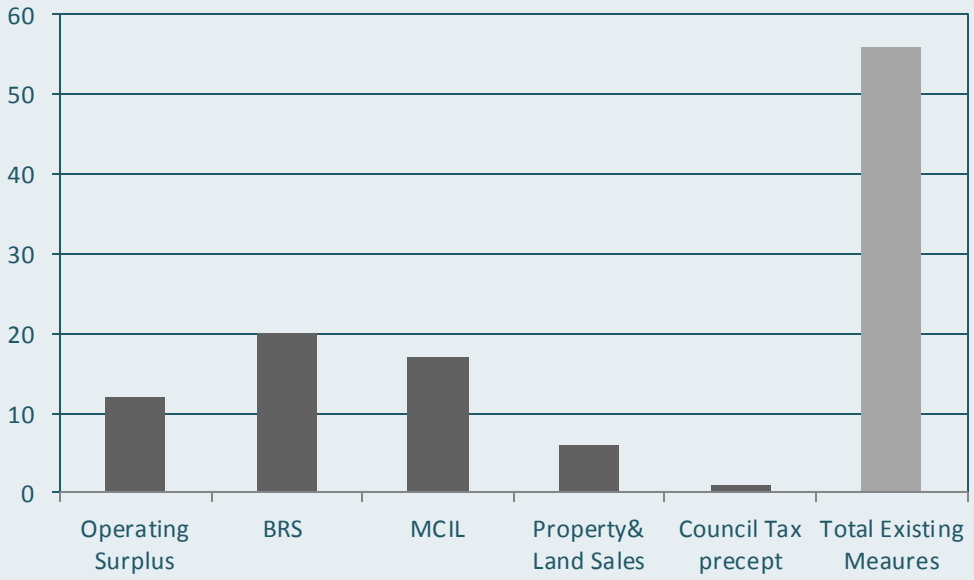
- identify proposals to phase costs and address affordability;
- maximise private-sector involvement in the development and funding of stations, and
- deliver a funding plan based on London contributing at least 50 per cent of the total £30bn project costs.

In March 2017, Crossrail 2 submitted a new strategic outline business case to government which included their proposals on how they would contribute to the CR2 project costs. This business case has not yet been made publicly available. Figure 1, however, gives an indication of how Crossrail 2 at the end of 2016 envisaged London covering approximately 56 per cent of the total budget for this project. This funding package includes a number of specific land value capture mechanisms similar to those used in the CR1. First, there is the proposal to continue the BRS once Crossrail 1's debt is repaid in the early 2030s with the revenue hypothecated to Crossrail 2. Similarly, a new MCIL linked to CR2 could be introduced as the current MCIL is due to conclude once the construction of CR1 is finished in 2019. Thirdly, it is argued that the Olympic Tax Precept, introduced as part of council rates to fund the 2012 Games, should be retained to support CR2, though this would generate only 1 per cent of the total project budget. Fourthly, it is estimated that property and land sales particularly linked to developments over

[9] M. Dix (CEO, Crossrail 2) presentation to Waterside Conference on the National Infrastructure Commission, May 2016.

and adjacent to Crossrail 2 stations could generate approximately 6.1 per cent of the total budget. Crossrail 2 have indicated their openness to leveraging private-sector investment to help fund the stations, though only on the basis of a mutually beneficial partnership: 'you are not giving the stations away to build so that the private investor can recoup all of the oversite benefits in the long term' (M. Dix, CEO, CR2, 2017).[10]

Figure 1: Direct London Contribution to Crossrail 2 Funding



Finally, it is worth noting that CR2 are also actively exploring the potential of investment by UK pension funds. Although to date UK-based funds have been relatively reticent to invest in infrastructure construction, the £4bn Tideway Tunnel project has attracted around £400m in long-term financing from various international pension funds.

Overall, the four land value capture measures in conjunction with an estimated operating surplus of 12 per cent will enable 'London' to contribute nearly 57 per cent of the total project costs for this £30bn infrastructure initiative. While this represents a large increase in direct contributions compared to Crossrail 1, the problem is that a number of these funding streams—BRS, operating surplus and

[10] See https://www.constructionnews.co.uk/analysis/interviews/crossrail-2s-michle-dix-how-london-can-find-the-funds/10022265.article

oversite development—which are expected to account for nearly 40 per cent of the total budget are not available to fund upfront construction costs.

