

LONDON TALL BUILDINGS SURVEY 2022

The NLA London Tall Buildings Survey is an annual publication, developed with research partner Knight Frank, presenting unique up-to-date data and analysis of London's tall buildings pipeline. The report is part of the year-round NLA Tall Buildings programme, bringing together industry experts and the public to discuss one of the capital's most debated topics.

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Residential data provided by Molior London

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Foreword

*Peter Murray OBE, Curator-in-Chief,
New London Architecture (NLA)*

This report was launched in the NLA’s temporary gallery in Stratford, one of a series of stops that the New London Model will make as it tours different parts of the capital while the city is in post-Covid recovery mode.

We chose Stratford because this year Queen Elizabeth Olympic Park celebrates the 10th anniversary of the 2012 London Olympic and Paralympic Games which accelerated development and regeneration in the area. When the 2012 Olympics were awarded to London the site consisted of old railway lands, low rise sheds and giant heaps of scrap.

Today, it is a thriving and dense mixed-use neighbourhood with a cluster of tall buildings which announces its success far and wide on the local skyline. This reflects not only Games-driven growth but also the policies of the London Plan and the densification of Opportunity Areas right across the capital.

These areas are easily picked out on the NLA’s model: groups of taller buildings in White City, Elephant and Castle, Greenwich Peninsula and in the City of London reflect a sea change in the shape of the city.

The tall buildings policy in the latter part of the 20th century was to scatter them across the landscape—sometimes as urban markers but often randomly as sites became available.

More recently they have been clustered around areas with good transport connections, creating a series of peaks across the otherwise low-rise city.

Whether or not we are going to see a reduction in the number of new towers in the future, the face of London has already changed irreversibly over the past two decades, and with a further 500 or so to come those changes will be even further reinforced.



© LLDC

Executive summary

583 tall buildings in the pipeline - down **1%** from 587 in 2020

109 schemes are now under construction, but starts are down **15%** on the five-year average

26 of London's 33 boroughs have a tall building pipeline. We are seeing a continued shift towards outer London, with **88** tall buildings in zones 3-4 and **41** in zone 5

More than **88,000** new homes are estimated across the entire tall buildings pipeline, or just under two years' worth of housing need based on GLA requirements of **52,000** new dwellings per annum

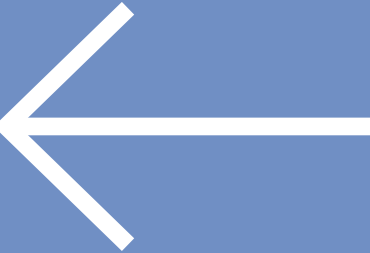
34 tall buildings completed in 2021, slightly below the **37** which completed in 2020. Over the last decade, the average number of tall building completions has been **20 per annum**

72 tall buildings were submitted for planning this year—down **13%** annually and the third consecutive year-on-year decline. A record **98** permissions were granted

341 tall buildings currently have planning permission and are awaiting construction, and a further **71** have been approved at Planning Committee but are yet to sign Section 106 (S106) agreements

Commercial buildings account for **13%** of the total pipeline and will deliver 18.55 million sq ft of new office space in the future, 41% of which is in the City of London

PIPELINE



Overview

There are signs of a slowdown of tall buildings in London. The pipeline of 20 storey-plus buildings in the capital contracted 1 per cent year-on-year in 2021, while the number of new planning applications put forward by developers and new construction starts—bellwethers for the state of the market—came in lower than long-term trends.

A slowing is not entirely unexpected; a combination of the uncertainties created by the pandemic, rising build costs, new safety measures, environmental regulations and increased affordable housing obligations in recent years have imposed greater scrutiny on high-rise development.

However, despite the slight decline in the overall pipeline, this year's figures should not be interpreted as the end of tall building in London. The survey points to a record level of planning permissions being granted last year, up 26 per cent on 2020, and the number of completed projects was robust. Context is also key. The future pipeline may have contracted slightly, but it remains significant. In total, there are 583 tall buildings proposed or approved with 109 of those currently under construction, 28 per cent and 19 per cent higher than back in 2016 respectively.

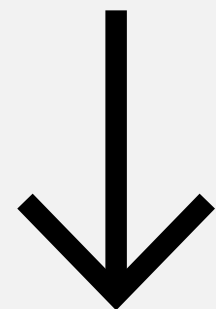
As we have noted in previous surveys, what is coming through the planning system and out of the ground, is increasingly across the outer London boroughs, in zones 3, 4 and 5, as well as for the Build to Rent sector, mirroring the trend in the wider new-build housing market. Commercial buildings account for 13 per cent of the total pipeline.



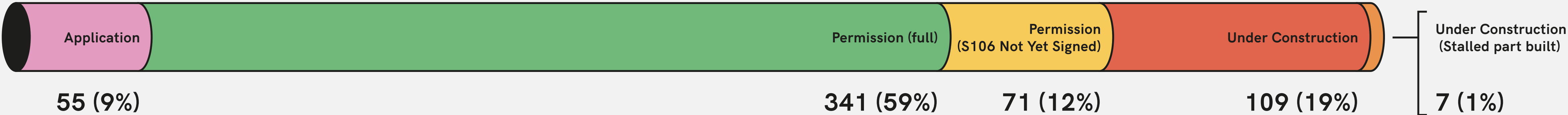
©Jason Hawkes, 2020

583

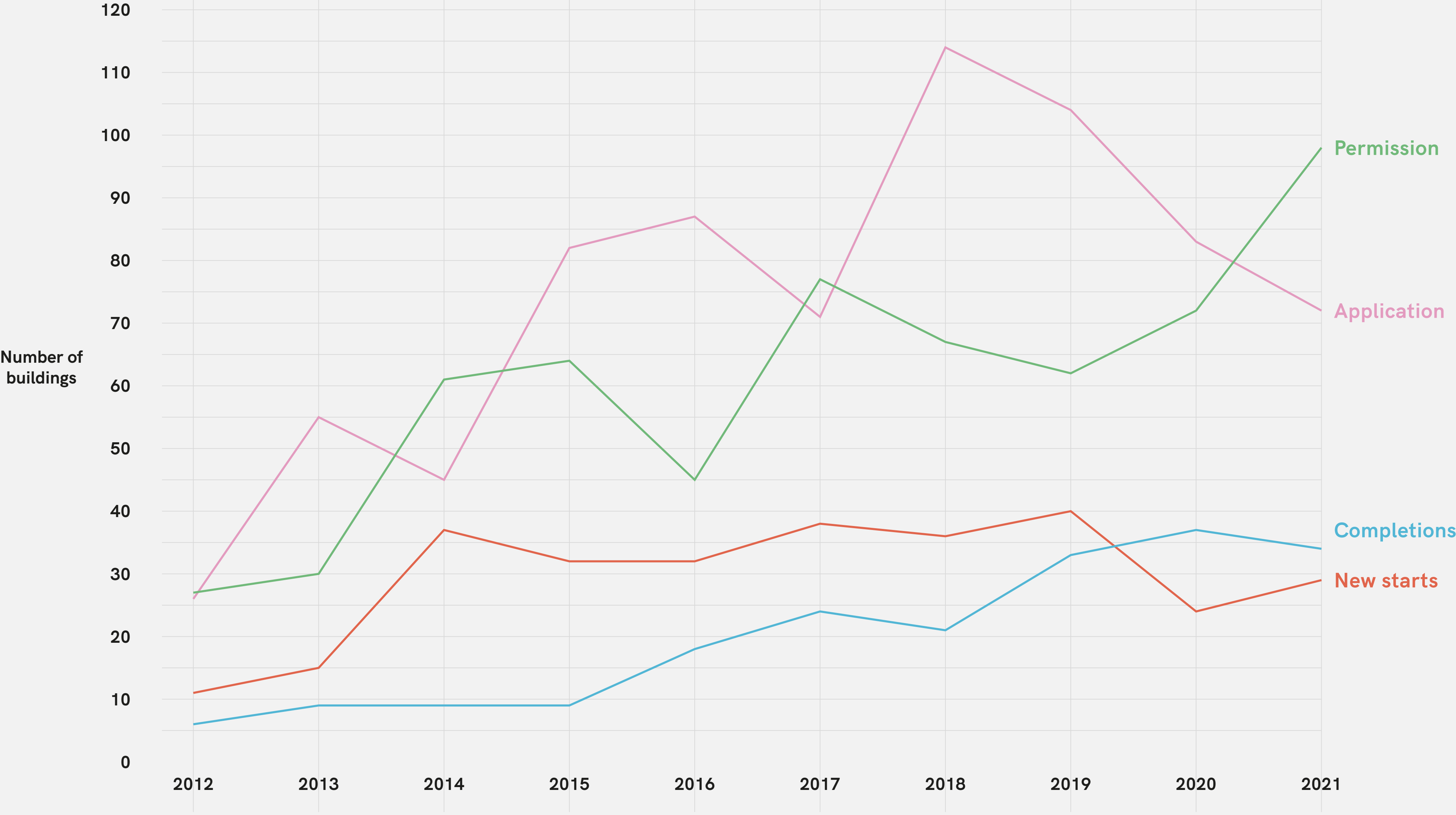
Tall buildings in the pipeline



Down 1% from 587 in 2020



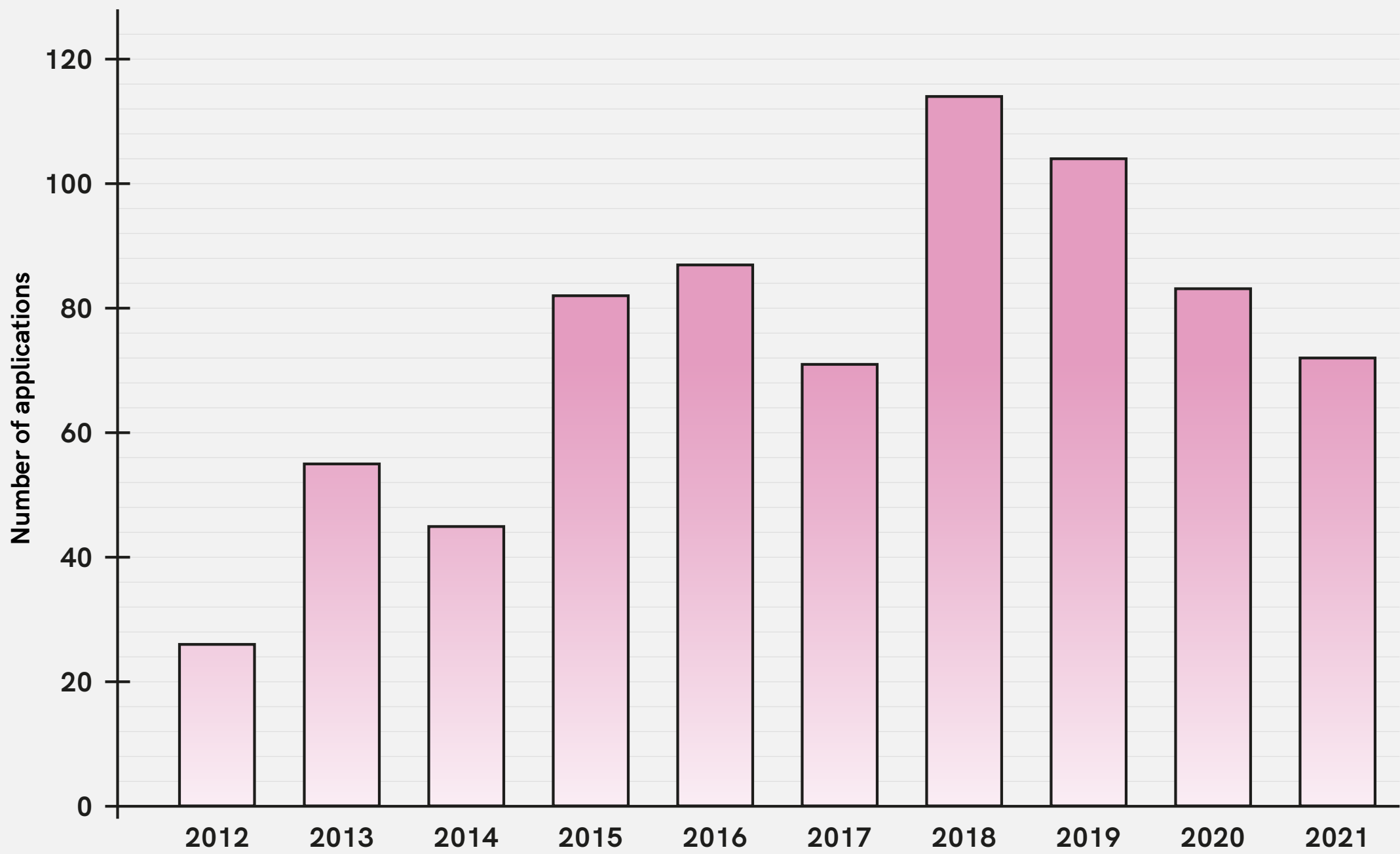
Long-term planning trends for tall buildings



