

Land value capture

Annexes



EVERY JOURNEY MATTERS

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Annex 1 – Land value uplift and public transport projects: theory and evidence

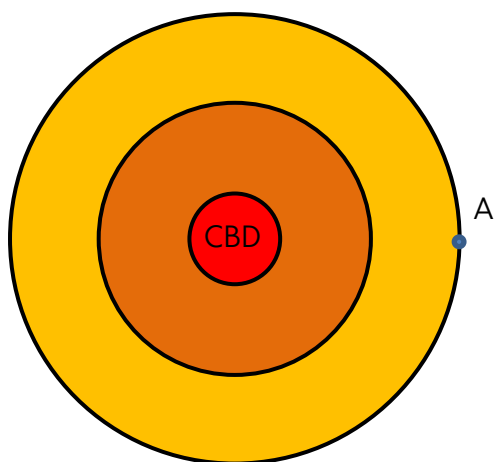
1. This annex summarises the theoretical and empirical insights from our review at Transport for London (TfL) of the literature on land value uplift. Study references are to the bibliography in the literature review.

Theory

The basic monocentric urban model

2. To develop the theoretical foundations for this study, we begin with the simplest case of the monocentric urban model. Consider a city with a central business district (CBD), where people work for a uniform nominal wage. Each person commutes from identical properties located in concentric rings around the centre (called ‘isochrones’). It takes the same time to the centre from any property on a given circle. But as one moves radially outwards from one circle to the next, the travel times go up and accessibility to the centre goes down uniformly (see **figure 1**).

Figure 1 – Monocentric urban model



3. This monocentric model makes simple predictions about the pattern of land values in such a city. Businesses as well as households will be in direct competition to locate within the central business district; businesses because they can serve the largest possible market of consumers from the centre, and households because living in the CBD minimises commuting times. Land values will therefore be highest in the CBD, and will then decline along a gradient as one moves outwards, as businesses drop out of competition for land, and households compete with each other in trying to locate as close as possible to the CBD. In equilibrium, real wages are equalised throughout as the reduction in land rents from moving outwards compensates for the increase in commuting costs, and no one has an incentive to migrate at the margin.

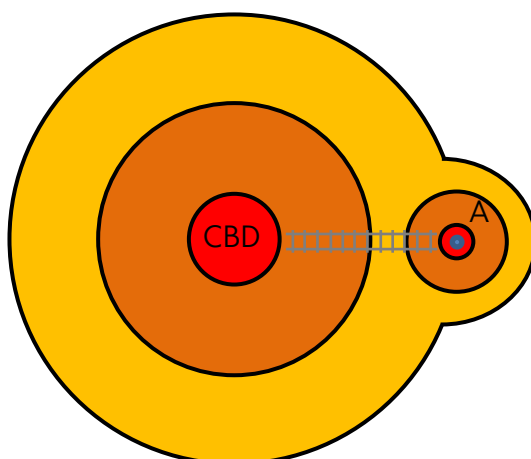
Introducing a transport intervention

4. What happens to land values if we introduce a public transport intervention¹ into this simple model? Imagine a transit link to point A on isochrone 2, which shifts all the properties located around point A in isochrone 2 'inward' to isochrone 1 by reducing journey times (see **figure 2**).

5. Transport economics theory tells us that all the transit users who are able to travel in from point A will experience an increase in real wages driven by a reduction in journey times and commuting costs (net of any fares charged). Now real wages are highest around point A, and everyone else will compete to locate there. This will drive up the price of housing (and land rents) around point A. If point A is a transit access point like a Tube station, then the theory suggests that competition between house buyers will create a similar pattern of a gradient in land values around point A as the gradient spreading out from the CBD, since accessibility to the CBD via point A will now vary with walking times to point A.

6. Beyond a reasonable walking distance (surveys of users in London suggests this is about one kilometre), commuters may choose no longer to use the transit link and the uplift in values should disappear altogether. This 'walkability' criterion should determine the project's zone of influence on land values.

Figure 2 – Monocentric urban model – impact of transport intervention



7. What will be the new equilibrium? As house prices around A rise, land rents will increase in concert. If the supply of land for new housing around point A is not completely inelastic, this increase in rents should lead over time to new housing development as more land is offered for residential uses.

¹ Most of the literature focuses on rail rather than road. One of the reasons for this may be that road projects do not usually involve discontinuous access points around which effects might be concentrated through a localised increase in demand for housing. The benefits of road projects tend to be dispersed over much larger geographical areas.

8. A new equilibrium will be reached once the increase in house prices just cancels out the real wage gains, and there is no further incentive to migrate from other locations to point A.² At this point, the transit project will have caused an increase in land values in a gradient around point A that has (a) lifted the prices of existing stock; and (b) induced the development of new housing. The increase in land values around point A (aggregated across existing and new housing stock) should equal the aggregate user benefits (or the original real wage gains) from travelling into the CBD from point A.

Predictions of the model

9. The simple model described above makes some powerful predictions about the land value uplifts of public transport projects: that they should scale with user benefits (in particular with journey time improvements to the CBD); that the uplifts should fall in a gradient around transit access points; that they should occur over time (following the availability of the new transport) as a new equilibrium is reached in the housing market with greater local supply and higher house prices; and that the extent to which the value of capitalised user benefits is distributed between existing stock and new development depends on the local elasticity of land available for housing.

10. This model makes no predictions about whether land speculators, developers or house buyers are able to anticipate the land value uplift prior to project completion. However, some of the empirical literature suggests that land values can indeed start rising straight after project announcement, and continue rising through the construction period, in anticipation of the eventual land value uplifts. There is no theoretical reason that this should always be the case.

Relaxing some of the model's assumptions

11. Consider next the effects of relaxing some of the assumptions in the basic monocentric urban model. What happens if nominal wages are not uniform (for example, if different workers are paid different wages based on skills and productivity)?

12. It is easy to show that the effect of this will be that land rents will still decline away from the centre, but the gradient will now depend not just on travel times but also on nominal wage differentials. The condition for equilibrium remains the same: land rent gradients will equalise the real wage everywhere so there is no net migration between locations. Similarly, if all locations are not identical in terms of place quality (for example, local schools, green spaces, community facilities), then land rents will differ both between isochrones, and along an isochrone.

13. Land rents will be lower in locations with poor place quality, but now equilibrium requires that real wage differentials between locations exactly compensate for place quality differentials. The important point is that in all these cases – so long as existing earnings and place quality differentials are unaffected by a change in commuting costs – once an initial equilibrium is reached, the effect of a new public transport scheme should be identical: to create an island of higher real wages compared to all other locations, which should cause the local demand for housing to rise, and induce a land value uplift in the manner as described above.

² For simplicity, we have focused here only on journey time benefits. But the model will predict exactly the same pattern of land value uplifts if users expect to derive other benefits from increased accessibility to the CBD via point A, such as access to a greater number of jobs, or more productive jobs. If this drives up the expected real wage from commuting via point A, it will drive up bids for housing around point A in the same way as above, until higher house prices cancel out the expected increase in real wages.

14. What happens if wage and place quality differentials are affected by the change in commuting costs? Although there is a sizeable literature on compensating wage differentials in the labour market, most of the cases deal with compensation for the location of the job, rather than the residence of the worker. For instance, many employers compensate workers for relocating their role from one city to another to reflect differences in the cost of living (for example, by paying a special allowance to relocate a worker from Manchester to London), or to compensate for the unattractiveness of working in particular locations (for example, by paying a hardship allowance to relocate someone from London to Kabul). These are not relevant for the monocentric model, where all (or most of) the jobs are located in the centre, and there is no change in their location.

15. The more relevant case for our purposes is when employers agree to reimburse commuting costs for employees (for example by paying for rail season tickets). Where such contracts are common, it is possible that some part of the reduction in commuting costs from improved public transport provision may be passed directly to the employer through reduced wages, and not get capitalised into land values. However, employers in the UK do not generally compensate workers for commuting costs. One reason for this is simply that it is inefficient in the UK – both the employer and employee are taxed on the benefit.

Theoretical conditions for land value uplifts on residential property

16. Is it possible to specify the conditions under which a public transport project will produce observable land value uplifts? There are three conditions that emerge from the theory:

- The transport project produces significant local benefits that are valued highly by users
- Access to these benefits depends on location, and the local demand for housing in those locations rises as a result
- The local supply of land is inelastic, so an increase in local demand for housing (even while inducing some new supply) causes land rents to rise

17. One implication of the first condition is that land value uplifts can be important markers of whether transport projects have in practice delivered benefits to users, and the scale of the uplifts should reflect the value placed on those benefits by users. Poorly planned or executed projects that fail to deliver the expected benefits should also fail to produce land value uplifts.

18. The second condition is more interesting. Land value uplifts arise because a real wage differential around a transit access point (relative to other locations) induces an increase in demand for housing in that location. There are two points worth noting here.

19. First, it is not obvious that the local demand should be a linear or continuous function of the real wage differentials produced by public transport. As place quality declines, it is possible that it takes larger and larger real wage differentials to encourage further inward migration from other locations, so the movement from one equilibrium to another becomes slower and more discontinuous.³ In such cases, improved accessibility to the centre can be a necessary condition for land value uplifts, but not a sufficient condition. The transport improvement may need to be accompanied by the delivery of other public goods to raise place quality before any significant land value uplift effects are observed.

³ The analogy here is with how, in the absence of a catalyst, an activation energy barrier can prevent chemical reactions from proceeding any further.

20. Second, the effect of local demand responsiveness on land rents may be heavily influenced by broader conditions in the economy and the housing market. It may be the case for instance that even though at the margin there is an increase in local demand for housing because of a transport improvement, this is swamped by a broader reduction in demand for housing overall due to recessionary conditions in the housing market. In such cases, one should still expect a gradient of some sort around the transport hubs, but not necessarily an absolute uplift in land values. Such positive uplifts may not become apparent until the property cycle has turned.

21. The third condition is fairly easy to satisfy in most urban contexts. The urban housing market tends to be relatively inelastic, and there are usually strict limits imposed on new development by city planners in light of the capacity of the transport network to deal with incremental traffic. In the accompanying literature review, we have included a review of the evidence on the extent to which housing supply responds to rising house prices in London.

Effects on commercial property

22. The monocentric urban model predicts that commercial property will mainly locate in the CBD, from where it can access the greater pool of labour, as well as the largest number of potential customers. Outside of the CBD, local businesses such as retail, supermarkets and restaurants will mainly wish to locate quite close around the transport hub, from where they can easily attract local customers as well as labour. This will create the familiar pattern of secondary town centres and suburban high streets.

23. For such commercial properties, improvements in transport accessibility to the centre should mainly reduce business travel (another class of direct user benefits), and the higher profitability should be readily capitalised into the rateable values of commercial premises around the station/transit hub. Unlike residential properties however, the zone of influence for commercial properties should not depend on a 'walkability' criterion, but rather on the radius within which it is profitable for local businesses to operate.

Agglomeration effects

24. The literature review notes that direct user benefits are only one class of benefits created by transport projects. The other major class concerns wider economic benefits. The most important of these effects in a city like London is agglomeration. Improvements in transport connectivity increase a location's access to economic mass (ATEM), a measure that weights a location's proximity to jobs by generalised travel costs.

25. Increases in a location's ATEM generally reflect an increase in proximity or employment density, which has been found to be associated with higher productivity and earnings due to agglomeration effects. A transport link that connects the CBD to a new pool of labour should increase the CBD's ATEM through effects both on proximity as well as inducing more economic activity to locate in and around the CBD. This can then raise productivity, wages and profits across the CBD.

26. Increased profitability in the CBD should get capitalised in the rateable value of commercial premises across the CBD, while higher wages should feed back into land values right across all the catchment areas from which the CBD's labour is drawn, including a feedback effect on the land rents generated by the transport improvement along its line of route. An important inference that emerges from this is that the zone of influence of a transport scheme that increases connectivity of labour into the CBD spreads right across the CBD, while it is concentrated within a short radius around transport hubs outside of the CBD.

Transport and new development

27. It is often suggested that one of the main impacts of a transport investment is that it unlocks land for development, and that this creates benefits over and above those captured by conventionally measured user benefits. For instance, the Department for Transport's (DfT's) guidance on assessing wider economic effects includes a method for calculating the benefits of land-use change where it can be shown that a development would not take place in the absence of the transport scheme due to the existing infrastructure being unable to supply a reasonable level of service to existing or new users. The DfT's guidance in turn notes that the analysis is likely to result in a large estimated value for the benefits of such transport-dependent development, because the surplus of value of land in, for example, residential use over land in agricultural use is typically large. In fact, in England it is often an order of magnitude difference.

28. There is a reasonable debate in academia as to whether such benefits are net welfare gains to society. The fact that a transport project unlocks new development does not necessarily result in a net benefit to society. It depends on whether private and social values of new development diverge. The transport project needs to correct for a market failure of some sort.

29. However, this is less relevant from the point of view of land value capture. The key point is that if new development is unlocked on a piece of land by transport, because the improved transport accessibility allows a change in use or higher density of development, this will have the inevitable effect of significantly increasing the value of that piece of land over and above the simple capitalisation of user benefits. In principle, some or all of this uplift can be captured to fund the project that caused it.

30. Theory makes no strong predictions about the effects of transport schemes on new development, beyond that it depends on the elasticity of local land supply and planning policies.

Placemaking

31. John Nellthorp (2016), in reviewing our Business Case Development Manual, has summarised the various factors other than transport that govern land and property value uplifts. Apart from transport accessibility, other locational factors such as the quality of the urban realm (including public spaces) and the retail offer in the vicinity can have significant effects on land values. He notes that as a result, we should not expect residential and commercial properties to be affected in the same way by the same set of factors – for example, residential property prices will be heavily influenced by the quality of schools and crime rates in the neighbourhood; retail values are likely to be heavily influenced by footfall; and office rents are likely to be heavily driven by proximity to other businesses through an agglomeration-like effect.

32. Other 'place factors' such as the pedestrian amenities, walkability and noise/environmental quality have also been found to have significant effects on property values. All of these features are incorporated in a conventional bid-rent model where land rent differentials reflect (in part) place quality differentials. This work, however, is a reminder that if both transport as well as place factors change together in a location, it can be challenging to isolate the effect of each independently.

Release of land and air rights

33. All the theoretical work on land value uplifts associated with transport projects concentrates on accessibility improvements. However, it is possible for certain types of transport schemes to lift land values not because of their transport benefits, but because they release land for development. For instance, a flyunder scheme that releases land above for development, or a

scheme to deck over depots to release air rights. There would be little capitalisation of user benefits in such cases; instead most of the gain should flow from the value of land or air rights released.

Empirical evidence from the literature review

Value uplift

34. The literature review sets out a detailed assessment of the empirical evidence, and how far it supports the theoretical predictions from the monocentric urban model. Mohammed et al (2013) have summarised the results of 26 studies, covering various types of rail transit interventions from around the world. Most (20) of these studies focus on residential property price impacts, and 16 out of these find positive value uplifts, albeit with a wide range. The studies that have focused on commercial or retail price impacts generally report much higher value uplifts than on residential, and all but one find positive results.

Gradient

35. Many studies discuss the 'zone of influence' over which uplift effects decay. Different studies report different distances over which this zone extends, with no real consensus. The two case studies from London (Jubilee line extension, JLE, and the North London line) for instance provide an indication that the zone may not extend much beyond 500 metres to one kilometre of a Tube station. Some studies suggest the gradient is much steeper for commercial properties compared with residential properties.

Timing

36. Some studies document a pattern where value uplifts are anticipated from the announcement of the scheme and continue right through the construction period. This pattern was also expected by a number of experts (BGVA and CBRE) in the case of Crossrail in London, but Savills' primary research for this study does not find any value uplifts anticipated during the construction period.

Agglomeration

37. Research by Volterra (2014) documents the correlation between access to labour pools and employment density, showing this is flat at low levels of accessibility and beyond a threshold level, employment density suddenly starts rising sharply. Volterra reports a similar pattern is found between employment density and earnings differentials, which are a reasonable proxy for Gross Value Added (GVA). Finally, research by KPMG (2012) shows that there is a fairly linear relationship between GVA and rateable values. A plausible explanation for this is that some part of productivity growth is capitalised into higher rateable values in the CBD.

New development

38. There is surprisingly little in the empirical literature on the effects of transport on new development. Research on the JLE found a 77 per cent increase in new consents, compared to 15 per cent for the reference case in inner east London. But no comparable assessment is available on other schemes.