Although the BRS has proven to be an effective land value capture mechanism, Crossrail 2 would not receive any revenue until around 2033, some nine years after the project is to begin construction. Similarly, capturing any uplift from land and property sales is again very dependent on the project being up and running and likely to be completed. Finally, any operating surplus will only begin to be generated once the service is operational in the mid 2030s.

This asymmetry between upfront financing costs and future revenue generation mechanisms is one of the challenges associated with specific land value capture mechanisms. As noted earlier, MTRC's successful approach to direct land value capture is premised on a long-term investment strategy, as the profits from land, property and commercial development have to be built up over a few decades from an initial low base. This is a critical issue for, although the UK Government has recently stated its support for the Crossrail 2 project, following a period of some uncertainty and tension between the Department of Transport and the GLA, it is recognised that the precise details regarding each partner's relative contribution and when they should make that contribution are still being negotiated. To some extent this latter issue would appear to more of a stumbling block as it is assumed that London will contribute at least 50 per cent, if not more, to the overall project.

The only mechanism that will provide funding in the short term is the implementation of a new MCIL; significantly, the mayor of London has recently initiated a consultation document on introducing such a policy instrument for CR2 in 2019.[11] While replicating the model of three different location-based charging bands, the proposed MCIL 2 is premised on charging higher rates for new developments than under the original scheme. Additionally, even higher rates for office, retail and hotel development are proposed for Central London and the Isle of Dogs on the premise that these areas have the highest potential commercial development arising out of the Crossrail 2 project.

The introduction of a new dedicated MCIL with higher associated payments is clearly a key goal for Crossrail 2 Ltd as it would help to alleviate some of the funding challenge they face. It is accepted, however, that this on its own will not be sufficient. The chief executive of the company has publicly stated that taking advantage of the potential £60bn in land value uplift could be the key to addressing their funding challenge. As will be discussed below, a taskforce has been established to design a new land value capture mechanism and it is assumed that this will be applied on a pilot basis to CR2.

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[11] See https://www.london.gov.uk/what-we-do/planning/implementing-london-plan/mayoral-community-infrastructure-levy

7.5 TfL and Land Value Capture Proposals

In 2017 TfL produced a new study on 'Land Value Capture' in which they stated that, since public transport generates substantial positive externalities, it is not fair or feasible that all the burden of funding should fall on commuters and/or the general taxation system. Furthermore, given the combination of reduced central government funding and the growing costs of meeting London's future transport needs, TfL concluded that land value capture mechanisms needed to be viewed as a core part of the alternative sources for funding investment in maintenance, upgrades and line extensions.

TfL thus proposed the adoption and/or further exploration of a suite of policy instruments designed to support the funding of strategic transport infrastructure by improving both the extraction of land value uplifts on new and existing stock and the extraction of planning gain from new developments (see Table 3).

Table 3: TfL Recommendations on Land Value Capture

Improve the extraction of land value uplifts on new and existing stock	Improve the extraction of planning gain from new developments
The government should explore with the mayor a framework for assigning zonal value growth in Stamp Duty Land Tax (SDLT). This could be part of a wider devolution of SDLT receipts or be limited to designated zones.	For zones with low to medium development potential with multiple landowners, the government should maintain the mayor's powers to levy a Community Infrastructure Levy (MCIL) as a general development tax that contributes to strategic transport infrastructure.
As part of the business rates reform, the government should consider regular revaluations and full zonal retention of revaluation growth from business rates as part of a wider devolution deal or through greater use of Enterprise Zones.	Bespoke section 106 developer contributions should continue to be negotiated on transport-dependent developments where there is a clear anchor landowner or developer.
The feasibility, effectiveness and acceptability of creating a new land value capture charge—such as a transport premium—should be explored further.	For zones with high development potential (particularly for housing) with multiple landowners, the government, TfL and GLA should consider designing a Development Rights Auction Model (DRAM) as a new land value capture mechanism.

Source: TfL, 2017: 9-10.

A number of features of these proposals are worth highlighting. First, TfL distinguish between measures designed to improve the extraction of land value uplifts from existing and new stock, and those designed to improve the capacity to capture planning gain from new development.

Secondly, TfL recognise the need to put in place a package of land value capture mechanisms rather than seeking to identify a single measure that will work most effectively. This package is comprised of a combination of existing measures (MCIL and S.106); adaptations to current measures (zonal retention of both business rates and Stamp Duty Land Tax), and the adoption of new and innovative instruments (transport premium and DRAM). A diversity of funding sources serves to give particular projects greater flexibility and ensure that they do not depend on a single measure, which can be problematic if that measure does not generate the expected revenue stream.

