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1 EXECUTIVE SUMMARY

Objectives

1.1 This report seeks to explain

- the infrastructure requirements of growth at Old Oak;
- when the demands for infrastructure arise;
- how much those infrastructure requirements cost; and
- how those infrastructure requirements might be paid for.

1.2 We have looked at a range of transport, social infrastructure (including open space) and utilities provision.

Date of research

1.3 The bulk of our primary research work was carried out in the summer of 2014. This report reflects the position at that point in time with regard to infrastructure costs and funding, and development costs and values. As is often the case with projects of this scale, views on the amount and type of infrastructure needed are likely to be modified as time passes.

1.4 The report was complete in draft form before the Old Oak Opportunity Area Planning Framework (OAPF) consultation process started, and so does not benefit from sight of that document. However, our emerging findings have been fed into the OAPF.

Gross infrastructure costs and funding

There are major infrastructure development costs at Old Oak. Costs total around £1.5bn

1.5 **Gross costs include the costs of delivering infrastructure in and around Old Oak to bring forward the planned growth of homes and jobs. They also include the delivery of national level projects such as the Crossrail to West Coast Mainline spur.** They exclude the costs of HS2 and Crossrail lines and stations themselves.

1.6 **Major investments in transport are needed at Old Oak** to connect the new HS2 and Crossrail stations into the local economy. (Without these investments, many of the benefits of HS2 and Crossrail could bring to the local area would be lost: we would build a superb rail infrastructure, but miss the economic development opportunity that could otherwise be released). Two new stations on the London Overground are likely to be required, at a cost of £260m. The Crossrail to West

Coast Mainline Spur is costed at £225m[1], and the pedestrian and vehicle link from HS2 to the West London Line Overground station is costed at £91m alone. Station capacity improvements at Willesden junction station will also be needed if we are to cope with existing demand, as well as a new bridge connection linking Willesden station across the West Coast Main Line with the EMR site. These combined works have been costed at £100m. Ground level changes make bridge and underpass projects particularly complex and costly.

1.7 **Whilst there are a host of very big civil engineering projects required, we have not neglected the smaller scale transport infrastructure needed for a healthy and sustainable future:** we have built in costs for a cycling 'mini-Holland', together with a network of public transport and pedestrian facilities.

1.8 **The full or partial relocation and/or reconfiguration of existing transport infrastructure at the Crossrail Depot site and IEP depot will be necessary to secure the comprehensive regeneration of the Old Oak area**. The Crossrail and IEP depots alone possess the ability to accommodate nearly 5,000 homes and 22,000 jobs. Any failure to achieve the large scale regeneration of this land will have a significant impact on the Mayor's vision for the area. (Anywhere else in the country these sites would be seen as regionally important developments on their own). The DIFS has been progressed in advanced of a confirmed solution for relocation/ reconfiguration and as such is based on a set of assumptions. These are:

- That the cost of securing the full or partial relocation and/or reconfiguration of the Crossrail and IEP depots would be borne by the development value of the land. The cost final costs will need to be factored into the development costs for the land, when ascertained.
- A cost of £300m has been assumed at the Crossrail Depot site. £150m has been assumed at the IEP Depot. This takes into account potential construction cost plus a risk allowance. True costs of the project could vary.
- The relocations of both depots would be to alternative public sector owned piece of land so no land costs have been taken into account.

1.9 As feasibility work is progressed it is likely that these assumptions will change and this could affect the development viability of affected sites.

1.10 **The scale of population growth at Old Oak effectively means that we are dealing with a new town. There will be 24,000 new homes, and so social infrastructure requirements are substantial.** We see a need for around £191m (gross) of new social infrastructure needed for a thriving new community, including new schools, open space, play space, and community centres.

[1] This cost is only for the physical works to make the connection to the WCML. It does not include optimism bias; does not include costs for the related supporting rail infrastructure required further up the WCML; and does not include operational costs.

1.11 **Utilities infrastructure will be needed to service this new population of residents and workers.** We estimate that £251m-worth of new utilities infrastructure will be needed, and caution that costs could rise as future studies better understand the need for upstream utilities reinforcement and integrated water management. A very significant utilities cost is the combined heat and power network required in London Plan policy. This alone would cost in the order of £172m. We expect that utilities companies will pay for a share (around £120m), which will be recovered from customer charges for using the heat and power produced, but we estimate that developers will still have to find around £52m to pay for their share of what will be a highly complex system.

1.12 **In total, the gross infrastructure costs identified add up to around £1.5 billion. There is likely to be a substantial margin of error in estimating these numbers: this is to be expected, as in some cases we are attempting to cost for infrastructure that might not be built for over 30 years.** Problems unanticipated by this study are bound to arise, and unexpected solutions arrived at.

1.13 **Having understood the costs of infrastructure, we now turn to how it might be paid for**.

Funding for infrastructure of £727m - £913m has been identified, depending on the affordable housing policy chosen. This means that the funding gap varies in size too

1.14 We have looked at a range of ways of paying for infrastructure, including S106, utility company payments, direct developer payments, and Community Infrastructure Levy (CIL).