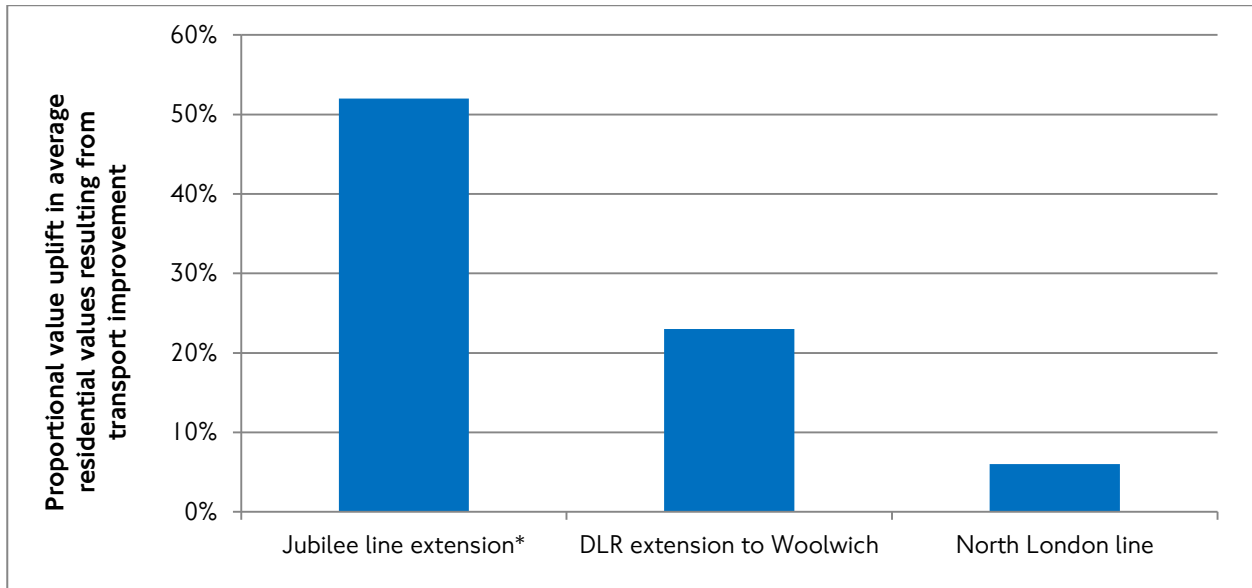
Annex 2 – Historic examples of land value uplift and development of a value uplift model

Land value uplift around historic London infrastructure projects

1. Savills extracted and analysed data from Land Registry on residential property transactions in the zones of influence surrounding four historic London infrastructure projects: the Jubilee line extension, the North London line change of franchise, the Docklands Light Railway (DLR) extension to Woolwich, and Crossrail.
2. The literature review carried out by ourselves and further studies reviewed by Savills suggested that the zone of influence surrounding each station was up to one kilometre, with value uplift strongest in the 500 metres surrounding each station and decaying as distance from station increases. Therefore, for each of these studies Savills considered residential transactions within 500 metres of the station (most strongly affected zone) and compared them to transactions between one and two kilometres away (beyond the zone of influence). The difference in value growth between these two areas gives the residential value uplift.⁴
3. For each historic project Savills considered growth in residential value from one year before construction on the project started to five years after project completion. In the case of the JLE, Savills considered growth from December 1995 until five years following the project's completion as Land Registry only records data from 1995 onwards. In the case of Crossrail, Savills considered growth from one year before the project began to May 2016 (the latest available at the time), since the project is not yet completed.
4. The results of this analysis showed that, on average, the areas around stations on the Jubilee line extension, the North London line, and Woolwich Arsenal did experience an uplift in values relative to the surrounding areas. However, it also showed that the areas surrounding Crossrail stations had yet to show any land value uplift. The uplift in residential values around the station on each of these projects is shown in **Figure 3** below.

⁴ There may be some uplift effect just beyond one kilometre from a station if the increase in transport connectivity brought about by the project is sufficiently large, however, we believe the area covered by the one to two kilometre radius is large enough that this should not affect growth appreciably in that area. As additional checks, Savills has benchmarked against value growth at a borough level and reviewed various forms of mix-adjusted growth.

Figure 3 – Residential value uplift around historic case study projects



Source: Savills analysis for TfL; Land Registry

* Excludes stations with low sample sizes of property transactions

5. The data did not suggest there was any residential value uplift around stations on the North London line or Crossrail prior to construction starting. Therefore when modelling value uplift on future projects Savills has assumed there will be no residential value uplift before the project begins.

6. The data also showed there was no residential value uplift around North London line stations while the line was being improved. This suggests the magnitude of the infrastructure project has some effect on the pattern of value uplift observed. This might vary from large infrastructure projects where there is substantial investment in improving connectivity (for example, the Jubilee line extension, Crossrail 2) to smaller scale projects where transport connectivity is improved more incrementally (for example, the North London line, Camden Town redevelopment).

7. The commercial property market consists of fewer, larger units than the residential property market, therefore there were not enough transactions around each individual station to make a similar transaction-based uplift analysis possible. Consequently Savills relied on the academic and commercial research covered by the literature review to establish the commercial value uplift around each project.

Categorisation of the case study stations

8. Breaking down the residential value uplift results by station, the analysis showed there was significant variation in the land value uplift from station to station.

9. Savills split the stations from each case study into categories with similar growth characteristics. There were four primary factors that appeared to affect the size of residential land value uplift (if any):

- Whether there was an adjacent high value residential area from which to draw emerging affluent demand

- The concentration of period housing stock around the station
- The scale of change in the quality and nature of the area following the project
- The scale of change in transport connectivity as a result of the project

10. Savills determined whether a station area was adjacent to existing high value areas by mapping the site locations in geographic information system (GIS) software and viewing them against average residential transaction values in the year the project was started. By visually comparing average transaction values within one kilometre of the stations to the areas slightly more than one kilometre from the stations, it was possible to identify which stations had a value gradient, ie those that were adjacent to higher value housing areas, and those that did not have a value gradient, ie those where values were higher than or very similar to any surrounding areas.

11. The concentration of period housing stock was measured using the 'Dwellings by Property Build Period and Type' dataset published by the Valuation Office Agency in 2014 and available on the London Datastore. A station area was identified as having period stock if more than half the area within one kilometre of the station was predominantly composed of stock constructed prior to 1930.

12. The presence of an adjacent high value area and the concentration of period housing stock together formed the basis for identifying the potential for an area to experience land value uplift. In Savills' experience, areas with a large amount of period housing and that lie adjacent to a higher value housing market tend to have greater potential for value uplift than areas where values are already the highest in the local area and with limited period housing. In cases where an area had one of these attributes but not the other, an individual judgement was made to reflect the size of the value gradient and the actual concentration of period housing stock.

13. The change in the quality and nature of the area surrounding each of the case study stations was estimated with reference to the literature review carried out by ourselves and the experience of Savills' real estate professionals working in those areas at the time of those projects. In the case of Crossrail stations, this assessment includes any planned regeneration and development that is expected to occur as a result of the new line.

14. The change in connectivity of a station was determined by comparing the estimated travel time from that location to London's Central Activities Zone (CAZ) before and after the infrastructure project and through discussion and agreement with ourselves. It also took some account of increases in transport capacity by considering whether each station was new, as was the case for Canning Town, or an improvement to an existing station, as was the case for London Bridge, both on the Jubilee line extension.

15. The change in quality of place and connectivity together formed the basis for identifying the amount of change in an area expected to experience uplift. Areas with extensive regeneration and development and large increases in connectivity should experience greater uplift than areas where there is limited change in quality of place and the transport connectivity does not change substantially. In cases where an area had one of these attributes but not the other an individual judgement was made to reflect the actual change in travel time and development surrounding the station.

16. Combining these two binary factors creates four categories with potential for increases in land value (due to the nature of current stock and place quality of the area) and the change in transport accessibility resulting from the transport scheme:

- High potential and high change (which we would expect to have the highest land value uplift)
- High potential and low change
- Low potential and high change
- Low potential and low change (which we would expect to have the lowest land value uplift)

17. The average value uplifts around the stations that fall within each of these categories were used to inform the modelling of residential land value uplift around future projects.

18. Stations were categorised in a similar way to estimate the extent of commercial land value uplift. The potential for uplift in commercial property values was estimated by looking at the existence of any high value office or retail areas and the presence of an interchange at the station. The change categorisation of stations was determined in a similar way as to residential value uplift.

19. Stations were considered to be adjacent to high value commercial property markets if such a high value market lay adjacent to the area surrounding the station. In particular, this categorisation considered proximity to the City, West End, and Canary Wharf business areas.

20. The presence of an interchange at a station was considered to be an important factor for the potential for commercial property value uplift because footfall would typically be expected to be higher around such stations. This categorisation considered stations with London Underground and/or London Overground interchanges but not those that had interchanges with National Rail services or associated bus stations.

21. Savills estimated the commercial land value uplift around each category of station with reference to existing academic and commercial analysis, adjusted to reflect the distribution of residential land value uplift observed around each category of station. For example, stations with high potential for commercial value uplift and high change were forecast to experience the top end of the potential uplift range reported in the literature. The value uplift estimates applied in the residential and commercial property modelling are shown in **Table 1** and **Table 2** below – project growth is additional to no project (underlying) growth rates.

Table 1 – Residential land value uplift estimates

Project	Zone	Real growth rate pa		
		Pre-construction	During construction	Post construction
No project (underlying)	High potential, high change	1.00%	1.00%	1.00%
	High potential, low change	1.00%	1.00%	1.00%
	Low potential, high change	0.50%	0.50%	0.50%
	Low potential, low change	0.50%	0.50%	0.50%
High impact uplift additional to no project growth	High potential, high change	0.00%	10.00%	6.50%
	High potential, low change	0.00%	2.50%	2.50%
	Low potential, high change	0.00%	0.00%	0.50%
	Low potential, low change	0.00%	0.00%	0.00%
Low impact uplift additional to no project growth	High potential, high change	0.00%	0.00%	2.50%
	High potential, low change	0.00%	0.00%	2.50%
	Low potential, high change	0.00%	0.00%	0.50%
	Low potential, low change	0.00%	0.00%	0.00%

Source: Savills analysis for TfL

Table 2 – Commercial land value uplift estimates

		Real growth rate p.a.		
		Pre-construction	During construction	Post construction
Project	Zone			
No project (underlying)	High potential, high change	1.00%	1.00%	1.00%
	High potential, low change	1.00%	1.00%	1.00%
	Low potential, high change	0.50%	0.50%	0.50%
	Low potential, low change	0.50%	0.50%	0.50%
High impact uplift additional to no project growth	High potential, high change	2.00%	2.50%	3.00%
	High potential, low change	1.00%	2.00%	1.00%
	Low potential, high change	0.00%	1.50%	0.50%
	Low potential, low change	0.00%	0.00%	0.00%
Low impact uplift additional to no project growth	High potential, high change	0.00%	0.00%	1.50%
	High potential, low change	0.00%	0.00%	1.00%
	Low potential, high change	0.00%	0.00%	0.50%
	Low potential, low change	0.00%	0.00%	0.00%

Source: Savills analysis for TfL

Applying the land value uplift categories to potential future stations

22. Each station and development area on the eight potential TfL projects was assigned one of four categories using the same method as for the case study stations.

23. The total impact of each project was estimated, within a scale from:

Large infrastructure projects with substantial changes in connectivity and quality of place, which followed the uplift estimates derived from the Jubilee line extension

Smaller infrastructure projects with limited changes in connectivity and quality of place, to which were applied an uplift estimate between those derived from the Jubilee line extension and the North London line

Projects with no improvement in connectivity, where no uplift in value growth was forecast (for example, Poplar decking, A13 tunnel). All potential land value uplift for this kind of site is assumed to be due to the development of new stock

24. Savills then applied these land value uplift estimates to each station to give a forecast percentage value uplift year-by-year.

Estimating the total uplift in land values

25. To estimate the total uplift in land values around each station, it was necessary to determine the current value of property in each station area.

26. For residential property, Savills estimated the total number of private households within one kilometre of each station by taking the number of private households (ie owner occupied, shared ownership and privately rented) in Output Areas in that radius at the time of the 2011 Census, then inflating that number using the relevant borough-level 2014 household projections.⁵

⁵ This is likely to represent a slight overestimate of growth, however, the household projections are assumed to have been correct when they were carried out in 2014 and so there should only be two years of divergence.

This number of households was multiplied by the average residential transaction value within each station radius in the 12 months to May 2016 to give an estimated total private residential property value.

27. For commercial property, Savills estimated the total rateable area within one kilometre of each station by filtering the Valuation Office Agency 2010 rating lists to show just properties with registered postcodes within that radius and summing the areas of all those hereditaments. The total rateable value within these areas was divided by an estimated yield, taken from the Investment Property Databank (IPD),⁶ to give the total estimated investment value for commercial property within each station radius as at the 2010 valuation date. These values were then inflated to 2016 values by applying the background growth rates used in the commercial property model.

28. Savills modelled the value of existing property using background value growth and new development that would have occurred without the project to give a 'no project' value. Savills then subtracted this from the value of existing property accounting for value uplift due to the projects, new development that would have occurred without the project, and new development that was catalysed by the project (the 'with project' value) to give the total value uplift.

29. The new development that would have occurred without the project was either taken from existing work carried out for us on the projects or modelled using borough-level household projections.

30. The new development that will be catalysed by the projects was taken from existing work carried out for us on the projects.

31. The total amount of value uplift for residential and commercial land around each station was then used as the input for KPMG's modelling of land value capture mechanisms.

⁶ The IPD yields are likely to reflect a higher grade of stock than is typical across all of London because it covers investment-grade property rather than all properties. Given that the land value attributable to commercial property is somewhat smaller than the proportion attributable to residential property, we believe this approximation is acceptable.

Annex 3 – Review of existing mechanisms to capture value uplift on existing stock and new development

Few instruments respond to value uplift on existing stock

32. There are four property taxes that impact existing stock:

- Council Tax
- Business rates
- Stamp Duty Land Tax (SDLT)
- Capital Gains Tax (CGT)

Council Tax

33. The Council Tax is levied on households, based on the estimated value of a property in 1991. It is an annual tax and represents a stable and predictable revenue source for the local authorities who use it to pay for council services. It is not specifically used for funding transport investment. A limitation of the current Council Tax system, which makes it ineffective for the purposes of land value capture, is that it does not respond to changes in property values, as the tax bandings have not been revalued since the introduction of the tax in 1991. Increases in Council Tax are currently limited to two per cent per annum without triggering a local referendum. The total tax take is therefore a fraction of the current property value and does not target any uplift related to transport investment. According to London Councils, in 2015/16, £3.5bn in Council Tax (including the Greater London Authority, GLA, precept) was collected in London.⁷

Business rates

34. Business rates are charged on most commercial properties and are a product of the property's rateable value (essentially the annual rent paid on the property) and a multiplier, set by the central Government and expressed as 'pence in pound of rateable value'. It is a counterpart to Council Tax on residential property and is paid by businesses annually, in theory making it a stable revenue source for local authorities, once the tax is fully devolved. Rateable values of commercial properties are revised every five years to reflect changes in rental values. However, any increase in average rateable values across the country are 'neutralised' by reducing the multiplier. Further, a system of tariffs and top-ups ensures that individual local authorities only receive rates receipts to reflect their spending needs. The end result is a limited link to value and limited potential of capturing land value uplifts resulting from transport investment. Business rates are forecast to generate approximately £6.9bn in London in 2016/17.

⁷ London Councils, <http://www.londoncouncils.gov.uk/our-key-themes/local-government-finance/local-taxation-council-tax-and-business-rates/council-tax>

35. There are two exceptions to revaluation neutralisation; both sit outside of the core rates retention system. The first is Business Rates Supplement (BRS), and the second is Enterprise Zones (EZs).

36. Business Rates Supplement, introduced in London in 2010 to raise funding for the Crossrail project, is a subset of the business rates system. BRS is set at two pence in every pound of rateable value and is paid by all businesses in London with rateable value above £55,000. It is an example of a method by which commercial property value growth can be taxed and retained in an area where growth has occurred. Given that the multiplier is fixed at two pence, redistribution of rates revenue that occurs under the main business rates system does not occur under BRS.

37. Enterprise Zones are a device through which the growth in business rates revenue above a baseline can be retained locally, with a view to paying for the infrastructure that has created that growth.