Source: Knight Frank
Research, Molior London

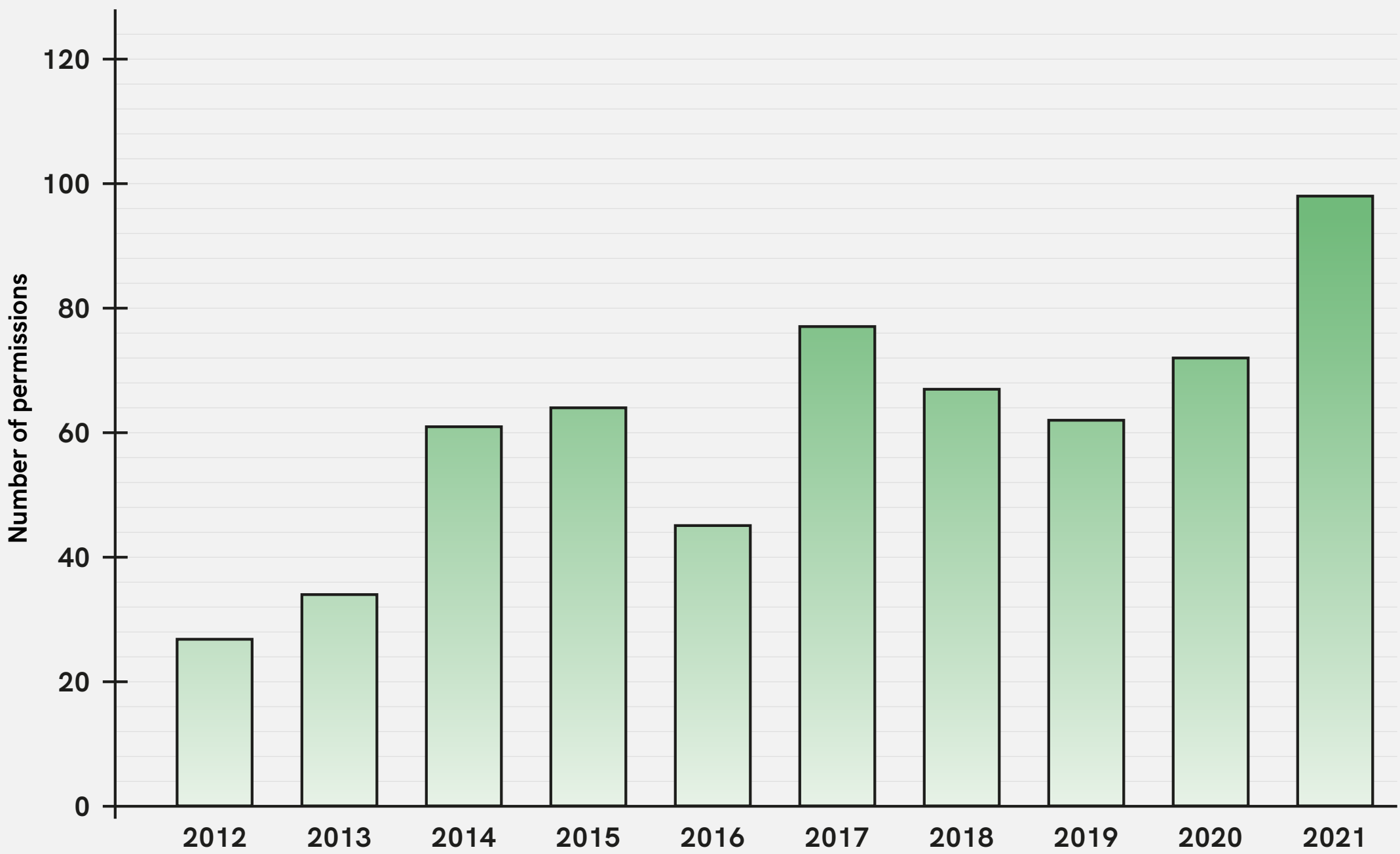
Applications

Developers submitted 72 planning applications for tall buildings in 2021, down 13.3 per cent on a year earlier and the third consecutive year applications have dropped. Submitted applications are 37 per cent lower than the market peak in 2018. Of the 72 applications submitted in 2021, 12 (17 per cent) were granted full planning permission the same year and a further five were approved at Planning Committee but were yet to sign S106 agreements by 31st December. The average height of tall building applications put forward in 2021 was 28 storeys, though this varies by borough with an average of 31 storeys for applications in inner London and an average of 25 storeys in outer London.



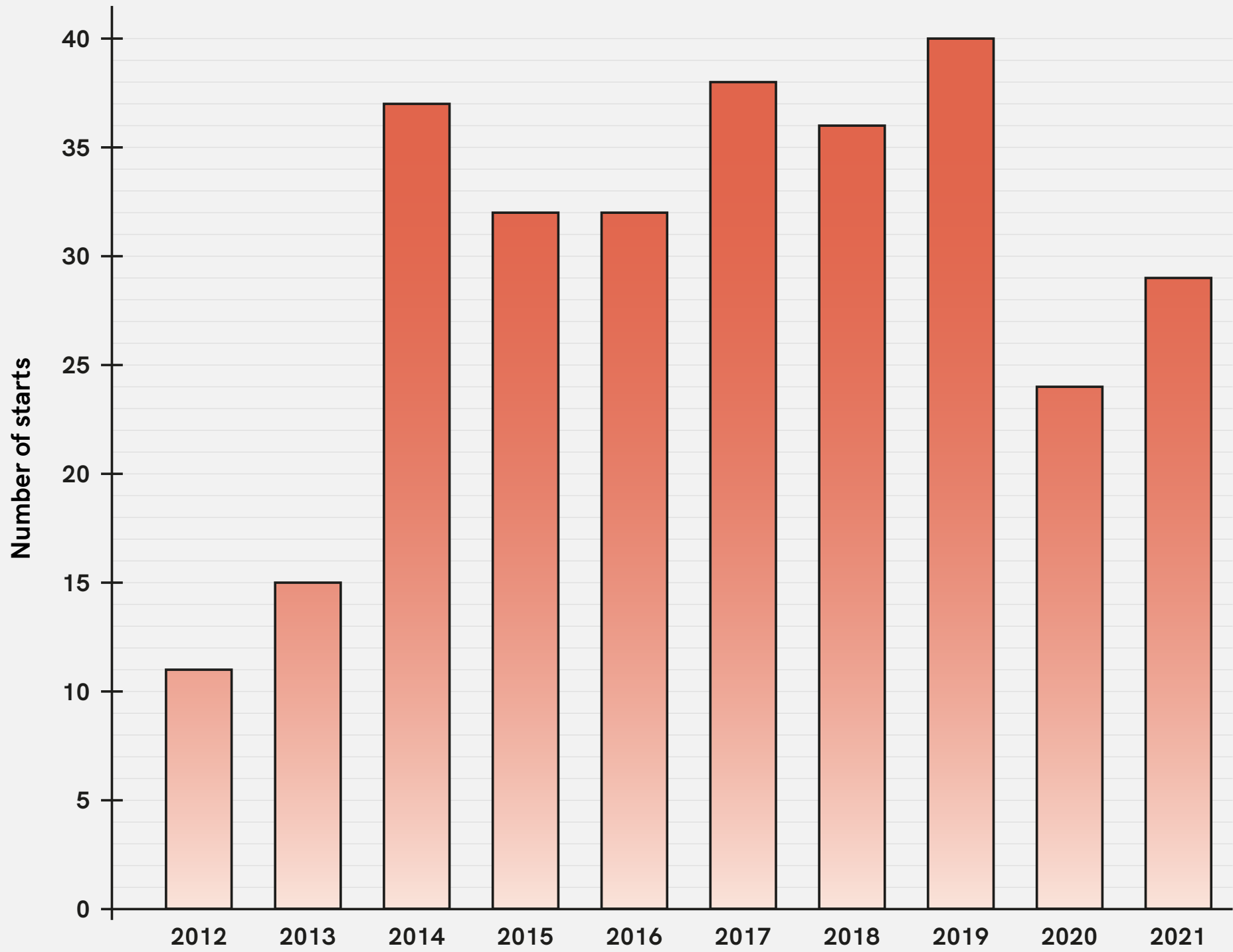
Permissions

There were 98 full planning permissions granted in 2021, 36 per cent higher than in 2020, and the highest annual figure on record. Some 56 per cent of permissions were granted in outer London boroughs, including a combined 34 in Newham and Brent alone. In part, the high level of permissions granted reflects the bumper crop of applications submitted in 2018 and 2019 which continue to work their way through the system with 51 per cent of consents last year for plans submitted in 2019 or earlier. However, it also suggests a willingness of Planning Committees to approve tall building proposals, either as standalone schemes or as part of larger masterplans. Some seven per cent of permissions were for commercial buildings, down slightly from 13 per cent the previous year.



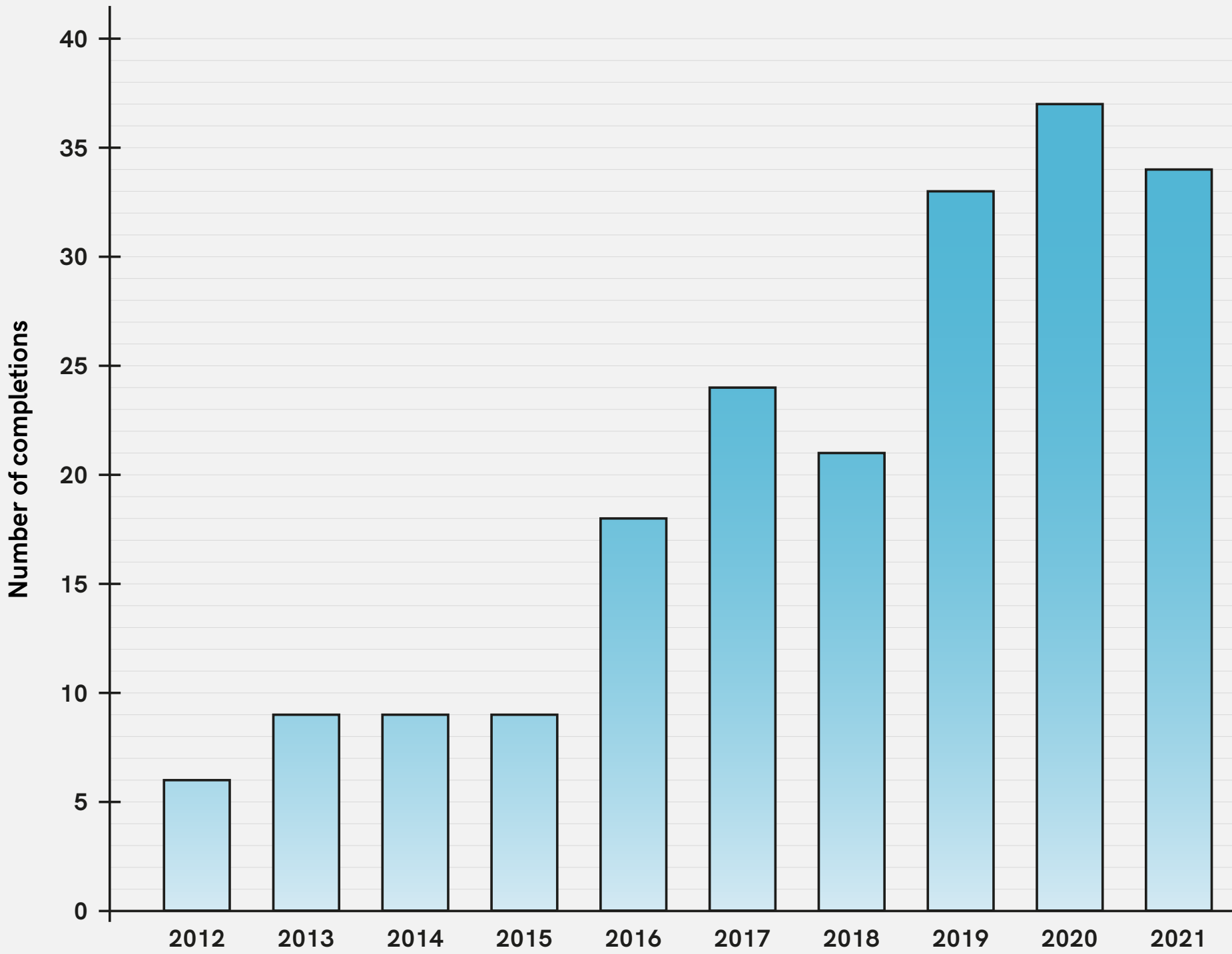
Starts

In 2021, a total of 29 tall buildings commenced construction. While this was an increase on 2020, it represents the second lowest level of new starts for tall buildings across London since 2013. A drop in new starts is consistent with the decline seen in the wider London development market over the last couple of years. Rising build costs and ongoing supply chain disruption in recent years has impacted the viability of some projects, especially given the already higher costs associated with building tall. Given an average build time of just over three years for the tall buildings completed in 2021, we expect future surveys will register a slowing in delivery rate as the pipeline works its way through over the next three to four years.