1.15 **CIL is the biggest single funding stream identified. CIL receipts must be balanced against affordable housing requirements, or we risk making developments unviable.** Increases in affordable housing requirements reduce the amount of CIL available to pay for infrastructure. **The eventual affordable housing level would be an issue considered by the OPDC board in the formulation of the Local Plan.**

1.16 **Below, we set gross infrastructure costs against funding available under different affordable housing scenarios.** The analysis shows we have a 'funding gap' – meaning that we have not identified enough money to pay for the gross costs of infrastructure at Old Oak.

Table 1-1 Estimated gross infrastructure costs Old Oak by infrastructure category (£000s) against identified funding (at 20% affordable housing) (including the assumed cost for delivering the WCML connection)

Gross infrastructure costs at Old Oak incl maintenance	£1.549 billion
Estimated funding, assuming 20% affordable housing	£913m
Funding gap	**£635m**

1.17 At 30% affordable housing, the funding gap is estimated as follows.

Table 1-2 Estimated gross infrastructure costs Old Oak by infrastructure category (£000s) against identified funding (at 30% affordable housing) (including the assumed cost for delivering the WCML connection)

Gross infrastructure costs at Old Oak incl maintenance	£1.549 billion
Estimated funding, assuming 30% affordable housing	£785m
Funding gap	**£763m**

1.18 At 40% affordable housing, the funding gap is as follows.

Table 1-3 Estimated gross infrastructure costs Old Oak by infrastructure category (£000s) against identified funding (at 40% affordable housing) (including the assumed cost for delivering the WCML connection)

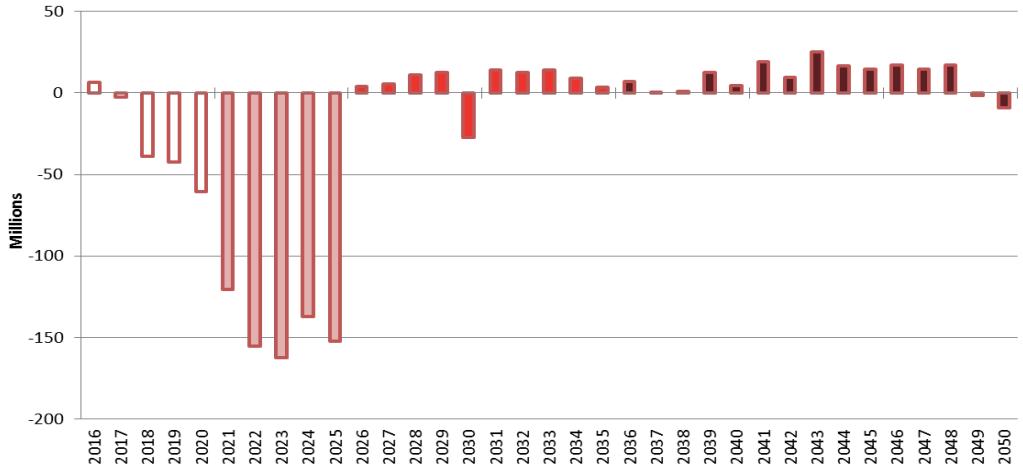
Gross infrastructure costs at Old Oak incl maintenance	£1.549 billion
Estimated funding, assuming 40% affordable housing	£727m
Funding gap	**£821m**

There are significant cashflow issues to 2025

1.19 Up to 2025, infrastructure costs far exceed infrastructure funding. There is a clear financing issue that will need to be addressed. Early phases create heavy infrastructure funding demands, but frequently see relatively modest infrastructure contributions.

- Up to 2020, there are heavy demands for roads and bridge investment.
- Negative flows between 2020 and 2024 are caused by large sums spent on new London Overground stations, the new eastern bridge from HS2 to north of the Canal, and the Willesden Junction station upgrade and bridge, and the Crossrail spur.
- 2029/30 sees the costs associated with the all-through school arise.

Figure 1.1 cashflow showing known funding against gross infrastructure costs (£)



Source: PBA/ JLL

Looking at costs and funding attributable to Old Oak

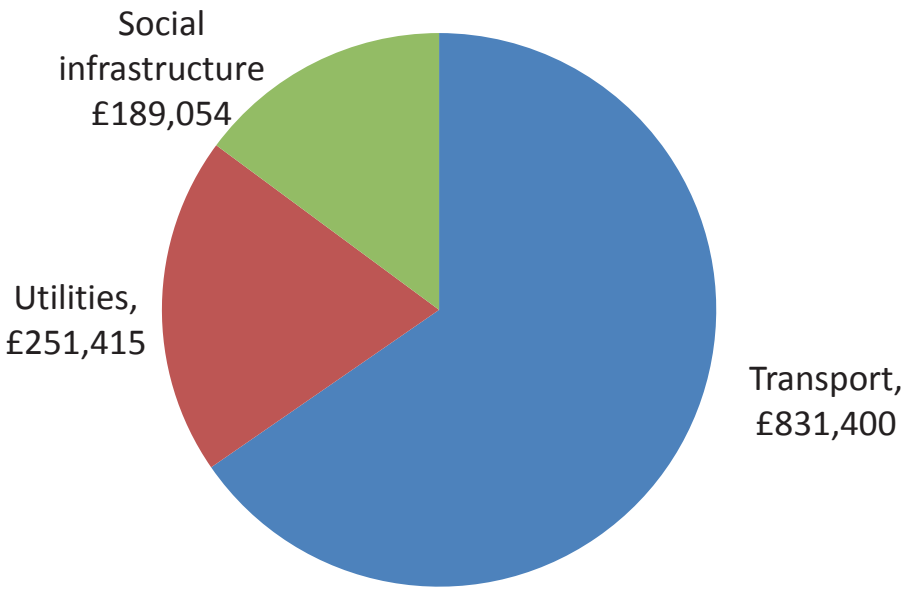
1.20 **Above, we have shown gross infrastructure costs.** The gross costs include national infrastructure priorities such as the WCML to Crossrail spur. Whilst worthwhile, these may not be directly attributable to growth at Old Oak itself.