Stamp Duty Land Tax (SDLT)

38. SDLT is a transaction tax paid on the purchase of land or property above a certain price. It is set as a percentage of the property value that increases up to a maximum of 12 per cent on properties priced above £1.5m. The tax responds fully to changes in land value given that the tax is set as a percentage of property price. Although there is a clear link to value on sale, SDLT does not target rental properties. SDLT follows the property market cycles so can be volatile. For example, in 2008/09 SDLT receipts in London fell by 54 per cent (to £1.24bn) in comparison to the previous year as a result of the economic downturn. The receipts did increase quickly subsequent to this fall and reached £4.28bn in 2014/15.⁸

Capital Gains Tax (CGT)

39. CGT is targeted at individual taxpayers and is levied on the profit from the sale of property or an investment. It is a good example of a tax that specifically targets the uplift in property's value. However, it does not differentiate between the uplift that results from the background price growth, from any other form of place improvement and from the transport-specific investment. It is collected at transaction and therefore targets value uplift at the point at which it is realised. The tax is calculated as a percentage of the gain realised and is therefore proportionate to the size of the gain. While a link to value is clearly present, the current Capital Gains Tax regime exempts gains made on the sale of primary residences and does not target rental income. This significantly limits the ability to use the tax for the purposes of capturing value uplift from within a zone of influence of transport investment, given that a significant number of residential dwellings are likely to be primary residences or tenant-occupied. Similarly to SDLT, CGT could be volatile as it is transaction-based. According to HM Revenue & Customs (HMRC) statistics, CGT receipts in London in 2013/14 amounted to £1.3bn, although the element of this that relates to land and property is estimated to be of the order of £400m.⁹

40. In summary, no single tax on existing property is currently designed to capture significant value uplift resulting from transport investment. Council Tax and business rates have a limited link to value but present a stable revenue stream. Although link to value is much clearer on SDLT and CGT, receipts from these taxes are volatile.

⁸ HMRC, <https://www.gov.uk/government/statistics/uk-stamp-tax-statistics>

⁹ HMRC, <https://www.gov.uk/government/collections/capital-gains-tax-statistics>

Value capture on new development enabled by transport investment

41. Transport authorities can capture value on new development either directly through land acquisition and self-development; or indirectly through taxation or negotiated developer contribution.

Direct development

42. Transport authorities can carry out over-station development (OSD), which is a way of capturing value uplift resulting from new transport provision. They are restricted to either undertaking development within the station footprint on land that would have been compulsorily acquired for the transport purposes or acquiring land on the open market, at the prevalent market price, and developing it.

43. The impact on land values around new transport investment, however, extends beyond the station footprint and covers the entire 'zone of influence'. A way of extending transport authorities' ability to capture a significant proportion of the value uplift from this wider zone of influence is to permit them to acquire land beyond the immediate station footprint and self-develop or sell development rights to third parties. This would require access to significant land acquisition budgets, which transport authorities do not have at present.

44. The ability to acquire land early is important, given that value uplift can be measured as the difference between the pre- and the post-transport scheme market value of a development site. If acquisition of the land by transport authorities is carried out post-transport scheme delivery, the market value would have already adjusted upwards to accommodate the transport investment effect, thus neutralising the ability of transport authorities to capture value uplift.

Taxation of new development

Community Infrastructure Levy (CIL)

45. CIL was introduced by the Government in 2010 as a spatial tax on new development. It is levied by local authorities and in London both the Mayor and the boroughs can levy a CIL. It is set at a rate per square metre of new development and is paid by developers at the point of development commencement. Local authorities can choose to set a flat rate across all land uses or differentiate rates according to land use and location.

46. Borough CILs have a limited value link as the tax is based on space rather than development value. The structure of the tax tends to be regressive – more profitable developments pay a lower proportion of development value as CIL compared with less profitable ones with the same floor area. This is partly compensated by authorities differentiating the rates for different types of development.

47. Arguably, CILs target development at the wrong time – at development commencement, when development risks are highest and the full development value has not yet been realised. Local authorities have discretion over the levels at which CIL is set, which can create uncertainty for the developers. Although authorities are required to publish annual CIL returns, there tends not to be a great deal of transparency in how the CIL receipts are being spent.

48. In contrast to borough CILs, the Mayoral CIL adopted a different approach and has been successful in raising significant proceeds. It is set at low rates that are not differentiated by land use and offer limited exemptions. The money raised is visibly spent on strategic infrastructure – for instance, the Crossrail project.

Section 106

49. The objectives behind the introduction of the CILs were to move away from the negotiated nature of the section 106 agreements, give developers certainty over the amount of tax to be paid on new developments and speed up the negotiation process overall. As such, the use of section 106 contributions towards strategic infrastructure (apart from the specially created Crossrail section 106 regime) has been significantly reduced and pooling restrictions make it difficult to collect meaningful sums via section 106 agreements, which make them an unsuitable form of capturing land value uplift. However, they are still commonly used to fund affordable housing and other local site-specific mitigations. Under the current system, section 106 contributions sit alongside CIL payments and the overall process of the developer contribution negotiation has not been speeded up.

50. In general, on projects (typically on rail extensions) where dependent new development is easily identifiable and relates to a single ‘anchor’ development scheme, it has been possible to capture a substantial proportion of the value uplift. This is clearly illustrated by the Northern line extension (NLE) to Battersea Power Station (where about 20 per cent of project cost is met via developer contribution) and the Overground extension to Barking Riverside (BRE) (where about 65 per cent of project cost is met via developer contribution).

51. Clearly dependent developments are the exception rather than the rule. In most major projects, dependent developments are not as easily identifiable. This is generally the case for strategic transport projects or longer rail extensions, for example Crossrail 1 and the Jubilee line extension. In these instances the transport schemes can often lead to significant increases in density of development and accelerate the timing of its delivery (as well as raising the values of development), but it is not the deciding factor in whether the development takes place at all. The process of capturing land value uplift via negotiation of a developer contribution breaks down in such ‘multilateral’ environments. Transport authorities therefore have to settle for low amounts of developer contributions. For instance, developers contributed to just £300m of section 106 contributions for the Crossrail project (about two per cent of total project cost), and to less than five per cent of the cost of the Jubilee line extension.

52. In summary, the ability of transport authorities to capture value uplift from wider zones of transport investment influence via direct development is limited under current legal and budget parameters. Citywide development taxes such as the Mayoral CIL are useful, and in some cases where new development is clearly dependent on the transport project, it may be possible to negotiate a high developer contribution. The big gap, however, is in the more common situation where dependent developments are not clearly identifiable.

Annex 4 – Additional CPO reform proposals

Proposal 1: Obtaining planning certainty through a reform of section 17 of the Land Compensation Act 1961

1. One way in which transport authorities could capture land value uplift that results from transport investment is through the direct development route. This would see a transport authority acquiring development rights within a 'zone of influence' and bringing third party landownership under single development control, as part of an area regeneration programme.
2. The acquisition of land for coordinated development would be done initially on a voluntary basis, but with the compulsory purchase (CP) as a backstop in situations where landowners are 'holding out' their land unreasonably.
3. In March 2016, the Department for Communities and Local Government (DCLG) and HM Treasury sought public view on proposals for further reform of the CP system, to which we submitted a response. A summary of the key points from our response can be found in **annex 5**. The Neighbourhood Planning Bill, introduced in the House of Commons for the First Reading on 7 September 2016, proposes two key changes. Firstly, the Bill seeks to restrict the market value of the land to be compulsorily acquired to the value under the 'no scheme principle'. Secondly, it seeks to permit the GLA and TfL to put forward joint compulsory purchase order (CPO) applications.
4. We support the Government's proposals. They should make the CP process easier and less time-consuming for the two authorities and provide acquiring authorities with an incentive to undertake wider area investment regeneration.
5. While these proposed changes would go some way towards simplifying the CP process, we consider that it does not go far enough in assisting acquiring authorities to capture meaningful land value increases. This is because the change will not address the fundamental issue of cost of compulsory land acquisition being too high.

Restricting the compulsory purchase price of land to no-transport scheme market value

6. Value uplift is essentially the difference between no-transport scheme and with-transport scheme market value of the land. The acquiring authority's aim would be to purchase land at a cost that is as close as possible to the no-scheme market value to benefit from the uplift resulting from the introduction of transport investment.
7. In its paper, 'Bridging the infrastructure gap',¹⁰ the Centre for Progressive Capitalism argues that the compulsory acquisition price of the land should be restricted to the existing use value. However, we consider that this will not fairly reflect the ability of the land to support alternative development in the absence of the transport investment. The land's 'no- scheme' market value

¹⁰ The Centre for Progressive Capitalism, 'Bridging the infrastructure gap', June 2016, <http://progressive-capitalism.net/wp-content/uploads/2016/06/Bridging-the-infrastructure-gap-June-2016.pdf>

should reflect any existing planning permission on the land, as well as any potential future planning permissions that could have been granted in the absence of the transport scheme.

8. Our understanding is that in theory, the CP Code (if the CPO reform consultation proposals are implemented) would restrict the acquisition price to the value that a willing seller would pay for the land in the open market, taking into account existing and potential future planning permissions, but ignoring the effect of the transport scheme. It is however very difficult in practice to determine the 'no-scheme' market value of the land.

9. To determine the 'no-scheme' market value, a valuer needs to know the existing use value of the land, and add to this the value of any existing planning consents that could be converted into new development, as well as any potential future consents that could have been converted into new development in the absence of the scheme. It is the third element that creates uncertainty in the valuation.

10. Knowing the market value of the land that would need to be paid early on can assist the acquiring authority in setting its CPO budgets and make the process more certain. Ideally, valuation of the land would take place before the acquiring authority starts the negotiation process with the landowner and before an application for a CPO is made. It could potentially help to avoid the need to issue a formal CPO notice as the landowner will know from the outset how much they can expect to be paid for the land.

Limitations of existing mechanisms determining development potential of land, and consequent market value of land

11. Under the Land Compensation Act an acquiring authority can obtain a section 17 certificate, which is a formal statement of what development the relevant planning authority would have permitted in the absence of the scheme. In principle, this should serve as an indication of the land's development in the absence of the transport scheme and should therefore provide a basis on which the 'no-scheme' market value of the land can be calculated.

12. Where an application is made to the planning authority for a section 17 certificate, the Land Compensation Act provides for the planning authority to give an opinion to the applicant on whether a planning permission for one or more land use classes stated in the certificate might, or might not, reasonably have been expected to be granted. The planning authority may then specify conditions and requirements on which development may have been granted a planning permission, but this is at the planning authority's discretion. In order for the acquiring authority to determine the market value of the land in a no-transport scheme world, it is crucial that the certificate specifies the acceptable land use as well as the possible density and quantum of the development that would be permitted.

13. This is important because often a transport scheme's effect can be to induce an increase in density rather than a complete change in use.

14. Through the latest Housing and Planning Bill, the Government is going to introduce a new planning consent route called 'permission in principle' (PIP). It is designed to increase the efficiency of the planning process and speed up the decision-making on granting developers with a planning consent. PIP will give developers a planning permission 'in principle' based on the high level development parameters, such as land use, location and amount of permissible development. The additional parameter of development amount overcomes the limitation of the section 17 certificate. However, PIP can only be granted on the actual development that is going to occur, not on what could have occurred in the absence of the transport scheme.

How the limitations can be overcome and a no-transport scheme market value of the land set

15. We consider that the following changes to section 17 certificate, to make it more akin to the PIP, could provide acquiring authorities with the right basis on which to establish the market value of the land that would be paid under compulsory acquisition:

- To make it mandatory for the section 17 certificate to specify permissible development in terms of land use, development density and development quantum
- Section 17 certificate to provide the permissible development information in both the 'with transport scheme' and 'without transport scheme' scenarios. Currently it only targets the latter, while PIP only targets the former
- Section 17 certificate to be a formal planning decision that can be relied upon at a later stage of land development process
- Section 17 certificate to be issued at the point the notice of intention to acquire land goes out to landowners – engagement with the planning authority that grants the certificate needs to start early

16. If the acquiring authority as well as an affected landowner can apply for such an 'enhanced' section 17 certificate, they will both have a common base of facts from which to derive a land valuation. The process could be improved further by establishing an independent panel of expert valuers (the Independent Appointing Body), who can impartially use this information to propose a 'no-scheme market value' to both parties. This could then govern the voluntary negotiations over acquisition, as well as inform and assist any formal CPO proceedings in front of a land tribunal later in the process.

17. The process of applying for the modified section 17 certificate and undertaking the land valuation on its basis should start approximately a year before the acquiring authority anticipates exercising its compulsory purchase powers. The process should be completed within three months of the acquisition date to ensure that the market valuation of the land is not out-of-date. In instances where the development rights auction model (DRAM) is used, the permissible level of development without the transport scheme, as well as its market value, could be established as part of the zonal development planning process.

18. The acquiring authority would pay for the independent valuation. The Independent Appointing Body could be made up of Royal Institution of Chartered Surveyors (RICS) and Compulsory Purchase Association (CPA) members. The results of the independent valuation could be relied upon by both the acquiring authority and the landowner as the valuer will owe a duty of care to both parties. The landowner would still have the ability to appeal to the valuation tribunal if they disagreed with the independent valuation.

19. These changes to the approach on land valuation should make the CPO process clearer and less adversarial. It will provide the desired certainty to both the acquiring authority and the landowners on the amount of compensation that would be paid and could potentially lead to the acquiring authority and the landowner agreeing a voluntary acquisition, before the CPO is put forward. The change should also be advantageous for the landowners as they will not have to bear the cost of assessing the fair value of land themselves.

20. A possible area of risk for the acquiring authority in securing the valuation of land early is in abortive valuation costs if the transport project for which the land is being acquired does not go ahead. This should not however be a strong enough deterrent from establishing the market value to be paid and necessary acquisition budgets early on.

Proposal 2: Incentivising the landowner to negotiate

21. Currently loss payments are made to businesses and home owners as part of the CP process. There is a requirement for acquiring authorities to negotiate with landowners to buy their land by agreement before the formal CPO stage. The DCLG guidance¹¹ says:

'The confirming authority will expect the acquiring authority to demonstrate that they have taken reasonable steps to acquire all of the land and rights included in the Order by agreement...'

'Compulsory purchase is intended as a last resort to secure the assembly of all the land needed for the implementation of projects.'

22. The payments are currently 10 per cent of market value for homeowners, 2.5 per cent for occupiers and 7.5 per cent for investors (the latter two percentages are proposed to be reversed in the Government consultation on the compulsory purchase reform). These payments disincentivise owners and occupiers to sell their property to the acquiring authority early on by negotiation because the compensation they would receive under a CPO would be greater.

23. For example an offer to a home owner to sell by agreement, say, at 20 per cent more than market value is only 10 per cent more than a CPO. This reduces the attractiveness of such an offer although some owners may nonetheless accept it for other reasons, for example, they want to move ahead of a CPO decision to avoid stress.

24. If the loss payments as part of the CPO process could be removed and offered only if the acquisition was settled on a voluntary basis before the CPO process starts, this could both speed up the process and provide more certainty to the acquiring authority on how much would need to be paid for the land. This proposal would go hand-in-hand with Proposal 1 by making the voluntary negotiation process more appealing to the landowner.

25. Restricting the loss payments to a certain percentage of the market value of the land, say 10 per cent, would also be helpful in providing the acquiring authority with clarity on the ultimate compulsory purchase price to be paid. It is recognised however that some acquisitions, especially involving residential property, would need to be approached on a case-by-case basis in assessing loss payments and a different percentage for loss payments could be determined.

Proposal 3: Designate blight zones

26. Acquiring authorities need to show that there is a compelling need in the public interest to acquire land for a CPO scheme. It is common for properties outside of the area of the scheme to be severely affected by noise from construction activities and/or their subsequent operation. We have experienced this on a part of the Crossrail 1 route. This was also observed on the Channel

¹¹ 'Guidance on Compulsory purchase process and The Crichel Down Rules for the disposal of surplus land acquired by, or under the threat of, compulsion', DCLG, 2015, page 6 accessed at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/472726/151027_Updated_guidance_for_publication_FINAL2.pdf

Tunnel Rail Link and High Speed 2. At present, the acquiring authority cannot purchase the affected properties as there is no compelling need for their acquisition for the purpose of the scheme. The acquiring authority thus requires making compensation payments to landowners.

27. The acquiring authority could designate specific properties/boundaries of transport scheme zones of influence where they want to give a right for landowners to serve a blight notice ie the acquiring authority would purchase property if the owners wanted to sell. If landowners do want to sell then the CP mechanism and assessment of compensation would apply. This is a very simple mechanism and sits easily with existing CPO legislation and it could be classed as another category of 'blighted land' in which a blight notice can be served. We are recommending that such a blight notice can only be served once an application for compulsory purchase powers has been made to avoid purchasing land unnecessarily but sufficiently early to address objections to the scheme.

