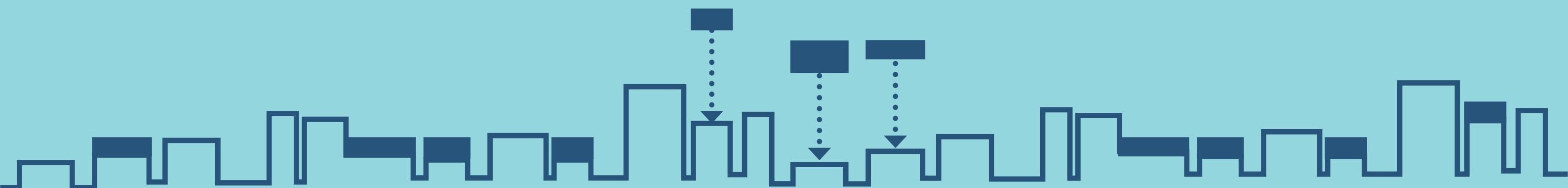


Raise the Roof

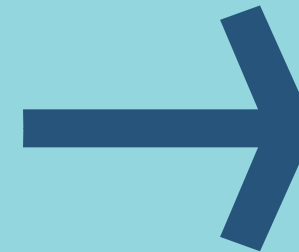


Using a mixed use approach to create new rooftop extensions in the Central Activities Zone

"There's a way to do it better - find it." Thomas A. Edison



Where else will we be looking for opportunities in central London in 2018?



UPWARDS

NOT TO THE CLOUDS, BUT TO



THE ROOFTOPS.

"The answer to building new homes isn't always an empty plot, or developing on a derelict site. We need to be more creative and make more effective use of the space we already have available..."



Housing Secretary Sajid Javid - 5 Feb 2018

This study indicates that over and above existing targets, an additional **25,650 homes** can be created in the **Central Activities Zone (CAZ)** alone by exploiting deliverable rooftop opportunities on both residential and non-residential properties. That means capacity should be at least **50% more than the current targets**. A perfect storm of policy initiatives, construction innovation, land costs and cross-pollination between sectors is going to make this theory an organic reality.

 / ha
7.95 additional homes per hectare

> 17 million sq ft additional residential space

> £30 bn development value

Introduction

Perhaps the only upside to the housing crisis is the wealth of creative thinking being aimed at a raft of both innovative and re-worked historic solutions. The crisis has already catalysed the Build to Rent (BtR) sector and given the off-site and modular agendas the priority they needed to target critical mass. The debate around tall buildings and the creation of communities has been fertilised by the crisis. Even the entrenched divisions between the Urban Densifiers and Garden City Cultivators have ensured that both supply fronts are getting the attention they require.

If we have reached a consensus, it is that the crisis is real and that all viable solutions must be taken up in parallel.

Rooftop development. Vertical extensions. Air rights. Whatever your angle, these topics are going to be seasoning your breakfast omelettes over the coming months. Throw in a quiet mixed-use boom and a very noisy off-site ignition and you might not need lunch.

This brief study aims to put a bit of flesh on the bone, in a real-time development and design context. We are parking the global spatial analysis and big data to take a low-tech granular approach over a defined piece of city around Victoria to see if this additional theoretical housing capacity might actually be deliverable. We can then feed this bottom-up information back into the wider CAZ context to speculate on the city wide significance.

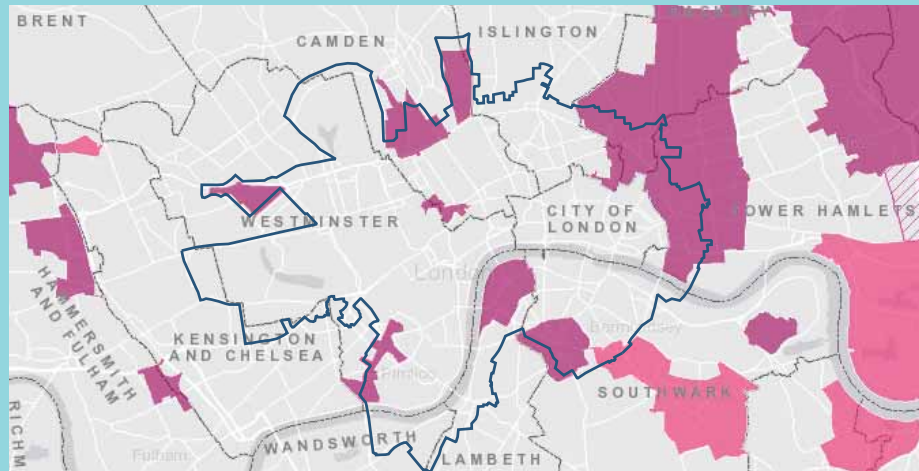
The study will discuss the approach and methodology that informed our diagrams, imagery and quantum of dwelling units. This will be contextually supported using local policies, a real case study and two approaches to development. We will also outline our debt to previous studies and how they have shaped our findings.



The Approach

83% of potential housing capacity within the CAZ is expected to be brought forward within Opportunity Areas, which represent just 16% of the area of the CAZ (see purple/pink zones on map below).

So, 84% of the CAZ by area is expected to bring forward just 17% of the 40,000 homes targeted.



This compelling blind spot is our starting point.

We have taken an area dominated by an Opportunity Area and major development sites and asked the following question:

If we ring fence the 'known' supply targeted via major development sites and look at the un-quantified remainder, how much additional supply might there be through just one rooftop initiative?

How much of the iceberg is there below the water level?

If we discount major development sites, listed buildings, key government buildings and schools in an area dominated by these assets, we reduce the size of our submerged berg significantly. If we then begin to apply pragmatic filters such as height restrictions from viewing corridors and structural capacity (there is little merit in assuming a traditionally constructed housing terrace can accommodate Mr. Javid's two additional stories), the berg melts a bit more. Factor in subjective planning appraisal by discounting completed architectural compositions of merit (unlisted) and being sensitive to townscape by considering height and bulk from a planning perspective, then the iceberg beneath the surface must surely be very limited indeed?