1.21 **We now focus on costs that are attributable to growth of homes and jobs at Old Oak.** This is a more useful number for purposes of local planning and CIL evidence, which is more concerned with the infrastructure required to deliver local infrastructure requirements.

Infrastructure costs *attributable to growth* at Old Oak amount to around £1.3b

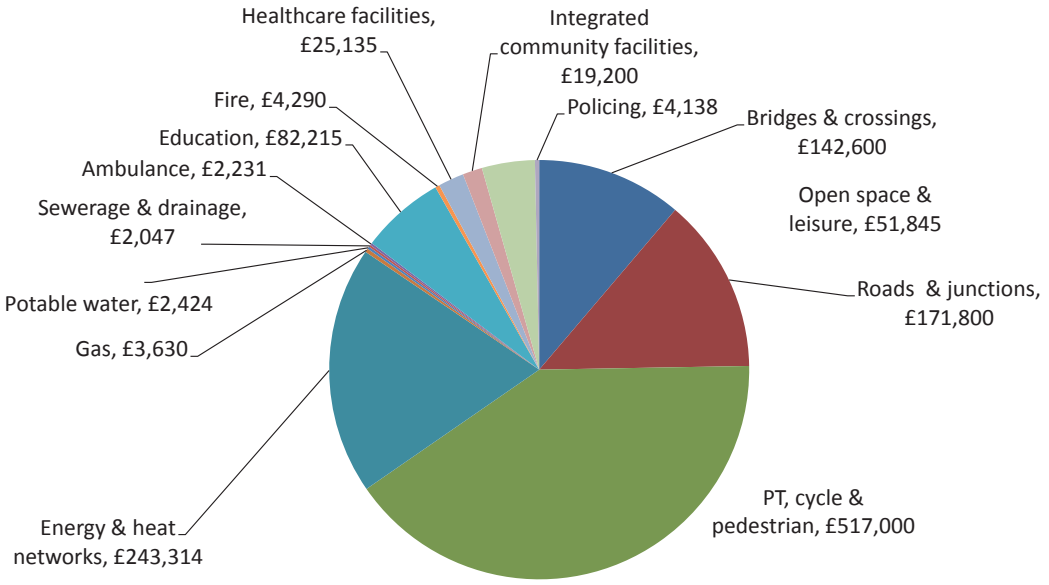
1.22 Figure 1.2 provides a high level overview of the costs at Old Oak.

Figure 1.2 infrastructure costs attributable to Old Oak by broad infrastructure category, including maintenance (£000s)



1.23 Figure 1.3 adds further detail to the infrastructure costs presented above.

Figure 1.3 infrastructure costs attributable to Old Oak including maintenance (£000s) (further detail)



1.24 **A small number of large projects account for a large proportion of the infrastructure costs. Cost-engineering these larger projects might yield substantial savings**, but we caution that that this process would have to be carried out carefully. Cutting infrastructure costs might mean cause sales values to fall. This might not actually improve the viability position overall.

1.25 **It may be possible to reduce infrastructure costs by carefully prioritising infrastructure requirements** – but again, it would be important to ensure that such an exercise created a genuine improvement in the viability position.

1.26 **Infrastructure costs are heaviest in the first two phases of development.** We calculated this based on the development trajectory provided. It is highly likely that the phasing of growth will not exactly match this trajectory in the real world, meaning that the timing of infrastructure requirements will also change. But whichever sites come forward first, it is likely to remain the case that infrastructure costs are heaviest at the beginning of the development process at Old Oak.

1.27 **Infrastructure costs are likely to change over time.** This study provides a snapshot of known infrastructure items and their costs. As further work is undertaken modelling development and progressing infrastructure items to more worked up solutions, it is likely that the infrastructure cost assumptions will change. It is more likely that the list of infrastructure and costs would rise rather than reduce. The OPDC will need to be cognisant of this and further work may be required to understand the relationship between infrastructure provision, viability and the funding of any gap.

Infrastructure funding at Old Oak

1.28 **We have investigated a number of funding methods.** We have calculated possible receipts through direct developer delivery of infrastructure through the

planning process, S106, S278 and CIL, and made a high level assessment of the scope for mainstream funding and more innovative funding such as TIF.

1.29 At all times, we have been careful to comply with the NPPF's requirements to understand possible developer receipts *after* development costs and policy costs have been paid. We have therefore **assumed that sites have to pay decontamination costs** at the levels indicated by our desktop research. With regard to policy costs, **we have 'priced in' London Plan policies on floorspace, heat networks, greywater recycling and Mayoral CIL**. **Land values have been set at a rate which we believe will mean that landowners have sufficient incentive to release the site for development**.