28. This change in blight provisions could allow the landowners who no longer wish to live in the area affected by construction to move, and to give the acquiring authority an opportunity but not an obligation to acquire additional land, which could have a potential for profitable redevelopment at a later date.

Annex 5 – Summary of TfL’s response to the Government’s consultation on further reform of the compulsory purchase system

1. In March 2016, the Department for Communities and Local Government and HM Treasury launched a consultation seeking views on further reform of the compulsory purchase system. The consultation presented a range of proposals aimed at making the compulsory purchase regime clearer, fairer and faster. TfL Operational Property submitted a response to the consultation. A summary of key response points is presented below. The full response is available on request.

2. The consultation questions were divided into two parts:

- Changes to compensation assessment and process
- Further technical process improvements

Changes to compensation assessment and process

3. We welcome the proposal to codify the ‘no scheme principle’ valuation principle in legislation. This seeks to disregard the scheme for which compulsory purchase is undertaken from calculating the market valuation of the land to be paid to the landowner as compensation. Current statutory provisions on defining the ‘no scheme principle’ are complicated and not always fully understood by the practitioners. Reform that would simplify and clarify the approach was encouraged.

4. We broadly support that the proposals made by the Law Commission should form the basis of taking forward the required legislative amendments that would codify the ‘no scheme principle’ valuation principle. Allowing the acquiring authority to define what it regards as the scheme in the CPO would be a good added step. Any drafting of the Bill should permit an acquiring authority to make the case for a wider statutory project being disregarded from calculating the ‘no scheme principle’ market value of the land.

5. We consider that the date on which the scheme is assumed to be cancelled should be the valuation date, not the launch date as proposed by the consultation.

6. We agree with the proposal that the definition of a regeneration scheme should be expanded to include transport projects that effectively form part of the regeneration project. If the definition of the scheme is expanded to include transport, then a bigger scheme could be disregarded from the CPO valuation and the land for the regeneration project could be acquired at pre-transport scheme values.

7. We support in principle the proposal that all development within a Mayoral Development Corporation (MDC) area should be disregarded for the purposes of determining the compulsory purchase price of the land. However, we are concerned whether exclusion of all development from the market valuation of the land could discourage private investment. Private investors may feel that the compensation for compulsory acquisition would disregard the impact of their investment

on land values and the price payable to the landowner would be lower than the current market price.

8. We agree with the proposal to repeal section 15(1) of the Land Compensation Act 1961. This repeal would mean that the planning assumption in assessing compulsory purchase compensation would reflect only the planning permissions that would be available in the market in the absence of the CPO scheme. The repeal will have an effect of reducing the price the acquiring authority would pay for the land to the 'no scheme principle' market value.

9. We welcome the proposal to repeal Part 4 of the Land Compensation Act 1961. The provision currently permits the landowners, in certain circumstances, to claim additional compensation payments within 10 years of the original settlement if a more valuable planning permission is granted on the land subsequently. This introduces an element of risk for the acquiring authority and could result in increased costs.

Further technical service improvements

10. The consultation proposed to permit the GLA and TfL to promote a joint compulsory purchase order for transport and regeneration purposes for one site. We welcome this proposal and sought powers that, with the Mayor's approval and after demonstrating a compelling need in the public interest, would allow the GLA, TfL or our subsidiaries to seek compulsory purchase powers for any combination of transport, housing or regeneration purposes. This would maximise synergy of the three principal functions. A joint CPO would remove the artificial division of a transport and a regeneration project on the same land and would make the CPO process less complex and more certain for the acquiring authority.

11. The consultation sought views on whether the acquiring authorities should have the right to use land on a temporary basis, in addition to the outright compulsory purchase. Temporary use of land may be required for construction worksites or storage of materials needed for the development. At present compulsory purchase provisions do not permit acquiring authorities to have a temporary use of land and require the land to be purchased under a CPO. Alternatively the acquiring authority can enter into a commercial agreement with the landowner. This tends to delay the process and make the use of land that is only needed on a temporary basis costly. We agree that temporary possession should be available in all circumstances where compulsory purchase powers are to be exercised and the landowner should be compensated appropriately.

Annex 6 – KPMG findings

KPMG, working with Savills, was engaged by us to support the development of a potential LVC approach focused on land value impacts in the immediate vicinity of our sponsored investments. The scope of KPMG's work was to develop an understanding of the potential contribution of a range of identified LVC mechanisms to eight of the major schemes that form part of our programme for London. This includes estimating, based on historic precedent, an order of magnitude approximation of the uplift potential in the immediate vicinity of projects that could materialise as a result of the transport investment programme. It also includes calculating the revenue potential of several possible funding mechanisms – both individually and in a 'package', 'qualitatively' appraising the mechanisms against a series of evaluation criteria, and considering their potential ability to support the raising of finance to support project costs.

The following is a summary of the key findings of the analysis.

Uplift modelling

Table 3 – KPMG model – uplift

Total uplift £m PV in FY17 prices (30 years)	Existing properties	Non-project new development	New project- related development	Total
Residential	57,229	4,333	13,231	74,793
Commercial	9,552	700	1,843	12,095
Total	66,781	5,033	15,074	86,889

- All figures are based on the outputs of the most recent Savills uplift model. The uplift modelling remains under development
- Uplift is presented over a 30-year timeframe, from each project's construction start date
- Existing residential stock has been converted to floorspace on the basis of an assumption of an average residence size of 100 square metres (with the exception of King's Road: 200 square metres)
- Value uplift for new stock has been calculated by deducting a notional 'without project' value from a forecast market value on a per square metre basis

Revenue modelling – illustrative package

Table 4 – Summary of illustrative package of mechanisms

Illustrative package of mechanisms	Mechanism duration	Adjustments	£m NPV in FY17 prices (FY17-FY61)	%
1. Business rates Option A (retain revaluation growth at sites)	1 April 2018 to 20 years post construction completion for each project.	None	£6,710	23%
2. SDLT Option A (hypothecate incremental revenue)	1 April 2018 to 20 years post construction completion for each project.	Reduction of 30% to account for downturn in transactions as a result of betterment levy.	£5,987	21%
3. Betterment levy Option C (floorspace based annual levy)	End of construction completion for each project plus 20 years.	None	£12,730	44%
4. Land pooling Option C	1 April 2018 to 20 years post construction completion for each project.	<ul style="list-style-type: none"> •Reduction of 30% to account for downturn in values as a result of betterment levy. •Participation rates across all land types increased to 80% to provide a proxy for the development rights auction model. 	£3,273	11%
Total			£28,699	100%

Figure 4 – Illustrative package – time series

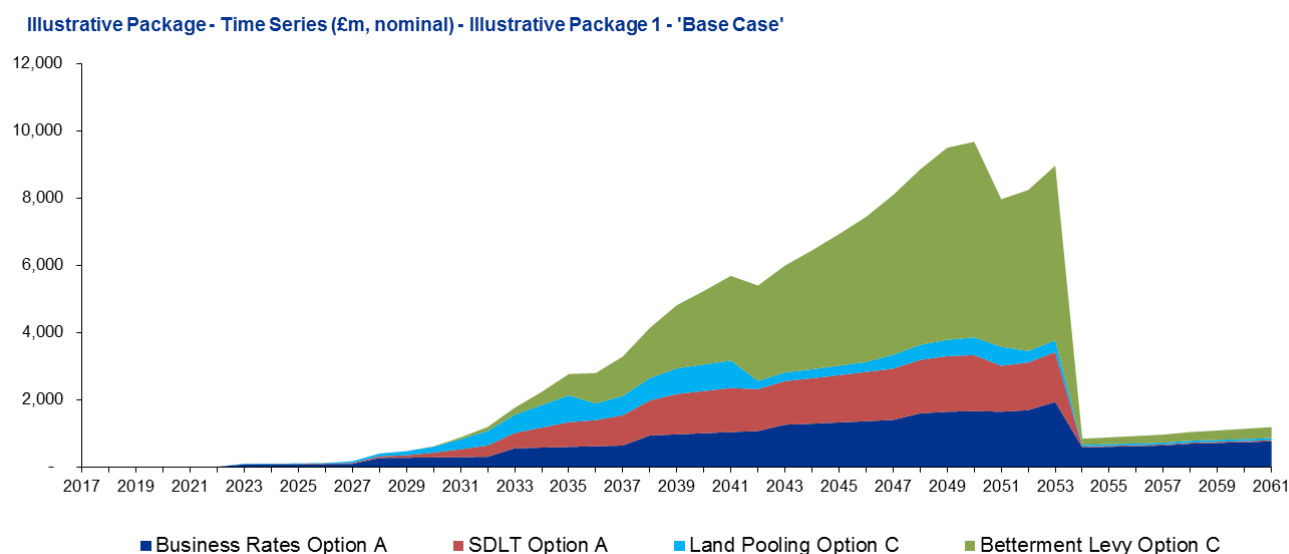


Figure 5 – Illustrative package – Net Present Value (NPV) of mechanism revenues

Illustrative Package - PV (£m) - Illustrative Package 1 - 'Base Case'

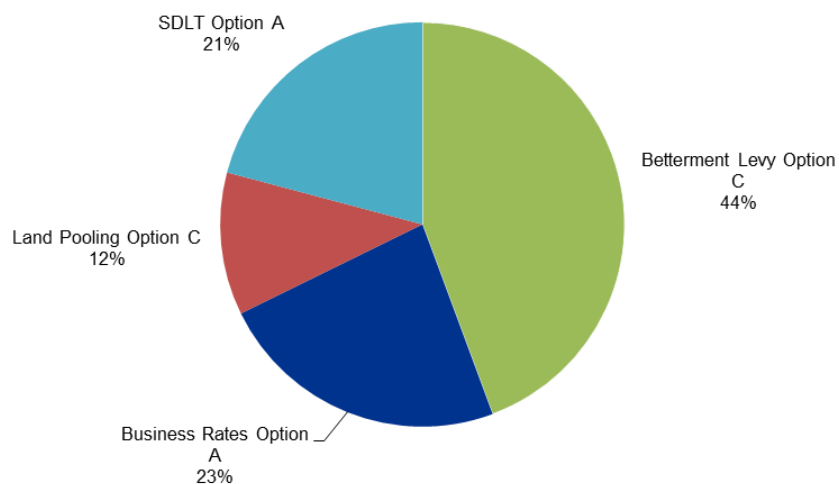


Figure 6 – Illustrative package – Business rates related revenue NPV by project

Business Rates Option A - Value Capture Revenue compared to Capital Costs (£m 30Y PV)

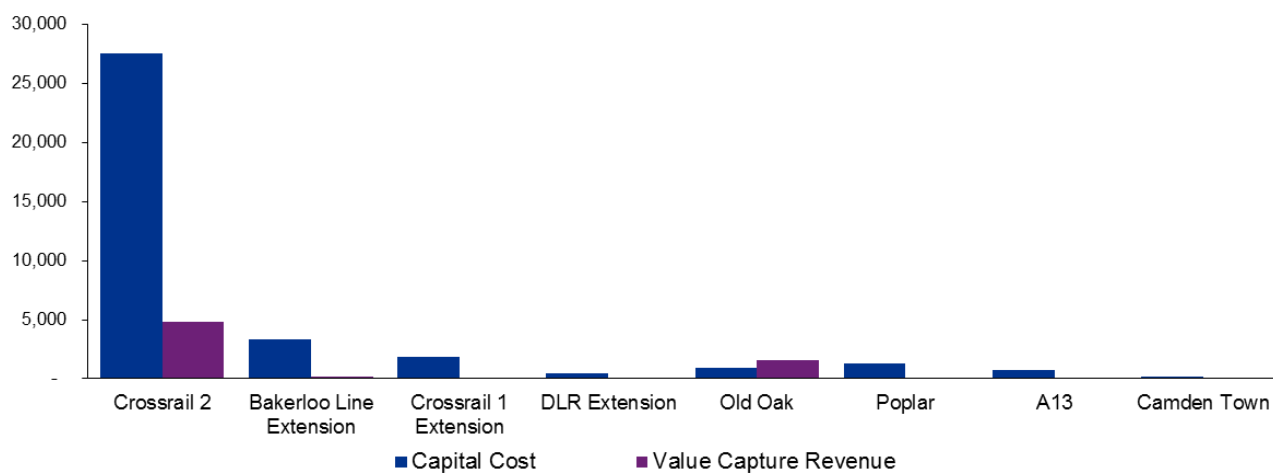


Table 5 – Illustrative package – business rates related revenue NPV by project

Business Rates Option A - Value Capture Revenue compared to Capital Costs (£m 30Y PV)	Crossrail 2	Bakerloo Line Extension	Crossrail 1 Extension	DLR Extension	Old Oak	Poplar	A13	Camden Town
Value Capture Revenue	4,799	228	78	5	1,582	-	-	18
Capital Cost	27,489	3,306	1,812	426	911	1,325	771	187

Figure 7 – Illustrative package – SDLT revenue NPV by project

SDLT Option A - Value Capture Revenue compared to Capital Costs (£m 30Y PV)

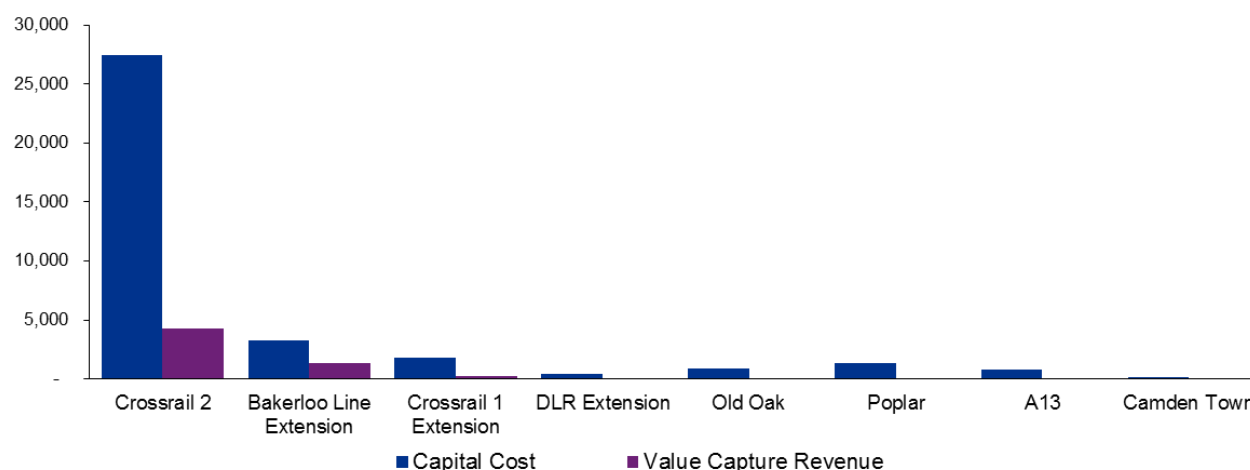


Table 6 – Illustrative package – SDLT revenue NPV by project

SDLT Option A - Value Capture Revenue compared to Capital Costs (£m 30Y PV)	Crossrail 2	Bakerloo Line Extension	Crossrail 1 Extension	DLR Extension	Old Oak	Poplar	A13	Camden Town
Value Capture Revenue	4,326	1,347	234	2	77	(0)	0	1
Capital Cost	27,489	3,306	1,812	426	911	1,325	771	187

Figure 8 – Illustrative package – Zonal supplement charge revenue NPV by project

Betterment Levy Option C - Value Capture Revenue compared to Capital Costs (£m 30Y PV)