Well, no. Actually it is still very considerable, but more of that in our findings below, along with more of the filters we have or haven't used to arrive at a conservative estimate.

The point being, planning is a complex issue which is why we have approached this study from a granular perspective. Bigger budgets, cleverer minds and more sophisticated algorithms have been used to quantify rooftop development predictions in both the recent and distant past, but the assumptions used have been unable to square the circular idiosyncrasies of planning and construction in central London.



Methodology

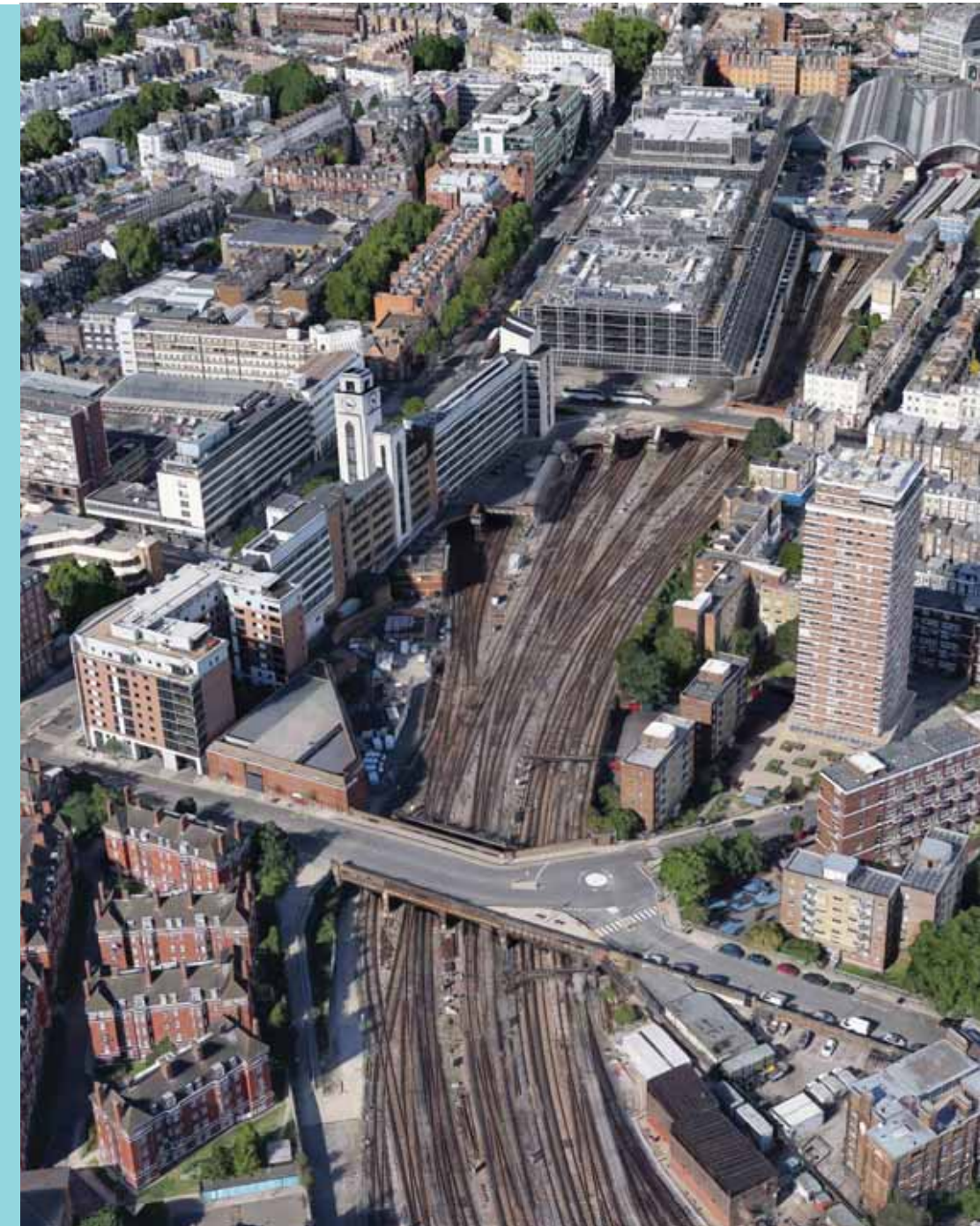
We have employed three principles to try and ensure the credibility of this necessarily subjective study:

1. **Familiarity:** we have focussed on a defined sq km in an area we know particularly well, from a townscape perspective, a policy and planning perspective and also a cumulative development perspective
2. **Conservatism:** in selecting an area dominated by existing major developments, listed buildings, religious and educational assets, viewing corridors and central government assets we have ensured, through the exclusion of these assets, that the study area should not be taking the shape of a statistical spike.
3. **Resilience:** because we haven't undertaken any detailed analysis of legal and planning (neighbourly) issues on a building by building basis, or input any data on leasing information, we are well aware that there may be buildings and structures highlighted which would fail to deliver their projected rooftop allocations. However, we are also aware that there may be many opportunities beyond those we have identified. Some sites could be also developed to significantly greater density through more comprehensive redevelopment.