1.30 **Significant amounts of infrastructure delivery are assumed to come through the masterplanning process (£202m).** This is because developers will frequently provide a range of infrastructure that will allow them to create a saleable, attractive development. Sometimes, this infrastructure may be the subject of a S106 or S278 agreement. Much depends on the approach of the planning authority.

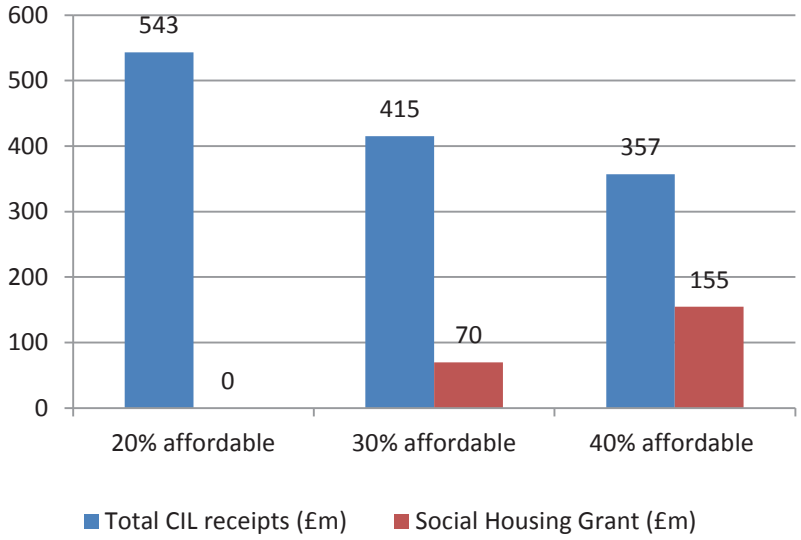
1.31 Developer contributions towards infrastructure through S106 forms an important component of infrastructure funding (estimated at £33m)**.**

1.32 We assume that an Energy Service Company (ESCO) will pay for a share of the heat network. The ESCO's share amounts to £120m.

1.33 **CIL receipts have been analysed. Estimates of CIL funding available vary, depending on the amount of affordable housing required.** This is because S106, CIL and affordable housing are funded from the same 'pool' of developer contributions. This pool is finite, and so higher demands for affordable housing mean that less CIL for infrastructure can be afforded (and vice versa). The CIL potentially available under different affordable housing policy conditions is highlighted in the figure below (Figure 1.4).

1.34 **It is important to note that to scenarios to deliver 30% and 40% affordable housing assume a subsidy for affordable housing through Social Housing Grant or similar.** The subsidy for affordable housing is intended to allow some CIL to be charged, but make sure that development remains commercially viable.

Figure 1.4 CIL receipts under different levels of affordable housing requirements (£000s) showing Social Housing Grant required



1.35 **Obtaining TfL funding or HS2 petition funding for infrastructure could be an important funding source.** Whilst we have not included this funding in our numbers at this stage, OPDC will seek to secure transport infrastructure via the TfL business plan and through the HS2 petition process in order to ensure a fit for purpose transport network.

1.36 **Other funding sources may provide a valuable income stream.** We cannot rely on innovative funding streams at this stage, but it appears that there are potentially major opportunities arising from the use of Enterprise Zone business rate capture. The sums of money involved are potentially significant. This income would be sufficient to finance a large TIF borrowing. We have not put a figure to this amount at this stage. Further work can provide a more accurate picture, and GLA/OPDC are currently in the process of appointing a consultant team to support this work.

1.37 We have summarised the various funding streams in the table below.

Table 1-4 Funding summary table (assuming CIL receipts with 20% affordable housing)

Mainstream funding	£14,778
Value of infrastructure assumed delivered through developer masterplans	£202,096
Value of infrastructure assumed delivered through S106 and S278	£32,500
Other funding (incl HS2 petition/ TfL)	nil assumed
Innovative funding and financing	nil assumed
Funding assumed from MUSCO/ESCO	£120,986
Projected CIL receipts **at 20% affordable housing, assuming nil SHG**	£543,000
Total	**£913,360**

Source: PBA, JLL

Table 1-5 Funding summary table (assuming CIL receipts with 30% affordable housing)

Mainstream funding	£14,778
Value of infrastructure assumed delivered through developer masterplans	£202,096
Value of infrastructure assumed delivered through S106 and S278	£32,500
Other funding (incl HS2 petition/ TfL)	nil assumed
Innovative funding and financing	nil assumed
Funding assumed from MUSCO/ESCO	£120,986
Projected CIL receipts **at 30% affordable housing, assuming £70m SHG or similar**	£415,000
Total	**£785,360**

Source: PBA, JLL

Table 1-6 Funding summary table (assuming CIL receipts with 40% affordable housing)

Mainstream funding	£14,778
Value of infrastructure assumed delivered through developer masterplans	£202,096
Value of infrastructure assumed delivered through S106 and S278	£32,500
Other funding (incl HS2 petition/ TfL)	nil assumed
Innovative funding and financing	nil assumed
Funding assumed from MUSCO/ESCO	£120,986
Projected CIL receipts **at 40% affordable housing, assuming £155m SHG or similar**	£357,000
Total	**£727,360**

Source: PBA, JLL

Identified funding is insufficient to cover the costs of infrastructure attributable to Old Oak

1.38 **Once known costs have been set against known funding, a substantial funding gap is apparent, even when a CIL is levied.** Depending on the affordable housing scenario chosen, this gap is between £358m to £544m on infrastructure attributable to Old Oak. This is a formidable funding gap, but it should be borne in mind that this does cover a plan that runs until 2050. Seeing this gap on a per annum basis makes the gap appear more tractable, with a per annum funding gap of £10m - £16m.