Thirdly, there is an emphasis on tailoring policy instruments to specific locational contexts in terms of different measures for areas of low to medium development potential compared to a zone with high development potential. Similarly, where there is a clear anchor developer or landowner, existing S.106 agreements are viewed as the best way to capture planning gain.

Fourthly, the DRAM, BRS retention and MCIL aim to address the challenge of the mismatch between the initial investment and capturing future value uplift as these measures can generate upfront revenue for a particular project.

Fifthly, a number of the new measures proposed are intrinsically linked to the issue of further devolution of fiscal powers to the mayor and the GLA, both in terms of full retention of major property taxes in designated zones (Stamp Duty Land Tax, business rates) and the powers to introduce new charges and levies.

Sixthly, TfL recognise that the viability, feasibility and acceptance of such instruments still needs to be worked out between the key stakeholders, in particular the GLA and central government. For example, while the idea of a new transport premium charge that would capture transport-induced value uplift in residential property is appealing in terms of fairness and effectiveness, it is accepted that this will be difficult to implement, and TfL have thus called for the initiation of wide consultation on this matter. Therefore, rather than saying that they have fully worked out the design of new land value capture mechanisms, their report signals the types of issues that should be part of the future policy dialogue and negotiations on how to fund strategic transport infrastructure.

Although there is a need to tailor policy instruments to specific contexts and projects, TfL argue that land value capture should be managed as a programme at corporate rather than project level in order to ensure that exposure to property market risks is diversified across a portfolio of projects. Additionally, the report states, pooling the revenue from a range of land value capture mechanisms into a strategic transport programme could create an infrastructure fund that could be used to support future projects, thus reducing borrowing requirements of such a programme. Although this would break the direct link between payment of charges

and the delivery of a specific project, the fact that the funds are still ring-fenced for strategic infrastructure is important. It would also give TfL the capacity to use collected funds to kick-start projects, which in turn can create further revenue-generation opportunities.

Finally, in making these recommendations on land value capture policy instruments, this report highlights the need for the UK Government to make the process of acquiring land through compulsory acquisition more transparent. This reaffirms that, in relation to strategic transport infrastructure, enhancing the effectiveness of land value capture mechanisms is intrinsically linked to the issues of how land is assembled for development and at what cost.

Drawing on internal modelling analysis, TfL estimate that the full application of all these policy instruments across eight planned transport projects with a collective budget of £36bn could generate between £29bn and £41bn in revenue, which is a considerable sum. This level of revenue would substantially enhance the mayor's capacity to fund the transport capital expenditure programme and improve transport connectivity to poorly served areas, thus unlocking new housing supply. It also has, they argue, the potential to improve the ability to support affordable housing through new developments around new transport investment.

As stated earlier, a number of the land value capture mechanisms that TfL are proposing for adoption are still very much in the policy deliberation and/or design stage. At the same time, it is evident that TfL now view land value capture as a core tool for the funding of not only strategic transport infrastructure but also for stimulating the supply of affordable housing. Furthermore, the range and types of measures they are proposing also demonstrates that the level of ambition for such mechanisms has clearly increased. In part this is due to the experience and learning from a number of transport projects. Equally, it is a recognition that meeting the transport, housing and economic needs of London requires a fundamentally new approach to the long-term financing and funding of strategic transport infrastructure (GLA, 2017a).

7.6 Land Value Capture and Affordable Housing

As noted above, TfL indicate that the adoption of a proposed suite of land value capture mechanisms has the potential to not only enhance the capacity to fund London's transport capital expenditure programme but also improve the ability to support affordable housing through new developments around new transport investment.

Interestingly, TfL have initiated a new programme that aims to use a proportion of their extensive 5,700-acre estate, which includes land and properties, to both support the mayor's commitment to build affordable housing and also generate revenue to invest in improving the city's transport network. An internal team has been established to provide a long-term development pipeline aimed at delivering around 10,000 homes, 50 per cent of which will be affordable, across a total of 300 acres of TfL-owned land. In 2016/17 TfL brought sites to the market that will provide 1,000 homes, with an expectation that half of them will be affordable. In

implementing this programme, TfL have indicated a willingness to adopt a number of different approaches to site development, including a property partnership framework of leading developers, direct-development and site-specific partnerships. There are also plans to release a number of smaller sites in the future, which again may require a different developmental model. Box 6 provides a brief overview of two of the sites being developed through TfL's property partnerships framework.

