IDEAS ABOVE YOUR STATION: EXPLORING THE POTENTIAL FOR DEVELOPMENT AT LONDON'S STATIONS

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FOREWORD

London's railway stations – both the land around them, and the space above them – provide a unique opportunity for urban and civic renewal at a critical moment in the capital's history.

As this Centre for London report impressively highlights, developing above and around stations delivers multiple benefits: from the creation of new land, new homes and new commercial centres in a space-constrained city, to the emergence of exciting new civic eco-systems and public realm. It offers the opportunity to deploy radical and progressive funding models that help address the continued erosion of national and regional public investment programmes. Most importantly, it can help keep the city moving, with a proper face to the future. To remain globally competitive, London needs a world-class transport infrastructure in the twenty-first century. Developing London's stations can help finance and deliver this.

This is not to say that progress is without challenges. London's infamous patchwork model of governance, planning, and approval can be an impediment to the smooth progress of what is inevitably a complex process, involving multiple stakeholders. Huge advances in engineering and technology, from piling to decking and sound/vibration insulation, are to be celebrated, and in particular, make over-station development at scale a new and exciting possibility. But the costs and design implications of such projects can make uncomfortable reading for those worried about conventional approaches to design, density and height. As elsewhere in the capital, levels of affordability in both the commercial and residential sectors cannot and must not be ignored. This report, authored by Kat Hanna and Nicolas Bosetti, does not shy away from examining these issues in detail, and offers pathways to progress and to a positive future for infrastructure, transport and development in the capital.

In our opinion, support for high-quality station development at scale will require strong and courageous leadership from both the public and private sectors, working in partnership. Innova, the joint venture between Network Rail and Capco signifies our commitment to such collaborations and we are proud of both our partnership and the opportunities it delivers for the city.

The issues highlighted here will no doubt be openly and honestly debated – including new design and density standards for key station development areas; governance and financing vehicles that support fast and efficient delivery; and how best to support further opportunities and projects in a virtuous circle of development for good. We hope that this report makes a valuable contribution to this debate, and forms part of a positive vision for the future of our capital city. It is a future that we are excited about and a positivity and ambition that we share.

David Biggs
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EXECUTIVE SUMMARY

As population growth continues, London is under increasing pressure to use space more efficiently and to concentrate dense development at transport hubs. The city's transport infrastructure continues to need investment at a time of fiscal constraint. This report asks how we can make the most of the development opportunities offered by London's stations. It finds that such developments are complex and sometimes commercially challenging, but can be made to work if decision-taking, governance and design are intelligently integrated. The report calls for a more active promotion of station development in planning policy, for devolved powers over taxation and land value capture, and for a renewed strategic focus to realise the potential of new and existing infrastructure.

Developing at rail and Underground stations has a number of potential benefits:

- It enables sustainable high-density development.

- It makes use of land and assets held by public bodies such as Transport for London and Network Rail (who together have plans for around 15,000 homes in coming years).

- It generates development receipts that can help fund infrastructure improvements.

- It creates new civic ecosystems of public space and facilities around stations, and can connect communities separated by rail infrastructure.

…but the record in London is uneven

- Good connectivity is not always reflected in residential densities around stations.

- Major projects like King's Cross and other London terminus projects have taken years to deliver, and

have often focused on development alongside rather than over the station.

• Other projects have stalled through a combination of operational constraints, planning requirements, popular opposition, and high upfront development costs.

• Delivery requires strong leadership, and an understanding of trade-offs between objectives and interest groups.

Building over stations can be commercially viable in some cases:

• Our modelling suggests that higher-density developments, mixing commercial and residential, can deliver station improvements when supported by revenues from developer contributions, rents, and in most cases, tax revenues.

…but a more comprehensive approach to development can deliver better commercial and civic outcomes.

• Assembling sites around stations can create a more balanced business case, as well as enabling a new mixed-use piece of city – complete with social infrastructure and public realm – rather than an isolated high-density development.

Development over or around stations is complicated by a number of risks and challenges:

• Institutions and Governance: Transport bodies are called upon to combine the provision of operational services with efficient exploitation of development opportunities, requiring an alignment of objectives and resources.

• Engineering and Operations: Building over operational stations is complex, and this often influences development scale and shape, requiring costly and disruptive possessions of infrastructure.

• Funding and Financing: Station improvements result in higher land values, but capturing these through taxation or ad hoc levies is complex.

• Planning and Politics: Given the high costs of decking and station rebuilding, planning requirements on affordable housing, density and rights to light can affect viability, and higher densities often provoke community opposition.

…so a more strategic approach is needed to capitalise on the opportunities offered.

• The Greater London Authority (GLA) and Transport for London (TfL), with Network Rail, should prioritise work to identify public land ownership around stations (particularly those expected to receive or require major investment in the near future), building on the work of the London Land Commission.

• The GLA should ensure that TfL and Network Rail's plans for upgrades and improvements are incorporated into long-term planning tools such as the London Infrastructure Map, as well as plans for opportunity areas and intensification areas, so that opportunities can be anticipated, planned for and co-ordinated.

• The Mayor, the GLA, and other scheme promoters such as HS2, should ensure that new stations include provision for over- and/or around-station development, as recommended by the National Infrastructure Commission.[1]

• The GLA should define "station intensification areas" in the London Plan as a strategic priority around key stations, setting higher minimum density and design standards in these areas, and (if necessary) using call-in powers to ensure approval of policy-compliant schemes.

• The GLA should explore establishing Mayoral Development Corporations or specific project development vehicles to provide the resources, expertise, and certainty required to make the most of station development opportunities when new rail schemes are being developed – particularly where multiple stakeholder interests are not yet aligned.

• The Mayor, the GLA and the London boroughs should adopt a tailored approach to affordable housing in over-station developments in order to reflect the value of station improvements; they should also encourage the use of review mechanisms to ensure viability and share value uplifts.

• The government should accelerate devolution of property taxes (as recommended by the London Finance Commission) to enable infrastructure to be funded by future tax revenues, as well as continuing to explore other means of land value capture such as development rights auctions.

INTRODUCTION

London is growing rapidly by UK standards. In the last five years, the city has accommodated an additional 600,000 residents and 700,000 jobs, at a growth rate twice that of the country as a whole.[2] At the same time, London's successive mayors have committed the capital to managing this growth within its borders, without infringing on the green belt. This has been viable so far – in part thanks to London's heritage as an industrial power, which has gifted the city large areas of former industrial 'brownfield' land that many European capitals envy. But these spaces have been much depleted in recent years: many of those remaining are either complex to develop or remain in commercial or industrial use.

Consequently, finding space for new housing and workplaces means intensifying existing land uses, and doing so in the right places. London is not a very dense city by international standards[3]: there is scope for encouraging denser uses of land and property, particularly around stations, where high connectivity is not always reflected in local density. Currently, 80 of London's circa 550 "station neighbourhoods" are less dense than the London average – and the remainder have densities that are typical for the borough in which they are located. Transport for London and Network Rail have significant land holdings near stations, and land can also be "engineered" by building decks over infrastructure – particularly on railway land near or above stations, which further harnesses their connectivity.

The potential of station land in London's prime property market has aroused enthusiasm. Railway land makes up a small portion of Greater London's area, but Transport for London and Network Rail are among the capital's biggest landowners. International examples – and buildings above Charing Cross, Liverpool Street and seven Crossrail stations – show what can be achieved. But the low number of projects completed (and their modest scale) in a period of dramatic land value growth suggests that there are significant barriers to densifying stations in the capital.

The drive to make better use of stations for development is growing, and there are rising expectations around their potential. Historically, rail operators have been nervous about allowing construction over an increasingly saturated transport network – but Transport for London and Network Rail are now actively seeking development opportunities over their land to meet their funding needs. Like most public bodies, they have been formally mandated by the Mayor or central government to make land available to meet housing targets. In particular, the Mayor's team is expecting Transport for London's land to enable well-connected, well-designed and affordable homes and offices.

Despite these expectations, the funding and policy environment has not changed to support the delivery of quality station densification projects. Decking above "live" infrastructure is complex and costly (especially above railways): yet if there is one city in the UK where such projects could be viable, it is the capital, where land values are the greatest.

This report investigates the irregular take-up of station densification projects in London, and suggests how we can make more of the potential for developing above and around the capital's stations:

- Chapter 1 makes the case for densifying London's stations.

- Chapter 2 draws lessons from existing station densification projects in the capital, as well as missed opportunities.

- Chapter 3 assesses the commercial and economic potential of over-site development in different parts of the city.

- Chapter 4 asks whether the delivery, policy, funding and financing environment reflects the complexity of building at stations.

• Chapter 5 suggests how the potential for station densification in London can be unlocked.

This report is based on desk research; interviews with engineers, architects, planners and development personnel at Transport for London and Network Rail; and estimates of costs and revenues from a theoretical over-station development, produced by Arup, a building, engineering and consulting firm.

The report considers how we can achieve greater interaction between transport investment and development. Given that station development projects often extend beyond over-site development, this report examines the potential for developing both *above* and *around* stations.

1
THE CASE FOR STATION DENSIFICATION

The cost and complexity of developments at stations makes them long-term projects, rather than a quick fix to increase the supply of housing and employment space. However, developing at stations has significant potential as a sustainable way to accommodate the city's long-term growth – generating many social and environmental benefits, as well as potentially cross-subsidising improvements to stations and infrastructure. This chapter explores the case for building at stations, and assesses the potential of such projects in London.

1.1 The rationale for building at and around stations

Create and intensify land in well-connected places

Like most large, growing cities, London faces a shortage of land for development. Railways make up around one per cent of London's area[4], but most have gone through minimal change since they were first built. With London's outward expansion constrained by the green belt, building over stations and intensifying surrounding streets is one of the ways to provide space for the capital to grow sustainably.

There are advantages to channelling urban growth near public transport – from limiting land consumption, to reducing the need for car use. In established cities like London, building at higher densities near stations also makes the most of existing infrastructure, while making further investment in the network viable in the long run.

These benefits are reflected in the "compact city" model that has been promoted by planners and urbanists in recent years[5] – for example, by the Urban Task Force and the London Planning Advisory Committee (LPAC). The Urban Task Force argued that linking development to public transport was necessary to regenerate large parts of the capital – and helped build momentum for large, mixed-used developments focused on King's Cross and Stratford stations. In 1998, LPAC suggested guidelines to allow higher densities in places with better public transport access – the first version of the London Plan density matrix.