1.39 **The funding gaps under different affordable housing scenarios are set out below.**

Table 1-7 Funding gap (assuming CIL receipts with 20% affordable housing (the main exclusion being the assumed cost for delivering the WCML connection)

Total infrastructure cost attributable to Old Oak incl maintenance	£1,271,868
Total identified infrastructure funding (20% affordable)	£913,360
Funding gap for Old Oak attributable infrastructure	**£358,508**

Table 1-8 Funding gap (assuming CIL receipts with 30% affordable housing (the main exclusion being the assumed cost for delivering the WCML connection)

Total infrastructure cost attributable to Old Oak incl maintenance	£1,271,868
Total identified infrastructure funding (30% affordable)	£785,360
Funding gap for Old Oak attributable infrastructure	**£486,508**

Table 1-9 Funding gap (assuming CIL receipts with 40% affordable housing (the main exclusion being the assumed cost for delivering the WCML connection)

Total infrastructure cost attributable to Old Oak incl maintenance	£1,271,868
Total identified infrastructure funding (40% affordable)	£727,360
Funding gap for Old Oak attributable infrastructure	**£544,508**

There are ways of closing this funding gap, but each of these choices will need very careful thought

1.40 **Ways of closing the funding gap could include the following**.

- Funding for Overground stations costs could be sought, possibly from TfL or DfT. Additionally, other funding (such as Business Rates Capture/TIF or direct Government grants) could have a significant impact;
- Affordable housing requirements could be reduced, or reprofiled to increase the amount of intermediate rather than social rented stock;

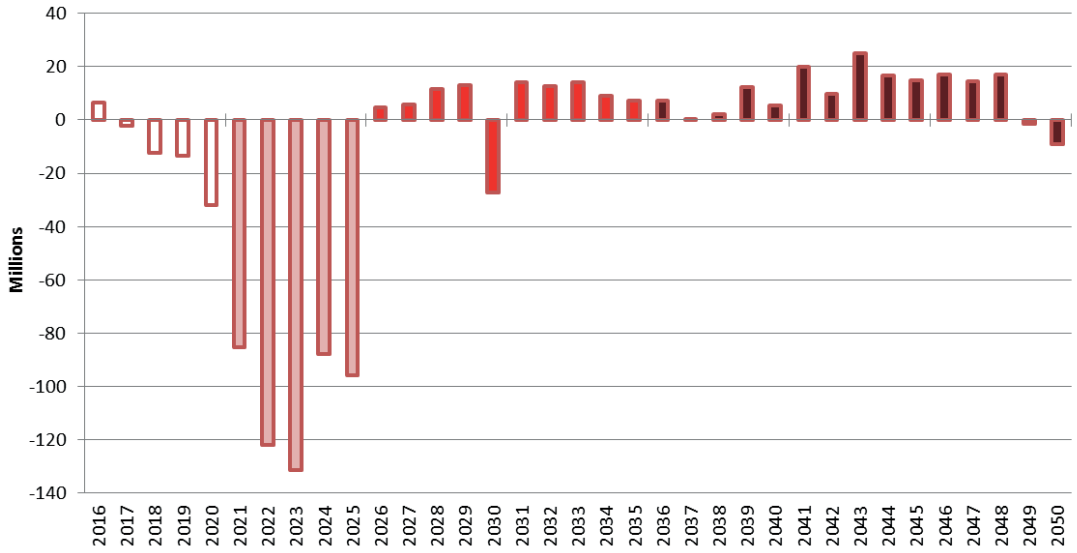
- Lower priority infrastructure could be dropped;
- Some of the least viable sites (such as Powerday) could remain in operation, meaning that (other things being equal) CIL charges on the remaining sites be set a little higher, without damaging plan viability;
- Combined heat and power requirements create significant costs, and other equally effective but more cost efficient methods of carbon reduction could be sought;
- Finally, value engineering could reduce infrastructure costs.

1.41 **However, we caution that, if done badly, this process could destroy more value than it saves in costs, leaving the development in a worse position overall.**

Cashflow is a problem before 2026

1.42 **Even if the funding gap was to be reduced, the fact remains that the bulk of infrastructure costs are incurred relatively early in the plan process. This is when infrastructure costs are high, but developer contribution receipts are still building up.** This creates a cashflow is a problem before 2026. We say more about the reasons for this in paragraph 26.45 onwards.

Figure 1.5 Infrastructure cashflow per annum showing infrastructure costs attributable to Old Oak development, against infrastructure funding (assuming 20% affordable housing)



Source: JLL, PBA. Figures are rounded. Affordable Housing is assumed at 20% across all phases

Given the cashflow situation, there is likely to be a role for borrowing in some form

1.43 **Borrowing - possibly for a relatively short period - would allow this period of negative cashflow to be managed.** Loans from Government or even the commercial sector may be possible. As we have pointed out above, there are significant opportunities around Tax Increment Financing, where a lump sum of funding is raised against future business rate and CIL income streams.