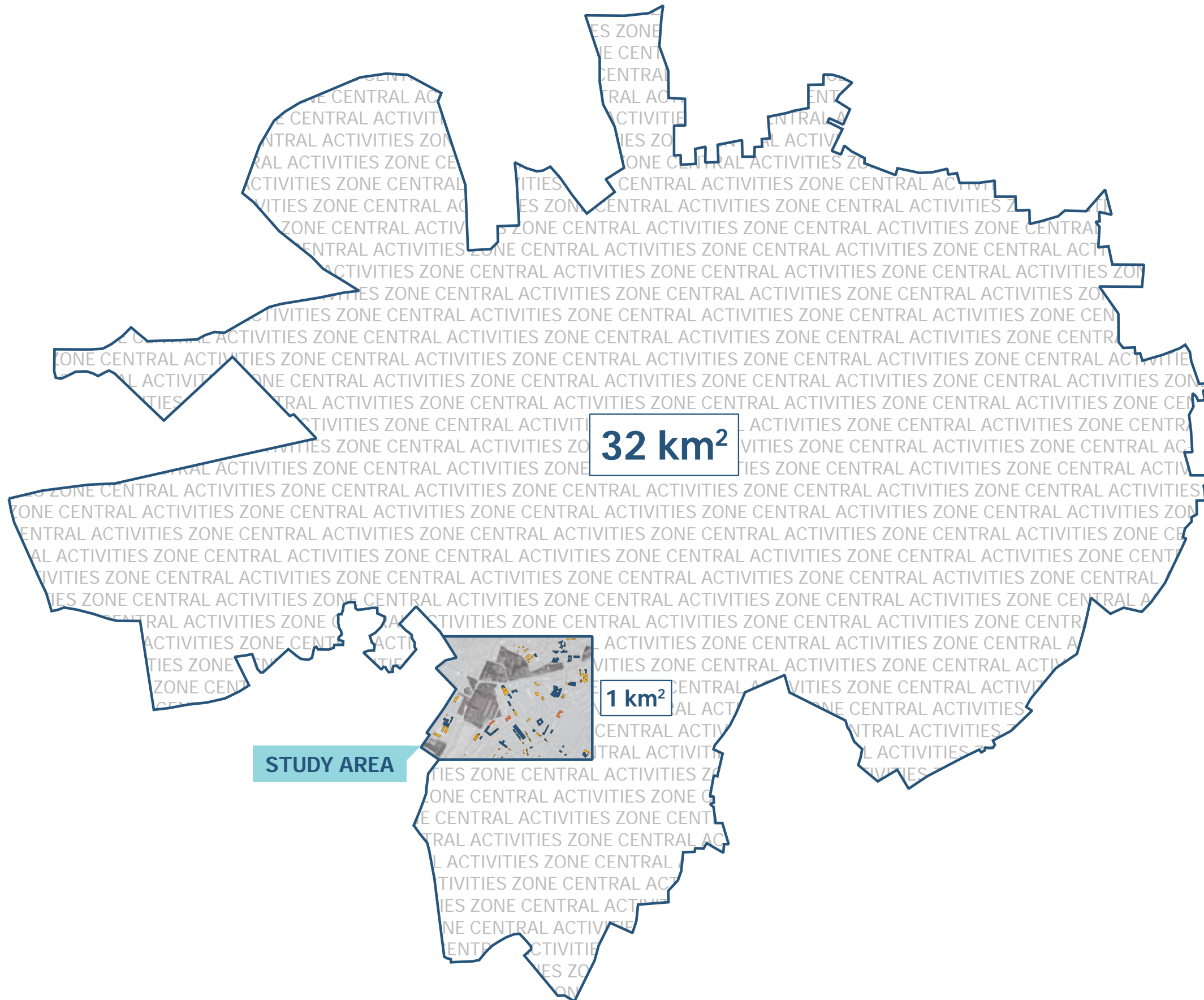
The following criteria were used to analyse and identify suitable targets from satellite and streetside imagery:

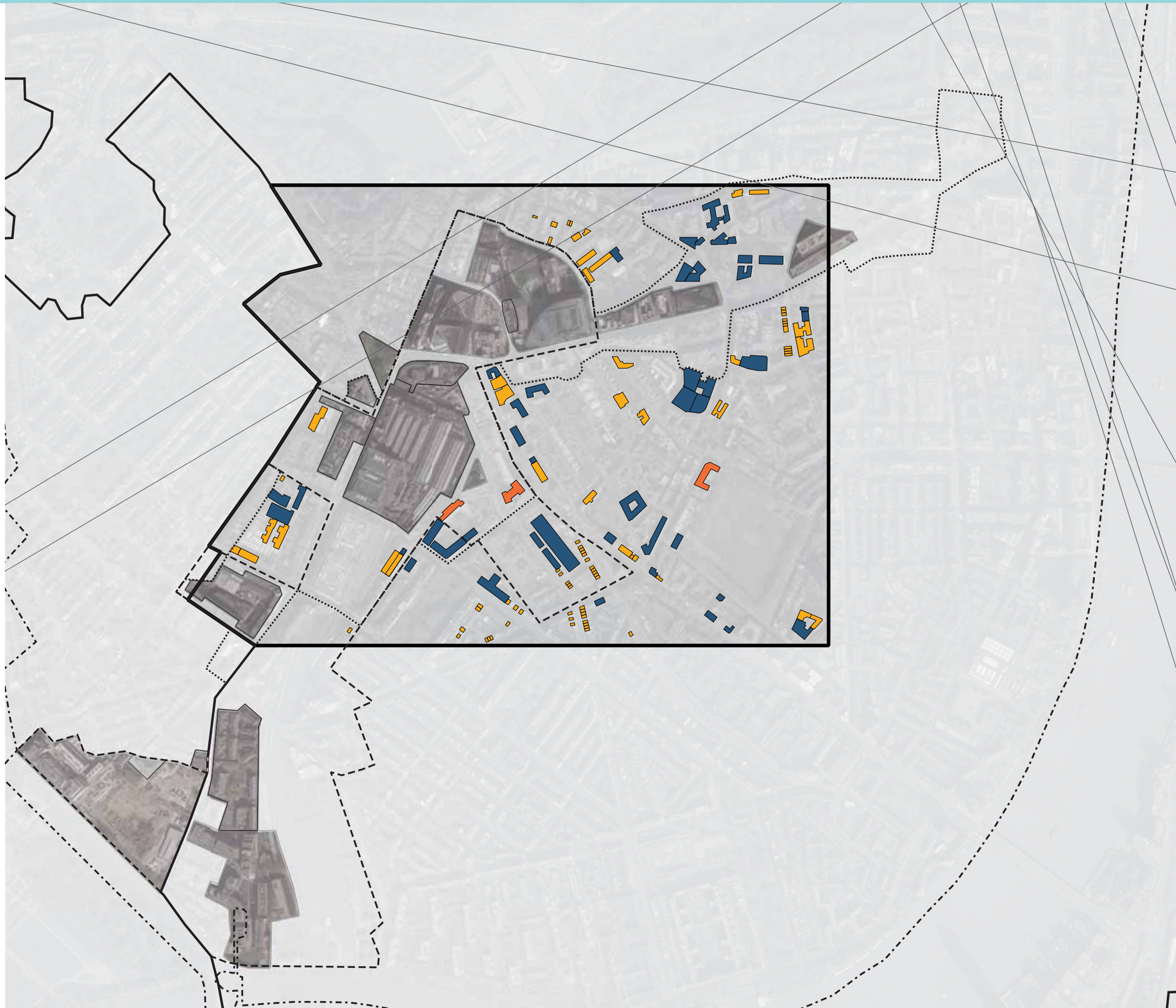
- The study site boundary takes 25 Wilton road as its centre and extends in all directions, bounded to the