The current London Plan makes reference to the need to focus on development in areas with good public transport accessibility, using public infrastructure to unlock land for development. It identifies Opportunity Areas (OAs) and Intensification Areas (IAs), aimed at enabling development or redevelopment at higher densities in areas with good existing or potential public transport accessibility. Each OA and IA is subject to its own planning framework, encouraging co-ordination between relevant stakeholders, and ambitious targets for residential or employment density. Unsurprisingly given the emphasis on using public transport to unlock development, one in three London stations now sit within an Opportunity Area[6]. The National Infrastructure Commission also recommended active measures to enable Crossrail 2 to support delivery of 200,000 homes.[7]

Mayor Sadiq Khan suggested in his 2016 vision document that he would take this further, looking specifically at stations: *"Intensifying development around well-connected transport nodes will form an important part of my vision for the city, and I will explore the potential of areas around a number of stations as locations for significant and much higher-density housing development."*[8]

Developing quality places

Redeveloping land at and around stations is not only an opportunity to increase housing supply – if done well, development can improve both public spaces and the "ecosystem" of civic and commercial uses around stations, augmenting their social function. Stations often act as the focal point of a neighbourhood[9], for better or worse. Half of London's existing stations are located in district or town centres.[10] Redevelopment is an opportunity to provide space for workplaces, commercial and community uses, as well as a pleasant public realm. In less-built-out parts of town, station redevelopments can be used as anchors for new or revitalised parts of the city – "new destinations" – as is the case in Stratford and North Greenwich in east

London, or in the upper Lea Valley, where Angel Road station is being rebuilt to unlock the 82-hectare Meridian Water development.

Developments at stations are also an opportunity to better connect neighbourhoods. Stations may be beautifully designed, but railways often act as barriers between neighbourhoods, sometimes separating areas with different fortunes – indicated in the expression "the wrong side of the tracks". The railway embankment at Clapham Junction is a striking example, where over 20 train tracks create a 200m-wide tear in the urban fabric, separating the most- and least-deprived wards in the London Borough of Wandsworth.[11] Similarly, many central London termini have cut through and shaped the destiny of neighbourhoods on either side.[12] Comprehensive station redevelopment can alleviate this division of urban space: the remodelling of Whitechapel station for Crossrail will add new access points to the north and the east of the station, connecting both sides of the tracks. London's larger stations, and the major termini in particular, have an important public realm function. Development at stations offers an important opportunity to enhance the placemaking role of London's station owners and managers.

Private landowners have long seized the opportunities brought about by rail infrastructure, but developments have been piecemeal and of patchy quality, particularly in lower-value areas. Public landowners are now increasingly acknowledging the potential for station development to create quality, mixed-use spaces. Transport for London in particular have signalled their intention to move away from land disposal in favour of partnership arrangements for development; to increase their control over the quality of schemes on their land; and to encourage mixed-use, mixed-income developments.[13] Good station developments are likely to increase property values in surrounding streets and can also provide new public spaces, as in the case of Barbican, Canary Wharf and suburban West Ealing. Quality developments also will help ensure that residents perceive

the project as improving and fitting in with the character of their area.

Funding for infrastructure

Changes to how infrastructure projects are funded have pushed transport operators to examine the contribution their property portfolios can make. The need for new sources of funding is especially acute in London, as both operations and capital investment need to keep up with ageing infrastructure and population growth. Transport for London will see its revenue fall in real terms, as central government funding is reduced and the Mayor freezes fares.[14] Fiscal restraint also means limited capital investment. Network Rail will continue to be under pressure to meet targets for property receipts and income set by the Office of Rail Regulation, and the government's recent confirmation of support for Crossrail 2 is subject to further assessment of whether London could meet half the costs of the scheme during construction.[15]

Stations are among the most expensive pieces of urban infrastructure to deliver. TfL's current estimate is that a third of the costs of Crossrail 2 are for stations and associated works, including improvements to facilitate new interchanges (£10.8bn of £32bn).[16]

New sources of funding have already been explored. To fund Crossrail 1, the government allowed the Greater London Authority to introduce additional taxes on business and property development – the Business Rate Supplement, Crossrail Section 106 and the Mayoral Community Infrastructure Levy.[17] These will be continued after Crossrail 1[18], but they are unlikely to become a major source of funding for upcoming projects given the steep rises in business rates since their 2017 revaluation – and the Mayor's policy priority that development should subsidise affordable housing.[19]

As a consequence of funding pressures, attention has focused on the potential for capturing land value uplifts. Most transport projects improve the connectivity

of an area and make it more desirable, which usually translates to higher land values. In the past, railway companies sought to capture these uplifts to fund rail infrastructure and meet operational costs. Most London railways were built by companies that bought land around stations, developed it and then sold the property once train services were in place; profits from housing enabled the Metropolitan Railway to remain a standalone company well into the Great Depression.[20] However, transport operators can no longer operate in this way. Restrictions on land assembly powers prevent public bodies from replicating the Metropolitan Railway model. This is unlikely to change in the near future, since the government is wary of allowing transport operators to acquire land for development.[21]

What TfL and Network Rail can hope to do is raise revenue from selling, developing, or leasing their current land holdings (or the air rights above them), then using these receipts for capital investment.[22.] This is not a new concept: the successive bodies overseeing railway land have sought capital receipts on their central London property assets by building above or near stations – for instance at Cannon Street, Charing Cross and Fulham Broadway. Transport for London is now planning to raise £850m by 2021/2022 from development and property disposal.[23] Other approaches to capturing land value uplifts – through taxes or co-ordinated development – are discussed further in Chapter 4.

1.2 The potential for station densification

London has room to grow around stations

Not only does densifying development above and around stations make sense in planning, urban design and commercial terms – there is also clear capacity for such growth in London.

First, TfL and Network Rail are among the largest landowners in London. Transport for London estimates that 10,000 homes can begin construction on their land holdings by 2021[24], and Network Rail has announced

plans to release land with capacity for around 5,000 homes in London by 2020.[25] However, the full development potential of transport bodies' land is likely to be much greater: TfL's target is based on an assessment of five per cent of their land holdings, and for both TfL and Network Rail, the figures include less complex sites that can be brought forward by 2020 or 2021. Greater investment into decking and land assembly around other stations could unlock more capacity for development in the long term.

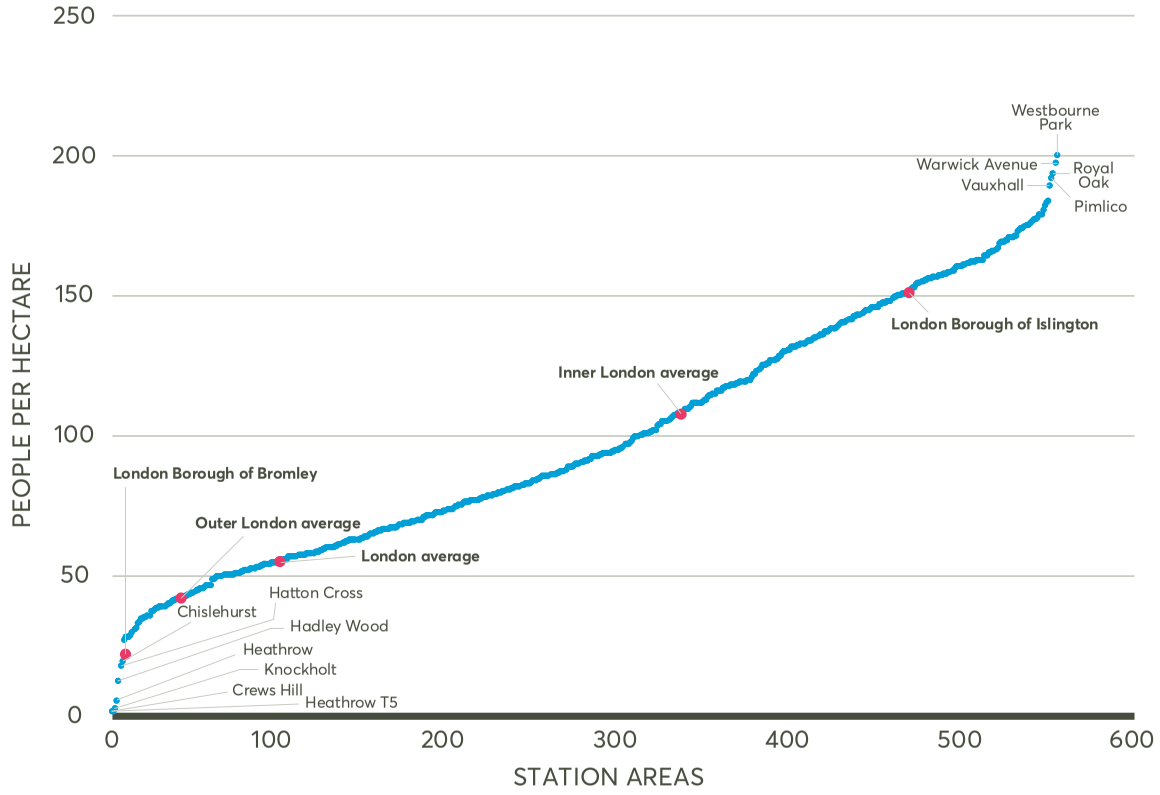
Second, many of the capital's station areas are of relatively low density. A 2015 study by London First and Savills estimated that 1.4 million more homes could be built in well-connected areas if higher residential densities were allowed.[26] In this present study, we looked more closely at the neighbourhoods adjacent to stations, examining the residential density of the areas surrounding each of the 559 London stations.

We defined these "station areas" as all areas within 1km of a station – which generally equates to a 15-minute walk. The smallest spatial unit for which data on residential density data is available is the Lower Super Output Area (LSOA) – this unit has an average population of 1,700 in London. The LSOAs that comprise or intersect with the 1km station radius are included in the density metric. Hence, the residential density of a station area is an average of the densities of these LSOAs. This indicator of population density includes green space and water, so underestimates density of built areas.

Unsurprisingly, we found that most stations are surrounded by higher residential densities than the London average. However, 471 of the 559 station areas (84 per cent) are less dense than the London Borough of Islington (London's densest borough). Full results are laid out in the following chart.

As the 1km radius encompasses a rather large area around stations, it could be that some stations are surrounded by both high- and low-density LSOAs – a level of detail that would be lost when calculating the

Figure 1: Residential density of areas within 1km of London stations, 2011



Source: Greater London Authority. Population Density.

average. So we looked at the residential density of the most dense LSOA within each station area. We found that a third of London's station areas do not have any 'dense' LSOA – that is, any LSOA with a residential density above the inner London average.

However, not all of these station areas will be suitable for densification. Some are employment centres or airports. For others, connectivity, as well as regulations around green space and heritage preservation, will constrain development potential. The London Plan also specifies that development should take into account local context and character.[27]

To identify the stations with most potential for densification, we selected station areas that are well-connected, but have lower residential densities than would be expected from their dominant local character.

METHODOLOGY

• We used ridership as a proxy for good connectivity, defining well-connected stations as being in the 60 per cent busiest London stations, which roughly equates to at least one million entries/exits and interchanges annually.