Testing other development scenarios

1.44 Our 'base case' scenario did not make a direct mention of a stadium, assumed that the Crossrail Depot remained in depot operation until 2041, and made a series of assumptions about the scale and timing of growth.

1.45 However, we know that our 'base case' development trajectory might well be superseded by events. We have therefore looked at the implications of other development scenarios on infrastructure requirements, costs and funding. None of these scenarios is intended to replicate or mimic an existing scheme.

- **Scenario 1: including a stadium (but delivering the same number of homes and jobs as in the base case).** Compared to the base case analysed, we found the effects of this scenario to be broadly neutral on infrastructure, costs and funding. Further detailed study would be required, but our thinking is that the Willesden junction footbridge is likely to be able to cope with football crowds, so transport infrastructure requirements stay similar; and similar numbers of homes and jobs are planned – so keeping social and utilities infrastructure requirements broadly the same as the base case. We have not assumed any additional funding would be available.
- **Scenario 2: keeping Powerday in its current operation, rather than developing the site for 1,200 homes under the base case.** There could be modest impacts on values in the immediate vicinity, but the Powerday site is quite well shielded from neighbouring sites. Effects are broadly neutral, but the loss of Powerday in its current operation would pose significant difficulties for the processing of construction waste at Old Oak.
- **Scenario 3: having the Crossrail Depot site begin development in 2026, not 2041 as in the base case.** Our analysis suggests that this scenario is highly desirable. We would be bringing forward tax receipts and developer contributions by fifteen years. Whilst this in itself is very valuable, an even greater benefit may arise from the sense of confidence and momentum that developing this central site earlier this would give Old Oak. Earlier development might also mean that the public sector would be more able to capture the increase in value created by early Depot site development. (Our logic is that if the relocation of the Depot happens *after* the bulk of development on neighbouring sites takes place, then any value uplifts which do take place as a result of the removal of this 'bad neighbour' will be experienced as a windfall gain to the owners of development on neighbouring sites at the time. There will be no possibility of capturing the uplift in value through S106 or CIL). Offsetting these benefits, though, could be costs which would be incurred by penalty clauses in existing operations contracts. We have not examined these possible costs. If the depot is not moved early, consideration will need to be given on how to retain values on neighbouring sites whilst the Depot is in operation, possibly through using buildings and urban design to screen the site.
- **Scenario 4: keeping the Crossrail Depot in Depot operation, rather than developing 2670 homes and 19400 jobs at the site as in the base case.** Our

analysis suggests that this scenario is highly undesirable. There is a major risk that the lack of a prospect of development at such a central site would damage market perceptions of Old Oak. The prospect of the site staying in permanent Depot operation may damage values on neighbouring sites: mitigating design measures undertaken may not entirely overcome this. The ability to deliver Further Alterations of the London Plan (FALP) housing and jobs numbers at Old Oak would be very significantly damaged. The economic impact of Crossrail and HS2 investment would be significantly reduced. Tax revenues from homes and jobs at the site would not arise in the way anticipated by the Core Scenario.

Towards a land use plan for the proposed OPDC

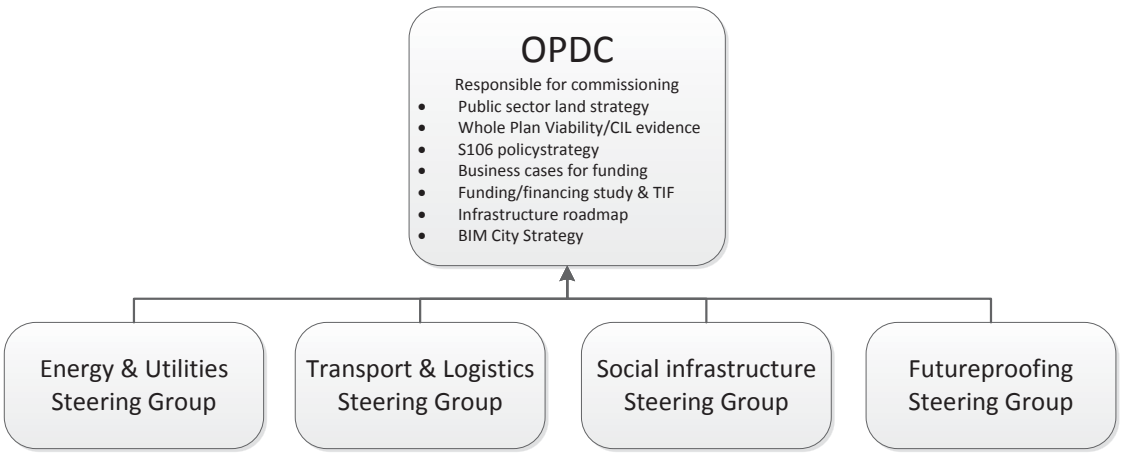
1.46 **We make recommendations on steps to take towards the plan for the proposed Old Oak and Park Royal Development Corporation (OPDC), and hope that this report provides a start to the evidence base needed.** We have explained the importance of Whole Plan Viability under the NPPF, and mapped a way forward towards a S106 policy, a CIL policy, and Regulation 123 list.