- west by the CAZ boundary
- All major proposal sites (as identified by the Westminster City Plan and the Victoria Area Planning Brief), both recently developed, under current development or highlighted for future development have been excluded, so all projected numbers are to be read in ADDITION to current housing targets
- Listed Buildings are excluded
- Central Government buildings (where known) are excluded
- Religious and School buildings (where known) are excluded
- No development has been allowed for over existing infrastructure (eg. roads and rail)
- Completed building compositions of architectural merit (subjective) have been excluded
- Recently refurbished or extended developments have been excluded
- Existing building scale and age (structural) have been taken into consideration when defining scale of extension
- Excessive overshadowing (subjective) has been avoided
- The new rooftop areas have been calculated using full building footprint or setback floorplates to generate Gross External Areas (GEA).
- To provide a conservative calculation of the total number of units, the sum quantity of all GEA's was divided by 100m², which is larger than the typical 1 and 2 bedroom market housing unit size, in order to accommodate for circulation and cutbacks due to Rights of Light and Sunlight/Daylight.









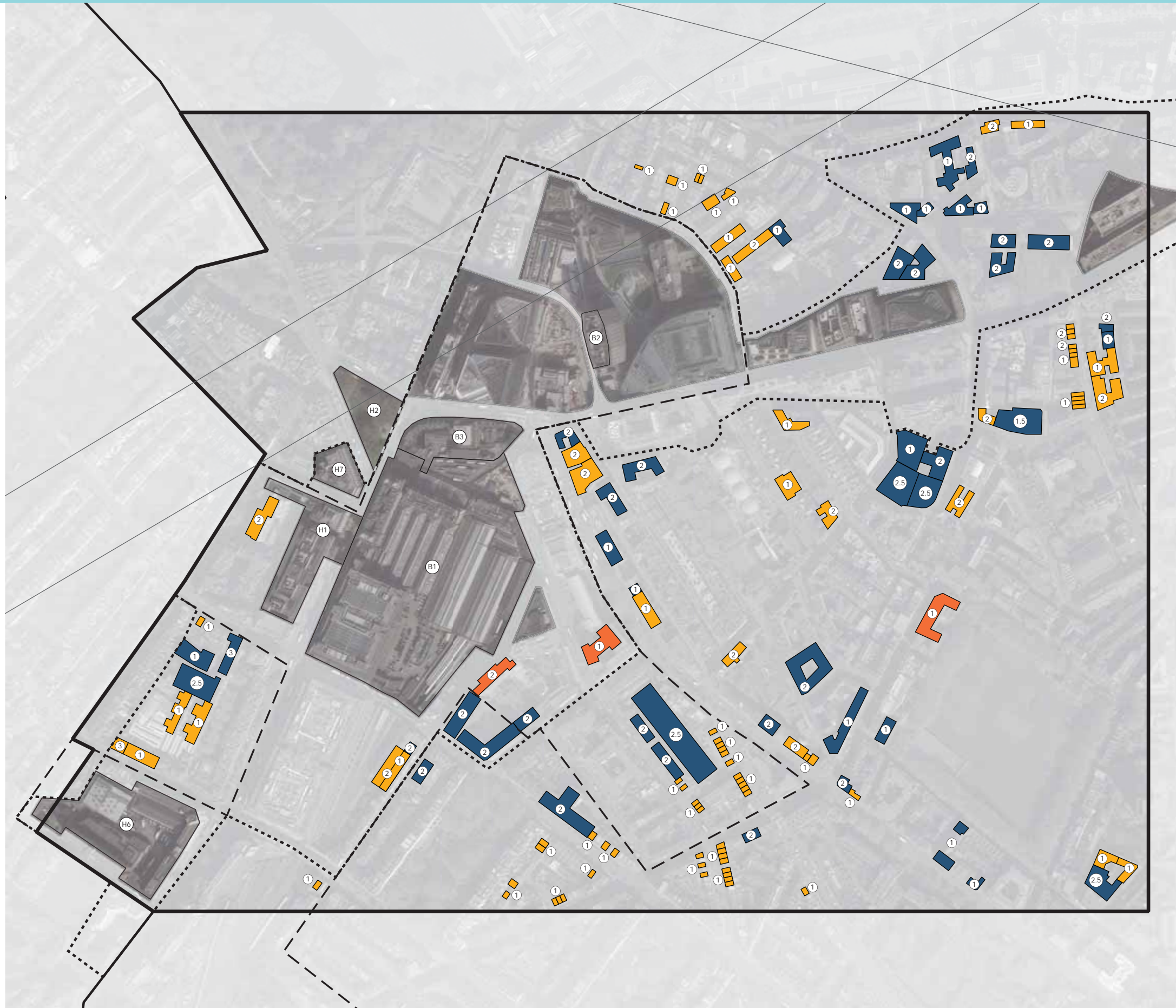
LEGEND

- 1 KM² SAMPLE AREA
- DWELLINGS (C1)*
- DWELLINGS (C3)*
- BUILDINGS OTHER THAN DWELLINGS*
- PROPOSALS SITES (DESIGNATED)**
- KEY SITES AND PROJECTS***
- 2018 VICTORIA OPPORTUNITY AREA
- 2011 VICTORIA OPPORTUNITY AREA
- CITY OF WESTMINSTER
- CENTRAL ACTIVITIES ZONE (CAZ)
- PROTECTED VISTAS

* Refers to predominant use below new residential

** Refer to Supporting Information: Appendix 1 of the Westminster City Plan for details of the proposals sites

*** Refer to Section 6: Key Sites and Projects of the Victoria Area Planning Brief (July 2011)



The study area measures **1 sq km**
 We have identified **130 buildings**
 With a total area of **79,463 sq m**
(855, 333 sq ft)
 when divided by 100 sq m/unit
= 795 units

LEGEND

- B# STRATEGIC SITES FOR VICTORIA OPPORTUNITY AREA **
- H# AREAS OF SURFACE INTEREST (CROSSRAIL LINE 2)**
- # NUMBER OF STORIES OF EXTENSION

** Refer to Supporting Information: Appendix 1 of the Westminster City Plan for details of the proposals sites



Current 2018 Aerial View with Study Area and 25 Wilton Case Study in Foreground



New Rooftop Developments



New Rooftop Developments Categorized by Predominant Use Below. Proposal and Key Project Sites shown in colour photographs.

Policy Context

At the beginning of February 2018, Housing Secretary Sajid Javid announced that the draft revised National Planning Policy Framework would support construction above homes, shops and offices, where it would be in keeping with the area.

The latest in a series of policy initiatives aimed at tackling the housing crisis, this announcement marks the timely re-emergence of a topic that is nothing new but highly relevant today.

The draft document, due to go out for consultation in the coming weeks, will include a range of policies developed since last year's housing white paper.

It will propose allowing two levels to be added to a property, provided it remain in keeping with the roofline of other buildings in the area.

Housing Secretary Sajid Javid said:

'The answer to building new homes isn't always an empty plot, or developing on a derelict site. We need to be more creative and make more effective use of the space we already have available. That's why we are looking to strengthen planning rules to encourage developers to be more innovative and look at opportunities to build upwards where possible when delivering the homes the country needs.'

At a local level, how does this latest announcement encouraging layered single-site mixed-use development dovetail with existing policy relating to the CAZ?

The 2016 CAZ SPG (Supplementary Planning Guidance) on the London Plan is clear on a range of issues which support this initiative:

- The demand is real. Younger professionals in particular want to live where they work. This is reflected in the ambitious 10 year target of 40,000 new homes within the CAZ (4.2.1)
- There is pressure to prevent loss of office (4.2.2) which favours a retrofit approach to existing office buildings
- New housing is specifically encouraged via a mixed-use approach (4.4.2)
- Residential development should be supplementary to employment uses in mixed-use schemes (4.4.2). Again this policy suits a piecemeal approach to layering residential over office
- The existing retail and leisure offer should not be constrained by residential development (4.4.3). This should encourage residential provision over existing retail and amenity uses
- Where office is lost through redevelopment it should be replaced off-site. Similarly when increased office space is sought, residential space must be provided, often off-site also (4.4.4). Finding suitable sites for off-site provision to satisfy planning policy is difficult and can delay or prevent planning consents. This clearly points to a solution that creates additional residential space above existing uses.
- Optimising housing output on small sites and via well designed infill development is encouraged in existing residential areas (4.5.2). Sensitive rooftop extension fits these criteria.
- The target demographic of those wishing to live in the CAZ reflects a need for more smaller units which are well suited to rooftop development and Build to Rent products which also suit a layered development approach with a longer term view (4.7.4)

The SPG also highlights one of the chief difficulties posed by creating strategic housing targets in complex urban environments: Not only are predictions being made against a constantly evolving development landscape, but they are also based largely on the part of the iceberg that can be seen:

(4.3.1) 83% of potential housing capacity is expected to be brought forward within Opportunity Areas. This is understandable because the opportunity areas are defined by the major development sites that create them. The major development sites are overwhelmingly the source of the 'known' mixed-use development pipeline which forms the tangible basis of the housing targets. However, Opportunity Areas (OA's) make up only around 16% of the area of the CAZ.



“The answer to building new homes isn't always an empty plot, or developing on a derelict site. We need to be more creative and make more effective use of the space we already have available...”

Housing Secretary Sajid Javid (February 2018)



Case Study

25 Wilton, Victoria

Architect: MAX Architects

Client: Royal London Asset Management

Formerly called Parnell House, 25 Wilton was an existing 120,000 sq ft office building over 6 floors completed in 1995. What started life as a light touch refurbishment of common parts snowballed into a £38m cut and carve retrofit incorporating 3 new floors of Build to Rent (BtR) apartments over comprehensive extension and repositioning of the commercial space.