• The dominant local character for each station area is determined using the following indicator of built form, also used in the London Plan: LSOAs are considered 'central' if 75 per cent or more of the residential units are flats; 'urban' if 75 per cent of units are flats or terraced houses; the remainder are considered 'suburban'.

• We excluded stations surrounded by high employment LSOAs, or characteristics that would constrain development potential, such as high proportions of green space (within the top 40 per

cent of proportions of green space). We outline the stations located in a heritage conservation area in the table below. Full methodology is detailed in the on-line Annexe to this report.

Results

The methodology set out above allowed us to identify station areas that are less dense than would be expected from their setting, or "local character". The finding are set out below, and a list of these station areas can be found in the on-line Annexe to this report.

Figure 2: Station areas with most potential for densification

	Dominant setting		
Residential densities	Central	Urban	Suburban
20% least dense	-	1 (1)	31 (25)
20%-40%	3 (1)	5 (3)	29 (26)
40%-60%	7 (6)	35 (30)	14 (13)
60%-80%	29 (19)	24 (18)	-

*Figure in bracket excludes stations within or adjacent to a heritage conservation area.
Source: Centre for London estimations. Full data can be found in the on-line Annexe to this report.

This suggests there are various opportunities to densify the neighbourhoods around London's stations, according to their location and dominant built form:

– *Central residential hubs*: the 40 per cent least dense well-connected stations in a predominantly "central" setting, such as New Cross, Ealing Broadway, Kilburn, Clapham Junction, Sutton or Surbiton.

– *Urban residential hubs*: the 40 per cent least

dense well-connected stations in a predominantly "urban" setting, such as Beckenham Junction, Harrow-on-the-Hill, Wimbledon, Tulse Hill or Upney.

– *Suburban well-connected*: the 20 per cent least dense well-connected stations in a "suburban" setting, such as Pinner, Purley, Orpington, Upminster or Romford.

This analysis is illustrative, and a case-by-case examination would be needed to assess the potential of individual stations. In some places, station upgrades and new stations will open up a window for development (see Figure 3). Indeed, the rapid growth in passenger numbers has brought forward the need for upgrades: some stations like Bank, Holborn or Camden Town have already become pinch points on the network. TfL is expecting that at least twenty stations will face severe crowding in the next decade, but their data release only includes stations that would suffer from deferring Crossrail 2. The capacity crunch on London's stations is likely to be higher, especially since Network Rail does not keep track on station crowding in the way that TfL does.[28]

Figure 3: Planned station works

	2017	2020	2025	2030
Step-free access only	14 tube stations Rail stations: Blackhorse Rd Brondesbury West Hampstead	25 tube stations 5-10 rail stations	15 tube stations 5-10 rail stations	15 tube stations 5-10 rail stations
Intermediate upgrade	Custom House Hackney Wick White Hart Lane			
Major engineering works	Crossrail 1 stations Bank (W&C) Victoria Finsbury Park	Euston Bank Elephant & Castle Camden Town South Kensington	Twickenham Holborn North Greenwich* Harrow-on-the Hill*	
New stations	Angel Road	Nine Elms Battersea Barking Riverside Old Oak Common	Bakerloo to Lewisham Elizabeth Line East of Abbey Wood DLR Thamesmead	Bakerloo (East of Lewisham) Crossrail 2

*Start or completion information not provided by TfL.
Source: Mayor's Draft Transport Strategy and TfL property development; Network Rail, Railway Upgrade Plan 2017/2018

In a growing city, development at stations is a sustainable way of accommodating growth, creating better places, and supporting investment in rail infrastructure. Looking across London, there appears to be significant potential in terms of land availability and existing densities – although realising these opportunities will depend on a number of factors including station setting, ownership of land, engineering complexity, and whether there is planned public investment or an acute need for upgrade. The next chapters look at the challenges involved in grasping these opportunities.

2
HISTORY OF DEVELOPMENT AT LONDON STATIONS

Many of the drivers for densifying London's stations have been identified before – when either public funding for infrastructure was scarce, land values were rising, or the city was growing but bounded in its outwards expansion. Some of these factors have been in play for a long time, yet the space above and around the capital's stations has rarely been developed. This section reviews the arrangements that led to both completed projects and missed opportunities.

Private-sector expansion (1850-1930s)

Development over stations or the railway adjoining them has remained an exception rather than the rule. This is because most of London's rail network was laid out by competing private railway companies: stations and lines were built quickly, with little thought given to the coherence of the network, let alone designing for over-site development. Development of surrounding greenfield land was unregulated, so promoters built outwards rather than upwards.

The few examples of over-site developments in the pre-WWII planning system were funded by railway companies, who developed hotels within their central London termini as they laid down tracks. However, these developments are small relative to the stations' footprints, suggesting the efficient use of land was not a strong guiding principle.[29] A few 1900s-era tube stations were also built with capacity for over-site development[30], and a couple of "anomaly projects" were carried out later on by London Underground, including the redevelopment of their headquarters above St James's Park station into 55 Broadway, which became London's tallest building in 1931.[31] Morden station was also designed to take development on its roof, though it was only thirty years later that a three-storey office building was added to it.

Office-led densification deals (1960s-1980s)

The British Transport Commission (created in 1947 to oversee all modes of UK transport) largely failed to take

a comprehensive approach to developing land at existing or new stations, or investing so that it could be done in the future. The Victoria line (1962-1972), the first underground line built in decades, did not come with a development strategy above stations or on adjacent land: Highbury & Islington station was flattened into a single-storey shed, while Seven Sisters, Tottenham Hale, Blackhorse Road and Walthamstow stations have until recently been surrounded by low-density housing and commercial uses.

A major shift took place in 1962: the government set up a new rail operating body, the British Railways Board (BRB), and introduced a legal duty to make rail operations financially profitable. Given falling ridership on the Underground[32], the property arm of the BRB sought to make most of the boom in London office construction[33] by redeveloping some of their London land holdings into office buildings through *ad hoc* deals with developers. Completed developments include Cannon Street (1962), Wembley Central (1966)[34], Euston (1968), Liverpool Street/Broad Street (1986), Charing Cross (1990)[35] and Ludgate (1990).[36]

Each of these developments was unique in scope: Wembley, Euston and Charing Cross were limited to the station footprint. Broadgate was a major development replacing disused Broad Street station, but also including an office building spanning live tracks and some adjacent land. Ludgate was part of the Thameslink project aiming to create a continuous train service on both sides of the River. The tracks were realigned in a box between Blackfriars and the new City Thameslink stations, allowing several office buildings to be created between the stations, and over-site development on the latter. The British Rail Property Board entered a variety of deals to reflect these particularities – for instance, receiving developer funding and rental income from office building in Wembley, but selling land to several developers in Ludgate.

The only housing and mixed-use development above railway land was the Barbican Estate, commissioned by

the City of London Corporation to repopulate the Square Mile. This was a much less lucrative option than office development – one of the reasons why the City decided to build at high density above the railway grounds. The project suffered delays and large cost overruns.

Investment into inner city regeneration (1980s-2000s)
From the 1980s, successive public investments in rail were designed to spark development opportunities and regeneration in poorly connected parts of inner London, particularly the eastern docklands areas. Increases in connectivity allowed building at higher densities, changes in land use designation, and a surge in land values.

Investment into the Docklands Light Railway (DLR) and the Jubilee Line Extension (JLE) were central to unlocking development on land adjacent to Canary Wharf and Royal Docks stations – though most of the DLR stations were not accompanied by a development strategy, meaning that until recently most of the housing built was at low density. Stations along the JLE (1993-1999) did benefit from a more holistic approach to design and engineering. The government grant included funding for piling able to support mid-rise buildings above Westminster, Southwark, Bermondsey, Canada Water and North Greenwich stations.

However, even where provision was made, JLE stations were delivered independently from the buildings above them – all but Westminster are still awaiting over-site development.[37] And development at Westminster station was secured by the public sector to accommodate new parliamentary offices, at a particularly high cost.[38]

Continued commitment to east London regeneration by the then newly elected Mayor of London Ken Livingstone meant that two of the new London Overground stations (Shoreditch High Street and Dalston Junction) were designed to withstand development. Development above and around Dalston Junction was completed alongside the transport works, in order to cross-fund the new station and the podium above it.

Increasing capacity to accommodate growth (2010s-2020s)

Since the Greater London Authority was set up, most over-site development projects have coincided with the construction of new railways, though the focus has now shifted to TfL's and Network Rail's land. Both transport bodies have been setting up joint ventures to build up some of their sites (see Chapter 4) – though interviewees suggest station densification has been less of a priority for Network Rail (apart from a few high-profile central London station densification projects such as London Bridge).

Crossrail 1 is one of the largest transport investments in the capital in decades, but critics argue that its development potential has not been optimised. Crossrail is developing some of the land it acquired to conduct engineering works at 12 of the 40 stations along the route. These are mostly in the West End and the City[39], following an agreement with central London planning authorities that the buildings demolished as part of the transport works would be replaced before completion. These developments generate some capital revenue (£500m, 3.4 per cent of Crossrail's total funding). Critics suggest the density of these developments could have been greater, and the property development strategy on public land more ambitious.

More development-funded infrastructure projects?

In recent years, the rapid delivery of new homes has become one of the main objectives of rail extensions. The two new stations of the Northern line extension to Battersea Power Station were designed to structurally withstand over-station development:[40] TfL was granted planning permission to build above both stations as well as on an adjacent site in Nine Elms, with development receipts partly funding the capital investment into the Northern line extension.

The extension of London Overground to Barking Riverside will be partly funded by receipts from the

development of 10,000 homes around the station – and the case for the scheme was made on the basis of its capacity to accelerate housing delivery.

As this overview has indicated, more attention has been paid to the potential of integrating development with major rail projects in recent years. The next chapter looks at the commercial case for doing so, and at the barriers such projects face.

3
COSTS AND REVENUES OF A LONDON OVER-STATION DEVELOPMENT

Few station upgrades in London have relied fully on receipts from commercial or housing development for funding. Public sector grants enabled the station works undertaken as part of the Jubilee Line Extension and Crossrail 1, and the Treasury underwrote the public loans taken out to finance the Northern line extension, backing them with ring-fenced tax revenues and development levies. Furthermore, these station densification projects were not conducted over live railways, making them less costly than projects above existing stations.

The small number of over-station development projects coming forward even in a period of rapid value growth suggests that revenue from development often cannot meet the full costs of building a deck for development, let alone funding major station works – at least in the current planning, funding and financing environment. In this chapter, we explore the costs and revenues associated with such projects.