Completions

In total, 34 residential and commercial tall buildings were completed in 2021, slightly below the 37 which completed last year and fewer than the 52 which were expected to complete according to last year’s survey. As in previous years, the data suggests that tall buildings are an increasingly deliverable form of development outside of the historically ‘prime’ areas, with 15 buildings completed in outer London in 2021, up from 10 in 2020. Notably, 35 per cent of the completions last year were for the BTR market, up from 24 per cent the previous year. The data suggests that 46 tall buildings are expected to complete this year — a 35 per cent increase on the 2021 total.

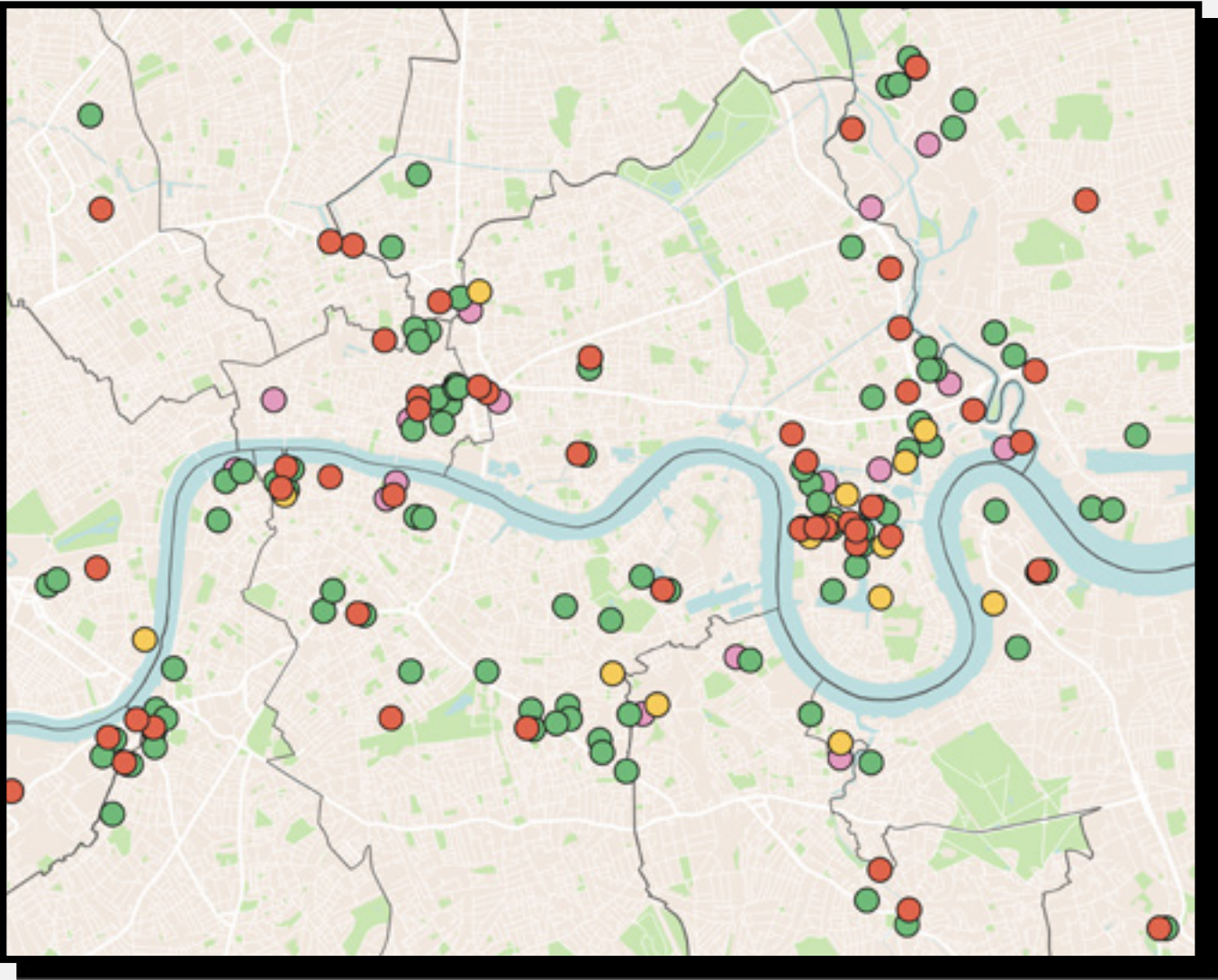
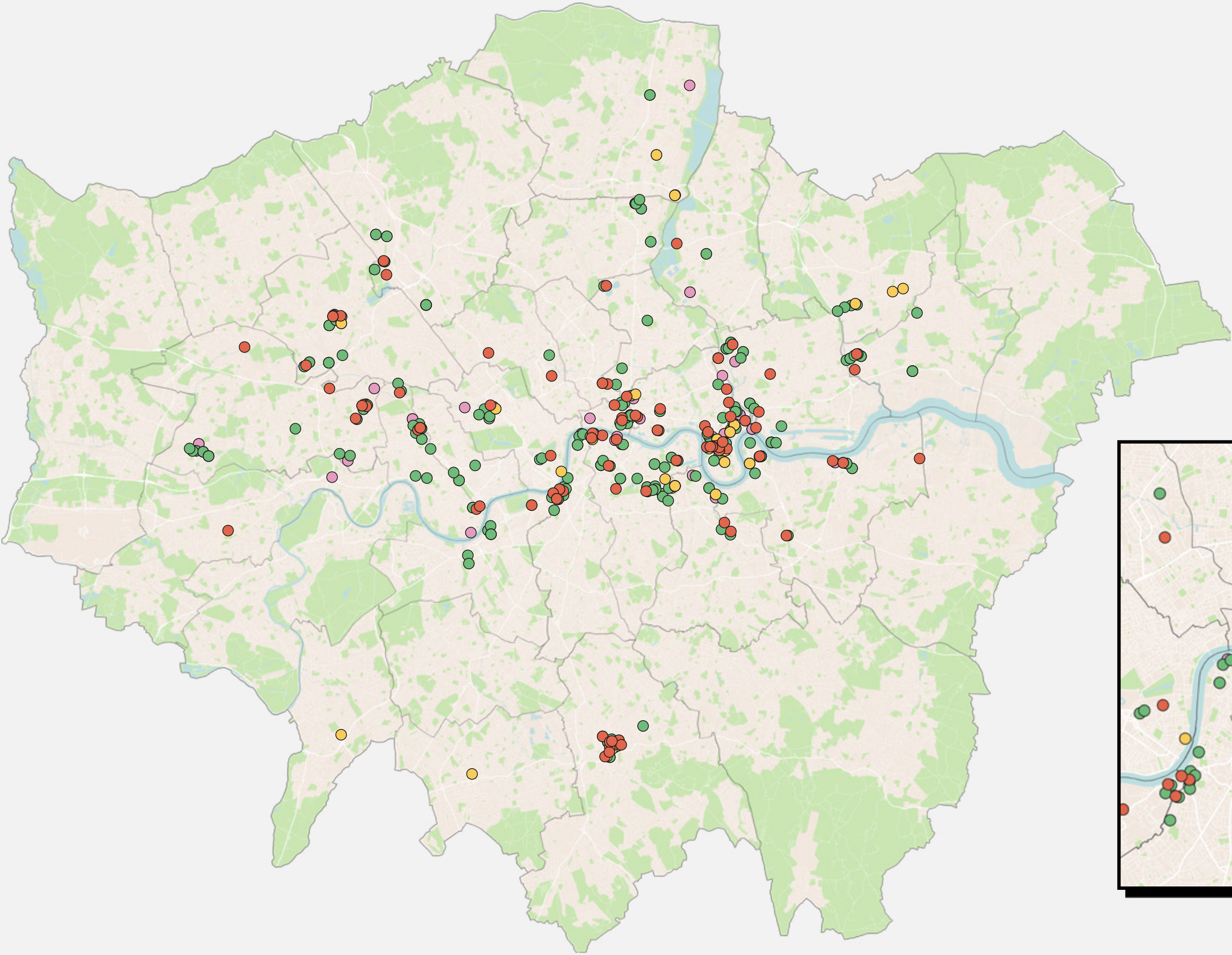


Source: Knight Frank Research, Molior London

Tall buildings pipeline map

Planning status

- Application
- Full Permission Granted
- Permission - S106 Not Yet Signed
- Under construction



Source: Knight Frank Research,
Molior London

Methodology

Consistent with previous years' London Tall Building Surveys, tall buildings have been defined as buildings of 20 storeys or above in height that are at various stages from application to construction. The data for 2021 refers to the period from 1st January 2021 until 31st December 2021. For residential schemes, current and historic data has been supplied by **Molior London**. 'Completion' refers to the point at which a building can be occupied. Where applicable, for larger sites, application, permission and start dates refer to individual buildings. Commercial building data comes from Knight Frank's commercial building database. Please note that our data is dynamic and can be subject to revisions. Consequently, some figures may not be identical to those in previous editions.

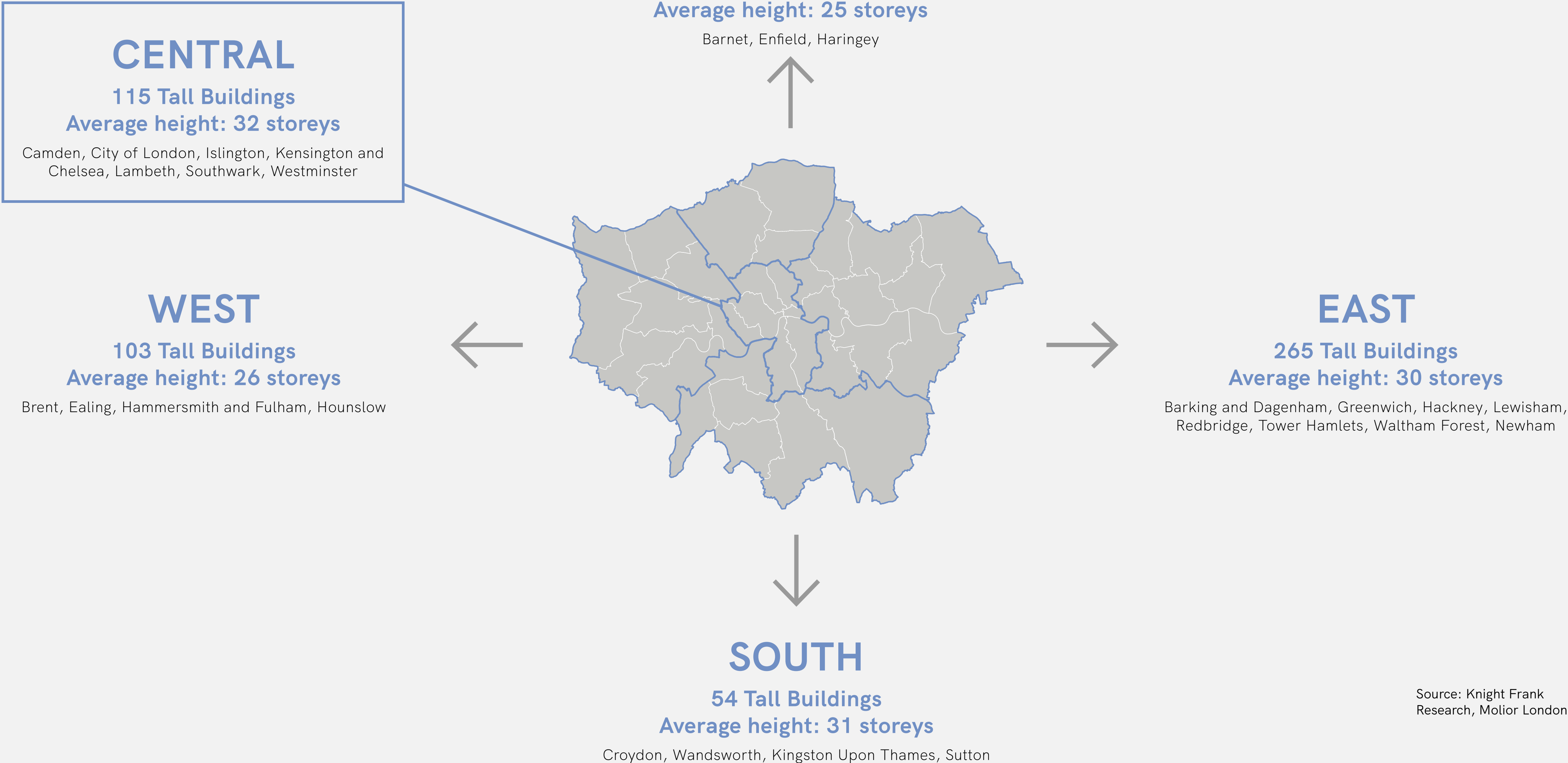


50 Fenchurch Street in the City Eastern Cluster ©DBOX for Eric Parry Architects

ANALYSIS



London sub-region and borough analysis



Source: Knight Frank
Research, Molior London

London sub-region and borough analysis

Consistent with previous years, the East London sub-region contains the largest number of tall buildings proposed, approved or under construction, accounting for 45 per cent of the pipeline with 265 tall buildings. This was followed by the Central region with 115 tall buildings in the pipeline (20 per cent of the total) and the West region with 103 tall buildings (18 per cent). Generally speaking, this split reflects the fact that higher density development has historically been directed towards urban centres, Opportunity Areas and Housing Zones.