Recommendations

Recommendations around organisational structure

1.47 **A process of policy co-design is likely to improve the policy development and delivery process at Old Oak.** The OPDC will need to deal cover a huge range of very detailed planning issues, making decisions with far-reaching implications in a short space of time. This is going to be extremely challenging. The OPDC may need to set up a structure that will help it bear some of this load by bringing expert help to into the OPDC planning process (see Figure 1.6). We expect that external stakeholders would be interested in being members of the steering groups, helping to ensure that the OPDC co-designs high quality policies with broad local support.

Figure 1.6 Suggested Infrastructure Delivery Steering Groups



1.48 Before we set out the role for these steering groups, we set out some general recommendations for the OPDC. (We make a series of individual recommendations related to individual themes in each chapter of the report).

General recommendations

- **The depot and sidings site needs very early attention.** We believe that the late delivery (or non-delivery) of development at the depot site is the biggest risk to the implementation of the Vision by a clear margin. The regeneration of the entire area could be affected.
- **A public sector land strategy is required.** Very large areas of land have a public sector freeholder at Old Oak. If co-ordinated, this creates a very significant opportunity both for economic return of revenues to the taxpayer, and for the economic development of the area.
- **As part of the public sector land strategy, public sector sites could be serviced, and income obtained from utilities supply.** Income streams from utilities or ground rent from retained holdings could help finance an innovative approach to community development at Old Oak.
- **The funding gap and cashflow needs addressing**. Steps could be taken to narrow the gap identified, and overcome cashflow difficulties, as discussed above.
- **Enterprise Zone status and a TIF should be investigated,** using the model established at Vauxhall Nine Elms Battersea (VNEB).
- **Local Development Orders and Mayoral Development Orders could be considered** in order to give planning certainty to developers. Similar methods were used at Canary Wharf, and were an important component in encouraging investment.
- **The business case for development could be developed:** we suggest that the OPDC may wish to work further on the economic benefits that investment, particularly in transport, may bring. This would allow the generation of a funding case to Government, and may form part of a TIF application.
- **CIL and S106 policy needs to be put in place as early as possible,** to allow developers to bid for sites in the knowledge of what they will be paying in infrastructure contributions – allowing them to pay the 'right' price for the land they need. In advance of CIL and S106 policy, policy intentions should be communicated consistently and clearly.
- **Planning policy and strategy must remain flexible** enough to cope with changing market and economic conditions – for example, perhaps by delivering lower levels of affordable housing in the early phases in order to pump-prime infrastructure delivery with increased levels of funding.
- **A very practically orientated project delivery 'roadmap' needs to be written** which would identify tasks on the critical path, set dates for those issues to be resolved, and clarify delivery roles and responsibilities; focus head-on on how any problems will be resolved; and define issues in time sequence, which would

allow the focusing of resources on short term issues and a process of active planning for medium term issues. This would also help the political process by clarifying decisions that need to be taken, when they need to be taken, and what the ramifications of choices are.

- **A narrative that shows how benefits will be shared across the OPDC area could be created.** We suggest that the OPDC will need to be able to show how the regeneration of Old Oak Common enhances both Park Royal industrial areas, and neighbouring residential areas to the north, south and east.
- **Relationships need maintenance and development.** We understand that GLA/OPDC officers already work closely with developers and public sector infrastructure providers, and relationships with utilities providers are developing. These links are essential, and need to be maintained and developed, alongside with work with local community groups.

Recommendations on transport infrastructure delivery

- **A Transport and Logistics Steering Group will be important.** Transport infrastructure is the biggest cost at Old Oak. Much more detail will need to be developed. Furthermore, the impacts of the construction of the HS2 and a new Crossrail station and depot represent a major transport impact in themselves. However, they are not yet fully understood. As more details emerge they are liable to significantly influence phasing.
- **Freight consolidation will be a major issue.** This could be considered by the steering group.

Recommendations on utilities delivery

1.49 **An Old Oak Utilities Steering Group could be very usefully instituted**, and could look at a number of issues.

- **The Steering Group could co-ordinate the management of upstream reinforcements and perhaps even oversee the joint requisitioning of infrastructure.**
- **The Steering Group could oversee the production of an Integrated Water Management Strategy**.
- **The steering group could help to organise finance** for up-front infrastructure costs.
- **The steering group could help organise the provision of land** for the electricity sub-stations and pumping stations. Past experience at Vauxhall Nine Elms Battersea suggests that this is a particularly important issue.
- **With the OPDC, the Steering Group could consider policy on heat and power networks**, in order to understand whether emerging innovations might be able to drive down the cost of carbon-efficient utilities provision at Old Oak.

Recommendations on a futureproofing

1.50 **A Futureproofing Steering Group** could work alongside the OPDC and undertake the following tasks.