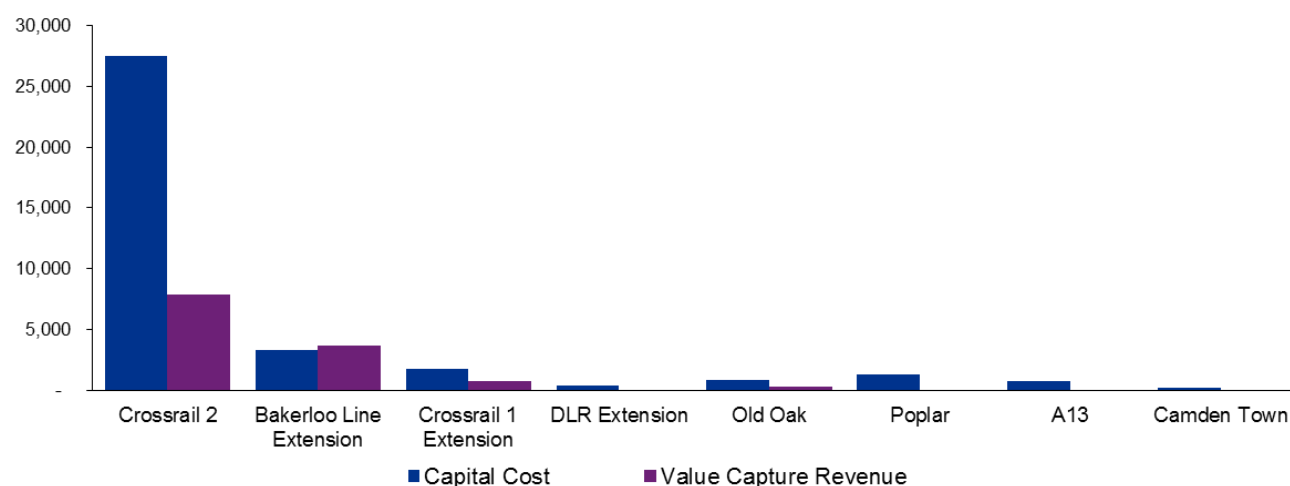


Table 7 – Illustrative package – Zonal supplement charge revenue NPV by project

Betterment Levy Option C - Value Capture Revenue compared to Capital Costs (£m 30Y PV)	Crossrail 2	Bakerloo Line Extension	Crossrail 1 Extension	DLR Extension	Old Oak	Poplar	A13	Camden Town
Value Capture Revenue	7,915	3,700	822	9	284	-	-	-
Capital Cost	27,489	3,306	1,812	426	911	1,325	771	187

Illustrative Package – development rights auction model (land pooling Option C)

Figure 9 – Illustrative package – DRAM revenue NPV by project

Land Pooling Option C - Value Capture Revenue compared to Capital Costs (£m 30Y PV)

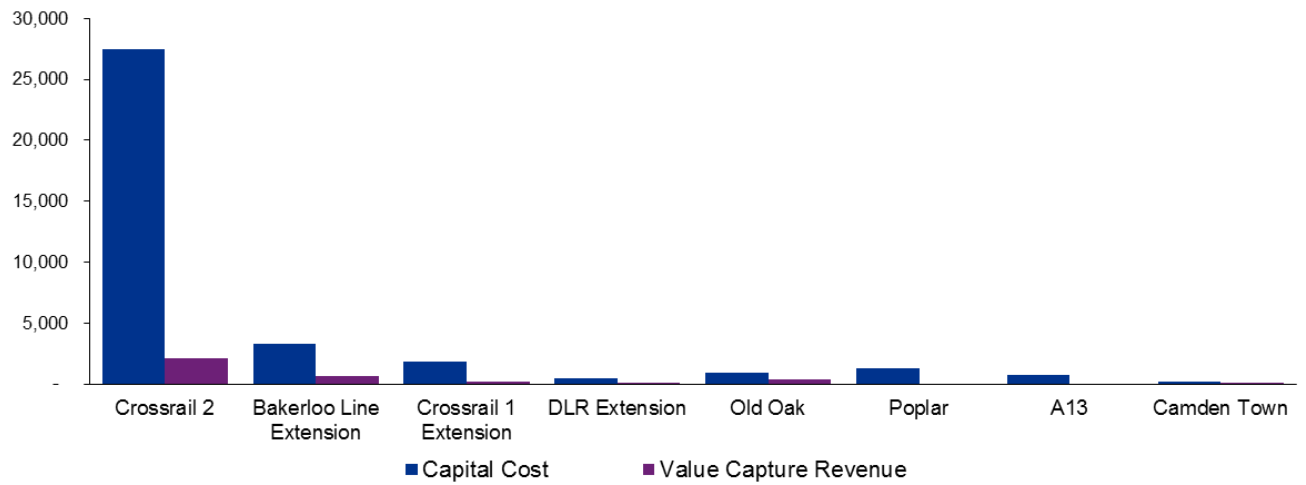


Table 8 – Illustrative package – DRAM revenue NPV by project

Land Pooling Option C - Value Capture Revenue compared to Capital Costs (£m 30Y PV)	Crossrail 2	Bakerloo Line Extension	Crossrail 1 Extension	DLR Extension	Old Oak	Poplar	A13	Camden Town
Value Capture Revenue	2,089	647	186	3	348	-	-	0
Capital Cost	27,489	3,306	1,812	426	911	1,325	771	187

Annex 7 – Literature review

Executive summary

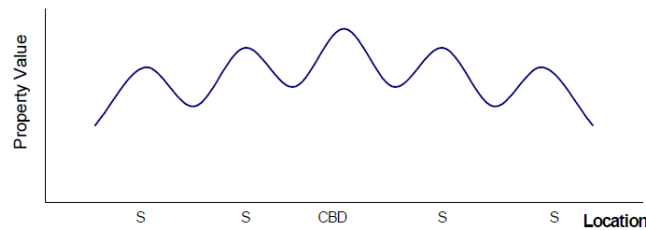
1. The theory of land value uplift is based on the bid-rent model developed by Alonso (1964). This model suggests that land values increase with decreasing distance towards the central business district (CBD), due to an increase in accessibility to more jobs and higher wages. Transport infrastructure effectively reduces the distance to (or increases accessibility to) the CBD, and therefore as distance to the station or transport hub decreases, property/land values tend to increase.
2. The evidence bears this out. In most cases new transport infrastructure causes an increase in the value of surrounding land. Both commercial and residential properties experience value uplifts. But the evidence suggests that effects persist for longer distances in the case of residential properties than they do for commercial premises. Some studies find that land value uplift effects persist up to a distance of around 1,000 metres for residential property and 400 metres for commercial property. There can also be negative effects on land value, if the areas immediately around the new transport infrastructure are associated with higher noise, a reduction in safety or increased incidents of crime.
3. Case studies around the world show how this uplift can be captured successfully and used to pay for new transport infrastructure. The most successful jurisdictions have achieved this with a systematic approach using direct value capture through land development, including Hong Kong Mass Transit Railway (MTR) and Japan. Land value capture has also been successfully used in London, for instance in funding the Northern line extension and the London Overground extension to Barking Riverside through developer contributions, but such attempts have been episodic and opportunistic. There have also been cases when land value capture was attempted but was not successful, such as the Docklands Light Railway extension to Beckton in the 1990s and the Nouveau Grand Paris project in France in 2010. Finally, the literature highlights recent cases when land value capture has not been used at all (or in any substantive measure), and significant opportunities to fund the project from the increase in land value were lost. The Jubilee line extension and Crossrail 1 are both good examples of this in London.
4. The literature review briefly considers the existing instruments available to capture land value uplift, and their limitations. It reviews attempts to tax new development on land in the UK, culminating in the introduction of the Community Infrastructure Levy in 2010. Finally, it ends with summarising four key lessons that can be learnt from past attempts to capture land value as a means of funding transport projects: first, that direct capture methods tend to be more effective at capturing uplifts from new development, while taxation methods are more suitable for capturing uplifts from existing assets; second, a systematic approach across a programme of projects is more effective than opportunistic attempts within individual projects; third, that value capture approaches should aim to balance the capture of uplift on existing stock and new developments; and fourth, that land value capture should be an important, but not the only, source of funding for individual transport projects.

Section 1 – Theory

The theory of land value uplift is based on the bid-rent model

5. There is vast literature examining the effects of new transport infrastructure on the value of surrounding property and land. The first rigorous treatment of this effect was the bid-rent model by Alonso (1964), which sought to explain the pattern of land rents in a city.
6. The bid-rent model predicts that in a monocentric city, the most expensive area will be the CBD. Commercial users in the CBD are willing to pay the highest amount and will tend to outbid the other bidders, as they benefit the most from agglomeration economies. As distance away from the CBD increases the land becomes less attractive to commercial users and more attractive to industry, whose bids determine the land rents over those of residential users. This is because industry needs more land but needs to be near enough to the CBD to use the CBD's services. As distance increases further the land becomes less attractive to industry and rents are set by residential users. In general, residential users will bid higher amounts as distance to the CBD decreases, due to the improved accessibility to jobs and higher wages.
7. Within such a monocentric urban model, investment in transport infrastructure improves the accessibility of the 'periphery' to the CBD. This increased accessibility creates three effects on land values.
8. First, it can increase the employment density in the CBD by increasing the supply of labour, leading to agglomeration effects that raise productivity across the CBD. This increases the profitability of businesses in the CBD, and as more and more businesses want to locate there, it pushes commercial rents up across the CBD.
9. Second, it can increase the number or type of jobs accessible from a location in the periphery (by improving connectivity). This should have the effect of increasing the demand for housing in that location (as well as the demand for local commercial facilities such as retail and restaurants). This will push up the value of land around that location in the periphery.
10. Finally, new transport can make existing jobs in the CBD cheaper to access from a particular location in the periphery (by reducing generalised travel costs for commuters). This will tend to raise the real wage for such commuters, but they invariably do not hold on to this gain. Their real wage gain is either bid away to local landlords in increased land rents (in a monocentric urban model with uniform wages) or to employers in the CBD in lower wages (in a model with wages that include a compensating premium for commuting costs). Employers then pass this gain on to consumers with lower product prices (assuming perfectly competitive markets). The ultimate beneficiaries are either landlords or consumers, depending on the economic model adopted. If markets are not perfectly competitive it is likely that higher profitability in the CBD would be capitalised into the land rents across the CBD.
11. As new public transport shapes a city, it creates a polycentric pattern of development, with a central business district surrounded by commuter areas with their own high streets and town centres around the local transit hub. As transport leads to polycentric structures, a linear polycentric city is likely to have a land rent gradient with a sinusoidal pattern. Local peaks occur around the station areas, and the global peak will be found around the CBD. Debrezion et al (2007).

Figure 10 – Polycentric pattern of development



Source: Debrezion et al (2003)

12. London mostly resembles a polycentric city. The patterns of land rents are highest in the CBD. However, contrary to the predictions of the bid-rent model, industrial uses of land tend not to outbid residential uses. As you move into outer London, industrial uses of land are a fraction of residential land uses. This is partly because residential use values are raised due to planning restrictions on land use, and partly because industrial uses are much less profitable than they used to be (when manufacturing was a bigger part of the London economy). In modern London, services dominate the centre. Away from it, wherever residential uses are permitted, they tend to outbid industrial or agricultural uses of land.

13. The theory predicts that a substantial proportion (but not necessarily all) of transport benefits of a new transport investment that improves accessibility to the centre should end up being capitalised into land values, either in the periphery (with rents highest near the transport hubs) or across the CBD. Some proportion of benefits may be passed on to consumers through lower output prices.

Transport projects can also affect land values by unlocking the development potential of land

14. Venables et al (2014) note that it is often suggested that one of the main impacts of a transport investment is that it unlocks land for development, and that this creates benefits over and above those captured by conventionally measured user benefits. They point to the DfT's guidance on assessing wider economic effects, which includes a method for calculating the benefits of land-use change where it can be shown that a development would not take place in the absence of the transport scheme due to the existing infrastructure being unable to supply a reasonable level of service to existing or new users. The DfT's guidance in turn notes that the analysis is likely to result in a large estimated value for the benefits of such transport-dependent development, because the surplus of value of land in (for example) residential use over land in agricultural use is typically very large. In fact, in England it is often an order of magnitude difference.

15. There is a reasonable debate in academia as to whether such benefits are net welfare gains to society. The fact that a transport project unlocks new development does not necessarily result in a net benefit to society. It depends on whether private and social values of new development diverge. The transport project needs to correct for a market failure of some sort.

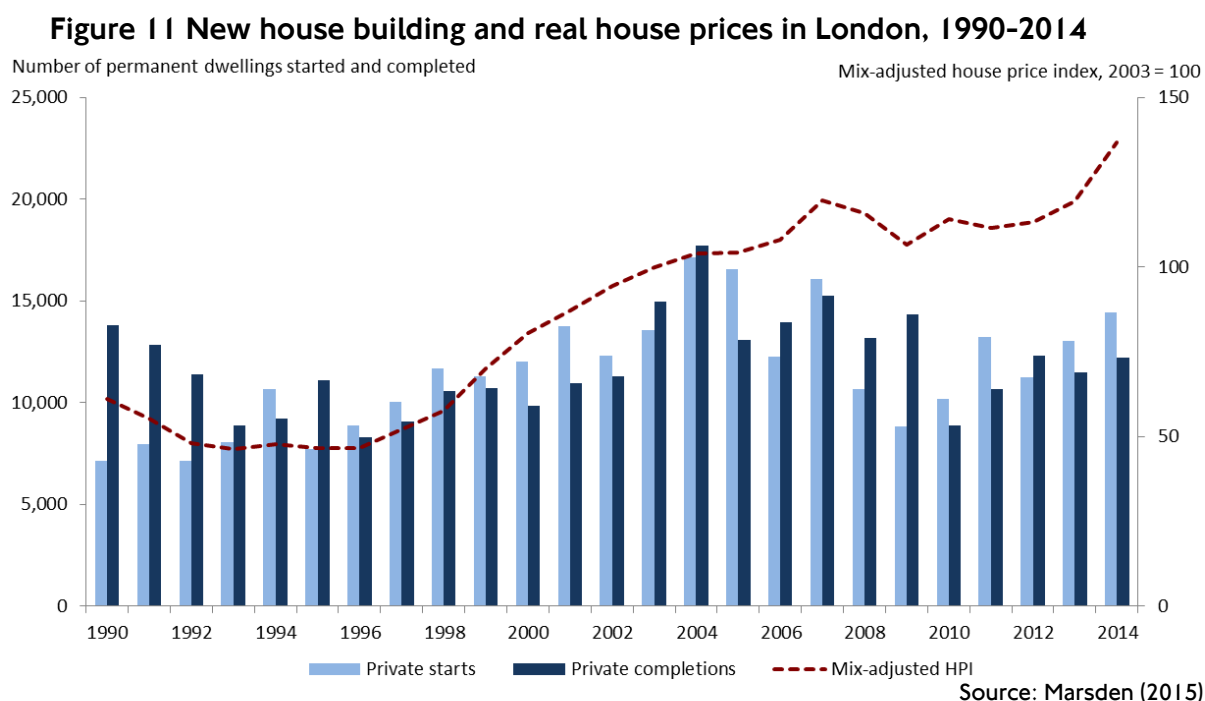
16. However, this is less relevant from the point of view of land value capture. The key point is that if new development is unlocked on a piece of land by transport, because the improved transport accessibility allows a change in use or higher density of development, this will have the inevitable effect of significantly increasing the value of that piece of land over and above the simple capitalisation of user benefits. In principle, some or all of this uplift can be captured to fund the project that caused it.

Caveat: even in theory, transport projects will not always generate large land value uplifts

17. The scale of land value uplift depends in the first instance on the scale of user benefits and the wider economic effects of the project, including its effects on dependent developments. Some academics think that a good post-facto test of whether a transport project really delivers net positive benefits to users is to look at the uplift in land values along the transport route. By corollary, projects that generate modest economic benefits will not generate large land value uplifts.

18. A second important factor appears to be the elasticity of housing (and land) supply. Where housing markets are relatively inelastic, there are good theoretical reasons to expect that the user benefits from a transport improvement will readily be surrendered to landlords in the form of higher house prices, as the latter are bid up by more and more people wanting to live in the better connected location. However, if the housing market is relatively elastic and an initial increase in house prices prompts a rapid expansion in local housing supply, then the effect on house prices will be dampened by the increased supply.

19. The graph below illustrates the inelastic nature of the property market in London. It shows the level of private homes that have been built over the last 25 years compared with the nominal house price.



20. A third important factor is the economic profile of the area around the transport intervention. An area which is declining will not experience growth solely due to new transport infrastructure, but instead will need investment in wider area regeneration before significant land value effects can be observed. This factor has resulted in transit-oriented development becoming increasingly popular over the last few decades all over the world.