Tower Hamlets (95), Southwark (60), Greenwich (50) and Newham (46) continue to be the boroughs with the greatest number of tall buildings in the pipeline, accounting for 43 per cent of the total. Just seven boroughs; Bexley, Bromley, Havering, Harrow, Hillingdon, Merton and Richmond have no tall buildings currently in the pipeline.



The Goodsyard in Hackney by Eric Parry Architects

City of London leads on height

Looking at the height of tall buildings in the pipeline in more detail, 63 per cent are for buildings of between 20 and 29 storeys. A further 25 per cent were between 30 and 39 storeys and the remaining 11 per cent were more than 40 storeys. The average height of all buildings in the pipeline is 29 storeys, in line with last year. The average height of tall buildings in the pipeline by borough ranged from 38 storeys in the City of London, with its higher proportion of office-led schemes, to 20 storeys in Sutton where there is just one tall building in the pipeline.

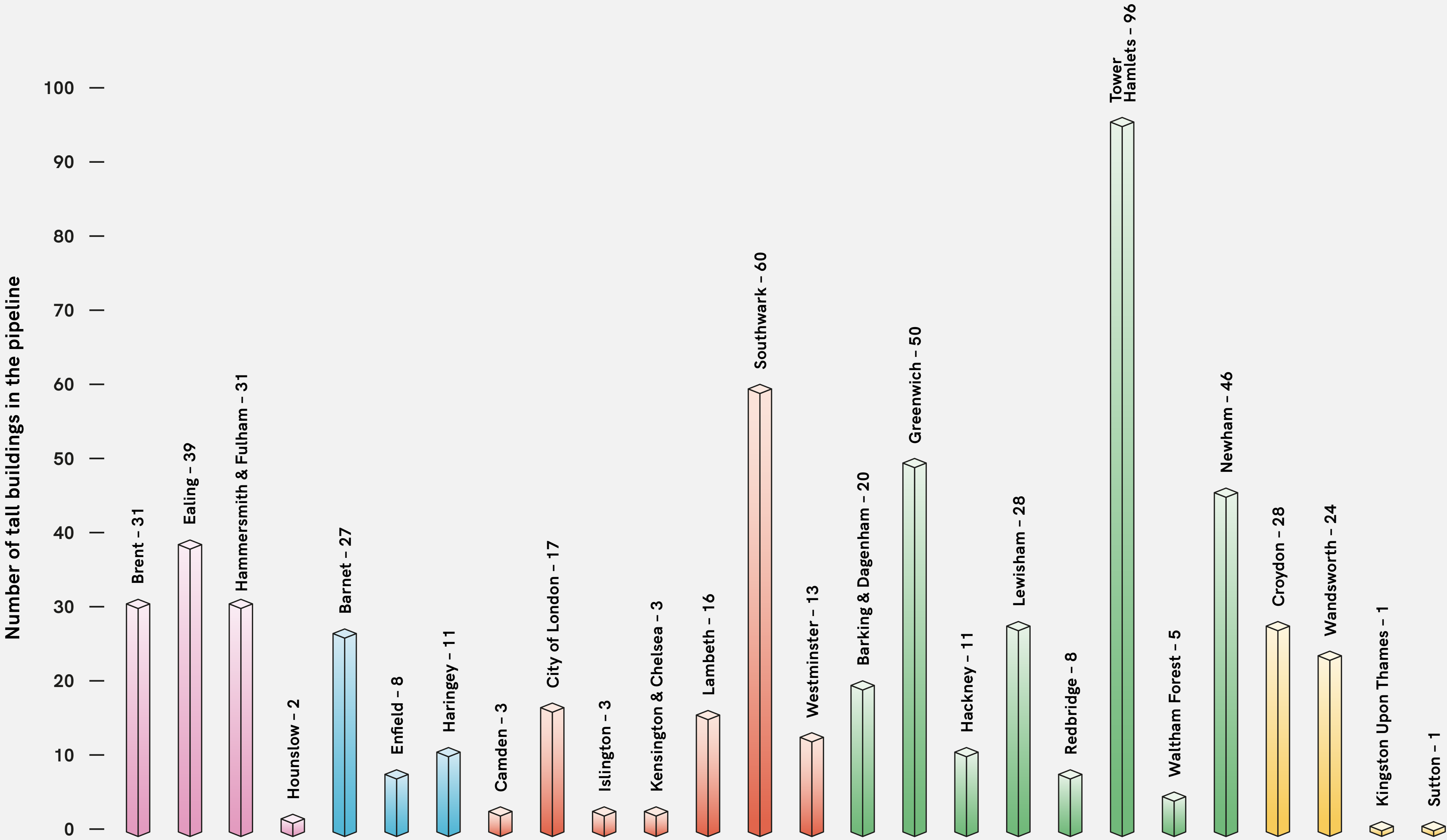
Building heights will be influenced by several factors, including construction economics, development risk, and viability and financing. A sharp rise in construction costs and wider supply chain disruption last year, presented challenges for developers and resulted in some squeezing margins. The Building Cost Information Service (BICS) is anticipating a further rise in build costs this year as a result of labour shortages and higher input costs, while there is also the prospect of tighter environmental regulations on the horizon.

Policy and political influences also play a part. The new London Plan, for example, pushes boroughs to do more than simply identify general areas where tall buildings will be suitable. They must now evidence and plan for tall buildings including identifying specific locations and provide justification for appropriate heights within their development plans. It is possible that policy development will slow down planning applications and local authority decision making in the short-medium term.

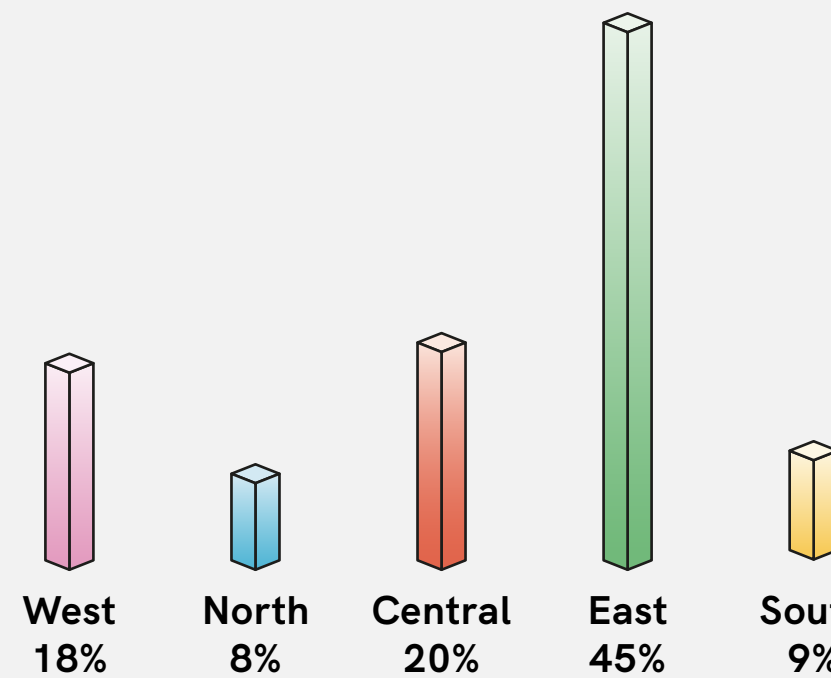


8 Bishopsgate in the City of London by WilkinsonEyre

Tall buildings in the pipeline by borough



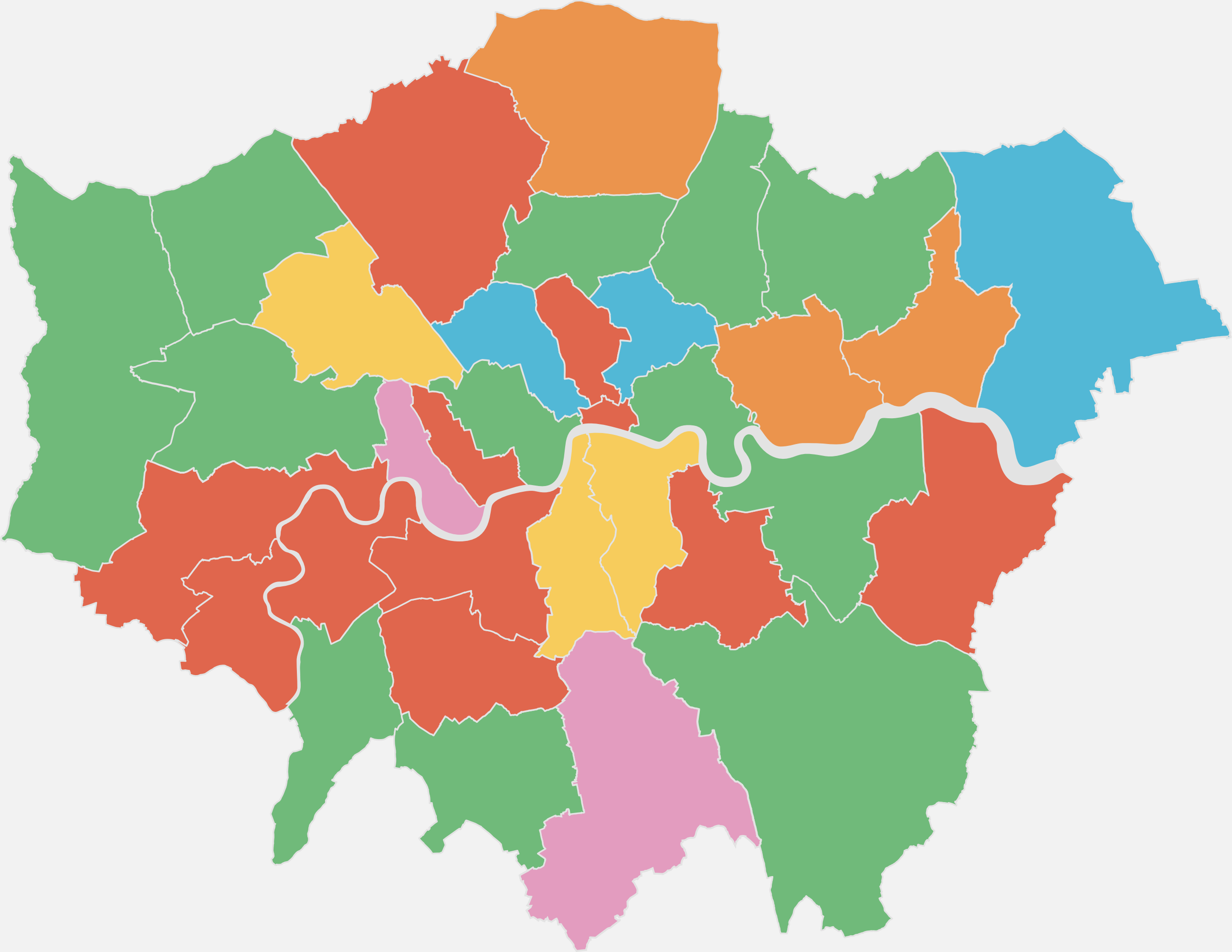
Percentage of tall buildings in the pipeline by location



Source: Knight Frank Research, Molior London

Tall buildings policy in individual boroughs

- Emerging policy with a tall buildings threshold the same as the London Plan
- Emerging policy with a tall buildings threshold higher than the London Plan
- Some guidance but no specific adopted or emerging tall buildings policy
- Tall Buildings Policy pre-dates London Plan (2021)
- Up to date adopted policy with a tall buildings threshold higher than the London Plan
- Up to date adopted policy with a tall buildings threshold the same as the London Plan



Source: Knight Frank Research, Molior London

A mixed picture for localised tall building policy

While the NLA London Tall Buildings Survey considers a tall building to be a structure of **20 storeys or above**, Planning Policy of the GLA and London’s individual boroughs have a variety of definitions.