Modelling assumptions

Arup estimated the range of costs and revenues from a development above a large London transport interchange, theoretically located in Lambeth. The project comprises decking over a large (12,000 sq m) station footprint, to support development in excess of 10 storeys, plus improvements to the station. The model is illustrative only, and most variables are site-specific. We make the following assumptions:

- Development over the station footprint only - 12,000 sq m in this model
- Floor-Area Ratios (FAR) between 4 and 6 (generally meaning buildings up to 10 storeys high).
- 30 per cent of the deck area is retained as public space, the remaining 8,400 sq m are sold for development.

• The development is mixed-use (various commercial /residential splits, with retail comprising 20 per cent of the commercial space).

• Between 23 per cent[41] and 50 per cent[42] of habitable rooms are provided as affordable housing.

The model assumes that a privately owned developer finances and delivers the works, as per a development agreement or joint venture with the transport authority. For simplicity, we have assumed that the engineered land is then sold in parcels (though the developer might also choose to develop directly). Below, we compare the costs of the works with typical land values for different areas of London, to indicate whether the sale of the development parcels would be likely to cover the cost of the works; though in practice, land values are derived from the anticipated development value (and would therefore respond to changes in mix and quantum of development).

The implication of different levels of affordability and density on sales values is not reflected in the model, but their impact on tax revenue is. The model estimates revenues from developer contributions and from property taxes in a central London location, using Vauxhall as an example.

The projection period runs from 2018 to 2042, including two years to gain planning consent, and six for the engineering works.

A broad range of engineering costs have been assumed from a benchmark of station development schemes, in order to reflect variations in the characteristics of stations, such as size, frequency of services, or risks (for example on ground conditions). However, the cost estimates are indicative, and real costs could be higher than the range of costs considered here, depending on station specifics.

The developer's capital investment covers works to support the decking, the building of the deck, and

station improvements. It does not include the costs of development above the "engineered" land.

Findings

The revenue streams from station development projects are shared between the developer and the local authority. The scenarios below consider what revenue streams from the project need to come together to cover the costs of development:

– Scenario 1: Revenue without public funding

– Scenario 2: Revenue with public funding, in current context

– Scenario 3: Revenue with public funding, if property taxes were devolved to local authorities

Scenario 1: Revenue without public funding

• *For a large, central London station, such as Vauxhall*

Using typical land values, revenue from sales of development parcels alone would not meet the costs of a theoretical development above a large, central London station, which are likely to be within the £150m-£250m range, in 2017 prices. Indeed, the £107m sales revenue falls short of the lower engineering cost estimate, even at high density (FAR 6), and lower affordable housing provision (23 per cent). However, the scheme could be viable on a larger development parcel, for instance if development extends beyond the station footprint. Alternatively, the local authority could agree to depart from its standard policies, allowing proportions of affordable housing below 23 per cent, densities above FAR 6 and little commercial space.

• *For other stations*

Development above stations outside London's central area could be less costly – in the £75m-£250m range, in 2017 prices. But income for sales would also be lower and is, according to the model, unlikely to match the £75m lower construction cost estimate.

Figure 4: High-level estimate of station engineering costs and income from development parcel sales (in 2017 prices)

Station area	Estimated land value (£ per sqm)*	Estimated Income from development parcel sales (8,400 sqm) (£m)	Engineering cost estimate (low) (£m)	Engineering cost estimate (high) (£m)
Dalston Kingsland	3,000	26	75	250
Hackney Central	4,500	39		
Ealing Broadway	2,500	20		
Tottenham Hale	500	2		
Vauxhall	13,000	107	150	

*These estimates made from benchmark land values reflect various expectations around density and affordable housing. London land values are difficult to estimate, engineered land above a station add another layer of uncertainty.
Source: Arup calculations; Costar

Scenario 2: Revenue with public funding, in current context

If local authorities sought to make the scheme viable and/or to ensure provision of affordable housing and other community benefits in line with policy, they could commit some of the future income that the scheme will generate. Indeed, the value of sales is only part of the total income generated by development. Developer contributions and business rates flow to local authorities; station rents to the transport body; and tax revenue to central government.

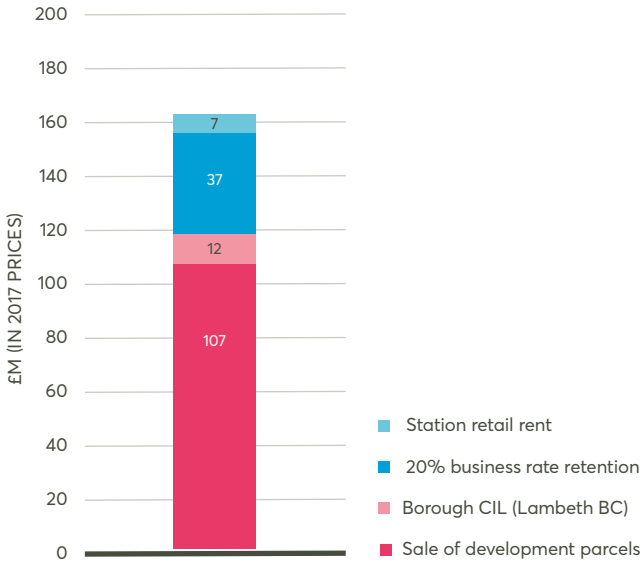
Hence, Arup modelled an assumption that the transport body would allow the developer to keep station rents for a certain time period, and the local authority

could borrow against a proportion of future borough CIL and business rates revenues.

For a large, central London location, station rents, borough CIL and a 20 per cent retention from business rates revenue would together represent additional funding ranging from £40m to £70m for the project, depending on development mix. Assuming costs at the lower end of the range (close to £150m), this additional funding would allow for positive internal rates of return- between 1 and 10 per cent - depending on the commercial/residential mix, density and affordable housing levels. However, a significant funding gap remains at the higher end of the engineering cost estimate (£250m).

The model does not estimate tax revenues from property and rental values in other parts of London.

Figure 5: Breakdown of total project income under scenario 2, £m (in 2017 prices) - assuming 50 per cent residential mix, 23 per cent affordable housing and FAR 6



Source: Arup calculations

Scenario 3: Revenue with public funding, if property taxes were devolved to local authorities

Arup estimates that into 2042, this theoretical station development scheme in a central London location would also yield around £700m in Stamp Duty to the UK Treasury, given that the scheme is in a high-value area. If the local authority were able to retain even a quarter of these Stamp Duty receipts, this would derive an additional £165m funding for the scheme, over the projection period. This would enable the scheme to meet costs of £250m, at the higher end of the estimated range. Some form of retention of these property taxes, recommended by the London Finance Commission, would represent a significant incentive to fund such a station densification project, and would enable the local authority to reinvest income from the development into the local area.

These high-level cost and revenue estimates suggest that complex over-station developments (that include upgrades to the station) are unlikely to be viable when funded only through the proceeds of property development, even where land values are high. But including adjacent land, allowing higher densities, or ring-fencing the resultant tax revenues could enable such projects to deliver a return on investment.

The next chapter looks in more detail at the barriers facing station development projects and the various ways of overcoming these.

4
BARRIERS TO STATION DENSIFICATION

This section reviews the organisational hurdles that have hampered station development – including the governance of transport bodies' assets, the powers that transport bodies have to facilitate development at stations, and transport bodies' relationship with planning authorities.

4.1 Institutional barriers

Governance of rail assets

The companies that set up London's rail network in the late-19th and early-20th centuries undertook real estate projects alongside transport investment and train operations. Several state-backed transport organisations combine these powers today – such as Hong Kong's MTR or Eastern Japan's railway company. But until recently, Transport for London and Network Rail have been focused on their core transport functions. Their duty has revolved around safety of operations and safeguarding assets for future capacity increases – essential to running a large and busy rail network.

"Doing" development as well as transport

Calls for transport bodies to use their assets to accelerate housing delivery and raise revenue from property are not new, but have nonetheless intensified in recent years. Although the 1999 GLA Act allowed TfL to acquire, assemble and develop land, its property development unit only had five members of staff until 2015. The team has now grown to 30+ people in mid-2017 after recruiting personnel from the development industry[43], and capacity continues to develop. It is also taking time to integrate transport bodies' growing development capabilities with their original transport function – sometimes out of fears that development aims (viability) could be favoured over operational aims (safety of operations, service closures, and preserving future capacity). Indeed, the collapse of a private sector-led decking scheme over the railway near Gerrard's Cross station in June 2005, which led to the

closure of the railway for six weeks, still resonates within the profession.

TfL is acutely aware of these tensions: Transport Commissioner Mike Brown has pledged to ensure that development functions will unlock rather than compromise opportunities on London transport.[44] Brown has also signalled that commercial activity is one of TfL's three "operational businesses" (alongside Surface Transport and London Underground) by allowing the Director of Commercial Development to sit on TfL's Executive Committee.[45]

The growth of Network Rail's real estate capability and expertise began in the organisation's previous incarnation of Railtrack. As a result, Network Rail has had development capacity for around two decades. In 2008, Network Rail formed Solum, a multi-site joint venture with Kier, which has seen development take place at a number of sites in London and the South East, and proposed or planned at others. Network Rail set up a separate property company in 2016, with a specific executive board.[46]

From a governance point of view, the Mayor's oversight of Transport for London is likely to have helped integrate the Mayor's housing agenda with TfL's transport priorities, and collaboration between the relevant teams.[47] Knowledge sharing – in terms of land assets held and strategic priorities – is therefore more established as common practice.[48] Network Rail have also been working closely with the GLA/TfL to identify sites for development and to maximise the use of adjacent sites.

To boost development capacity at their sites further, Transport for London, Network Rail and the Greater London Authority have also established a growing number of joint ventures with developers which are focused on stations – the largest at Earl's Court (TfL with Capco), with additional ventures at Barking Riverside (GLA with Bellway Homes and now L&Q) and Clapham Junction (Network Rail with Kier and now Capco). TfL's 2017/18 budget forecast also mentions entering

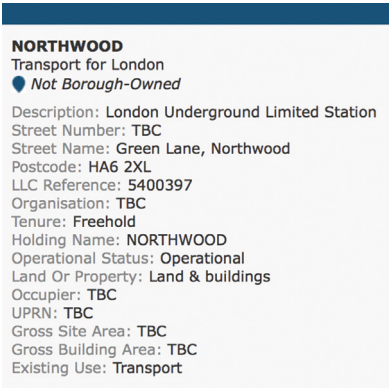
joint ventures at Landmark Court, Blackhorse Road and South Kensington.

Uncertainty around commercial potential

While progress has been made by TfL and Network Rail in collecting and sharing data on land holdings, the task of identifying land ownership across London is an ongoing one. As a TfL representative told a recent London Assembly meeting: "We have identified the first 300 [acres] and we will continue to keep trawling our land to bring through any element of land that is redundant or can be used better for housing."[49] In some cases, it is not clear who owns what, given changes in ownership and waves of land acquisition and disposal.