Section 2 - Empirical evidence

There are different methods of measuring the land value uplift caused by transport infrastructure

21. There are a variety of methods to measure land value effects of transport infrastructure. The main methods used are the hedonic price regression, geographically weighted regression and the 'difference in difference' method (DID).
22. **Hedonic pricing regression** is a popular technique. This method attempts to separate out the factors which make up a property's value, such as its aesthetics, access to transport, and the neighbourhood. A hedonic regression is put together to show the effect that the different factors have on property value. The disadvantage of the hedonic framework is that it looks at factors within a defined catchment area. This assumes that all properties within a zone are affected in the same way, regardless of distance. This therefore does not take into account spatial heterogeneity. It is also difficult in this method to deal with the problem of different factors moving together, a problem known as collinearity, which can bias the results.
23. The other principal method is the **geographically weighted regression**. Similar to the hedonic pricing method, the geographically weighted regression uses a regression to account for the different factors that effect property value. However, it also uses the location of individual properties to run a regression in regards to distance on each factor, weighting more heavily those that are nearer. This produces multiple local results, and fixes the problem of the regression trying to fit into a single global model. However, it requires granular datasets and is therefore more difficult to conduct. Like the hedonic price method, this approach also faces the difficulty of isolating the impact of transport, and showing causality rather than correlation.
24. The third method, **difference in difference**, compares the change in value of the treated group with the change in value of the control group before and after the change in transport infrastructure. The treated group are properties situated within a defined catchment area, and the control group are properties situated outside the defined catchment area.
25. It is not clear whether a particular method biases the results in any predictable direction. For instance, Gibbons and Machin (2005) found that the hedonic price method produced statistically higher results than the DID method. On the other hand, Agostini and Palmucci (2008) found that the DID method gave higher results than the hedonic price method. However, both studies used different types of data.
26. Mohammed et al (2015) uses both the hedonic price method and the DID method to estimate property value uplift as a result of the Dubai Metro from 2007 to 2011. They used cross-sectional and pseudo panel data from the same datasets, to try and correct for the effect that the other studies had in using different datasets. The DID method showed that for residential property up to one kilometre away from the station the uplift was 7.8 per cent, whereas, the hedonic price method showed that for residential property up to 1.5km away from the station the uplift was 1.2 per cent.
27. The methods used in the literature mostly focus on property values (sale or rental) and do not take into account the relationship between transport and new development or land use change. Therefore, they may understate the benefits realised in practice by landowners from new transport infrastructure.

Most studies show a positive relationship between land/property values and new rail infrastructure

28. A number of studies report a positive effect on land/property values due to new rail infrastructure, including Agostini and Palmucci (2008), Debrezion et al (2007), Gibbons and Machin (2005), McDonald and Osuji (1995), McMillen and McDonald (2004) and Mohammed et al (2015). Gibbons and Machin (2005) looked into the effect that transport has on house prices using examples from the Jubilee line extension and the DLR in London. They showed the projects caused house prices to rise by 9.3 per cent over the period 1997–2001, compared to houses which did not have any transport infrastructure changes near them.

However, there are some exceptions...

29. A few studies report negative effects on land/property prices due to transport infrastructure. Armstrong (1994) and Mohammed et al (2013) both find that there can be negative effects on property/land prices directly around the station. They suggest that this could be due to noise, crime or additional congestion caused by the new transport infrastructure. There are also circumstances where there has been no noticeable effect, such as the construction of the new Metro in Tyne and Wear. Walmsley and Perret (1992) found that if an area is in economic decline, as in certain areas of Tyne and Wear at the time, new transport infrastructure cannot reverse this alone. Du and Mulley (2007) support this, and found that house prices did rise in areas that were performing well economically upon the opening of a new station, whereas in relatively deprived areas the new transport had no effect as of two years following completion.

And the results from different studies cover a very broad range

30. The table overleaf summarises the results from a broad range of studies, showing the variations in geography, method and outcome.

Figure 12 – Summary of studies

Author(s)	Type	Measure	Rail system	Location	% change
Voith (1991)	Residential	Purchase of property	Commuter rail	Pennsylvania and New Jersey	3.8–10%
Laakso (1992)	Residential	Purchase of property	Metro	Helsinki, Finland	3.5–6%
Al-Mosaind et al. (1993)	Residential	Purchase of property	Light rail	Portland, USA	10.6%
Chen et al. (1997)	Residential	Purchase of property	Light rail	Portland, USA	10.5%
Weinstein and Clower (1999)	Residential	Purchase of property	DART light rail	Dallas, USA	–5.2%
Dueker and Bianco (1999)	Residential	Purchase of property	Light rail	Portland, USA	6.5%
Chesterton (2000)	Residential	Purchase of property	Underground	London, UK	71.1% and 42%
Bowes and Ihlanfeldt (2001)	Residential	Purchase of property	MARTA	Atlanta, USA	–19% to 2.4%
Clower and Weinstein (2002)	Residential	Purchase of property	DART light rail	Dallas, USA	7.2% and 18.2%
Bae et al. (2003)	Residential	Purchase of property	Seoul's rail	Seoul, Korea	0.13–2.6%
Cervero (2003)	Residential	Purchase of property	Light and commuter rail	San Diego County, USA	–12% to 46%
Gibbons and Machin (2003)	Residential	Purchase of property	Underground	London, UK	1.5% increase every 1 km reduction
Yankaya and Celik (2004)	Residential	Purchase of property	Metro	Izmir, Turkey	0.7% and 13.7%
Debrezion et al. (2006)	Residential	Purchase of property	Dutch national railway	Holland	25%
Du and Mulley (2007)	Residential	Purchase of property	Tyne and Wear light rail	England, UK	–42% to 50%
Duncan (2008)	Residential	Purchase of property	Light rail	San Diego, USA	5.7% and 16.6%
Pan and Zhang (2008)	Residential	Purchase of property	Shanghai rail transit system	Shanghai, China	1.1% and 3.3%
Agostini and Palmucci (2008)	Residential	Purchase of property	Santiago metro	Santiago, USA	From 3.8% to 7.4%
Benjamin and Sirmans (1996)	Residential	Rent of property	Metro	Washington, DC, USA	Each one-tenth of a mile reduces by 2.5%
Bollinger et al. (1998)	Office	Rent of property	Light rail	Atlanta, USA	–7%
Weinberger (2001)	Office	Rent of property	Light rail	Santa Clara County, USA	7–10%
Weinstein and Clower (1999)	Retail	Purchase of property	DART light rail	Dallas, USA	4.6%
	Office		DART light rail	Dallas, USA	22.7%
FTA (2000)	Commercial	Purchase of property	Metro	Washington, DC, USA	2% increase every 1000 feet
Cervero (2003)	Commercial		Light and commuter rail	San Diego County, USA	71.9–91%
Weinstein and Clower (1999)	Residential	Purchase of land	DART light rail	Dallas, USA	7.7%
	Retail	Purchase of land			29.7%
	Office	Purchase of land			10.1%
Cervero and Duncan (2002)	Commercial	Purchase of land	Light rail	Santa Clara County, USA	23%
	Commercial	Purchase of land	Commuter		120%

Mohammed et al (2013)

31. The percentage change figures in figure 12 show the premium value for residential properties located within a station's zone of influence compared to properties located outside of the zone of influence, at a point in time.

32. These results are varied for a number of reasons. First, the transport systems are different, and therefore provide different levels of improvement in accessibility. Different stops/stations have different levels of service and therefore provide varying levels of accessibility benefits.

33. Second, the presence or absence of substitute methods of transport can affect the uplift in land and property values. Debrezion et al (2007) note that although both rail and highways can cause property uplifts, if both are present then the effect of each one is lower.

34. The third reason is that the methods used in the studies differ. As mentioned earlier, the three main methods are the hedonic price method, geographically weighted method and the 'difference and difference' method – these can produce different results.

35. Finally, the uplift of property is affected by the wider economic environment. If demand for housing is strong the results will be amplified, if the demand for housing is weak then the effect will be reduced. It is strong demand combined with inelastic supply that drives the London market.

Different types of rail have different effects on land/property uplift

36. Different types of rail developments tend to produce different results. Mohammed et al (2013) and Debrezion et al (2007) found the impacts on land/property value were higher around commuter railway stations than light railway stations and heavy railway stations.

There is much less evidence of uplift in land/property due to new road (rather than rail) infrastructure

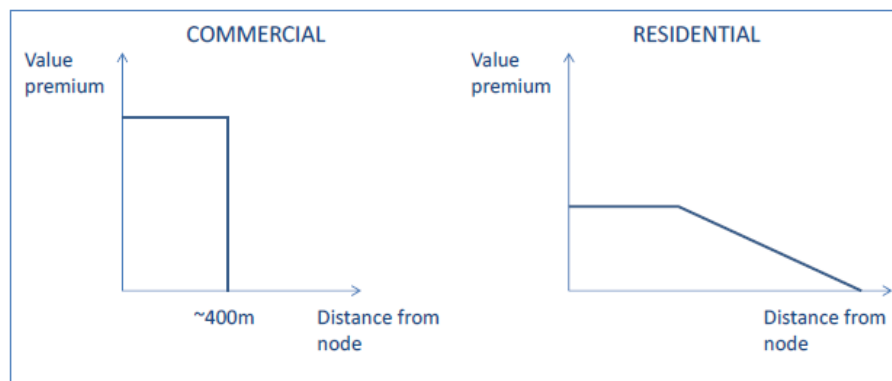
37. Compared to rail infrastructure there are fewer studies on the effect new road infrastructure has on land/property values. Levkovich, Rouwendal and van Marwijk (2015) show that new road infrastructure can increase property/land values; however, there are more likely to be increased negative effects directly around the highway due to increased levels of traffic (and the associated noise and pollution).

The rate of decay of uplift effects with distance from the station varies between commercial and residential properties

38. As suggested by the bid-rent model, the distance from the station affects the increase in value in property/land values resulting from improved transport infrastructure. The 'zone of influence' around the station that is influenced by the transport has been discussed in many studies. Banister (2005), Ko and Cao (2013), Mohammed et al (2013), Petheram, Nelson and Miller (2013) and Smith and Gihring (2006) all find different distances that are affected by transport infrastructure, ranging from 0.25 miles (approximately 0.4km) to up to 1.25 miles (approximately 2km). The range of estimates suggests there is not a consensus on how far the zone of influence extends around new transport infrastructure. Perhaps a good overarching reference point is the study done by the RICS Policy Unit – Land Value and Public Transport (2002). This suggests that commercial property is affected up to 400 metres away from the transport hub while residential property is affected up to 1,000 metres away from the transport hub. These values are also found in the literature review in Banister (2005), and Mohammed et al (2013) quote the RICS Policy Unit paper as a reference.

39. The figure below illustrates the distance at which land value uplift persists due to new transport infrastructure.

Figure 13 – Land value uplift decay from node



Nellthorp (2016)

40. The table below is taken from Nationwide mortgage data and it shows the premium that consumers are willing to pay to be located nearer to a rail station. This table shows that land value uplifts can persist further than 1,000 metres.

Figure 14 – House price premium around rail stations

Proximity to a Tube or National Rail station	Premium
500m	10.5%
750m	7.6%
1,000m	4.9%
1,250m	2.3%
1,500m	0.0%

Nationwide (2014)

Transport benefits start to be capitalised in land/property prices from the date of announcement of a new project

41. In principle, one should expect value uplifts in property/land values to be apparent from the announcement of the transport project as landowners anticipate the benefits of the project, but with an element of uncertainty since the cost and timing of service commencement (and the wider economic effects generated by the project) may be unknown. House and land prices should then continue to rise as the project proceeds, and both the costs and benefits become clearer and more certain. In practice, property/land values rise quite quickly following the announcement of a new scheme, as shown by McMillen and Osuji (1995). However, the benefit of the transport project is not known and therefore people often tend to overestimate the value of the uplift, and this then results in revisions downward when the new transport opens as expectations are realigned with house prices. This pattern is documented in Mohammed et al (2013).

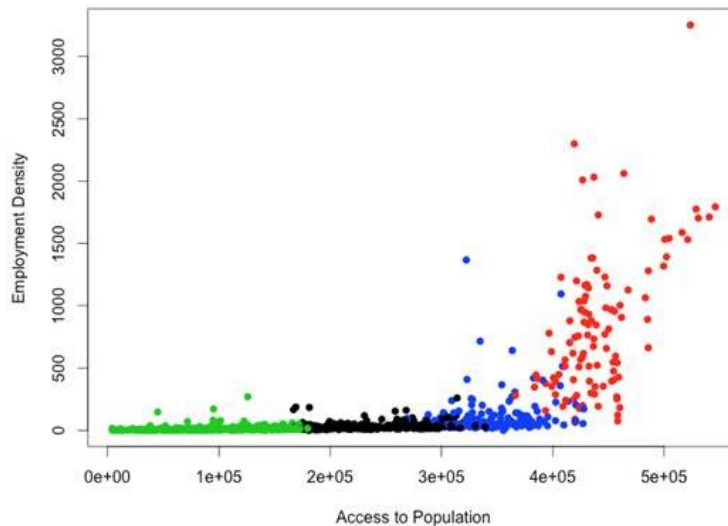
There is empirical evidence that new transport investments raise employment density, productivity and rateable values in the CBD

42. There is some empirical evidence to support the idea that transport projects can cause rateable values to rise across the CBD due to agglomeration effects, if they have the effect of raising employment density, which then increases productivity through agglomeration economies,

which then cause rateable values to rise as higher profits are capitalised into land rents across the CBD.

43. For instance Volterra shows that there is a positive correlation between locations' accessibility to pools of labour, and the employment density at that location. This suggests that if transport investment increases accessibility to labour it could also raise employment density.

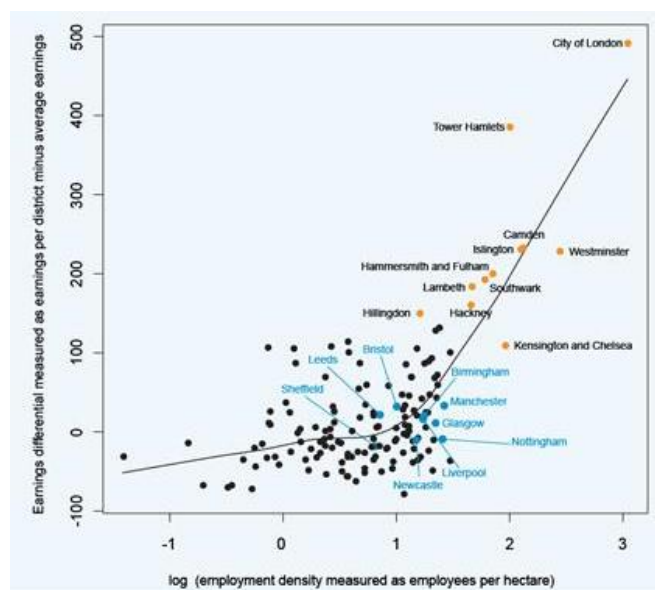
Figure 15 – Employment density against access to population



Source: Volterra

44. Volterra (2014) shows the relationship between employment density and earnings differentials which are a relatively good proxy for productivity. This shows that there is a linear and positive correlation between the two but after a threshold level there is a non-linear increase in productivity for a given increase in employment density.

Figure 16 – Employment density against earning differential (2008–2012 average)



Source: Volterra (2014)

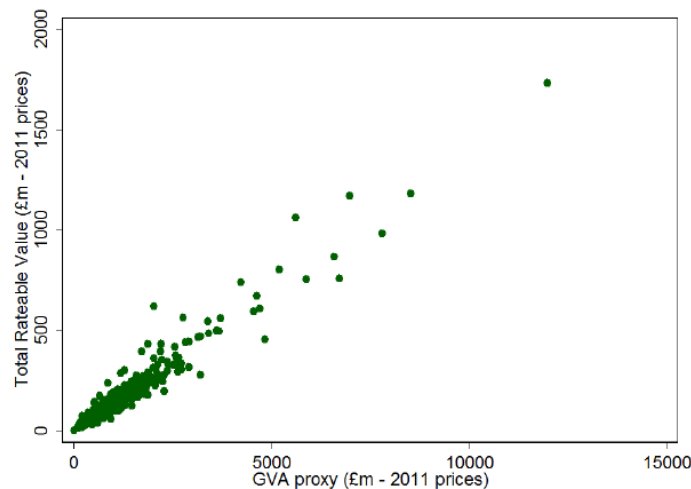
45. Most of the research into the link between productivity and transport focuses on the idea of access to economic mass. Overman et al (2009) identify elasticity between productivity and

changes in access to economic mass by rail of about 0.25, with approximately 0.2 of this being people effects, and approximately 0.05 being place effects. This suggests a national 10 per cent improvement in access to economic mass might bring about a 0.5 per cent national increase in productivity and thus rateable value (RV) per employee, but the same 10 per cent increase in a given locality might increase productivity, and thus RV per employee in that locality alone by 2.5 per cent.

46. Finally, there is evidence from KPMG (2012) that increased productivity is associated with higher rateable values. A plausible explanation for this is that some part of productivity gains realised by businesses in the CBD get capitalised into land rents.

Figure 17 – Relationship between rateable value and GVA proxy: England and Wales

Figure 3: Relationship between Rateable Value and GVA proxy: England and Wales



Source: KPMG (2012)

47. A caveat is that this is correlation, not causation. And it is likely that employment density, productivity and RVs are impacted by a range of variables other than transport, and so isolating the impact of transport can be challenging.