The London Plan (2021) goes further than its predecessors in determining what constitutes ‘tall’ in policy context by applying a **six storey, or 18 metre**, threshold, though also acknowledging that height will vary between and within different parts of London. Fire safety guidance is also being consulted on as part of the London Plan and will refine policies on fire safety and design to include the requirement for a Planning Stage Fire Safety Strategy and incorporation of evacuation lifts for mobility impaired people. Importantly in this regard the government’s Building Safety Bill also applies an **18 metre (or 7 storey)** threshold for high-rise buildings to be included within its scope.

Considering the London Plan definition as a baseline policy definition for tall buildings, and assuming that an up-to-date tall building policy is one adopted after the publication of the draft new London Plan in December 2020, our analysis shows that two London boroughs (Croydon and Hammersmith & Fulham) currently have an up-to-date adopted policy with a tall building definition which aligns with the London Plan definition.

Three other London boroughs (Brent, Lambeth and Southwark) have an up-to-date adopted tall buildings policy with a tall buildings threshold higher than the London Plan.

Four of London’s 33 boroughs (Bexley, Camden, Hackney and Havering) offer limited guidance within their local plans on tall buildings, but they do not have specific tall buildings policies, of which Camden, Hackney and Havering do not have emerging tall buildings policies either.

Out of the 16 boroughs with emerging policy, three have a tall building definition which aligns with that of the London Plan and 10 have an emerging policy with a tall buildings definition higher than that of the London Plan.

Our research shows that the majority of boroughs either have policies in place or emerging when it comes to tall buildings. We expect the position shown in our map will change as more Local Plans are reviewed and—at the very least—brought in line with the London Plan. However, it is interesting to note that, of the boroughs with an emerging tall building policy, most have opted for a threshold higher than the London Plan definition, which might suggest a generally supportive approach to higher rise development.

How tall is tall?

20 storeys or above

considered by the NLA London Tall Buildings Survey

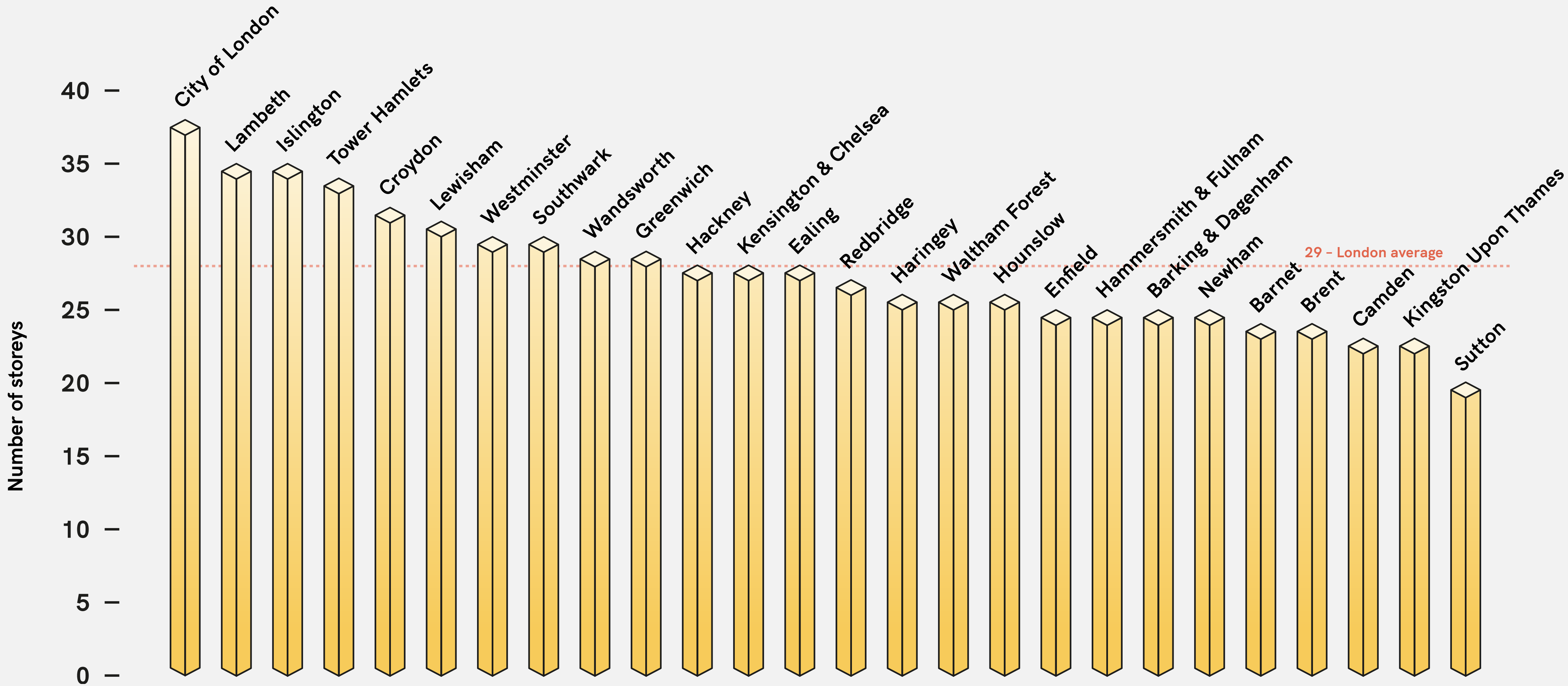
6 storeys or 18 metres

determined by the London Plan (2021)

7 storeys or 18 metres

proposed by the government's Building Safety Bill

Average height of the tall building pipeline by borough



Source: Knight Frank
Research, Molior London

Building up, out, and for residential

Most of the tall building proposals are located within inner London. However, in line with a trend we identified in previous Tall Building surveys, there has been a further shift towards the outer zones.

There are now 228 tall buildings in the pipeline in outer London, up 6 per cent from 216 last year, according to the data which has been supplied by Molior London. By contrast, the pipeline in inner London fell year-on-year to 355 tall buildings. As a result, outer London boroughs now account for 39 per cent of the tall building pipeline, up from 37 per cent in 2020 and 36 per cent in 2019.

Of the 20 outer London boroughs, 13 had tall buildings in the pipeline in 2021. Newham (46) continues to be the outer London borough with the largest pipeline of tall buildings though other ‘hotspots’ are emerging including Ealing (39), Brent (31), Croydon (28) and Barnet (27). Overwhelmingly, these are residential-led schemes.

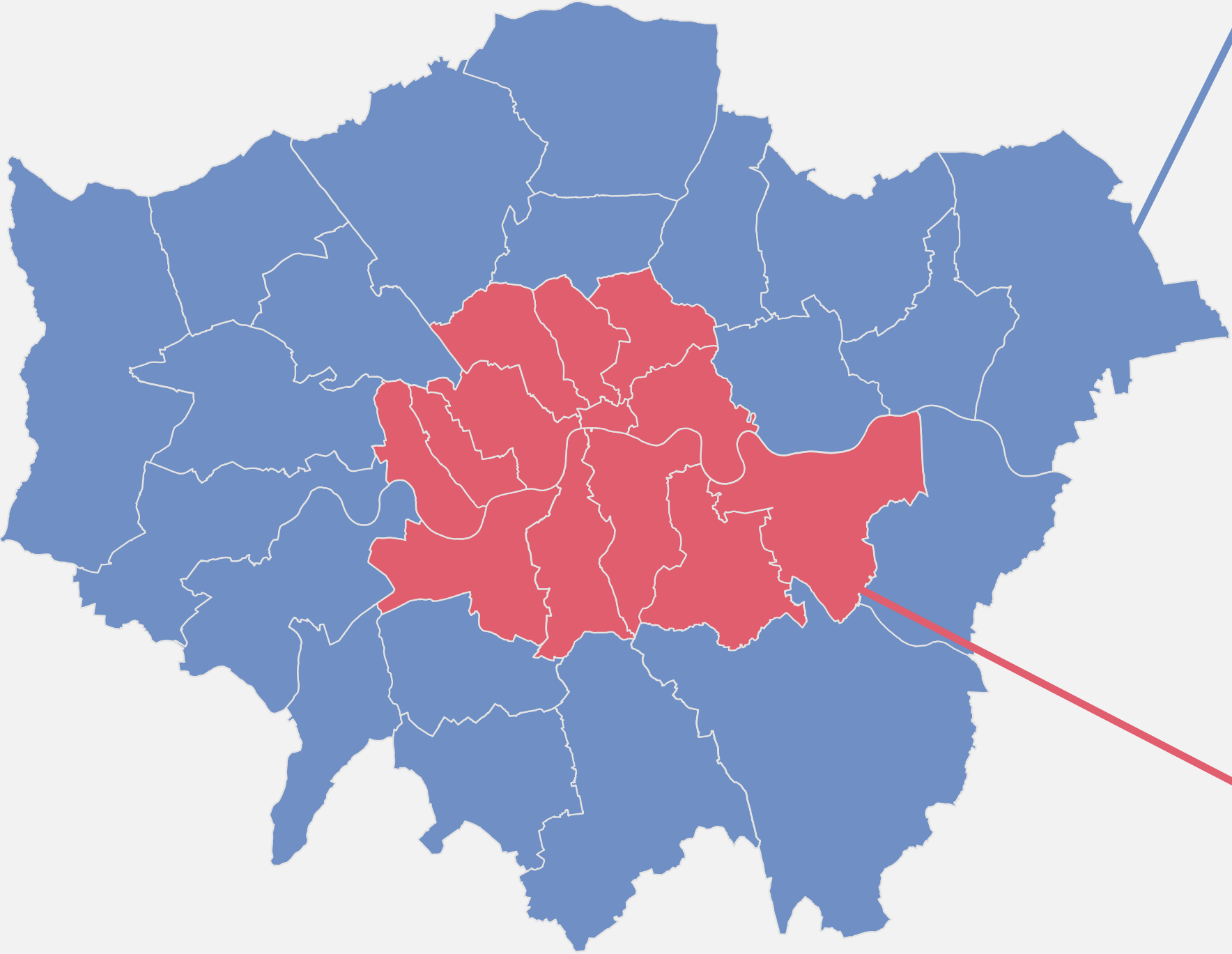
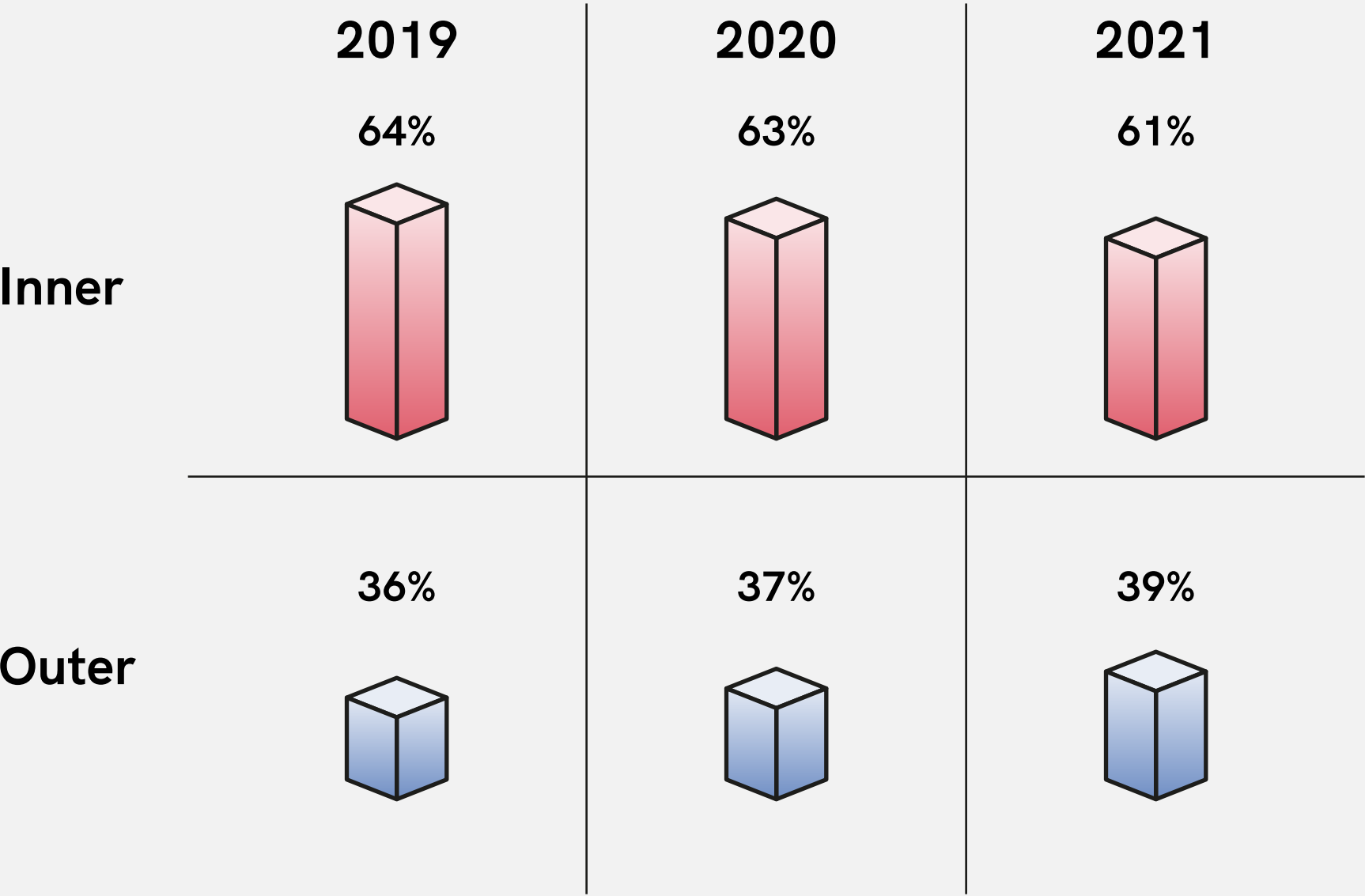
A combination of factors is likely to be underpinning this shift, including comparatively lower land values—which can make sites more viable to build—as well as ongoing large-scale regeneration projects in outer boroughs. Higher density schemes are also likely to be viewed by local authorities as a means of meeting housing targets and accommodating the capital’s continuing growth, as well as supporting the Mayor to fulfil his pledge of protecting the Green Belt.