In addition to enhancing housing supply and supporting affordability, this initiative is also viewed as an important source of revenue that will be reinvested in maintaining and upgrading the transport network. TfL expect to generate approximately £850m from its property development programme—offices, retail and housing—over the next five years. Most of this revenue will come from the rental income on property. This new source of revenue is critical for TfL, given that their subsidy from central government is due to be reduced by £700m in the same period.

Within this overall programme, the nature and scale of the development that takes place in each of the projects is highly site-specific. Thus, in the two examples described in Box 6, the number of houses provided ranged from 80 to 400. It may also be the case that the balance between residential and commercial development will vary. Differences in the nature and scale of projects and also their location suggest that the level of land value capture will vary by project. The adoption of a programmatic approach, however, enables TfL not only to manage the financial risk associated with individual projects but also to pool overall revenues into a larger fund to support their transport infrastructure.

The TfL initiative is a prime example of policy innovation, since it combines:

- development of public land to deliver public policy initiatives;
- active intervention in the housing and commercial property markets;
- use of land value capture to support investment in public transport;
- the building of affordability into the supply of housing, and
- transit-orientated development.

Significantly, in the context of this report, it combines enhancing housing supply, improving affordability and use of land value capture to fund infrastructure. It is also worth reiterating that it is London's Transport Authority that has undertaken this active developmental role in urban place-making. This has not required the acquisition of any new powers but rather appears to be premised on an organisational willingness to embrace a broader mandate and to use existing resources and assets to deliver public policy goals. Aside from their status as a devolved transport authority, the political support of the mayor for initiatives that generate revenue for public investment and/or improve the supply of housing,

including affordable homes, appears to be a key factor in TfL's willingness and capacity to engage in new areas of activity.

Box 6: TfL's Affordable Housing and Value Capture Programme

In March, TfL selected Triangle London Developments—a consortium of the developer U&I and the housing association Notting Hill—to build 400 homes, develop commercial, retail and office space and provide an improved transport hub and new village square at Kidbrooke-Greenwich. This four-acre site was the first to be awarded using TfL's Property Partnerships Framework. A joint-venture partnership is being established to deliver the project. In accordance with mayoral priorities, 50 per cent of the homes will be affordable. This site, which had been vacant for eight years, benefits from its proximity to the Zone 3 Kidbrooke national rail station and the Henley Cross bus station. The mayor has also committed to fast-tracking more public land for development as part of his new Housing Strategy.

In July this same consortium was chosen as the preferred bidder to develop Landmark Court, a 1.8-acre site that TfL owns near Borough Market in south London. This development—currently being used as a carpark and within walking distance of London Bridge station—is to have about 130,000 sq. ft. of commercial and retail space, as well as 80 new homes of which at least 35 per cent will be officially classed as 'affordable'. Assuming planning permission is secured, the development is expected to be completed in 2022. Again, a joint-venture partnership between TfL and this consortium is being used to deliver this project.

In addition to enhancing housing supply and supporting affordability this property development programme is also viewed as an important source of revenue that will be reinvested in maintaining and upgrading TfL's transport network. TfL expects to generate approximately £850m from its development programme—offices, retail and housing—over the next five years. Most of this revenue will come from the rental income on property. This new source of revenue is critical for TfL since their subsidy from central government is due to be reduced by £700m in the same period.