48. The relationship between transport and employment density are often brought together in land use models (LUTI, Land Use Transport Interaction, models), that adjust density in response to changes in access and labour supply brought about by changes in transport provision, and/or other interventions.

49. These models, and the research they are based on, tend to point to transport being able to influence those things that drive (or enable) higher levels of density and thus GVA and rateable values, but at the same time they also highlight how factors can combine to frustrate these changes (for example planning, or a shortage of labour, or developer viability), and how changes in one location will affect the density of others. These models tend to point to the affects (other things being equal), declining with distance, depending on the nature/quality of the transport networks available, but also how rare it is that these other things are equal. In some circumstances this could mean development is concentrated around a particular hub or station, but in others less so.

The evidence on the impact of transport on unlocking new development is more anecdotal than statistical, and better suited to the case study method

50. The effect of transport investment on new development is typically indirect and often uncertain. Studies of individual projects often indicate a scale of new development ‘unlocked’ by the scheme – for instance, the GVA study of Crossrail suggested that it was the catalyst for building 57,000 new homes. Similarly, the case for Crossrail 2 has been supported by the claim that it will unlock up to 200,000 new homes, particularly by ‘opening up’ the Upper Lea Valley for development. The difficulty with such measures is that it is not possible to ascertain how much of this development would have occurred in the absence of the scheme, since no credible counterfactual case is available.

51. It is well recognised in the literature that transport and land use are linked through a two-way mechanism, where land use changes create demands for new transport capacity, while new transport facilities can be the catalyst for land use change by opening up previously inaccessible areas. Some studies attempt to estimate elasticities of land use change with respect to transport capacity, but the results appear to be difficult to generalise. Still (1997) noted that methods used in the UK to forecast land use changes associated with transport projects tend to be ad hoc and difficult to compare with each other. Most frequently, planners use their own judgements or an expert’s opinion, and more recently, complex modelling tools such as LUTI models.

52. It is clear from the publication of density matrices such as that set out in the London Plan that urban planners take accessibility to public transport into account when making planning decisions in relation to land use and density. In some cases, the link is explicit. For instance, it is not uncommon in the UK for planners to give conditional approval to new developments that make their delivery contingent on the associated delivery of additional transport capacity. The Northern line extension and Barking Riverside extension are both recent examples in London. In Toronto, an urban development strategy was formed that channelled development into the specific areas served by the new metro system.

53. Venables et al (2014) note that the DLR and Jubilee line extension were intrinsically linked with development at Canary Wharf. The route of the high-speed link to the Channel Tunnel was changed to promote development of Stratford, while the 67-acre development at King’s Cross is explicitly built around the upgrading of the railway station and the new high-speed line to Europe at St Pancras. This highlights the benefits that can be achieved when the development cycles for infrastructure and property coincide (Doherty, 2004). Some of these cases are considered in more detail later in this annex.

New transport infrastructure does not always increase land/property values

54. Land value uplifts are higher where public transport is highly valued, with high market share of passenger journeys. Land value effects therefore are affected both by what alternative modes of transport are available to commuters in a city, as well as the general culture of using public versus private transport. For instance, if an area is already well connected by bus or another type of rail, the land/property value will not see as high an increase due to the new transport infrastructure as an area poorly served by public transport Mohammed et al (2013). Most studies tend to consider the distance to the CBD as a factor in explaining the pattern of uplifts, with areas already well connected to the centre benefiting less than areas that are not. The implication is that where connectivity to the CBD is unchanged, uplifts should not be expected. However, the review has not found studies examining the effects of improving connectivity between two non-CBD locations, where there is no change to CBD connectivity, to confirm if that is indeed the case in practice.

Section 3 – Land value capture methods

55. There are in principle only two ways to capture value uplift from land and property; either to own the land/property, or to tax it.

56. In most direct methods of land value capture, the public authority acquires ownership over the development rights associated with land in the 'zone of influence' around a transport hub. The public authority then captures the value uplift through the sale of these development rights in return either for an upfront premium, and/or through a share of profits from the development in the long term.

57. Indirect methods of land value capture rely on various taxation mechanisms. These seek to capture value created by the project at different points in the value chain, and from different classes of beneficiaries. For instance, some of the value created by a project is automatically captured:

- In additional fares compared to the baseline farebox revenue paid by users
- In taxes on new development (such as section 106 and CILs paid by developers)
- In property taxes paid by occupiers of residential or commercial premises
- In Capital Gains Tax paid by sellers of land or property
- In Stamp Duty Land Tax paid by buyers of land or property

58. Given a level of these fares and taxes, the observed land value uplift should represent the 'residual' of user benefits and wider economic benefits after these taxes have been taken into account.

59. The case studies that follow illustrate examples of each of these different methods of value capture.

Section 4 – Case studies

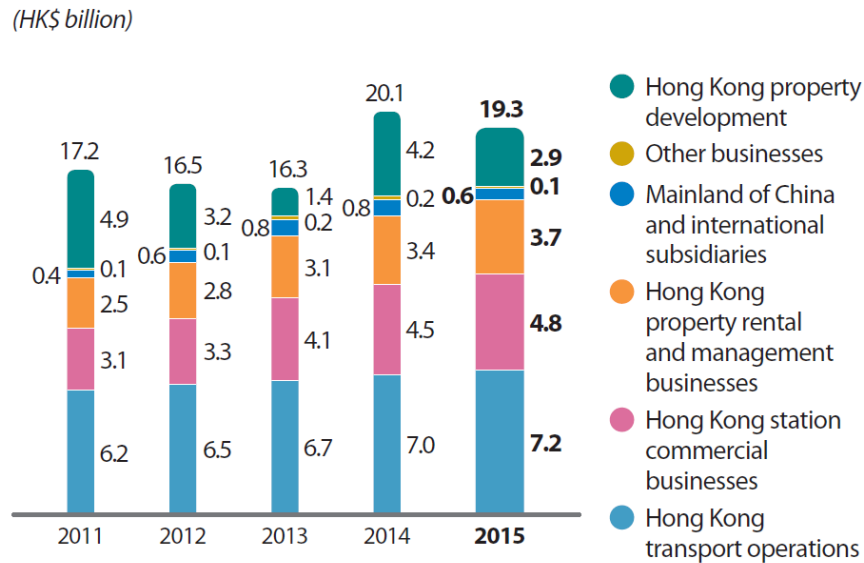
Direct land value capture – systematic

Hong Kong: the MTR

60. The Mass Transit Railway (MTR) Corporation in Hong Kong is probably the most famous example of successful, direct land value capture. The MTR calls its model the ‘rail plus property’ business model. This is how it works:

- When the MTR is considering a new railway line, it works with the Hong Kong Special Administrative Region (SAR) Government to assess the cost of construction, and then to identify suitable property development sites along the new railway line
- The Government owns all the land in Hong Kong. It grants to the MTR exclusive development rights over the land above the railways and depots, and along the railway line, for a period of 50 years. This avoids the need for the Government to have to use compulsory purchase powers to assemble land. This is a key difference between Hong Kong and the UK
- The MTR pays lease charges for the land to the Government which do not take into account the increased value that results from the transport project
- The Government is incentivised to work with the MTR as it is the majority shareholder in MTR (and receives a dividend from a profitable transport operation), and high land value creation from transport minimises the need to provide the MTR with grant or subsidy
- After creating a comprehensive masterplan for each site (which maximises the demand for transport through very high density development around the station), the MTR then goes through a public tender to sell the development rights to private sector property developers
- The private developer normally pays for all the construction costs, including the land premium to obtain the right to develop
- The MTR then receives an agreed profit amount from sold residential units before a contractual deadline

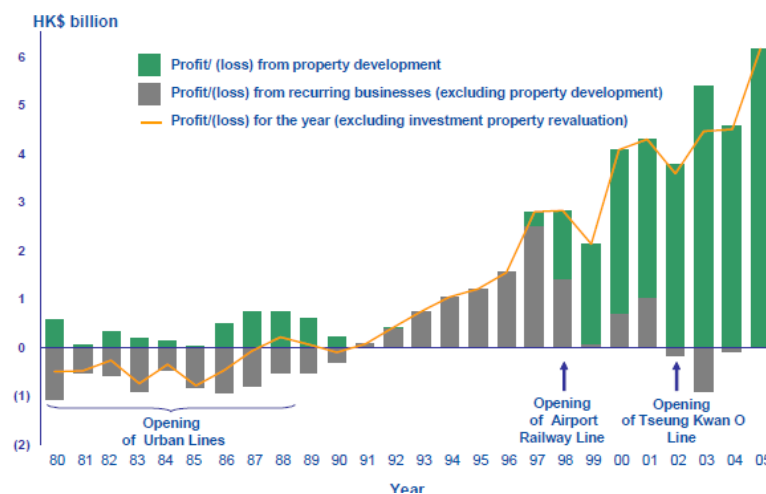
Figure 18 – MTR operating profit contributions



* Excluding project study and business development expenses

Source: MTRC website

Figure 19 – MTR property development – comparative performance



Source: Cervero and Murakami (2008)

61. The MTR has over time built a substantial portfolio of properties around the city, and the profits from development mean that instead of relying on subsidy from its government (like other transport agencies around the world), it actually returns very healthy dividends to its government as shareholder. The graphic above illustrates the scale of the operating profits from property compared to the profit from the core transport operation. This ‘rail plus property’ model has enabled the MTR to fund its capital expenditure entirely from internal cash generation. However, the second graphic is a reminder that this kind of direct land value capture is a long-term investment – the profits from land and property development have built up over a few decades, starting from a low base.

62. Hong Kong’s model works well for a number of reasons. Firstly, due to the scarcity of land in Hong Kong, property developers are willing to bid and pay for the construction along the new railway lines, including paying the premium for the uplift in land value.

63. Secondly, it is not possible to get around Hong Kong very easily using cars, therefore the majority of people that live in Hong Kong use the public transport system. The market share of MTR in passenger journeys in Hong Kong is 48.5 per cent (MTR Corporation in Numbers – 2015).

64. Thirdly, the MTR has a close relationship with the Government. This allows MTR to gain the right to develop above railways, depots and along the railway line without facing competition for land acquisition and development rights from third parties. If MTR was not granted the development rights for the pre-scheme value, it would be unable to gain directly from the land value uplift.

65. Finally, the MTR has developed strong internal expertise in property development; although MTR is not responsible for the construction of the property development it takes an active role in many aspects, as the property development interacts with the railway.

Japan

66. Similarly to Hong Kong, Tokyo's railway companies have historically used real estate profits to pay for transport infrastructure. Japan's national railways are privatised into seven for-profit companies. JR East is Japan's largest railway company based on passenger numbers. JR East requires no subsidy from the Government, one of the reasons being the use of commercial development and housing development proceeds. The planning system encourages building of commercial development and housing along the transport routes. JR East owns the land around the railway and lets it out, earning nearly one third of its revenue from shopping malls, blocks of offices and flats.

Direct land value capture – opportunistic

67. The Hyderabad Metro Rail (HMR) in India is implementing a public-private partnership for a metro project which will be 77km long and have 66 stations. This is being implemented in a design-build-finance-operate and transfer agreement, over a 35-year period. The agreement is between Hyderabad Metro Rail (HMR) and Larsen & Toubro Limited (L&T). HMR is a vehicle set up by the state government to manage the project. Through HMR, the Government gave L&T the right of way for metro construction and the lease to land for property development close to the metro stations. L&T will finance the majority of the new metro, which is estimated to cost US\$2.7bn, and expects to recover these costs over a 35-year period. The revenue sources are as follows: fares revenue (50 per cent), property development (45 per cent) and a viability gap fund (subsidies from national government).

68. An example of when opportunistic direct land value capture has not worked is the DLR extension to Beckton in 1994. At the time the Royal Docks were owned by London Docklands Development Corporation (LDDC). The Government gave approval to turn the area around the DLR extension into a new employment, retailing, leisure and residential centre for London. Through this the LDDC was able to acquire land by agreement and through compulsory purchase. There were also powers for public sector land to be vested in the Corporation by the Secretary of State. The intention was that the sites owned by the LDDC would be sold and a profit would be made through the increase in land value.

69. However, this did not happen as the three huge consortia lined up to develop the Royal Docks pulled out due to the economic downturn of the early 1990s. It took another seven years for construction to take place. The first developments were the University of East London in 1999 and the ExCel London exhibition centre in 2000. By the time development finally started in earnest, the LDDC no longer existed (the land had been disposed of to other bodies but gains in value were

minimal) and the DLR project had been completed and franchised (Enoch, Ison and Potter, 2004). And so, the land value uplift could not be used to pay for the DLR extension.

70. This serves as a lesson regarding the timing of development relative to the transport project. Property developments are influenced by the wider economic climate, and the timing for the most profitable sale of development rights may not always fit in with the construction timetable of the transport project (and its funding needs). The DLR case is also a reminder that it may not be prudent to expose individual projects so significantly to the vagaries of the property market.

Indirect land value capture – systematic

Japan

71. Japan has a fixed property tax that can be implemented by municipalities. The fixed property tax is levied on property, land and tangible business assets. These are revalued on a regular basis, the assessed value of tangible business assets are assessed each year and land/property value is assessed every three years. The valuation seems to work well. For example, in Nagoya out of 760,000 taxable properties, only 114 appeals were filed on land values and 17 on building values. The fixed property tax rate is set at a flat rate of 1.4 per cent, however local governments have the power to levy the fixed property tax rate up to 2.1 per cent. These raise around 45 per cent of the total municipal taxes.

Australia

72. In Australia, the Australian Capital Territory Government has enacted reforms to abolish or reduce a number of inefficient taxes – including land transaction tax and duties on some types of insurance. Lost revenue will be replaced by increases to general rates, which are linked to land value. These reforms are being phased in over a number of years, and are designed to be revenue neutral.

Indirect land value capture – opportunistic

73. A different example of indirect land capture – albeit unsuccessful – is the Nouveau Grand Paris project. New metro lines totalling 205km by 2030 and 72 new metro stations are being built at an estimated cost of €25.5bn. To fund it a betterment levy was considered in 2010 which would have been a new tax on real estate or land value profits resulting from sales in the perimeter of the new transport network. But the betterment levy was abandoned because:

- It would have been difficult to measure the effect of the new transport infrastructure on real estate profits
- There was an uncertain correlation between value benefit and the distance from infrastructure
- It would have been difficult to handle properties partially located in the perimeter
- This method of raising funding was seen to be too dependent on the housing market to ensure stable financing for the transport project

74. There are a number of lessons that can be learnt from the Grand Paris case. First, basing a development tax instrument on real estate profits is difficult because of measurement and boundary issues. Second, exposing individual transport projects in a major way to property market risks seems unwise. In the UK for instance, the CIL is a simple development tax levied on a square metre basis regardless of profitability. To turn it into a tax on profitability it would require getting developers to keep site-specific accounts and there would be issues around validating development/remediation costs as well as auditing the books. Separately, there could be boundary problems as with the Paris example. Exposing the project entirely to property risk in this way would not be prudent.

75. Closer to home in the UK, land value capture is funding part of the Northern line extension project in London. The NLE will cost £1bn and is being financed by the GLA through borrowing. This will be repaid through locally retained business rates (tax increment financing) in an 'Enterprise Zone' and through contributions from developers under section 106 and the new Community Infrastructure Levy across the wider area. The unique part of this project is that a low value site has remained undeveloped so close to high value central London. This has created an unusual situation where a rail extension (NLE) could unlock a high density and large-scale commercial development on the Battersea Power Station site, which then generates significant incremental business rates to help pay for the NLE. Since the transport improvement largely serves one single large development in the Battersea Power Station site, it has also allowed a bespoke section 106 deal to be negotiated with that developer for around 20 per cent of the project cost. However, the total CIL and section 106 income (including contributions from other developers in the area) only meet around 30 per cent of the total project cost. The remainder is financed on the back of incremental business rates income.

76. Further east along the river, the extension of the London Overground to Barking Riverside is also being largely funded through developer contributions from the large housing development it is designed to serve. The extension is expected to cost £263m, and will serve a new development of 10,800 homes. The developer (Barking Riverside Limited, a joint venture between the GLA and London & Quadrant, a housing association) has agreed to make a contribution of £172m towards the project (roughly 65 per cent of project cost), based on the land value uplift generated from the change in use. This is a much higher percentage of project costs than can usually be captured through CILs or section 106. This project is also unique in its circumstances for two reasons. Firstly, the land was already owned by GLA Land and Property and the GLA provided grant funding for an estimated £350m remediation costs. Secondly, and similar to the NLE, the transport improvement serves one single large development and so it is easier to negotiate a developer contribution for the transport project than would be possible with multiple counterparties.