More broadly, a move towards outer London is consistent with the wider trend in the London development market in recent years, with applications and permissions in inner London having dropped significantly. Meanwhile, the new London Plan, adopted in March 2021, notes that there is significant potential for “appropriate intensification” in outer London boroughs, particularly for housing.

When looking at the overall pipeline, residential remains the primary driver of tall buildings in London, accounting for 87 per cent of all tall buildings in the pipeline. It is estimated that approximately 88,000 new homes could be provided by this pipeline, which is just under two year’s supply of the housing need for London based on the new London Plan requirements of some 52,000 dwellings per annum.

As we have noted in previous reports, the data confirms that tall buildings can make a significant contribution towards meeting London’s housing need, as well as being an efficient use of land to deliver housing. This is particularly true for sites close to new or existing transport links where residents benefit from easy access to public transport as well as the high levels of amenity that denser urban environments can deliver.

Inner and outer boroughs



Outer

39%
of tall buildings in the
pipeline with

228
Tall buildings

Inner

61%
of tall buildings in the
pipeline with

355
tall buildings

Source: Knight Frank
Research, Molior London

Playing the long game

The data provided this year has allowed Knight Frank to do further analysis of the timelines of the completed schemes as they have moved through planning and construction phases.

While there were 34 tall building completions in 2021, a number of these buildings formed part of multi building planning permissions, hence there were 26 separate planning applications.

However, the data shows that the timeframes for developments from submission to completion vary quite significantly.

Of the schemes completed in 2021, Lewisham Exchange (in the London Borough of Lewisham) had the shortest development programme of two years and eight months. Its planning application was submitted in January 2019 and construction completed in October 2021. On the other hand, East Village Plot N06 in Stratford has the longest development programme of 14 years and six months. While the original outline planning consent was submitted in March 2007 and consented in November 2007, it was not until May 2014 before the reserved matters application for the detailed scheme was submitted. Construction did not start until December 2018 and the scheme completed in October 2021.

Summary of key trends from the 2021 completed developments:

9 Years and 7 months

is the average time taken to go from planning submission to construction completion for an 'outline' application with 'reserved matters' approvals.

5 Years and 6 Months

is the average time taken to move from planning submission to construction completion for a 'full' planning application.

1 Year

is the average time taken to move from planning submission to securing full planning for a 'full' planning application.

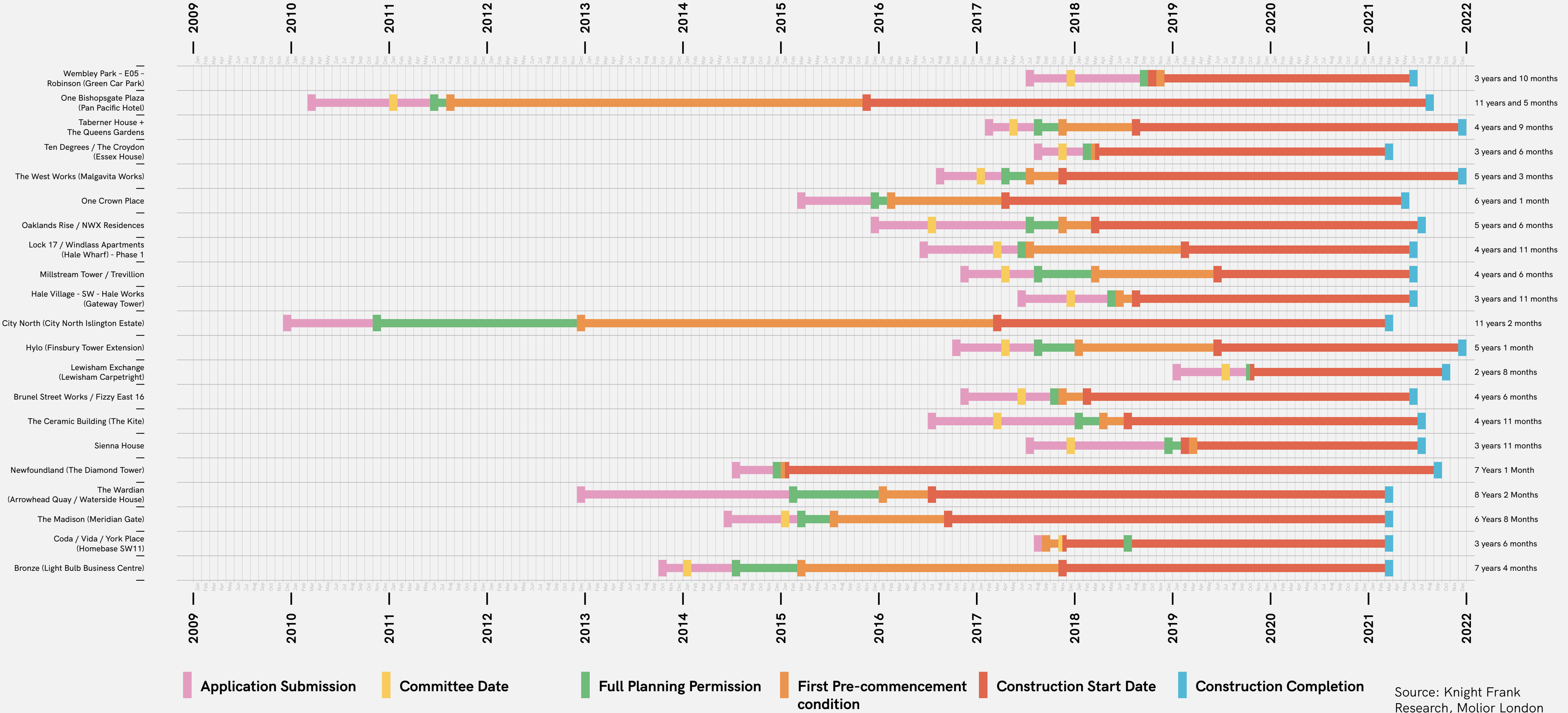
5 Years and 2 Months

is the average time taken to move from planning submission to securing full planning permission under an 'outline' application with subsequent 'reserved matters'.

3 years and 4 months

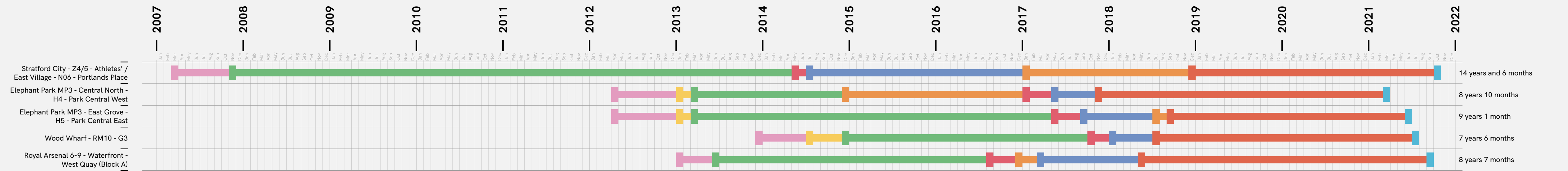
is the average construction timeframe from start on site to completion.

Timeframes from submission to completion



Source: Knight Frank Research, Molior London

Timeframes from submission to completion

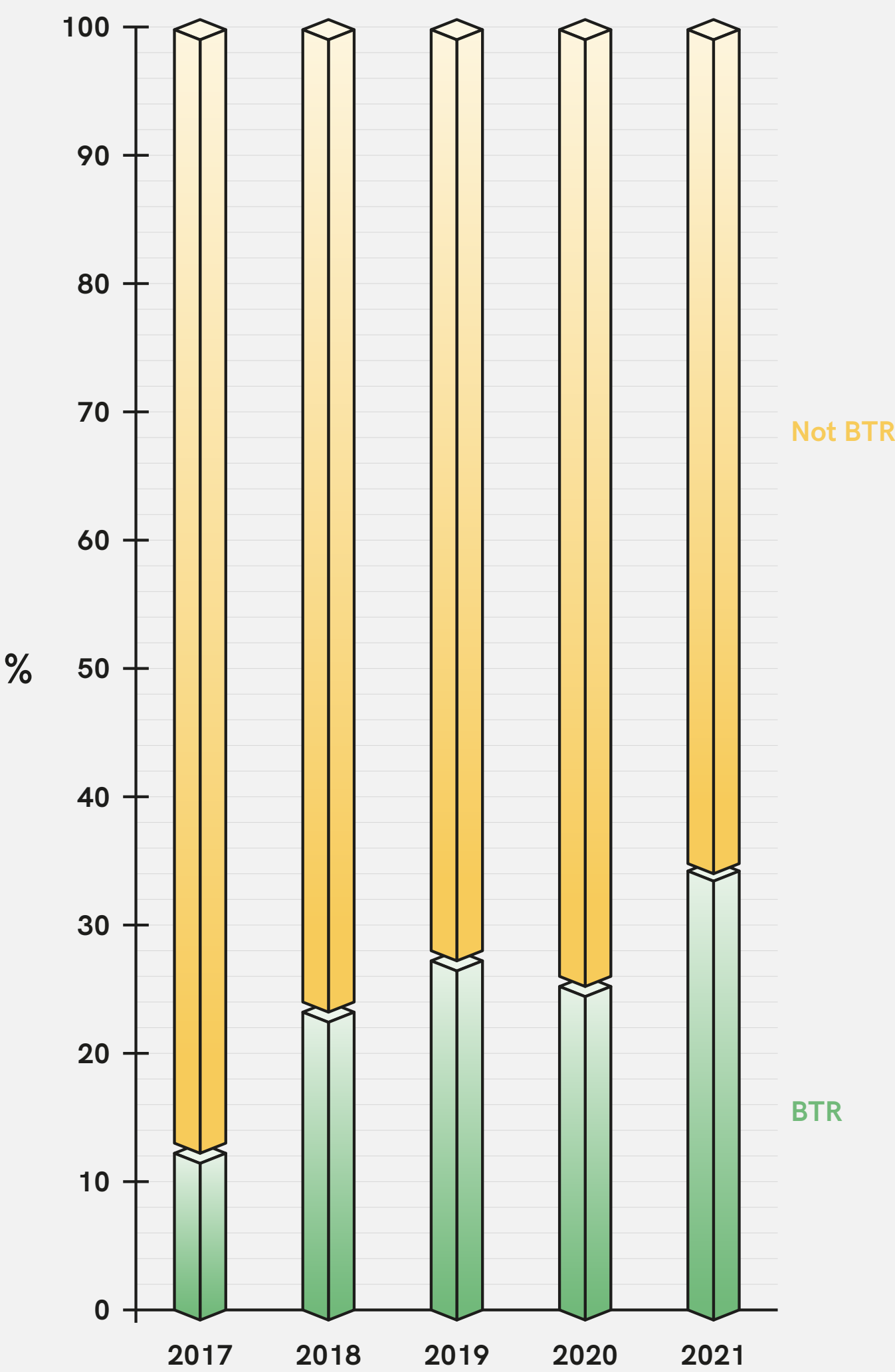


Source: Knight Frank
Research, Molior London



The rise of Build to Rent

BTR as a proportion of all residential tall building completions



Commercial tall buildings

Just 13 per cent of the tall buildings in the pipeline are commercial in nature, representing 18.55 million sq ft of new office expected to complete between 2022-2028.

Almost 41 per cent of the commercial floorspace in the tall buildings pipeline will be built in the City of London followed by 7.7 per cent in Southwark and 7.4 per cent in Lambeth. Both local authorities overlap the Southbank office submarket which has seen significant growth in commercial development in recent years.