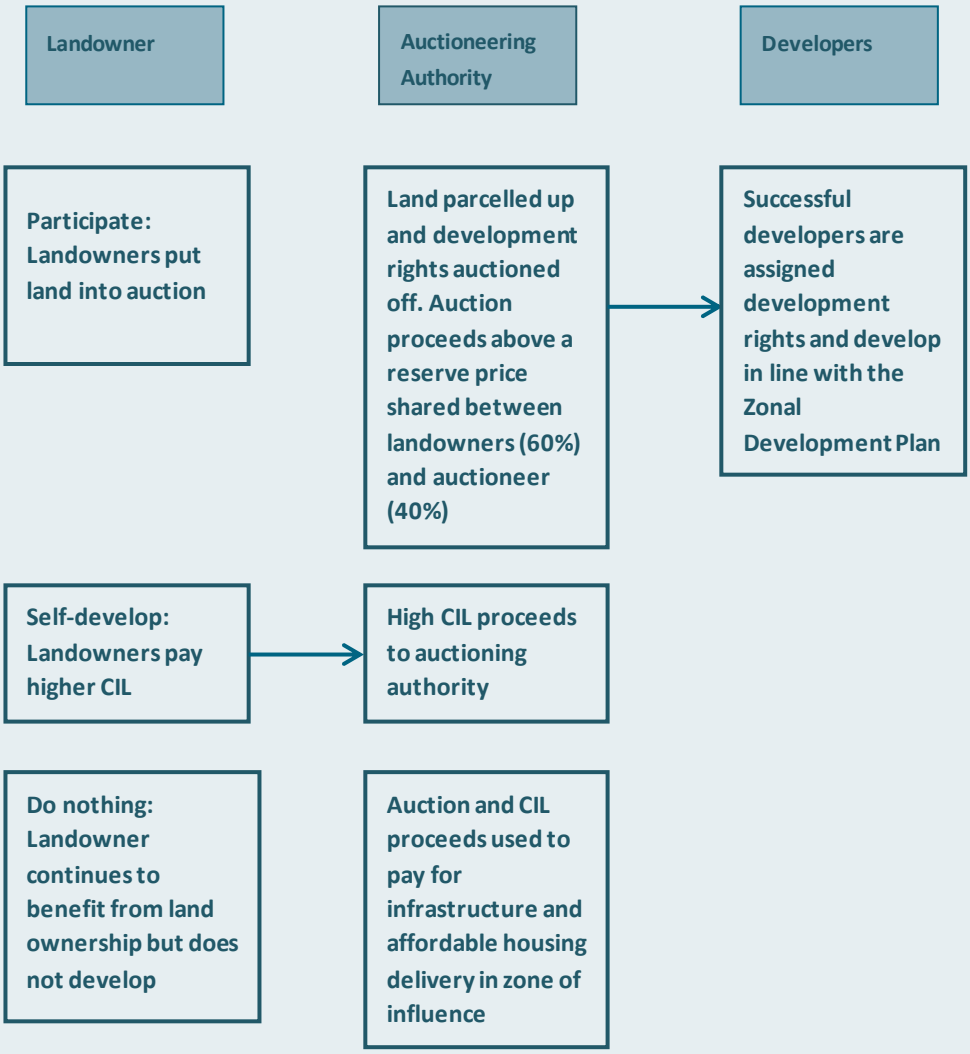
7.7 Memorandum of Understanding on Devolution: a New Opportunity for Land Value Capture

In March 2017, the British Chancellor of the Exchequer, the Minister for London, the Mayor of London and the Leader of London Councils signed a new memorandum of understanding (MoU) on further devolution of powers to the GLA.[12] This MoU covers a number of key policy issues, including infrastructure funding and retention of business rates.

[12] See https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/597291/London-Devolution-MoU.pdf

In relation to the development and funding of infrastructure, the UK Government has agreed to establish a joint taskforce bringing together the GLA, TfL, London councils, HM Treasury, Department for Transport (DfT) and Department for Communities and Local Government (DCLG) to explore the options for piloting a Development Rights Auction Model (DRAM) on a major infrastructure project in London, with the most likely candidate being Crossrail 2. The adoption of a DRAM as a land value capture mechanism for zones of high development potential was one of the main proposals in TfL's land value capture report (see Table 3). The main elements of this model are outlined in Figure 2.

Figure 2: Development Rights Auction Model



The negotiation of this MoU reaffirms the link between the process of devolution and the ongoing policy dialogue about how to fund infrastructure within city regions. It is worth noting, for example, that the development of an innovative earn-back model for financing Manchester's light metro was part of one of the GMCA's devolution agreements (NESC, 2017).

Secondly, it suggests that central government is supportive in theory of new land value capture mechanisms, which is interesting given that historically there was a lack of support from the Conservative party for such measures (Aubrey, 2016; Grover, 2017). As noted earlier, a strong political consensus is key to ensuring the effective implementation of land value capture mechanisms.

Although the proposed DRAM still has to be designed and agreed by the Taskforce, TfL have already outlined in principle how this policy instrument would work (Figure 2 (TfL, 2017).

First, it requires the relevant transit authority working with urban planners to draw up an integrated development plan in a defined zone around a major transport facility. Within this defined zone, the planning and consenting of land use and density and the planning of transport investment are fully integrated. Furthermore, the focus of the former is to maximise the degree of land value capture from improvements in accessibility and to stimulate urban regeneration.