The 2015 London Land Commission sought to address this challenge of poor quality or siloed data on public land holdings, including land owned by transport bodies. The results of this audit of all public-sector owned land in the capital are presented in an online tool, last updated in 2016. This version does not include any data on Network Rail holdings, as the data that Network Rail provided to the Mayor in 2015 was not in a publicly available form.[50] However, the LLC does not indicate ownership boundaries, making it difficult to work out adjacencies with boroughs' or other estates (see following page).

Snapshot from London Land Commission's publicly available data



Source: Mayor of London (2017). London Land Commission Register. Retrieved from https://maps.london.gov.uk/webmaps/LLC/ [accessed on 23.08.2017]

The GLA is currently working with TfL to improve quality of data on publicly-owned land in London, meeting regularly with some London boroughs, Network Rail, government departments and other large public estates to identify public land ownership.[51]

Powers to facilitate development at stations

Building stations with extra capacity – and with a structure allowing for over-site development – has become more common. However, there has been a longstanding reluctance in central government to allow the public sector to think comprehensively about integrating transport and development – fearing a "land grab". Upon privatisation of British Rail, all non-operational land was placed in a separate government body, the British Railways Board Residuary. Hence, all of Network Rail's land is deemed to be operational, both from a regulatory and a planning legislation perspective. Any land release by Network Rail requires extensive consultation within the organisation and with external stakeholders.

The preference has been for the public sector to sell assets or bring infrastructure to "unlock" development and increase capacity – relying on the private sector to build out and up, while shaping station areas through planning control. This is even the case for infrastructure projects "of national importance": the Department for Transport (DfT) confirmed in January 2017 that High Speed Two Ltd would be stripped of powers to purchase land for development purposes.[52]

Generally, strict and complex conditions are attached to transport bodies purchasing land – making the use of these powers costly. As a consequence, TfL and Network Rail have been reluctant or unable to use compulsory purchase for development purposes. They have sought agreements with landowners instead, although this means transport bodies have paid higher land acquisition costs, and are vulnerable to ransom strip pricing. However, 2017's neighbourhood planning bill does open the way for TfL to share the GLA's compulsory purchase powers, which can be used for regeneration or housing aims.

The Mayor of London also has the ability to establish Mayoral Development Corporations (MDCs) with powers to buy and sell land (including using CPOs); build transport and other infrastructure; give business rate discounts and other financial incentives; take planning decisions; and set planning policy for their area. This concentration of powers, though controversial, includes the ability to act one step removed from local authority politics, and to signal to private investors that a project is of significant strategic importance. Though they are themselves complex to establish, where planning and land assembly is a significant challenge, MDCs or other specific delivery vehicles could be explored as a means of bringing forward development above and around new or remodelled stations.

Dispersed responsibility for planning

Local authority support – even when tacit – can help reduce risk for station densification projects. Some London boroughs have actively partnered on such

projects: examples include the London Borough of Hackney, who leased some of its land to Barratt Homes to improve the viability of development above Dalston Junction station; or the London Borough of Lambeth, who agreed to bring forward the TfL redevelopment of their community centre on the Fenwick Estate, a site adjacent to Clapham North station.[53]

However, while Transport for London has described its good relationship with several London boroughs[54], the dispersed governance of planning in the capital – essentially divided into 36 authorities (32 boroughs, the City of London Corporation, two Mayoral Development Corporations and the Mayor of London) as well as the Secretary of State – has led to wide disparities in the willingness to endorse station densification projects.[55] In addition, local authorities have limited financial incentives to grow their housing or office stock: as Chapter 3 showed, most of the long-term tax revenue from development flows to central government, while planning control happens at local level.

Case study: Hong Kong Metropolitan Transit Railway

Hong Kong's Metropolitan Transit Railway (MTR) uses property development (typically high rise apartments and malls) near and above stations in order to fund the construction of new lines.

The Hong Kong Special Administrative Region government owns all land in Hong Kong, with all private leases lasting a maximum of 50 years, along with full development rights. The government gives the MTR development rights at new railway stations, for which MTR pays the government a "before rail" price. (MTR itself is 76% owned by the government.) The MTR has a share in future profits from these developments, and the government then receives land premiums throughout the 50-year lease period, profiting from its 76% stake in MTR without the risk of investing in each project.

The different pattern of land ownership and development in Hong Kong means that replicating this model of development in London is difficult, as land can rarely be acquired at "before rail" prices. MTR also has a major advantage in that development is planned and underway before railways are operational, removing many of the constraints and costs often associated with building above and around

stations. The opportunities to do this in London are few and far between, given the density of the capital's existing infrastructure. Finally, the level of density that is both achievable and acceptable in Hong Kong means that the value captured is likely to be higher than can be achieved in London. Peak residential densities in Hong Kong reach up to 111,000 people per square km, four times London's peak density per square km.[56]

Case study: Old Oak Common

Current discussions about over-station development at Old Oak Common in west London highlight some of the difficulties in securing the funding and flexibility required to future-proof station development.

The development is managed by a Mayoral Development Corporation – Old Oak and Park Royal Development Corporation (OPDC). Initially, designs for a new HS2 station made no provision for over-station development at a later date. HS2 agreed to consider changes to its plans, but has highlighted design, funding and timetabling issues; no agreement has yet been reached on how any enabling work should be funded or financed. This matter is further complicated by the location of a Crossrail depot adjacent to the proposed HS2 site – again, without any enabling works.

At the heart of this discussion is the question of who should fund or finance such provision, and what then happens with the value created by this investment. An in-principle agreement between the Department for Transport and OPDC was signed in 2016, agreeing to transfer all Department for Transport/Network Rail land and Air Rights to the OPDC on commercial terms.

It is not considered likely that OPDC will receive a substantial government grant for enabling costs. This leaves OPDC with the question of how to raise the large upfront capital required for these works. A review by Mayor Sadiq Khan into the OPDC plans warned that this lack of funding could jeopardise the provision of affordable housing at Old Oak Common, suggesting that funding the high cost of infrastructure may require a quantum and scale of development that is unacceptable in height, scale, density or mass.

4.2 Operational and engineering risks

While institutional collaboration is key to identifying and delivering station development projects, a number of projects are also likely to require significant coordination in terms of managing the operational and engineering risks that come with building above and around stations. With recent advances in construction techniques, the engineering itself is not a problem –

rather, the difficulties lie in finding the money, time, and flexibility to implement solutions.

The busier the network, the more difficult and more expensive over-station development is likely to be. As London's Underground and mainline networks get busier, the acceptability of suspending train services for construction purposes diminishes. Procedures which may once have been carried out in operational stations may now require the temporary closure of platforms and even stations. These closures mean incurring large additional costs for possession, and further large costs should works overrun. While it is possible to reduce track closures by temporarily re-routing trains on disused tracks or by "piggybacking" on other planned closures and upgrades, the existing high levels of demand on London's rail infrastructure means such opportunities are limited. As discussed in the last section, the challenge of maintaining operations throughout development often reflects the tension between the operational side of rail companies and those managing property developments. Given the formal role of Network Rail and TfL as transport authorities, actions that may be seen to jeopardise the ability of transport companies to run services are no doubt perceived negatively by passengers, even in instances where development over operational railways is required to secure investment for continued operations.

Predicting the operational costs involved in over-station projects is not straightforward. Major projects require timeline contingency to allow for the unexpected challenges that come with developing in an inner-city location. These challenges range from finds such as WWII bombs and archaeological remains to more everyday challenges, including relocation of utilities and signals. London is an old city with a legacy of multiple infrastructure investments over centuries, adding to the complexity and uncertainty of its subterranean sites. More extensive decking may also result in additional requirements in terms of ventilation and air quality, such as the construction of ventilation shafts or the introduction of more strenuous sub-surface regulations.

The costs of station development vary significantly based on a number of elements. Major factors include whether the development is above a newly built or existing station, the amount of retrofitting required, the availability of land adjacent to the station, and the type of development planned. For buildings above new stations, the depth of buried rail infrastructure is particularly important, as it impacts the amount of piling required. In existing stations, engineering requirements will be affected by the condition and strength of existing piling. In all instances, the exact alignment of decking above the station – as well as the load-bearing capacity and eventual use of the deck – will have an impact on engineering solutions.

While the increased use of London's infrastructure network can add cost and time to developments, innovations in engineering and construction can also de-risk and speed up projects. The more that can be done off-site, or even "alongside-site", the less the disruption to operations. For example, the large footbridge recently put in place at East Croydon station was constructed alongside the site and then lifted into place. New methods of more lightweight construction, such as the use of cross-laminated timber, allow a greater number of units to be built on a load-bearing platform within the same weight restriction.

There are other means of reducing the load-bearing requirements (and hence cost) of over-station decks. The first option is to reduce the size of the load placed on the deck by using the newly created space as a park or other public realm. Building can then be concentrated around the deck, or even on existing park space that is replaced by the new space created above the deck. The Earl's Court development has adopted this "linear park" model, minimising the amount of construction taking place above the deck. A second option is to develop engineering solutions that maximise opportunities for load transfer. This can be done by building bridges rather than decking across tracks, as was achieved at Broadgate.

Leaving space between decks and new buildings can minimise the transmission of vibrations into buildings. Generally, commercial development requires less suppression than residential development, so costs can be reduced by placing commercial rather than residential development nearest the train tracks. The installation of rubber structural bearings or elastomeric bearings can reduce vibrations – as was used for the residential development above St James's Park station.[57] Separation of station and development can also help ensure the longevity of both – allowing access to the station for improvements or expansion of the rail network.

Disruption to operations can best be minimised by putting enabling works in place before stations are operational. This includes constructing stations with piling or podiums that could take development at a later date; or using station boxes to protect tracks from construction that may take place on land adjacent to the station. Given the impact of operational risk on project budgets, there is a case for building in enabling works for over-site development even if there are not yet specific plans for such development. This means that should a time come where development above the station is considered, the resultant disruption is significantly reduced. This approach featured prominently in the construction of the Jubilee Line Extension (JLE) platforms. For example, the original podium built into Bermondsey station in 1999 was planned to support a 6-storey building – and one interviewee suggested that with strengthening, it could support up to 15 storeys. However, the fact that it has taken nearly two decades for Bermondsey or Southwark station to be put forward for such a project shows that designing for over-site development does not necessarily guarantee the delivery of the scheme.