77. Both case studies above illustrate that the scale of contributions is generally higher where there is a single 'anchor' dependent development (such as when a rail extension serves a single large development). In such cases, it is often possible to bilaterally negotiate a significant contribution towards the transport infrastructure from that developer. But with multiple landowners/developers, the transaction costs of negotiating a deal quickly become prohibitive and the only way to gain agreement is often to settle for the lowest acceptable contribution. For example, in contrast to the NLE and BRE examples above, Crossrail raised only £600m from developer contributions, representing less than five per cent of the cost of the project.

78. The table overleaf summarises some of the key characteristics of these case studies, and shows that systematic deployment of LVC mechanisms has tended to be more successful (and has raised more funding) than opportunistic attempts.

Table 9 – Summary of case studies

Case study	Direct/ Indirect	Opportunistic /systematic	Successful /unsuccessful/ in progress	LVC target	Funds raised relative to project cost
MTR	Direct	Systematic	Successful	New development	High
JR East	Direct	Systematic	Successful	New development	High
DLR	Direct	Opportunistic	Unsuccessful	New development	-
Hyderabad Metro Rail (India)	Direct	Opportunistic	In progress	New development	Medium
Fixed property tax (Japan)	Indirect	Systematic	Successful	Existing stock	-
Land value tax reform (Australia)	Indirect	Systematic	In progress	Existing stock	-
Grand Paris	Indirect	Opportunistic	Unsuccessful	Existing stock	-
NLE	Indirect	Opportunistic	Successful	New development	Low
Barking Riverside	Indirect	Opportunistic	Successful	New development	Medium

Missed opportunities in London

79. Previous attempts at LVC in London have been episodic, opportunistic and relatively ad hoc (in contrast to the more systematic approach adopted by Hong Kong and Japan). The Jubilee line extension and Crossrail 1 provide two recent and high profile examples where the opportunity to capture land value has largely been missed altogether. Research from Jones Lang LaSalle (JLL) shows that the JLE caused a £2.8bn increase in land value around Canary Wharf and Southwark stations alone, against a capital cost of £3.5bn for the entire project.

80. Similarly, in the case of Crossrail 1 (a project that will cost circa £14bn), analysis by GVA (2012) suggests that over the period between 2012 and 2021, the project will increase existing property prices to the value of £5.5bn, and that it is the catalyst for the building of 57,000 new homes, which would have increased land values between £6bn-£19bn (TfL estimate) depending on whether they represent densification or change in land use. However, at least some proportion (there are no estimates of how much) of this new development may have occurred without Crossrail. The estimated impact of Crossrail 1 across London is a 35 per cent overall uplift in residential values and a 27.5 per cent overall uplift in office values in central London; and a 27.5 per cent overall uplift in residential values and a 2.5 per cent overall uplift in office values in west London (GVA, 2012). Against this, as mentioned above, Crossrail managed to raise just £600m in contributions from developers (and in fact, £300m of this was through the Mayoral CIL spread across all developments in London, not just on the Crossrail line of route).

81. These cases show that very large uplift effects occurred with these significant transport schemes, relative to their capital cost. But this does not necessarily mean that all of the uplift could have been extracted to pay for them. In general, it is not possible to capture very large proportions of value uplifts through taxes on development or occupation without affecting the incentives to develop in the first place. Moreover, at least some of the increased land value associated with the existing stock of properties will have flowed back to the Exchequer over time in higher Stamp Duty receipts (which are linked to transaction values). However, we do not currently have any estimates of how much of the uplift observed in such projects is passively captured already through such existing taxation instruments. The next section discusses the current taxation instruments available and the extent to which they do (or do not) respond to increases in land or property values.

Section 5 – A review of taxes on land and property in London

Few of the current suite of land and property taxes are sensitive to land value uplifts

82. The current suite of land and property taxes includes:

- **Council taxes** – entirely devolved to local government, these taxes raise circa £3.5bn a year in London, and are paid by residential occupiers, based on the value of property as of April 1991. No revaluations have been carried out since, and even if a revaluation were carried out, it would change the distribution of liability to pay Council Tax between bands, but not necessarily raise the overall yield as the latter is controlled by central Government and the principle is that councils should be funded in relation to need, not property values
- **Non-domestic rates (business rates)** – these taxes are to be devolved entirely to local government over the course of this Parliament (by 2020). Business rates raise circa £6.6bn a year in London; are charged on the rateable value of properties; and revaluations occur periodically (the Government intends to increase the frequency of revaluations). So in principle, rates should be sensitive to value uplifts in commercial premises. However, in practice, government regulates the national non-domestic rating (NNDR) multiplier so it only grows at inflation, and value growth in individual areas tends to be redistributed away through equalisation mechanisms
- **Stamp Duty** – collected by central government. Stamp Duty Land Tax (SDLT) is sensitive to value growth. As the value of properties sold increases, so does the Stamp Duty tax under the new progressive structure. SDLT raises circa £3bn a year in London, and is one of the only ways in which the existing tax system captures some of the value uplift caused by transport investments, at the point at which it is realised by the land or property owner in a land/property transaction. However, SDLT is not devolved locally and therefore unavailable to directly fund or finance local transport projects
- **Capital Gains Tax** – collected by central government. In principle, the Capital Gains Tax should be the tax most sensitive to value uplifts caused by transport investments. In practice, it raises hardly any money (circa £400m a year in London). This is calculated as the total tax accrued in London (2013/14) which was £1,257m, of which approximately 31 per cent represented tax on non-financial assets (ie land and buildings). This is small when compared to other taxes because as a matter of policy, no Capital Gains Tax is charged on a property owner's principal residence. The majority of transactions are therefore excluded from its purview
- **CILs/section 106** – entirely devolved, these taxes are levied and collected locally in London. In particular, the law allows the Mayor of London to set and levy a Mayoral CIL to fund strategic transport infrastructure. The Mayoral CIL collected £118m in 2015/16, and has raised circa £245m since it was introduced in 2012. The MCIL is set at different rates for different zones in London, ranging from £50 per square metre in zone 1 boroughs like Camden and Islington to £20 per square metre in zone 3 boroughs like Barking and Enfield. It is a flat rate tax and does not respond to land or property value uplifts. However, it is the principal means through which some of the value uplift monetised by landowners through new developments is captured for the purposes of funding transport

- In addition to the Mayoral CIL, the Planning Act 2008 introduced the borough CIL as a tool for local authorities in England and Wales to deliver infrastructure to support development in their area. The CIL charging power came into effect from 2010, and most new developments which create net additional floor space of 100 square metres or more (or create a new dwelling) are liable for the levy. Relatively small amounts of money have been raised so far through the borough CIL – research by Savills showed that in 2013/14, a total of £49.8m was raised through CIL, of which 94 per cent was related to the Mayoral CIL, with the average borough raising only £200,000 via the borough CIL
- CILs are not a replacement for section 106 obligations. They are meant to be complementary, in the sense that developer contributions sought through section 106 agreements should focus on mitigating the specific negative local impacts of new development, whereas the CIL is intended to raise funds for broader, strategic infrastructure development. The legislation makes it clear that there should be no circumstance in which a developer is paying both a section 106 and a CIL payment for the same infrastructure
- For the purposes of this study, it is important to remember that even though section 106 obligations may not be used to fund strategic transport infrastructure, they do represent an extraction of value from the developer/landowner. In fact, the sums raised through section 106 obligations dwarf those raised through CILs. In 2011, DCLG estimated that section 106 obligations raised circa £3.7bn across England and Wales, compared to the small sums above for borough CILs

Raising CIL rates may not extract more value uplift

83. In theory, if the public sector were dissatisfied with the current level of extraction of value uplifts through the tax system, it could increase this level by raising the tax rates on land or property. One of the most obvious candidates in local government finance is the CIL. But raising CIL rates may reduce rather than increase the value extracted from transport investments if it puts the overall level of development at risk.

84. CILs are a tax set at a standard rate in an area, regardless of land value. CIL is levied on the developer when they have purchased the land and started construction, but not yet sold the new development. It is therefore levied at the point of maximum risk for the developer. If the rate at which CIL is charged is increased, it may not increase the amount raised through CIL but instead disincentivise developers from development.

85. As developers are aware of the CIL rate they will be charged, in theory it should be priced into the value they pay for the land, and therefore higher CIL rates should be passed through to the landowner. But if the supply of land for development is inelastic and competition from developers is high (or if developers maintain reserves of land in previously purchased land banks, as is the case in London), the effect of higher CIL rates may simply be that developers hold back from development until house prices rise high enough to generate the target profit margin. The consequent lack of development in turn puts pressure on the taxing authority to reverse the increase in rates. This is one of the important ways in which the CIL as a tax on developers (and development) differs in its economic effects from a land value tax on landowners which taxes the unimproved value of land.

The history of development taxation in the UK shows the difficulty of extracting value uplift by taxing new development

86. There have been seven attempts by Labour governments between 1945 to 2010 to introduce some form of development taxation:

- The **Development Charge** (in force 1948-1951), a national 100 per cent tax on the increase in land value arising from development
- The **betterment levy** (in force 1968-1970), a national 40 per cent tax on the increase in land value arising from development
- The **Development Land Tax** (DLT, in force 1976-1985), a national 80 per cent tax and then a 60 per cent tax on the increase in land value arising from development
- The **mandatory tariff** (proposed 2001, not implemented), a flat rate charge per unit of development, set locally
- The **Optional Planning Charge** (OPC, partially implemented in 2004), a negotiable flat rate charge per unit of development, set locally. Local authorities would have been forced to set a charge
- The **Planning Gain Supplement** (PGS, not implemented), a national tax at a modest rate on the increase in land value arising from development, collected nationally but with the majority of funds raised to be returned to local authorities
- The **Community Infrastructure Levy** (CIL, introduced in 2010 and still in force), a mandatory flat rate charge per unit of development, set locally, with 100 per cent of the funds collected and retained by local authorities. Local authorities can choose whether or not to introduce CIL

87. In the first three cases, the instrument was implemented by a Labour administration and abolished by the subsequent Conservative administration, though not immediately in the case of DLT. The CIL, when it was introduced in 2010, was the first form of development taxation in the UK for over 35 years.

88. The common pattern in this history is that taxes which did not have cross-party support did not survive. As fresh initiatives were attempted, they increasingly faced a credibility problem – if developers believed the tax would not survive a change of government, they would hold back and lobby the Opposition for a change in the tax regime. The result was a collapse in revenues for the taxing authority.

89. It is useful to note the four most common reasons for business opposition to previous forms of development taxation:

- The money raised may not be spent on productive infrastructure (which is essentially an argument around hypothecation)
- The tax rate may be set too high (earlier forms of development taxation were prone to set very high tax rates, on the grounds that the value uplift was a windfall gain)

- Valuations of the tax base may be arbitrary and prone to error (this was particularly the case with the opposition to the Planning Gain Supplement, which required a valuation of land with and without planning consent)
- It may be too complex and time-consuming to administer (this was particularly the objection to any tax that required individual negotiations with local authorities, and in fact remains a common complaint in relation to section 106 obligations)

90. DCLG are currently reviewing the CIL, and the head of the review has been recently quoted saying the levy is 'not providing a huge amount of funding for infrastructure' and has failed to provide a 'faster, simpler, more transparent system' than section 106. Even so, any reformed CIL or successor tax instrument will need to address the four objections raised above.

Section 6 – Conclusions

There is strong evidence that improved transport connectivity leads to higher land and property values in a ‘zone of influence’, but the scale of effects is context sensitive

91. The evidence from the literature shows that property/land values tend to increase due to new transport infrastructure, with some predictable patterns:

- There is more evidence for impacts of rail than for road projects. It appears that rail projects tend to produce more significant land value uplifts compared to road schemes
- New commuter rail infrastructure tends to have greater value uplift effects on land/property values than heavy or light rail
- Commercial property values are affected directly around the station; whereas residential property values tend to be affected up to a greater distance (at least one kilometre away in radial distance)

92. Although the uplift effects are context sensitive, both theory and evidence suggest that large uplift effects should be expected from transport investment in dense, public-transport dependent agglomerations with inelastic housing supply, such as London.

93. All the benefits of a transport project are not necessarily capitalised into higher land values in a small radius of stations along the route. An improvement in accessibility that increases employment density in the central business district may produce agglomeration economies which are ultimately reflected in higher land values in the central business district.

94. Although context is important, the one common theme running through the literature is that land value uplift effects depend upon transport user benefits (such as journey time savings and improved connectivity) and wider economic effects (such as agglomeration economies) of transport. A logical basis for defining the ‘zone of influence’ of a transport project (as opposed to an arbitrary radius of 750 metres or one kilometre) is therefore to map those areas where these benefits are likely to occur.

Direct development is more effective than taxation in extracting value from new development enabled by transport, but taxation methods are more suitable to extracting value from uplifts on existing stock

95. Direct land value capture (of the sort practised in Hong Kong by the MTR Corporation) both maximises development potential around and above the stations, and extracts most of the value from new development to pay for the transport that enables it. Taxation based methods on the other hand tend to be relatively blunt, weakly targeted and prone to negative feedback effects on the incentives to develop. The history of development taxation in the UK is particularly marked by failure. Taxation methods are better suited to extracting some of the uplift realised by the existing stock of land and property.

96. Systematic application of land value capture (particularly where value is extracted from new development) is likely to be more successful than ad hoc, opportunistic attempts. By ‘systematic’, we mean that land value creation and capture is intrinsic to the design and planning of the transport scheme from its inception (as in Hong Kong), rather than an afterthought (as too often in the UK). Ad hoc application of land value capture suffers both from the problem that individual projects are

not well placed to be highly exposed to development risk (as with the DLR case study), but also that project sponsors face sharp incentives to minimise timescales, budgets and opposition from stakeholders. This leads more often than not to development and regeneration around the core transport project being seen as an expensive add-on to the project, and something to be sacrificed in the face of funding pressure or stakeholder objections.

97. Land value capture can also be implemented in a systematic way through creation of a systematic link in property or land taxation to property value. In such cases, the uplifts are taxed not necessarily as they are monetised, but gradually over time. Taxes go up naturally as land or property values rise, creating funding to pay for infrastructure, which is in many cases not just the cause of rising local land values but can often also form part of the supply response by freeing up new housing development. Taxes on unimproved land are in general considered to be more efficient than taxes on buildings and other property.

Intelligent land value capture systems should aim to balance the burden of paying for transport infrastructure across existing stock and new development

98. The literature suggests that land value uplifts are a windfall gain for landowners, who monetise it both through new developments, as well as the existing stock of property. The gain in the former case is realised when newly developed assets are sold; in the latter case, the gain is realised when uplifted assets are rented (as is often the case with commercial property), or when they are sold (as is typical of residential property).

99. Intelligent land value capture mechanisms should aim to:

- Capture some proportion of this windfall gain ideally at the time it is realised or monetised, rather than taxing a notional capital gain based on an assumed value uplift
- Avoid taxing new developments so highly that it creates disincentives to develop
- Balance the burden of paying for the infrastructure that creates the uplift between existing and new stock

Land value capture should be an important, but not the only, source of funding for transport projects

100. The MTR in Hong Kong is an extreme example of direct land value capture, using a combination of cheap access to land over and around its stations, and a planning framework that actively encourages very high-density development around its stations. Where this combination of features is not available, land value capture will probably not yield gains on the same scale as Hong Kong.

101. But even if such gains were possible, it would not generally be prudent to completely expose individual projects to the vagaries of the property cycle. Direct land value capture methods should therefore be applied on a portfolio basis, across projects, limiting the exposure of an individual project to this risk, and balanced by income from indirect methods. It is notable that even the systematic use of land value capture in Hong Kong has yielded results only over a period of time, not immediately. The MTR in its early years operated at a deficit like other transport authorities, and it is only over a span of 10 years or so that the surplus from its property business became substantial enough to finance capital expenditure on new projects. So the use of land value capture cannot be seen as a short-term fix; it is over the long term that it produces reasonable returns. The MTR experience also indicates the value of managing a land and property development

programme at a corporate level, rather than it being delegated to an individual project. Land value capture does not suit being managed at project level as it is a medium-to-high risk activity, the returns are generally received at the end of the project and it can be difficult to borrow against future development revenues. Managing land value capture at a corporate level enables a portfolio of developments to be constructed from the initial projects, from which surpluses can be drawn over time to finance new transport projects.

102. Finally, the design of land value capture mechanisms needs to keep in mind the time and cost pressures facing transport projects, and the frequent pressure to minimise the borrowing requirement. An ideal mechanism would help projects minimise the budgetary outlay, while not becoming an additional source of stakeholder opposition or delay.

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