The new mixed-use scheme tripled the gross development value of the building. The scheme got planning despite being at the conference of 6 conservation areas, adjacent to 2 listed buildings and flanked by 2 red routes.

So far so good, but nothing out of the ordinary?

Two factors make this case instructive in the context of this study. Firstly the quantum of extension to the existing structure and secondly the mix.

1. The completed scheme extends to 160,000 sq ft, which is an increase of more than 30%. Conventional structural wisdom suggests a rule of thumb that allows for an additional 10% mass to be added to an existing concrete or steel structure of a certain age (one that has settled). By that assumption, our 6 floor building would have done well to accommodate a single additional floor rather than 3. We were lucky to have inherited a robustly constructed building and we had to employ set-backs to deal with issues of light to neighbours, but modern

lightweight construction can add significant advantage over this old rule of thumb in terms of number of stories. Off-site prefabricated or modular construction techniques are developing this lightweight advantage further as we type.

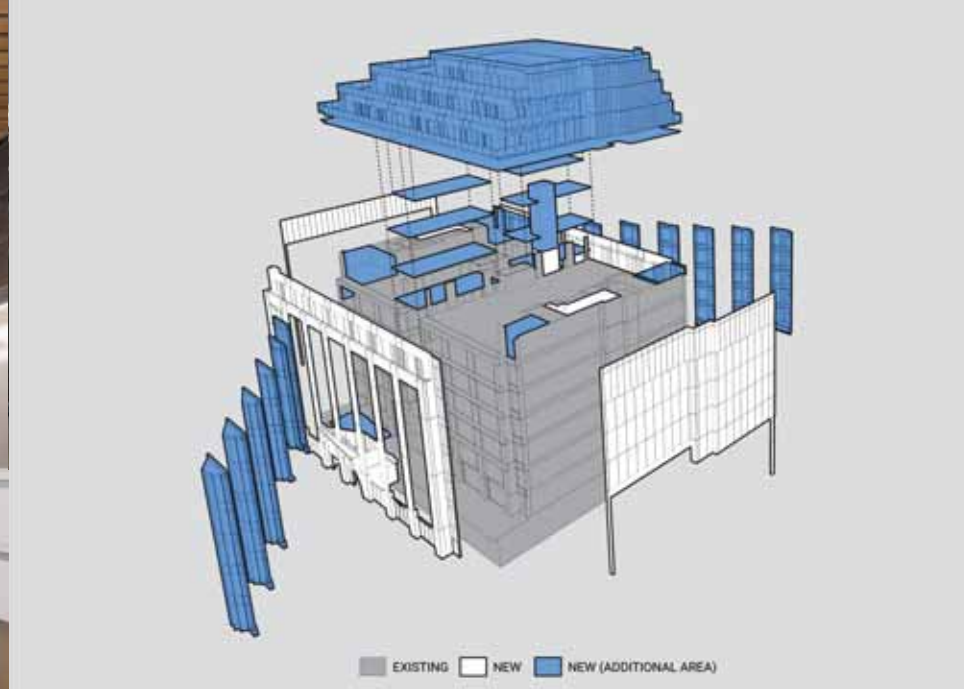
2. Conventional wisdom also says you don't build residential over commercial space, (particularly office), and yet that is precisely what this development set out to deliver. BtR puts this old chestnut to bed. If the ground floor is designed properly and the landlord holds on to the apartments, the historic objections to this layered approach disappear. As building managers adapt to the more involved skills associated with curating retail space and modern office space (particularly shared workspace), so we realise the new generation of BtR building management overlaps with these evolving skillsets. Central management can operate multiple uses under a single roof.

This case shines a light on the rooftop equation in ways not studied in detail before. Using existing commercial developments to deliver rooftop apartments opens up a huge new reservoir of potential. Doing so using lightweight and potentially off-site construction methods multiplies this potential. As developer and investor attitudes shift to embrace these opportunities, the Housing Secretary's announcement putting government weight behind this approach from a policy perspective squares the circle.

Rooftop development can look beyond the mansard and beyond the residential sector. Within the CAZ there are many thousands of significant office, retail, leisure and hotel buildings that could also be considered under this application. Some of the required criteria are listed in the conditions section of this study.

<http://maxarchitects.co.uk/project/25-wilton-road/>
<http://maxarchitects.co.uk/project/295-vauxhall-bridge-road/>