Only 16 per cent of the commercial pipeline is under construction whilst 67.4 per cent have full planning but are yet to start development. Nine of these schemes were granted permission more than three years ago.

The high number of schemes with full planning relative to the low level of construction activity is a result of starts being delayed due to the pandemic and the increased development risk arising from the uncertainty relating to future working patterns and the ability of developers to obtain lettings at viable rents.

The outlook for starts is dependent on prospects for rental growth as expected developer profits have been dented by rising cost inflation, higher financing costs and a shortage of skilled workers in the construction sector. Accordingly, many developers will only proceed with commercial development construction with secured pre-lettings. Recent tall buildings completions with pre-lettings ahead

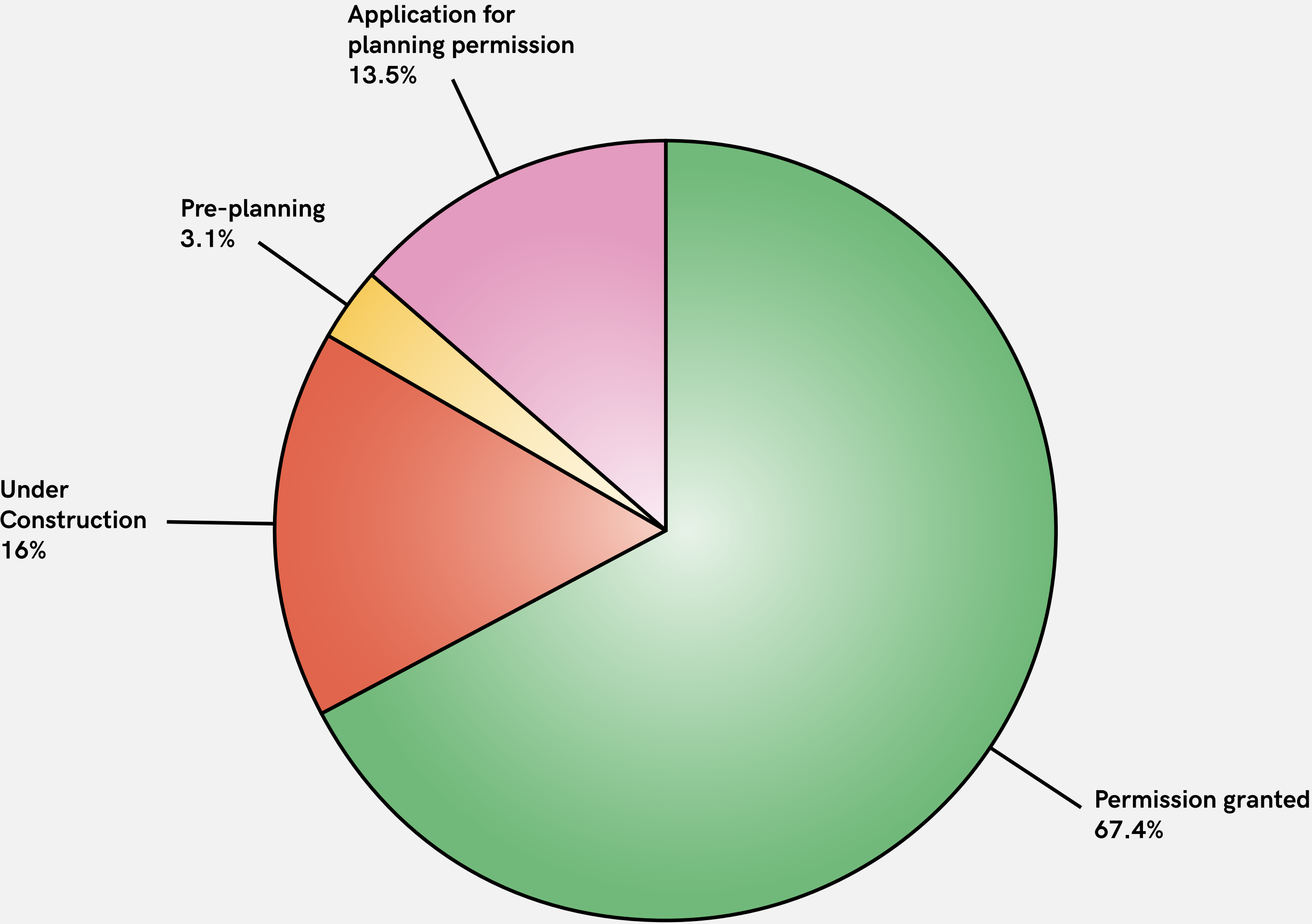
City of London leads for office tall building pipeline

Local Authority	No. of schemes	Floorspace (m sq ft)	% of total floorspace
Camden	1	0.38	2%
City of London	12	7.45	40.6%
City of Westminster	2	0.73	3.9%
Hackney	1	0.41	2.2%
Hammersmith & Fulham	1	0.51	2.8%
Islington	1	0.43	2.3%
Lambeth	2	1.38	7.4%
Newham	1	0.34	1.9%
Southwark	5	1.43	7.7%
Tower Hamlets	6	5.40	29.1%
Total	32	18.55	100%

of completion had between 29 per cent to 85 per cent of space let ahead of completion.

Historic analysis of tall buildings completions in London shows that rents achieved by developers are higher than the average prime rent in the broader market. Recent completions can be categorised as best-in-class buildings with high levels of environmental certification, are in locations with easy access to transportation hubs, a rich amenity offer and health and wellbeing facilities within the building or in close proximity. Rents achieved on recent tall building completions have been between 8-14 per cent higher than the average prime rent in the broader office market.

Over two-thirds of the office tall building pipeline has been granted planning permission



Looking ahead: A planning view of tall buildings

by Stuart Baillie, Head of Planning, Knight Frank

This year's Tall Buildings Survey shows a further reduction in the number of new schemes (down 13 per cent) entering the pipeline and a continued slowdown of construction starts (down 15 per cent on the long-term average). Yet planning permissions are at their highest on record (98) and it has been another bumper year for completions (34). 2021 was therefore a very active year for Tall Buildings.

However, the pipeline has not quite delivered on projections of previous years which forecast significantly more starts and completions in 2020 and 2021. Of course, some of this delay in moving from 'planning' to 'construction' is related to wider economic and political tailwinds from Brexit and the global pandemic. It is important to note that a similar trend has also been witnessed in non-20 storey construction in the past two years.

The record number of permissions suggests that Planning Authorities continue to be receptive to tall building schemes and that the 2021 London Plan with its tightened criteria for tall buildings may not have been the deterrent to skyscrapers that many Planners speculated it would be. There is some truth in this, with 12 schemes submitted in 2021 and securing full permission the same year but it must be kept in mind that many of these schemes were submitted for Planning in 2019 and were well developed schemes prior to the adoption on the latest London Plan.

Perhaps of more importance to the future supply of tall buildings in London are statistics relating to a decline in new schemes and a slow move from Planning to construction start. These statistics suggest that investors and developers may have lost confidence in tall buildings temporarily at least. In this context there are a number of factors at play:

1 Increased build costs

Various sources are quoting increased build costs, materials prices alone rose 20 per cent annually in 2021, according to the BCIS. For tall buildings with a longer build timeframe this will be more acutely felt.

2 Building safety

Planning Committees are already interrogating schemes that don't conform with emerging guidance, particularly the issue of second stairwells on tall buildings. Schemes in Tower Hamlets and Hammersmith & Fulham have been forced to accommodate additional stairwells prior to securing planning permission and this is even before the Building Safety Bill becomes law.

3 Planning

The 2021 iteration of the London Plan tightened up the regulation of tall buildings from a development management perspective with additional location, design and impact tests. This has not yet resulted in a slowdown in consents but there have been fewer planning applications. The Hillingdon Gardens scheme by Inland Homes became a bit of a test case for Policy D9 with the Judicial Review determining that tall buildings can still be considered even where a Local Plan has not designated a site suitable for a tall building.

4 ESG

Energy usage are becoming key considerations and can add significant risk to the planning process and cost to the end development. Developers building to invest in a long-term income stream are more likely to buy-in to the sustainability business case whereas conventional build for sale apartment products may become more expensive to fund and sell simply increasing house prices. Many professionals feel that the regulatory authorities need to control this but there is disagreement about the best assessment methodology to use in what is a rapidly evolving field.

5 Politics

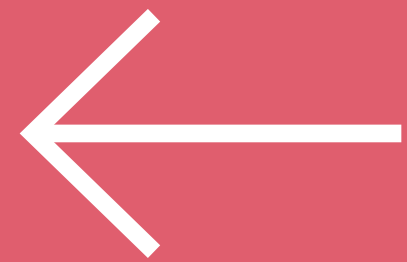
Perceptions of tall buildings continue to be polarising and it has been interesting to note in the run up to local elections that politicians in some boroughs have spoken out against the unchecked growth of tall buildings. The Leader of Ealing Council in particular articulating concerns about inappropriately located tall buildings. Ealing of course had their refusal of Southern Grove's 55 West scheme overturned by the Planning Inspector at Appeal in 2021.

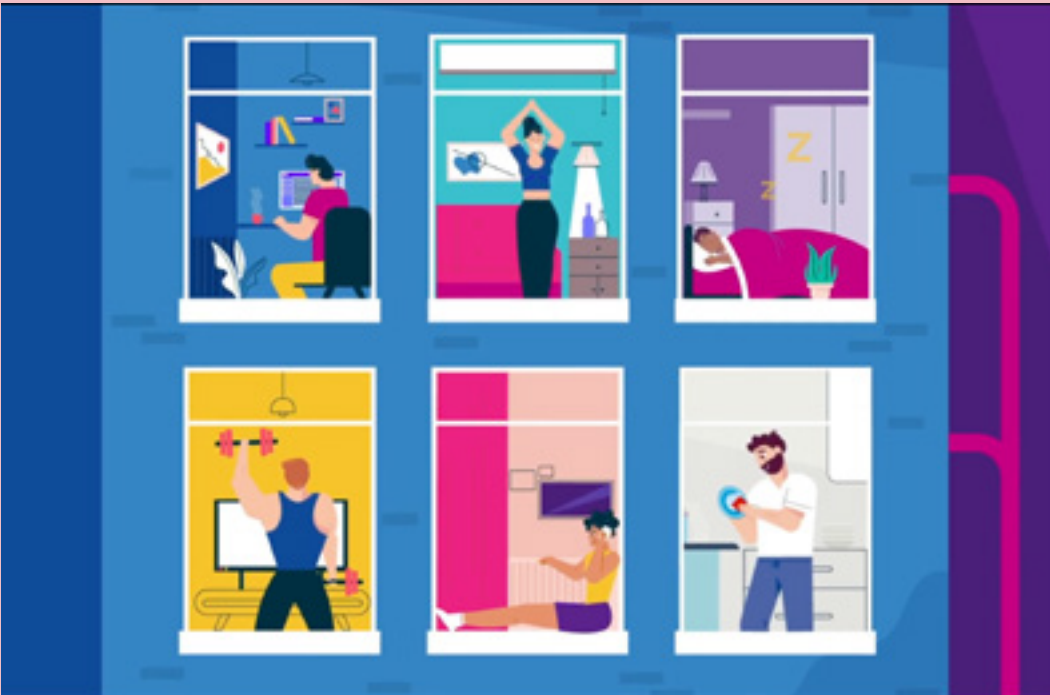
With 583 tall buildings in the pipeline there remains a lot still to deliver. There could be a plateauing of the pipeline but 2020 and 2021 may yet prove to be anomalies due to the wider economic factors influencing construction.

Changes in central Government responsibilities for Planning and Housing suggest that there will be no easing of the Green Belt and 'accelerated planning' policies such as zoning appear to have been abandoned. However, the London Plan encourages intensification, it remains to be seen if that intensification becomes more focused on midrise developments rather than 20 storeys plus.



VIEWPOINTS





High-Rise Heating

by Worcester Bosch



Achieving net-zero in tall buildings

Peter Jackson, Principal, SOM



Historic England Advice Note on Tall Buildings

*David English,
Development Advice Team Leader,
Historic England*

High-Rise Heating

by Worcester Bosch

Following the Hackitt Review released in 2018, restrictions were placed on the type of material that penetrated an outside wall, basically the horizontal flue that most boilers were installed with could not be the typical type with a plastic air duct, it had to be made of a non-combustible metal material. This was put in place to ensure the safety of those living in a tall residential building. However, given boilers are very effective at heating properties, what would be the alternative to not only ensure resident safety but also to meet efficiency standards set out in building regulations? This is where heat networks come in.

Heat networks consist of a plant room and multiple Heat Interface Units (HIUs). The central plant room generates more efficient heat on a larger scale and then pumps it through a network of pipes to multiple properties.

With one central plant room generating the heat, there isn't need for a gas boiler in each apartment within the building, and so no individual gas supply and subsequent safety risks which come from it.