Case study: Dalston Lane

While not specifically an over-station development project, Dalston Lane saw the construction of 121 residential units above a safeguarded route for Crossrail 2 and the HS1 tracks. It faced constraints similar to an over-station development

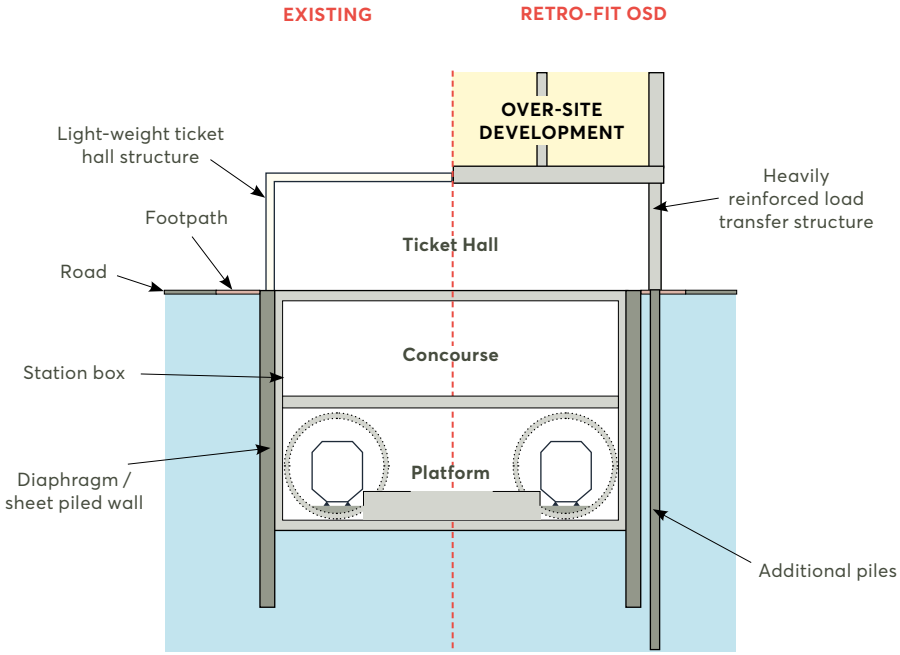
project, including maximising units within load-bearing constraints and building a deck without compromising the integrity and operations of the tunnel. The project adopted two solutions to address these particular challenges.

First, rather than use conventional piling methods, an internally reinforced raft slab was constructed, meaning the depth of foundations required was not as great. Second, using cross-laminated timber rather than concrete for the residential units 25 per cent more units could be built without breaching maximum weight restrictions. The use of cross-laminated timber was also significantly quicker than conventional building methods, meaning less disruption.

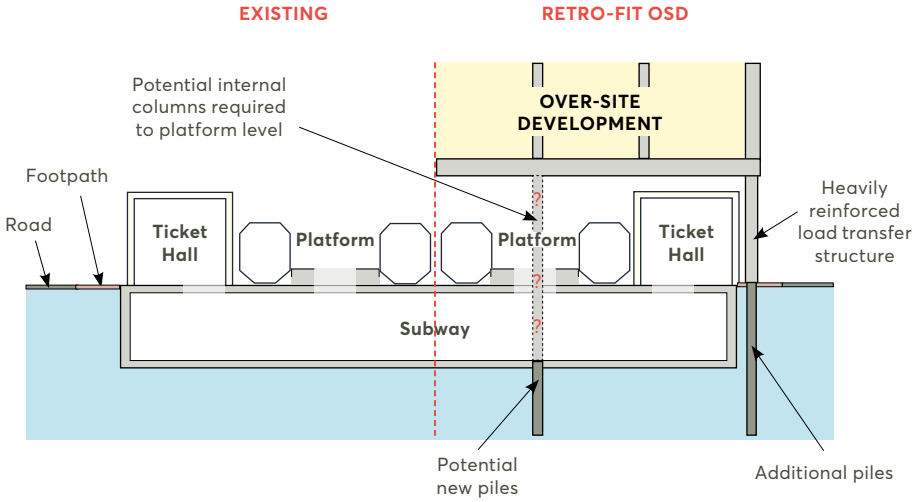
As these indicative drawings, prepared by Arup, show, retrofitting over station development usually requires significant piling works to bear the additional load. Where piling and other engineering works can be integrated into station construction from the outset, costs and disruption can be reduced.

Figure 6: Examples of over-station development (simplified)

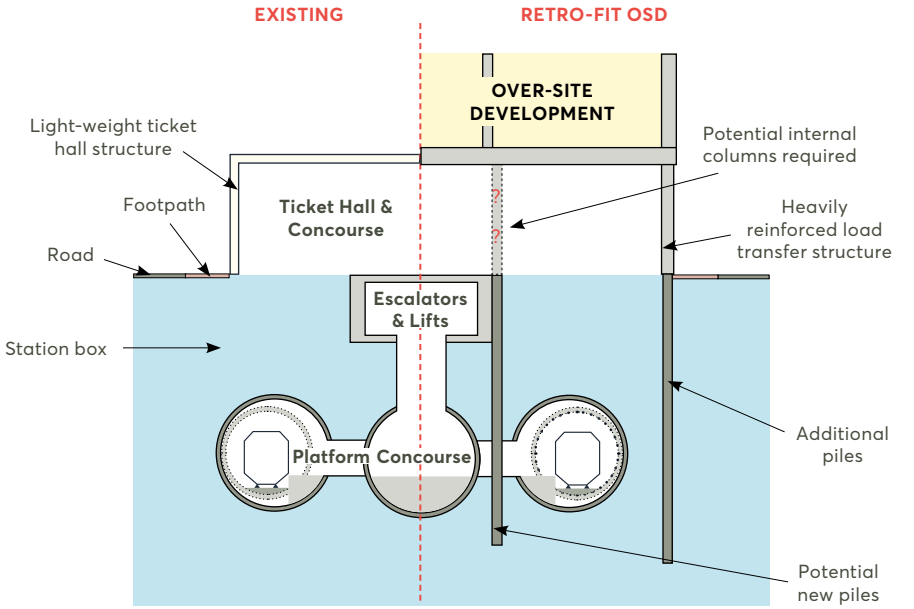
TYPE 1 - OSD of Cut & Cover Station Box:



TYPE 2 - OSD of At-Grade Station:



TYPE 3 - OSD of Mined Station:



Source: Arup

4.3 Financial barriers

As preceding sections have shown, over-station development is expensive and complex, involving significant construction risk, early capital outlay, and deferred receipts. And as Arup's modelling demonstrates, public intervention may be required to unlock the potential for over-station development to deliver transport enhancements as well as homes and workspaces.

The modelling undertaken for this report assumes a joint venture with private partners, which offers the advantages of allowing a single team to co-ordinate works to the station itself, the enabling works for over-station development, and the construction, sale and letting of the development. This may be the best means of delivery – though direct contracting by public bodies should not be ruled out – but it may not be the best means of financing such a scheme, given the higher costs of capital paid by most private developers.

In some cases, developers may have access to significant capital reserves: examples are the investment of the BT pension fund around King's Cross and of the Qatari sovereign wealth fund at London Bridge. In other cases, public sector loans or loans backed by public sector guarantees may be the most cost-effective way of securing funding: Transport for London is already a significant borrower, with nearly £10 billion of debt, and has excellent credit ratings. Using public borrowing or guarantees does expose the public sector to risk, but in reality, the residual risk of major transport infrastructure projects always reverts to public bodies.

Even if upfront capital investment by public bodies is not possible, fiscal flows can contribute to the business case. New development at a station does not just yield rents and capital receipts: it also yields local tax revenues – Council Tax and business rates – as well as one-off payments such as Community Infrastructure Levy (CIL). Tax increment financing (TIF) schemes use additional tax revenues to repay loans taken out to pay for new infrastructure. A TIF approach was adopted to

fund the £1 billion cost of the Northern line extension to Battersea, with business rates, CIL and other planning obligations being ring-fenced to repay the state loan, backed by an HM Treasury guarantee.

A more elusive goal has been the capture of land value rises created by new or enhanced infrastructure. These have been noted in relation to major transport projects in the past. A 2005 study estimated that the £3.3 billion Jubilee Line Extension was responsible for £2.1 billion in property value increases around Canary Wharf Station and £78 million at Southwark[58], and research undertaken for Transport for London estimates that future transport projects expected to cost £36 billion could return land value uplifts of £87 billion[59].

The immediate beneficiary of land value rises is the landowner; while Transport for London and Network Rail will benefit from rises in the value of their own property, their ability to use compulsory purchase to secure a stake in wider property value increases is limited. As the London Finance Commission has argued, devolution of property taxes – in particular Stamp Duty Land Tax and Capital Gains Tax on property – would enable some participation in property value rises. However, such tax receipts are unpredictable and would in any case be expected to fund general services once devolved to London. Ring-fencing them (or Council Tax and business rates) within a particular area to fund transport infrastructure would therefore – in part – represent a diversion of funding from other services.

Research undertaken by Transport for London for the London Finance Commission recommends two new approaches to land value capture: the "development rights auction model" and a "transport premium charge".[60] Under the first approach, landowners around a new transport scheme would be offered the opportunity to pool their land and offer it for development according to an agreed masterplan. Assuming a successful auction of these rights, the increase in land value resulting from the transport scheme would be shared between the

private landowners and the transport authority. Those landowners who did not participate would be taxed punitively on any development through CIL. The government agreed in the March 2017 budget to work with the Greater London Authority to pilot this approach.

The "transport premium charge" approach, likely to be more controversial, would impact on existing property, whereby people moving into an area as owner-occupiers or tenants would pay an additional charge reflecting the value of enhanced transport access. In theory, this would ensure that landlords or owner-occupiers shared the windfall, in terms of rent or property value, resulting from transport improvements.

Our modelling has illustrated the challenges in making over-station development commercially viable on its own, especially if it is expected to fund infrastructure enhancements – even though repeated studies have shown that these unlock significant land value increases. In these cases, a more comprehensive approach, as discussed in the next chapter and supported by development rights auctions, can help ensure viability – as would full devolution of property taxes.

Case study: Hudson Yards, New York City

Hudson Yards in West Manhattan is the largest private real estate development in the history of New York, and shows the potential of linking transport infrastructure with major new development. It is governed by a set of agreements relating to planning, financing and construction between the City of New York, the State of New York, and the Metropolitan Transport Authority (MTA), alongside two dedicated corporations – the Hudson Yards Development Corporation (HYDC) and the Hudson Yards Infrastructure Corporation (HYIC).

Critical to the initial plans set out in 2005 is the extension of the #7 subway line, which was intended to be publicly funded – split between the MTA (80%), New York City government and New York State government with the aim of spurring private investment in the site. However, the extension of the #7 line was not seen as a capital priority by the MTA, so the City decided to fully fund it itself, budgeting $2.1bn. The planning and development of the area is under the control of HYIC, and takes a phased approach: the Eastern Yard (Phase 1) is the main high-rise area, while the Western Yard (Phase 2) is based around open community space.