Two Approaches to Development

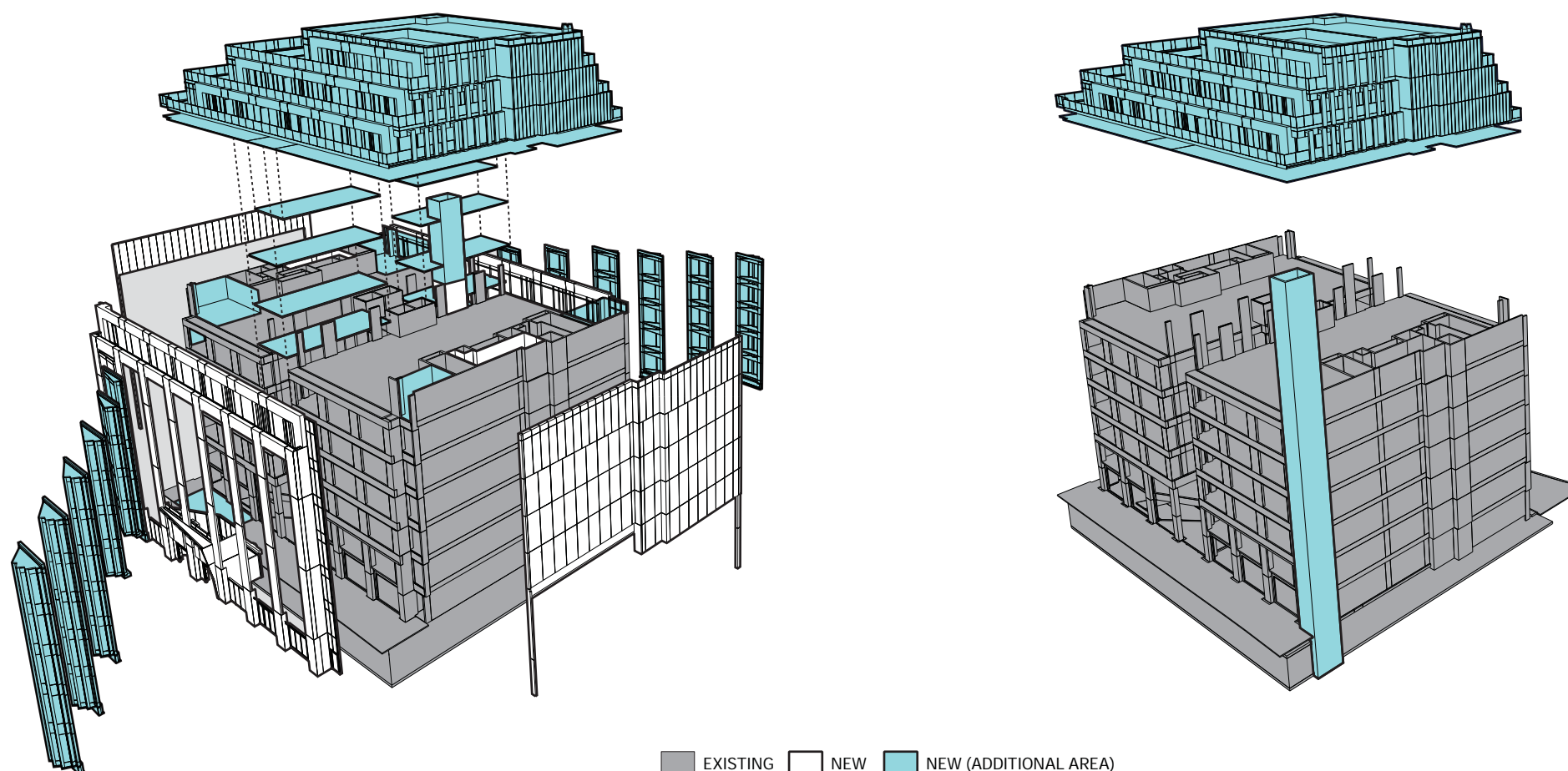
There are two ways to approach rooftop developments dependent on the existing tenancy arrangements:

1. Development-Led Approach: Comprehensive refurbishment where vacant possession is an option and the residential core can go through the office.

2. Asset Management-Led Approach: Light touch extensions, where office leases are ongoing and a lift core needs to be installed on the outside of the building.

The case study on the previous two pages is an example of a successful development-led approach. Vacancy and low occupancy allowed for a comprehensive refurbishment and new residential extension to be developed as part of a major re-positioning of the asset, as shown in the diagram on the left.

The diagram on the right shows how on the same scheme, an asset management-led approach could have been taken had there been an income stream that needed to be maintained. Lighter-weight construction and vertical access inserted within an existing niche of the building envelope would have allowed for a lighter touch approach with minimal disruption to existing tenants.



Standing on the Rooftops of Others

The decision to undertake this piece of work was informed by circumstances, as is so often the case. MAX Architects had recently completed the case study 25 Wilton, we specialise in mixed-use development, we are working on Build to Rent schemes and we are also working on lightweight off-site housing solutions. This rooftop initiative sits at the conference of all these highly relevant development trends, so we felt the time was right to explore the potential in a bit more detail.

Having taken the decision, our research built on the findings of 3 key studies to which we are indebted.

Strategically, the 2015 report 'Redefining Density' by London First and Savills sets out the case for a many pronged approach to increasing density in certain locations. Rooftop development is briefly covered as a largely suburban and subsidiary initiative, but not seized upon as a significant lever.

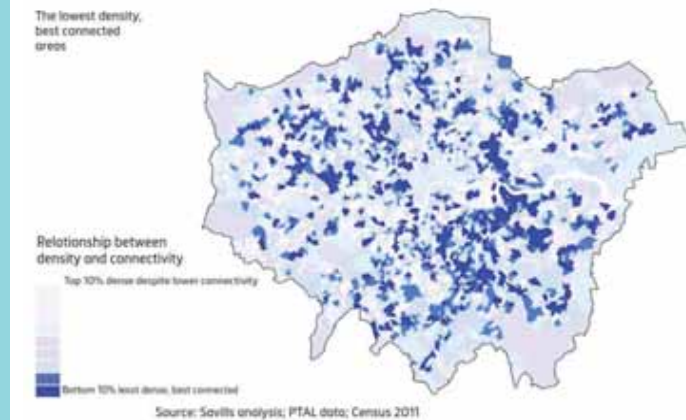
A more detailed and granular study on specifically residential extensions, 'Rooftop Development in Camden' was undertaken by HTA for the leading specialist air rights developer Apex in 2016. It involves a call for the kind of specific policy support for rooftop extensions referred to this week by the Housing Minister, then sets out criteria for rooftop extension and a desktop spatial study using satellite imagery to identify target sites. We have employed a very similar approach in this study, albeit with a wider focus in terms of building type and sector, suited to the mixed-use areas within the CAZ. Interestingly, when the often larger footprints of eligible commercial buildings are included, as in this study, the projected densities are significantly higher (we are projecting 7.95 homes per hectare compared with HTA's 1.14 homes per hectare).

Apex Airspace are now also focussing on London's commercial building stock and we seek to work with them to extend the scope of this study going forwards.