Instead, each apartment will have a HIU, something that looks, feels and works like traditional combi boilers but needs less maintenance, with servicing only required every three years, and as mentioned doesn't require any gas to be supplied directly to each apartment, therefore the risk

of carbon monoxide being removed from properties. This also eliminates the requirement for individual annual gas safety checks to be made in each apartment, something which will greatly ease complications around access for property managers.

The plant room, or energy centre, can generate heat from a multitude of different sources, most notably renewable sources such as heat pumps (air, ground or water source), or even solar thermal panels which utilise the earth natural thermal properties. Alternative options include high-efficiency boiler technology, including modern ranges that are able to run on 20 per cent hydrogen-blends or bio-fuels and biomass.

Other sources include waste heat which utilises unexploited heat from sewage plants, industrial processes, or subway networks such as the London Underground.

Hybrid systems are also a viable option. The most popular hybrid systems today consist of an air source heat pump as the main generator of heat, with a peak-load boiler installed as a support. Heat networks typically operate below 25 per cent of their peak demand for over half of the year, which is why heat pumps are well-suited to larger schemes. By having peak-load boilers on standby, when the outside temperature drops to its coldest, the hybrid

heat network will continue to provide end users with instant hot water and heating.

This type of heat network system provides several benefits in relation to the sustainability credentials of any high-rise development, whilst also ensuring residential comfort.

By opting for a hybrid heat network when specifying a new high-rise development then developers would also be supporting future carbon emission reductions. It is looking increasingly likely that current boilers will be replaced by hydrogen-ready appliances in the coming years, so much so it could become a mandatory requirement. If this occurs, then by installing a hybrid system into a high-rise development now, means that it is future-proofed and ultimately avoids considerable costs later down the line.

So in summary, although the Hackitt Review brings essential new safety regulations, it also brings with it an opportunity to incorporate new heating technology such as heat networks, which will help commercial, high-rise property develops achieve their net zero targets.

You can find out more on the benefits and applications of heat networks and HIUs [here](#).



Achieving net-zero in tall buildings

Peter Jackson, Principal, SOM

SOM has designed a new 56 storey tower for the eastern cluster of the City of London that will become 100 Leadenhall Street, or 'Diamond Tower'. Designed to respect the city's historic and contemporary urban context, the distinctive elegant tapered form preserves London's key historic views. When complete it is anticipated that it will be among the first skyscrapers in the UK to achieve net-zero carbon.

The project was given planning consent in 2018—almost a year before the ambitious RIBA 2030 Climate Challenge was published. The challenge set a series of stepped targets designed to help architects on the road to net-zero and beyond. Typically, once a project of the size and complexity of 100 Leadenhall achieves consent, there isn't much opportunity to make significant non-essential changes. We have been lucky in this case to have a progressive client in Frontier Dragon, who is willing to invest the time and money to allow us to revisit the concept design to make a building that sets a new benchmark for sustainable tall buildings.

If there is a phrase that defines our approach on the journey to greater carbon efficiency, it is 'radical collaboration'. The team at SOM are working in concert with the consultants, planners and client team. The level of engagement we get from a client can vary a lot but,

in this case, we have a client who is very engaged in the process and understands what we're trying to achieve and the challenges we face. It has been a very collaborative way of working between the design and client teams, which has enabled an iterative and integrated design process. We're following a rigorous quantitative and qualitative performance methodology every step of the way.

Where things stand now, we are on the road to achieving net-zero carbon and meeting or exceeding the current industry benchmarks, but we think there is still more to be achieved, so it's an evolving situation. We are still at the concept stage, revisiting our original design and are confident we can reach both embodied and operational targets on carbon and bring the project to at least net-zero and even go beyond. Office buildings have to consume less than 55 kWh/m²/year in operational energy to meet the current 2030 target for this typology and have less than 500 kgCO₂e/m² of embodied carbon.

Climate targets are moving forwards quickly and outpacing the time it takes for tall buildings to go through the planning process, meaning that by the time a building has been through the consent process, the carbon goalposts have already moved on. A key piece of the jigsaw for us is that construction on 100 Leadenhall isn't scheduled to begin until 2023, once vacant possession of the existing

office buildings is obtained. This interim period bought us time that we wouldn't normally have.

In a way, we're peering into the future and predicting that by the time construction is complete, net-zero buildings will be the norm. Our ambition is to go beyond carbon neutral so that 100 Leadenhall is still ahead of the curve when the first tenants move in.

Since much of the embodied carbon in a skyscraper comes from the superstructure, SOM Engineers achieved significant embodied energy reductions through changes to the structural system. The overall mass of the building has not changed, meaning that we are constraining ourselves to make changes within the existing consent, but we have reduced the number of materials. Embodied carbon has been reduced by 35-40 per cent against a typical commercial building construction at this scale. The three biggest steps that have helped limit the embodied carbon are a reduction of spans, a more efficient and reconfigured core and a changed floor composition from a steel beam and metal deck to a post-tensioned slab. A significant amount of embodied carbon will be saved by reduced parts used in the MEP systems. We're also maximizing passive design approaches of daylighting and solar shading together with efficient building systems to deliver a high-performance, healthy and resilient building that will last for generations.



100 Leadenhall Street in the City of London designed by SOM



Historic England Advice Note on Tall Buildings

David English, Development Advice Team Leader, Historic England

In the right place, well-designed tall buildings can make a positive contribution to urban life. Equally, there will be sites where the impacts upon the historic environment cannot be overcome or minimised. Such sites may be inherently unsuitable for tall buildings due to the harm they would cause to the significance of heritage assets.

Providing advice on the impact of tall building proposals on London's heritage is a major part of the work of Historic England's London and South East Regional Team. When considering schemes we take a proportionate approach, focusing on the most harmful impacts to historic buildings, areas, and archaeology, of the greatest significance.

This proportionate approach was evident when we reviewed our responses to tall building proposals in London over a thirteen-year period, looking at 574 proposed towers across 356 schemes, based on the 2017 NLA's London Tall Buildings Survey. Of these schemes, we advised that 7 per cent would cause high levels of heritage harm, sufficient to give us serious concerns. In 49 per cent of cases Historic England made no comments, deferring to the Local Authority. In 18 per cent of cases we were not consulted.

Building on this experience, tested in recent years at major public inquiries such as the 'Tulip' Tower, as well as updates to national planning policy and guidance

on design, feedback from a public consultation and a research report *Assessing the Impact of Tall Buildings on the Historic Environment* (Node 2021), Historic England recently published the second edition of its Tall Buildings Advice Note. Both the updated advice note, and research report can be downloaded [here](#).

The Tall Buildings Advice Note is aimed at local authorities, developers, designers and communities. Its purpose is to support sustainable development, and the successful management of the historic environment.

Key principles underpinning the advice include that a plan-led approach is the most appropriate way to determine the location of tall buildings. This approach should be supported by an evidence base that explores alternative options for the location and heights of tall buildings. Having a good understanding of place, character and historic significance is key to decision making, and tall building proposals should take account of local context and historic character.

To support the development of proposals, either as applications or in plans, Historic England advocates early and meaningful engagement at plan-making and pre-application stages. To make this early engagement most effective, we welcome and encourage joint discussions

with ourselves, the Local Planning Authority (and the GLA) at local plan and pre-application stages, so please get in touch.

The new advice note provides greater detail than the previous edition on the tools needed to understand impacts on heritage. This is to assist the preparation of draft local plan policies and the development of planning applications in a way that avoids and minimises harm. It includes checklists highlighting the types of information and evidence that councils and developers should consider producing to help with the identification of sites that are likely to be acceptable for tall buildings, and to support informed planning applications.

Both the Advice Note and the accompanying research report include a suite of case studies from across the country, highlighting important lessons that we consider could be applicable more broadly. These include the benefits of 3D digital models and ensuring that application visual material reflects the human experience. Additional considerations that are explored include advice on clusters of tall buildings, the importance of considering heritage early in the design process, and the assessment of cumulative impacts.

The Advice Note is intended to be read alongside other Historic England advice notes, which remain indispensable for assessing the impact of tall building proposals on heritage, such as Historic England Good Practice Advice Note 3: The Setting of Heritage Assets.

A



B



C



Impact of tall buildings on a cityscape: a - city skyline | b - dispersed tall buildings | c - a tall buildings cluster

The Advice Note covers the whole of England, not just London. There are however a considerable number of tall building proposals in London and this seems likely to continue to be the situation for a while yet. Given London’s globally renowned wealth of historic buildings, parks and landscapes, and the acute impacts that tall buildings can have over wide areas, we anticipate that the Tall Buildings Advice Note will play an important role in supporting planning across the capital, helping all groups make better informed decisions about this sometimes-challenging form of development.

A



B

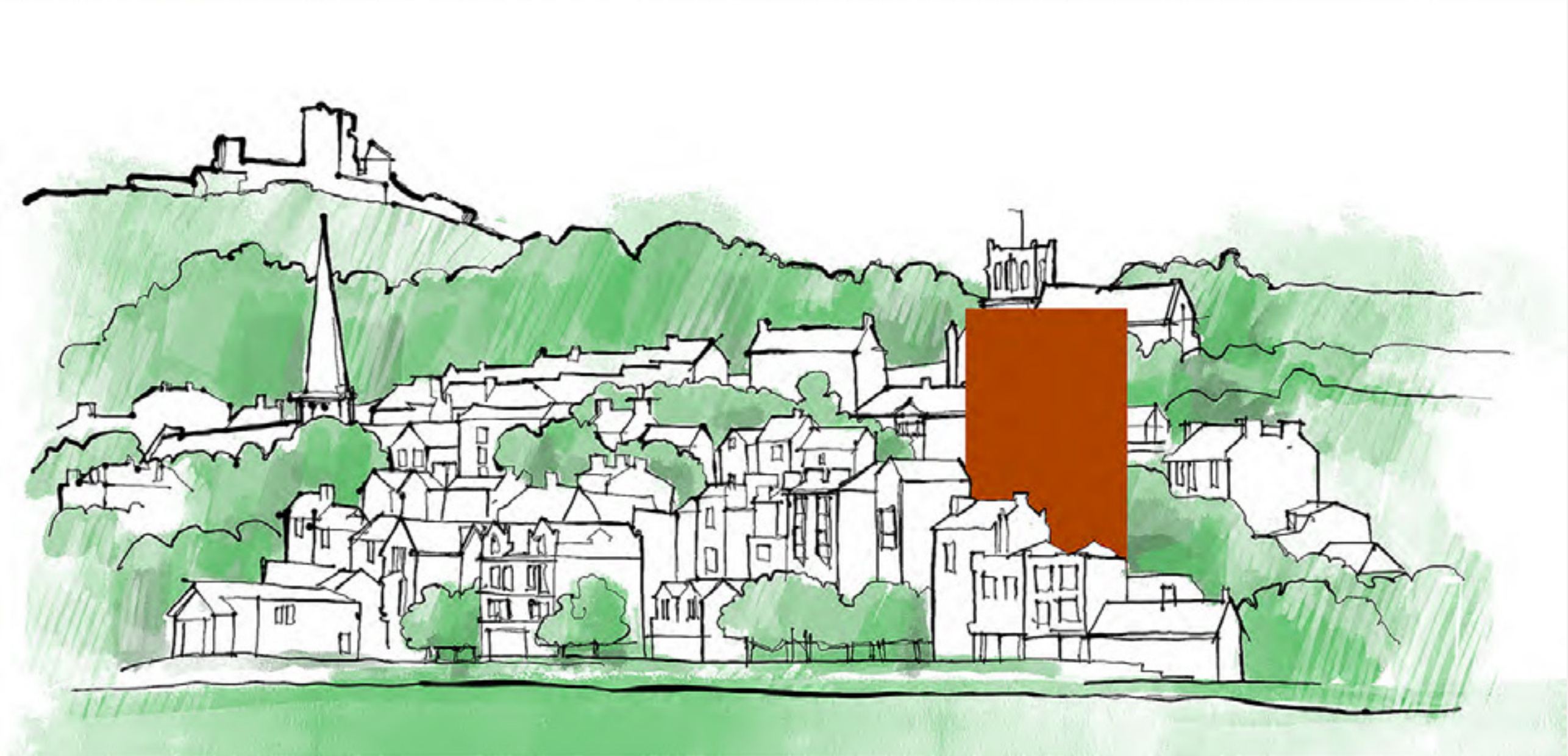
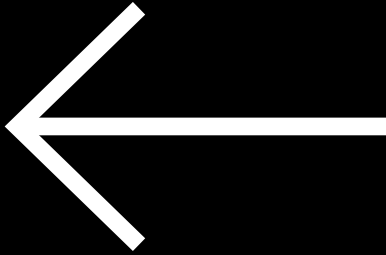


Image: Examples of how tall buildings affect views, heritage assets and setting. A - example of a tall building visually competing with heritage and impacting the skyline | B - example of a tall building visually obstructing and visually competing with heritage assets

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