A number of financial mechanisms were used to capture the investment made by the City into Hudson Yards, including:

- **Payment in Lieu of Taxes (PILOT):** HYIC issued 40-year bonds backed by payments in lieu of real estate taxes (PILOTs): any tax levied on new or refurbished properties in the area is ring-fenced for repaying debt and interest. The actual revenues from the PILOTs have so far fallen short of expectations, meaning HYIC has had to pay more interest than anticipated. Critics have also highlighted that the combination of PILOTs with tax breaks/ credits risks undermining the real estate tax base.

- **Air Development Rights:** The MTA and HYDC sold air development rights over the rail yards. An IBO report found sale of rights and related fees totalled nearly $500m to May 2016, below an estimate of $641.5m.

- **Bonuses:** Other revenues for the City come from bonuses paid by developers to build at extremely high densities, allowing additional floor area ratio allowance of 8 FAR for particular sites (above currently zoned FARs of 10-33); this was at a cost at the time of $100 per square foot per annum, which is indexed and rises annually with CPI.

Evaluating the success of Hudson Yards is challenging given the long project timelines and complex financial mechanisms used. The first major development on the site was operating at 100% occupancy in 2016, alongside the announcement of further relocations, including BlackRock and Boston Consulting Group.

4.4 Planning policy and politics

In combining housing and transport infrastructure, development at stations is subject to a number of policy priorities from national, regional, and local government. These policies cover a range of aims, including maintaining and improving the quality of the built environment, mitigating the costs of development, and achieving desired mixes of use types and tenures in specific settings.

However, planning policies and their enforcement also carry a political dimension, which enables residents to influence development in their local area. London's stations are used by millions every day: development above them is highly visible and must balance a range of

potentially competing demands and priorities. As such, station developments are prone to meeting local opposition.

This section reviews whether the current planning context reflects the complexity of building at stations, and how local democracy can improve the quality of development, rather than prevent it altogether.

Affordable housing

Where affordable housebuilding was once dominated by local authorities and housing associations, a decline in public sector activity has meant that planning gain from private sector development has become more and more important in delivering units below market rates. A series of incremental policy measures, and specifically Section 106 of the 1990 Town and Country Planning Act, extended the statutory obligation of developers to mitigate the negative impacts of projects, and prioritised contributions to affordable housing – subject to the economic viability of the development. As a result of the increasing reliance on developers' planning obligations for the provision of affordable housing, large developments are now often scrutinised in terms of how much (and what type) of affordable housing is being provided.

Mayor Sadiq Khan has pledged to boost the delivery of affordable housing since he came to power: he has set a "strategic aim" for 50 per cent of all new homes in London to be affordable, a target that is also held by 19 London boroughs. Sadiq Khan has also pledged that development on land owned by Transport for London would include a minimum of 50 per cent affordable housing.

Previous chapters have demonstrated the very high cost of engineering land above stations, as well as the trade-offs between funding upgrades to the station and levels of affordable housing. National planning policy requires affordable housing targets to be applied flexibly – they are subject to financial viability testing — in order to unlock difficult sites for development. In the case

of land owned by Transport for London, the current understanding is that affordable housing targets will be monitored across the transport body's development portfolio – meaning TfL projects must deliver 50 per cent affordable housing in aggregate.[61]

Some local authorities have taken a similar approach, creating bespoke affordable housing agreements with developers, as part of which affordable housing is built off-site using financial contributions from the developer. This approach has, however, been criticised for compromising the creation of mixed-tenure neighbourhoods around stations. Off-site provision and cross-borough collaboration on affordable housing allocation therefore requires striking a balance between making the most of lower land values – which enable more affordable homes to be built with the same amount of money – and preserving and enhancing social mix.[62]

Given the impact on viability of both long timeframes and the risks associated with station development, one means of optimising affordable housing is to introduce contingent affordable housing contributions or review mechanisms. While the terms of such mechanisms are often project-specific, the general principle is that viability is reappraised once the project has neared completion, either in terms of delivery or unit sales. This allows planning authorities to capture any unexpected increase in value above what was anticipated when an initial S106 contribution was agreed. The Mayor's Supplementary Planning Guidance for affordable housing suggests that this would be done by assessing changes to gross development values and build costs.[63] It should be noted that any reduction in affordable housing due to a drop in revenue should result in new planning permission being required.

If we are to make the most of the development potential of London's stations, and use their redevelopment to catalyse the creation of mixed-use, mixed-tenure urban transit hubs, then there is a compelling case for national, regional, and local

government to allocate additional resources to such projects. Creating such hubs, as opposed to mono-tenure dormitory-style accommodation, requires bold political decision-making.

If these types of development have a value that goes beyond a simple quantum of floorspace, how can policy support them? Where it is hard to achieve station remodelling as well as other planning commitments, can policy show flexibility? If affordable housing at stations is to be prioritised (and station locations will not work for all those in need of affordable housing), should enhanced rates of subsidy be used to support this (for example, in the form of central government grants)? Or should density standards be revised to enable and require much higher densities, thereby supporting higher land values and/or the cost of building new infrastructure for development?

Case study: Fisher Street Development

The eight-storey residential development at Fisher Street in Holborn is built over a new Crossrail ventilation shaft and headhouse rather than a station. Nevertheless, the project exemplifies potential ways of mitigating engineering and planning risk.

First, development architects HOK were engaged in the design work of the shaft early on, and had good knowledge of the requirements and constraints of the site. Second, the developers agreed an alternative approach to affordable housing requirements. They negotiated a contribution to affordable housing elsewhere in the borough of Camden, rather than on-site, and agreed that a further viability assessment would be carried out either on full completion of the development, or once half the properties had been sold. This flexibility on viability helped minimise the risks associated with the complexity of the project, while ensuring that a proportion of any eventual additional value would be directed to further affordable housing units.

Density

One way of increasing development value, and therefore potential affordable housing contributions, is to allow more height and density above and around the station.

Building densities in London are guided by the Sustainable Residential Quality (SRQ) matrix. These guidelines, reflected in London Plan policy, set ranges

for densities based primarily on Public Transport Access Levels (PTAL) and residential settings (determined as central, urban, and suburban). While the application of these guidelines is flexible – 57 per cent of developments of 15 units and above were above the optimal range set out in the SRQ in 2014/15[64] – these guidelines can be used both by boroughs and local opposition groups to challenge projects with high densities, sometimes on the basis of impact on local services (see below).

While height is not identical with density, it is another major trigger for controversy, affecting many scuppered and even successful over-station development projects. Opposition can be based on a number of factors – the impact of tall buildings on the surrounding environment, rights to light, perceived changes to the character of the locality, or encroachment on protected viewing corridors.

Case study: 21 Moorfields

21 Moorfields shows the challenges of co-ordinating and planning dense development with the delivery of a major infrastructure project. Developers Land Securities purchased a site at 21 Moorfields in 2015. A planned over-station development will sit above the existing Moorgate Underground station in Central London, and a future Crossrail ticket hall.

As architects Wilkinson Eyre observe, the project faces a "number of constraints above and below ground, including proximity to listed buildings and conservation areas with restrictive view corridors." One specific complication arose when proposals for two towers of 16 storeys were met with a number of unresolvable right-to-light claims, holding up initial piling and enabling works which were due to commence in 2016. This risked missing the window for enabling works ahead of the arrival of Crossrail. Land Securities sought to resolve the situation by asking the City of London Corporation to use Section 227 powers – under which the City would effectively take temporary ownership of the development, meaning that objectors would have to accept compensation for loss of light rather than seeking an injunction. The City of London approved the use of these powers in March 2016.

No overarching framework for station densification

In addition to being covered by a range of London-wide policies and supplementary guidance, a large number of stations lie within or close to places with planning designations as opportunity areas or housing zones

– large sites or areas that have been designated for development and intensification of both housing and employment, often in combination with infrastructure investment. These designations intend to encourage local planning authorities (usually boroughs or development corporations) to take a more bespoke approach to planning decisions, including optimising densities and setting expectations in terms of both building heights and densities.[65] But a third of London's stations are not covered by any policy designation,[66] and there is currently no existing designation specifically covering stations.

In reflecting London's strategic priorities, a designation can help provide grounds for a mayoral intervention in planning decisions. Early on in his Mayoral term, Sadiq Khan called in developments in the Harrow Housing Zone and Tottenham Hale Opportunity Area which had been rejected by their respective boroughs. The plans were approved by the Mayor with some amendments, on the basis that "both schemes are close to transport links and this is one of the key factors in determining where major housing developments should be built.[67]

However, other planning designations can make any sort of development around stations more challenging. One in four London Underground stations has some form of listed status, meaning that listed building consent is required from local authorities if changes are to be made. Similarly, a number of stations owned by Network Rail are either listed, or have elements with heritage status, such as Victory Arch at Waterloo. Additionally, 20 per cent of London's stations fall within conservation areas, meaning demolition or substantial alterations are likely to require permission from local authorities.[68] Changes to these stations are also likely to attract a larger number of objections – not just from station users, but also from those seeking to protect London's heritage and conversation sites.

Proposed development can also lead to calls for further planning restrictions. In 2010, Richmond Borough Council introduced a recommended maximum height of

4-5 storeys into its Supplementary Planning Document, following residents' objections to a proposed 7-storey development over Twickenham station.[69]

Impact on services and disruption

People tend to associate high-density development with large numbers of new people. There is a concern that this creates additional demand on transport infrastructure, as well as on public services including schools and GPs. If an individual's experience of a station is that they can barely get on a train at 7am, they are unlikely to welcome an additional 200 people within the immediate vicinity of the station, especially in the absence of station improvements. Residents and commuters are also put off by disruption – whether this is a change in access to the station, or the noise and congestion that comes with major construction work.[70]

Engagement and communication is therefore vital to building trust between the numerous stakeholders involved in station development. This includes being up-front and transparent about potential disruption, making provision for local businesses who may need to be relocated, and setting out a vision for an improved station and public realm, with potential for better station access and social amenities.

Local politicians can of course play an important role in either promoting, scrutinising, or potentially blocking new schemes, meaning that relationships between bodies such as TfL, Network Rail, the GLA and developers are hugely important in ensuring a smooth development process. The importance of this is increasingly recognised by TfL, with Lester Hampson, Property Development, saying to the London Assembly: "All of our developments will be bought through a special purpose vehicle with our developers and JV will be responsible for the consultation. I can absolutely assure you that we will be reinforcing good quality consultation in everything that we do, not just necessarily on the large sites but on the small sites, too."[71]

5 MAKING THE MOST OF OPPORTUNITIES

Chapter 3 of this report showed the challenges of making over-station development viable without public sector support, and Chapter 4 looked in more detail at the challenges these projects can face.