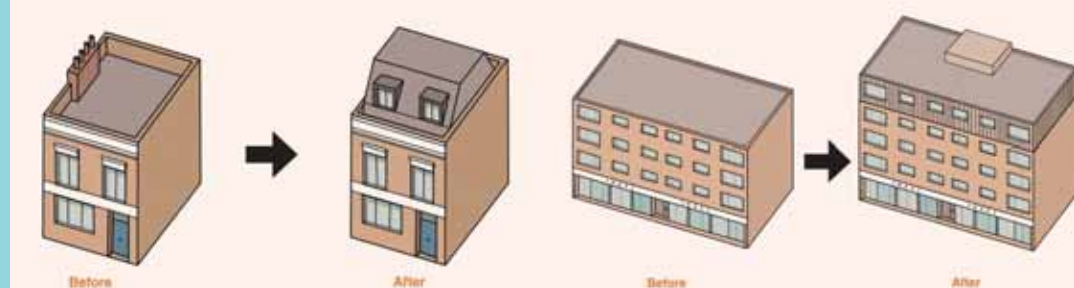
Finally in 2017 Knight Frank built on the Housing white paper's call to explore air rights and produced the powerful study 'Skyward' from its geospatial team, using the kind of 3 dimensional digital database that many professionals believe should form the basis of a London-wide spatial planning tool to aid with strategic decision making around tall buildings, sensitive townscape issues and density. We have used many of the same filters as Knight Frank, including listed building information, prevailing ridge line analysis and viewing corridors.

Our next step would ideally be to compare in detail our particular study area with the Skyward outputs. There would undoubtedly be a good deal of overlap between their outputs and ours, but there would also be differences: Firstly, we don't have access to the land registry historic air rights database, but more importantly, we have delved into the subjective world of townscape, urban design, individual building merit and localised height and mass considerations to inform our study. Largely because of the scale of the Skyward exercise, such factors could not be picked up by an automated spatial analysis, regardless of the sophistication of the filters. Neither approach is perfect, but a parallel analysis of a defined area using both would be highly informative.

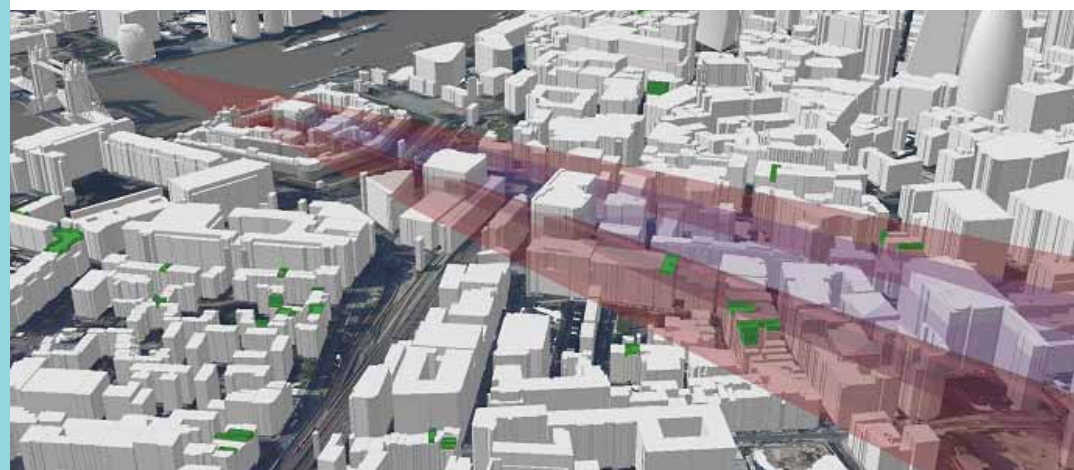
We established through a preliminary discussion with the Knight Frank geospatial team that the Skyward dataset capped at two-storey extensions generates a total development area of 594, 846.8 sq ft over the study area featured in this research. Interestingly, if we subtract the 30% that we had allowed in our gross areas for cutbacks/setbacks related to townscape and neighbourly issues, our development area equates to 598, 733 sq ft. Even allowing for the inevitable discrepancies in site selection between the granular and Skyward approaches, the similarity between the two areas is informative.



Redefining Density by London First and Savills - 2015



Rooftop Development in Camden by HTA for Apex - 2016



Skyward by Knight Frank - 2017



Conclusion

With uncertainty hanging over the development horizon, perhaps the most compelling advantage of this new pipeline of rooftop development is its inherent flexibility from a landlord and developer perspective.

The objectives are achievable at all scales, from the traditional mansard over existing residential, to the multi-storey retrofit extension above large scale buildings, so there is no barrier to entry in this cross-over sector.

Value can be added at all points in the development cycle, so timing is also flexible. If vacant possession or low occupancy allow for a comprehensive re-development, then the new residential space can be developed as part of a major re-positioning of an asset through a development led approach. However, if an income stream needs to be protected, lightweight and/or off-site construction can allow a lighter touch asset management led approach with minimal disruption to existing tenants. A vertical access solution can be integrated and intrusive or independent and bolt-on to suit.

Building new homes at roof level has clear advantages in terms of cost and value, both to developers and occupiers. Building without groundworks, site remediation and sub-structure offers significant cost savings. Providing often panoramic views of central London from rooftops is highly desirable, which has obvious advantages in terms of capital value, but also in rental terms, given that we envisage BtR to dominate this market.

Geographically, unlocking this mixed-use approach is by no means limited to central London. MAX Architects are already working on schemes in other UK cities where values are lower and housing demand less critical. The approach requires a specific skillset, but can be applicable across geographies.

With land and development sites critically constrained and policy opening up, we see rooftop housing development as a very significant part of the solution to the housing crisis in built-up areas.

We think it is unlikely that new planning guidance will be created under permitted development in this space, so design quality will remain a critical component in the successful delivery of air rights development in our view.

If you would like to know more, please contact us to discuss the opportunities.



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