Secondly, a periodic development rights auction is held in which the development rights over land voluntarily put forward by landowners are auctioned in assembled packages to a competitive field. Non-operational but developable public-sector-owned land would also be entered into the auction as part of standard public-sector pooling arrangements. Financial gains above a reserve price for the packaged land are then shared between the landowners and auctioneering authority, most likely on a 60:40 basis. No development taxes (CIL or S.106) are payable by those participating in this scheme. If landowners decide not to participate, they have the choice of self-developing or not developing. In the former instance they will be liable to a high Community Infrastructure Levy (CIL). Finally, the proceeds from the auction and the CIL will be used to fund infrastructure costs and affordable housing within the designated zone of influence.

For the relevant transit authority, the benefits of this model are that it has the potential to provide upfront revenue without having to undertake expensive land acquisition. TfL research suggests that the application of DRAM to a small number of appropriate projects currently in the pipeline could generate around £3bn in land value capture to support infrastructure and affordable housing. Secondly, the integration of planning, consenting of land use and density rules with transport investment facilitates a focus on smart transit-orientated development within the designated zone of influence. For landowners, the advantage of the DRAM is that participation is voluntary. They retain most of the uplift in land value and have the opportunity through land pooling to maximise the value of their land by making it part of larger development site that has planning permission. Finally, developers who are not landowners do not have to engage in pre-planning speculative land

purchase. And, if successful in the auction, they have full planning rights to develop in accordance with the Zonal Development Plan, which is 'development-focused'.

As this scheme is voluntary, there is potential for landowners to engage in holding out. TfL suggest that a combination of measures could help mitigate, if not fully remove, the holdout problem, in particular early engagement and consultation with landowners regarding the zonal plan; the financial incentives to cooperate; the potential higher levies for self-development, and a credible threat of CPO.

TfL also highlight that implementing such a scheme will have to overcome a number of possible barriers including building capacity and expertise in the public sector; opposition to active public intervention; sectional property interests; a lack of cooperation by planning authorities, and the need for new legislation.

Although the final design of any DRAM has to be agreed by the Taskforce, the concept as proposed by TfL is quite ambitious and shows the extent to which land value capture as a funding mechanism has been embraced by the key transport institution in London. Secondly, TfL's DRAM is clearly focused on generating revenue to support both the provision of transport infrastructure and affordable housing. This reaffirms that, in the context of London, regional strategies for public transport and affordable housing are increasingly seen as being interdependent.

The DRAM example demonstrates that ambitious land value capture mechanisms associated with transport infrastructure need to be fully integrated with land-use planning in order to be effective. Similarly, maximising the potential of such mechanisms also requires the relevant public body to have a strong developmental and interventionist ethos and the capacity to assemble sufficient land for development without having to engage in speculative and expensive land acquisition.

8. The Adoption and Implementation of Value Capture Financing: Key Lessons

There appears to be a fairly strong policy rationale for greater use of value capture mechanisms in the financing of urban public transport, and there are a number of high-profile examples of this working in practice. However, it can still be difficult to move from the acceptance of this concept to actually adopting and implementing it in practice. As Salon (2014) argues, the real challenge is how can transport bodies transition from being reliant only on state funding and fare-box revenue to being willing to embrace a more comprehensive and complex financing package that incorporates the appropriate use of mechanisms to capture the value that transport systems add to locations?

8.1 Institutions Matter

First, it is important to have in place institutions with the willingness, capacity and authority to adopt and implement value capture mechanisms. Salon (2014) highlights that, in both London and Paris, the existence of governmental bodies with region-wide authority over transport and its financing has enabled the implementation of certain value capture mechanisms. In the former example, the fiscal powers afforded to the mayor under devolution arrangements have enabled the introduction of policy instruments designed to generate revenue to support investment in strategic transport infrastructure. The ongoing work around a new DRAM to fund infrastructure was also facilitated by the latest MoU on Devolution. The further development of a more sophisticated and effective suite of land value capture mechanisms in London would also appear to be intrinsically linked to the debate about further devolution of fiscal autonomy to the capital. More extensive fiscal autonomy would afford the opportunity to raise and retain higher levels of revenue from land value capture mechanisms. It is also suggested that social support for such measures would be enhanced by increased fiscal devolution and autonomy.