In this chapter we suggest a strategic approach to station development that takes into the account the unique nature of many station development projects, and their position at the nexus between transport and housing or commercial infrastructure.

'Future-proofing'

As set out in the section on engineering and operational challenges, making provision for over- or around-station development at the time of construction can dramatically reduce the risk of major disruption to operations.

A few stations in London were initially built with provision for over-site development at a later date – for instance, Bermondsey, Southwark, and Canada Water along the Jubilee line. But despite the investment into structures to support development, it is only in recent years that these opportunities have been pursued – and today's higher density expectations would require stations to be re-engineered.[72]

Another approach to future-proofing new stations for development at a later stage is to cover stations and immediate tracks with a station box, thereby protecting these facilities from potential disruption caused by future development. By ensuring that nearby transport assets are protected, developing alongside railways and stations becomes somewhat more straightforward. Typically, these boxes are not to be built on and do not have significant load-bearing capacity, but can act as positive signal for investment and development at a later date, without all the risks and complexities of development works conflicting with operational demands. A recent example of station box provision is at Shoreditch High Street station, in which it was claimed that without the box *"the future of Bishopsgate Goodsyard would be severely constrained or would require line possessions resulting in major disruption to ELL [East London Line] services."*[73]

Future-proofing can allow station development projects to adapt to changing markets and values, which means opportunities arising at a later date are not missed. For example, at the time that designs were being made for Whitechapel station, land values were considered too low to justify development above the station alongside the Crossrail works. By the time values were high enough to justify an over-site development, the window for conducting work alongside Crossrail had passed. Several interviewees suggested that this was the case for most Crossrail stations.

There is of a course a risk involved with future-proofing stations. Making the case for enabling works requires a good understanding of long-term plans for route engineering and opportunities surrounding new stations. There is evidence that some station rebuilds conducted as London's inner-city population was declining ended up creating bottlenecks on the railway system. For instance, parking was developed around Gunnersbury station, with the number of tracks reduced from four to two – meaning that London Overground services now run through the station on the same tracks as the District line.

This risk can be mitigated by co-ordination between scheme promoters (whether HS2 or Crossrail 2) and the GLA. It should not necessarily be left to individual local authorities to anticipate demand for development above or around new stations, and a strong lead from the GLA as well as scheme promoters would set a presumption for future development. Indeed, one of the aims of the GLA's London Infrastructure Map and London Strategic Infrastructure Requirements report is to collate such information.

Comprehensive station development

While future-proofing and the integrated development of new stations is of course important – especially at a time when Crossrail 2 looks increasingly likely, and major new stations such as Old Oak Common come

forward – more can be done to make the most of existing stations in London.

The most immediate opportunity is often presented as simply building on top of stations. As this report has shown, however, even where projects are feasible in terms of engineering, costs are often high, and as such, can restrict the design and end use of whatever is built above. As the modelling in Chapter 3 illustrated, it can be hard to make over-station development viable, even in an area with high property values and high densities. In areas where land values are lower, the cost of over-station development may require additional funding, or trade-offs in terms of building height and tenure mix. There are therefore strategic decisions that need to be made as to which stations should be targeted for over-station development – for example, those in high-value areas where receipts can be used for transport investment; and stations earmarked for significant upgrades, where public funding may help build the business case, and improvements for local people may be seen as justifying higher density development.

Yet, as this report has highlighted, much of what is exciting and desirable about station development is the ability to create quality, mixed-use, highly accessible places. This is particularly the case in areas where stations, especially large mainline stations, have acted as a barrier, or "edge", to neighbourhoods.

Case study: Euston Station

The planned redevelopment of Euston station, taking place alongside the new HS2 terminus, provides an example of how consolidation of land ownership, combined with public investment into enabling works, has unlocked private sector investment to enable the redevelopment of a long-unloved station.

The co-ordinated approach to redevelopment at Euston is formalised by the Euston Strategic Board – a partnership between the London Borough of Camden, the GLA, TfL, Network Rail and HS2 Ltd. A key focus of the Board has been to make the case for comprehensive station development, and for the provision of public sector funding for works enabling over-station development to "respond to both the scale of the enabling challenge and the time between initial investment and securing returns from new development." [74]

Earlier this year, HS2 limited, acting on behalf of the Secretary of State for Transport and Network Rail announced the shortlisting of five bidders for commercial and residential development over and around Euston station. The redevelopment of Euston station is very large – covering 22 hectares of land owned by DfT and Network Rail. Appointing a Master Development Partner (MDP) reflects a vision for comprehensive station development, extending beyond the station freehold footprint into the wider Euston estate. This will require co-ordination not just with the relevant local authorities, but with the HS2 station designers and Transport for London.

The MDP will be responsible for securing planning consent for the scheme, which will form a blueprint for a new mixed-use district at Euston with improved public realm and accessibility, while optimising development value. While the government has committed to directly funding enabling works for over-station development at the HS2 terminus (including piling, development decks and a potential basement), the presence of protected viewing corridors as well as engineering constraints may limit the height of over-station development. Developing at height on adjacent land may be one means of overcoming these restrictions: specifically, on parcels of land at the south of the site that are identified by the Euston Area Plan as an area suitable for taller buildings.[75] Reviews by Network Rail into the feasibility of development over the station are ongoing.

The chosen Master Development Partner is due to be announced by the end of 2017.

By acquiring adjacent land, and by using engineering techniques such as decking to connect disconnected parcels of land, landowners and developers can create sites for station development that are more flexible and potentially more viable. A larger site can create a more diverse investment portfolio, allowing investors to spread risk across a range of asset types, including residential (for sale and Build to Rent) and commercial. Phasing can be managed strategically. Adjacent sites can be brought forward first, helping with cash-flow and financing: alternatively, they can be used to allow a more flexible approach to engineering works, or for the assembly of pre-manufactured components.

Spreading development over a larger site means the project is not financially reliant on high-density development on a small footprint of land, but can adopt a more flexible approach to massing. This approach also

allows for greater flexibility in terms of masterplanning and mix of uses. Rather than maximising value on one parcel, developers may even decide not to build directly above stations, but to use newly created land achieved by decking for public realm or green space, rather than an isolated high-density development.

Comprehensive station development can therefore offer a wider footprint with greater potential for mixed-use, mixed-income communities, and benefits for commuters, residents, and other stakeholders. Comprehensive station development is not necessarily about scale – such an approach can apply both to major rail land sites and to stations in Zones 3-4, where lower land values can in fact make acquisition of adjacent land more feasible, even if sale values are lower.

Case study: Clapham Junction

Clapham Junction is in urgent need of remodelling, and a consortium is looking at achieving this through comprehensive development above and around the station.

The station is well-known as Britain's busiest interchange, and the tracks form a barrier that separates Wandsworth's most deprived ward from its least. Yet despite the dilapidated state of the station, rapid increase in ridership, and the surrounding high property values, Clapham Junction is still awaiting development. Network Rail has been seeking development partners to increase private investment around several stations. The most challenging project (at Clapham Junction) was stalled, and Network Rail set up a new joint venture with Capital and Counties Properties PLC (Capco) to upgrade the station and open up development opportunities above and around it.

As such, Clapham Junction is seen as a potential site for comprehensive station development, going beyond the "red lines" of the station footprint. The likely arrival of Crossrail 2 adds further complexity. Initial proposals include:

- Rebuilding the station to accommodate more and longer trains, as well as the additional passenger numbers forecasted.

- Bridge the barrier currently formed by the railway viaduct, creating continuous public realm from Northcote Ward through the regenerated estates of Latchmere Ward to the River Thames beyond.

- Decking over the new station to create 41 acres of land for mixed-use

development. This may catalyse wider development – with the potential to become a new mixed-use metropolitan centre.

• Integrating the development with rebuilding of the station. Developers argue that the scheme be could be significantly subsidised by over station development – depending on the scale of the scheme and the nature of partnership between public and private sector.

A scheme of this size does, however, come with some risks. If the project is to be self-financing, high-density development will be required. This has implications in terms of potential opposition from local communities, and in securing planning permission for a development density that could exceed the upper limits currently specified in the London Plan. The plans proposed by developers Delancey and Land Securities in 2008 attracted significant local opposition, particularly around the impact of building height.

The proposals are currently being discussed with regional and local politicians, who have been receptive to the initial ideas – reflecting the potential economic impact of the development in terms of improved transport connections, substantial enhancements to the station, and additional fiscal revenue from added residential and commercial space. This project underlines the importance of addressing both the benefits and trade-offs for a wide range of stakeholders, including commuters, local businesses, residents, and the local authority.

The complexities of planning, politics, financing and engineering make over-station development a tough proposition in London. But in a city that is short on space and short of funding to maintain and enhance its rail networks, developing at and around new and existing stations cannot be neglected: it is a sustainable form of development, a source of funding for new and improved infrastructure, a means of creating mixed-civic ecosystems at transport hubs, and a way of strengthening and connecting communities. This report sets out the practical steps London's planners and transport authorities need to take to realise the potential of stations as hubs for sustainable development and civic life.

RECOMMENDATIONS

• The Greater London Authority (GLA) and Transport for London (TfL), with Network Rail, should prioritise work to identify public land ownership around stations (particularly those expected to receive or require major investment in the near future), building on the work of the London Land Commission.

• The GLA should ensure that TfL and Network Rail's plans for upgrades and improvements are incorporated into long-term planning tools such as the London Infrastructure Map, as well as plans for opportunity areas and intensification areas, so that opportunities can be anticipated, planned for and co-ordinated.

• The Mayor, the GLA, and other scheme promoters such as HS2, should ensure that new stations include provision for over- and/or around-station development, as recommended by the National Infrastructure Commission.[76]

• The GLA should define "station intensification areas" in the London Plan as a strategic priority around key stations, setting higher minimum density and design standards in these areas, and (if necessary) using call-in powers to ensure approval of policy-compliant schemes.

• The GLA should explore establishing Mayoral Development Corporations or specific project development vehicles to provide the resources, expertise, and certainty required to make the most

of station development opportunities when new rail schemes are being developed – particularly where multiple stakeholder interests are not yet aligned.

• The Mayor, the GLA and the London boroughs should adopt a tailored approach to affordable housing in over-station developments in order to reflect the value of station improvements; they should also encourage the use of review mechanisms to ensure viability and share value uplifts.

• The government should accelerate devolution of property taxes (as recommended by the London Finance Commission) to enable infrastructure to be funded by future tax revenues, as well as continuing to explore other means of land value capture such as development rights auctions.

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Railway stations are the hinges around which London turns. But despite their centrality to city life, the space above and around our stations remains remarkably underdeveloped. With a shortage of space and funding, what can London's rail hubs offer the city? *Ideas above your Station* examines the barriers to densifying development at London's stations, and suggests ways we can better integrate rail infrastructure with building the homes and workplaces we need.

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