8.2 Institutional Mandate and Culture

The institutional mandate and culture of the transport agencies is also critical, as it determines how they react to both opportunities and challenges with regard to funding and development. It is not uncommon to find public transport bodies that rely heavily on a combination of state funding and fare-box revenue and also have a narrow service-orientated mandate. Equally, there are examples of other transport authorities that have been willing or indeed forced to embrace alternative funding models and have also recognised the need to adopt a more proactive approach to fostering economic growth and/or urban (re)development. The WMATA has been characterised as having an entrepreneurial spirit and has embraced land value capture as a core principle of its mandate (Mathur, 2012; Schlickman *et al.*, 2016). Similarly, TfL have been to the fore in making the case for alternative ways of funding strategic infrastructure, with a particular emphasis on adopting a range of value capture policy instruments. It has also begun to explore land development initiatives that would generate rental revenue for transport, increase housing supply and support affordability.

8.3 An (Ambitious) Developmental Approach

It was suggested above that using value capture mechanisms to fund strategic public transport projects can facilitate the emergence of a more developmental approach to infrastructure. This relationship can work the other way in that the adoption of a developmental ethos by relevant institutions can encourage greater willingness to explore the potential of various land value capture mechanisms in seeking to achieve key policy outcomes.

A developmental approach recognises that strategic transport infrastructure not only delivers a key service but also has an enabling role in terms of its impact on other key policy areas. Furthermore, transport investment, when combined with a

complementary suite of policies, can contribute to the achievement of the long-term public goals of sustainable environmental, economic and social development.

This developmental ethos can be embedded in the relevant transport authorities; for example, the WMATA, the MRTC and TfL. There is also a case for establishing bespoke development institutions that have a concerted focus on delivering a specific project and/or developing a particular location. In both instances a developmental ethos can move the policy focus beyond the delivery of particular assets—a railway extension or additional houses—towards an emphasis on place-making premised on sustainable urban development.

This invariably creates a more complex policy challenge for the relevant institution(s), with the need for strong inter-institutional cooperation and coordination across interdependent policy areas. At the same time, embracing a more ambitious developmental approach may actually open up new possibilities for policy innovation and collaborative problem-solving, particularly when such activity is focused on particular bounded projects.

8.4 Organisational Capacity

Designing and implementing effective land value capture mechanisms also requires public authorities to invest in building their organisational capabilities, particularly in terms of having a team with relevant expertise and knowledge of financial markets and instruments; urban economics; infrastructure financing; the real-estate market; project management, and the development industry (Cheshire *et al.*, 2014; Schlickman *et al.*, 2016). As the UK's Infrastructure and Projects Authority have highlighted, a combination of the increasingly complex context for infrastructure development and the emergence of new ways of working, in particular the need for an active collaborative relationship with the private sector, has necessitated investing in improving public-sector capacity (IPA, 2016).

8.5 A Financing Crisis

A crisis in transport financing can serve as a catalyst for embracing new approaches to funding. In particular when state funding is not sufficient to fund systems operations, maintenance and/or new infrastructure, transport bodies are forced to look at and adopt new funding approaches (TfL, 2017; Schlickman *et al.*, 2016). Salon (2014) suggests that, in four of her case-study examples (see Table 1), value capture was embraced as a last resort to address serious shortfalls in funding. Similarly, in making the case for wider usage of value capture, the Australian Government argues that the need for further transport infrastructure projects is greater than can be currently funded using existing taxpayer and user-based funding sources. It is worth noting that this type of financial crisis did not seem to be a factor in either Hong Kong or Tokyo, where since the 1970s the rail-based systems have been constructed on a platform of value capture that involved integrating land development with transport development (Suzuki *et al.*, 2015).

8.6 Multiple Jurisdictions

Experience indicates that seeking to implement value capture strategies across multiple jurisdictions is especially difficult. For example, the Washington Metropolitan Area Transit Authority (WMATA) receives subsidies for its operations and capital expenses from the District of Columbia, the State of Maryland and five cities and counties within the Commonwealth of Virginia. This institutional structure protects the WMATA from budgetary crisis. As noted earlier, the WMATA has undertaken land value capture-based projects in the Washington area. However, although a large-scale, system-wide location value capture programme is attractive to the agency, it is impossible to put in place because of a misalignment between political governance and the agency's functional service area. Additionally, the legal frameworks for taxation are substantially different in each political jurisdiction, which further complicates any attempt to develop a system-wide model of value capture.

8.7 Projects and Policy Learning

In situations in which there has traditionally been limited use of value capture mechanisms to fund strategic infrastructure, specific ambitious projects can be a conduit for greater willingness to adopt new approaches to funding, especially if central government is unwilling to totally fund the initiatives. The actual doing of the project can also generate new insights and thinking with regard to policy actions and ways of working.

A key learning for both the WMATA and TfL from initial uses of fee/tax-based land value mechanisms was that there was a sense of missed opportunity in that, given the scale of development that eventually took place, they could have been more ambitious with regard to the level of revenue they sought to capture. Both these organisations have adopted a strong, consistent approach to the importance of using land value capture while continuing to be open to new ways of achieving this objective. It is also important to recognise that increasingly, in practice, there is a closer meshing of the ends (policy objectives) and the means (financing, funding and planning). In the case of Greater Manchester, for example, the adoption of a more developmental place-making strategy, an ambitious transport project and the design of an innovative funding model were all interlinked (NESC, 2017). Similarly, the deliberations around the funding model for Crossrail 2 and the type of objectives that this project is now aiming to achieve are interlinked.

To a degree, the UK experience of undertaking mega transport projects is an example of a phenomenon noted by Healey in her overview of the nature and role of spatial planning in the early 21st century, *Making Better Places* (Healey, 2010). She observes that, in a context in which comprehensive spatial planning is less possible, and certainly less in evidence, specific ambitious *projects* can be the means through which place-making agendas are often pursued (*ibid.)*. As highlighted above, the NIC have suggested that Crossrail 2, for example. could provide an opportunity to rethink how housing is planned and delivered in London and the South-East.

8.8 The Centrality of Land

Adopting effective value capture mechanisms to fund public transport requires more active land management. In particular, ensuring a sufficient supply of land for development at an affordable price is critical to both the types of measure that can be adopted and their potential effectiveness. The foundation or starting point of the MTRC's highly successful Rail + Property model is their ability to acquire land for transport and development at pre-development prices. The WMATA have used a combination of their own land and purchased land to build a land portfolio that they then market to private developers. A key reason why TfL have championed the Development Rights Auction Model is that it would enable the transport authority to assemble land for development on a voluntary basis, thus avoiding the need to engage in costly and time-consuming land acquisition. The same organisation is using its land bank to underpin a development programme designed to increase the supply of affordable housing and generate revenue for reinvestment in transport services. It is also accepted in the UK that there has to be greater use of CPO and that, in essence, this policy lever has to be viewed as a credible threat by landowners.

One land has been assembled, it is essential to have in place supportive land-use policies that not only facilitate land value capture but also foster sustainable urban development (National Bank, 2014). As noted earlier, the impact of public transport on land values is in part dependent on both the location of the land in the city and the adoption of transit-orientated development policies, including land-use policies that support higher-density development (Salon, 2014; Salon *et al.*, 2017).

8.9 Social Support

The adoption of a new charge or reallocation of existing tax revenues to a particular transport project necessitates social support. This is not always easy as there is a strong assumption that the state should pay for improvements in public transport. Similarly, rallying public support for additional charges is challenging, particularly in the current political climate. Thus it is not surprising to find that value capture mechanisms tend to focus on business and commercial properties.

Linking new or additional charges to the delivery of a particular project can serve to mitigate opposition to value capture mechanisms as it creates a transparent link between extra financial contributions and the generation of particular benefits that are associated with the project.

Of course, there also needs to be a belief that a particular strategic transport investment will actually deliver the expected benefits—e.g. enhanced accessibility and improved services, improved access to housing, economic growth and property uplift, and reductions in carbon emissions.

This highlights the need for key stakeholders to make the case both for the particular project and a new way of funding it. This task is part analytical, part communicative. For example, in relation to both Crossrail 1 and 2, a number of reports were undertaken that sought to demonstrate the benefits that would be

generated by each of these mega transport investments. This, however, has to be matched by extensive communication and engagement with both business and civic society.

8.10 Political Support

Once this type of social consensus is in place, political leaders need to be prepared to rally and authorise support for a project and the associated value capture instruments. This can be problematic. First, the benefits associated with major transport projects will often be medium to long-term in nature while the costs in terms of disruption or other negative externalities will often be immediate. Secondly, politicians tend to be reluctant to make the case for additional charges even if these are associated with improvements in services and/or broader economic and social development. At the same time, the mayor of London has been to the fore in championing the need for new land value capture mechanisms as part of a new funding model for strategic infrastructure. Similarly, in the case of Hudson Yards District, it was the mayor and city council who were the initial driving force behind the transit authority adopting new land value capture mechanisms. This type of political support can send a strong signal to public institutions and encourage them to adopt a more innovative approach to the funding challenge.

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