- **The Steering Group could develop Building Information Modelling (BIM) techniques to improve the efficiency of infrastructure delivery.** The benefits of this approach could be around cost control, cashflowing investment, intelligent site sequencing, and intelligent co-ordination of delivery – helping stop the often uncoordinated approach to laying utilities which results in roads being dug up and re-laid multiple times.
- **'Smart city' techniques could be adopted early at Old Oak, which would create definable benefits for new residents and businesses**. This could be developed as part of a SMART public realm and construction logistics plan. EU funding (Climate kic) is available for some proof of concept work, and could be separately investigated. The Steering Group could help.
- **Old Oak could be a testbed for new G-Fast technology, which offers 80-500mbps speeds.** These speeds are far beyond those available even to Ethernet users. Planning should start now.
- **With the steering group, the OPDC could knit together BIM, smart city methods and an economic development strategy into a coherent whole**. It might follow the example of Christchurch in New Zealand, which is integrating smart city provision into its £40b 'sensing city' rebuilding programme, and using this to create a new digital economy for the city's future.

Recommendations on a social infrastructure delivery

1.51 Service providers remain under great pressure to deliver services for less money. This is likely to continue to force significant innovations in service delivery and estates strategies.

- **A steering group will be able to keep the OPDC informed of service delivery changes** and ensure that the future infrastructure is tailored to future delivery strategies.

Key facts, figures and assumptions in the study

- **24,000 homes and 55,000 jobs delivered over by 2050, averaging delivery of 700 residential units a year.** It is possible that other housing products (such as private rented sector products or student accommodation) could see per annum housing output rise, meaning that the 24,000 homes envisaged in Further Alterations to the London Plan (FALP) could be delivered more quickly than we assume here.
- **Gross costs of infrastructure are around £1.549 billion**. Gross costs are defined as being those of infrastructure physically being delivered in the Old Oak area, which includes the Crossrail-West Coast Mainline spur, plus all the infrastructure costs of infrastructure at Old Oak itself.

- **Infrastructure Costs *attributable to Old Oak* itself are around £1.271 billion**. These are the costs more specifically targeted at supporting the development of homes and jobs described in the Vision document.
- **These costs include maintenance, and make a tailored allowance for contingency**.
- **Likely funding of infrastructure through CIL, S106, ESCO and direct developer delivery is between £727m to £913m**, depending on rates of affordable housing required. On costs of infrastructure attributable to Old Oak, t**his creates a funding gap of £358m - £544m.**
- **The assumed cost to acquire sites is £2m/acre +30%, or the value of land with buildings, +30%, whichever the highest**. In addition, allowance has been made for the value of existing plant and machinery employed at the sites, with **sufficient incentive for key landowners to move**, and so release land for development.
- **£300m is assumed within these numbers for the Crossrail depot site to move**. The cost of securing the full or partial relocation and/or reconfiguration of the Crossrail depot would be borne by the development value of this land. This indicative number assumes that land for the new Depot can be found from within the Network Rail estate. If a new site outside the Network Rail estate was needed, then costs would rise significantly. As such when the final attributable costs are identified (which could be higher than £300m) then this cost will need to be factored into the development costs for the land. The £300m cost should be understood as a high level figure which could change substantially as further feasibility work on the depot relocation is undertaken.

Build costs assumed

Table 1-10 Build cost summary

Category	£/sqft	£/sq m
Medium Private Residential	£2,098	£195
Medium Affordable Residential	£1,991	£185
Tall Private Residential	£2,368	£220
Tall Affordable Residential	£2,152	£200
Retail	£915	£85
Small / Medium Office – 10 storeys	£2,341	£218
Large Office – 20 storeys	£2,476	£230

We have made a further allowance of £20 per sq ft for external costs.

Residential sales values assumed

Table 1-11 Residential sales values (£ per sq ft)

Use – Residential	Capital Value £ per Sq M (Ph1/Ph2/Ph3)	Capital Value £ per Sq Ft (Ph1/Ph2/Ph3)
Private Residential	£5,920 / £6,548 / £7,535	£550 / £600 / £700
Affordable Residential (60% of Private)	£3,552/ £3,875 / £4,521	£330 / £360 / £420

Source: JLL

Suggested CIL schedule

1.52 These are outline numbers only. More detailed work will be required before a CIL can be set before a public examination. A critical part of a setting the CIL will be a more detailed understanding of delivery and who will deliver which pieces of infrastructure. This work will feed into a CIL over the next 12 months.

1.53 Increased affordable housing would see overall CIL receipts and rates per sq m fall. The table below is based on 20% affordable housing being provided at Old Oak. No decision about affordable housing policy has been made by OPDC. This report also assesses impacts on viability of 30% and 40% affordable housing. We provide this information in order to help OPDC look at the balance between CIL receipts and affordable housing policy requirements.

1.54 The indicative CIL charges increase over time, reflecting our assumption that sales values rise as PTAL improves and the Old Oak area becomes established.

1.55 Please see Chapter 23 for more details.

Table 1-12 Potential CIL per sq m, assuming 20% affordable housing (assuming nil Social Housing Grant)

CIL Table (£sqm net additional)	Ph1 20% affordable	Ph2 20% affordable	Ph3 20% affordablle	Ph4 20% affordablle
Resi High Band	£115	£290	£520	£520
Resi Low Band	£105	£215	£460	£460
Office	£75	£75	£200	£200
Retail	£35	£35	£50	£50
Hotel	£75	£75	£150	£150
Industrial development across OPDC area (incl. Park Royal)	£0	£0	£0	£0

Table 1-13 Potential CIL per sq m (assuming affordable housing at 30% and assuming £70m of Social Housing Grant payable during phases 1 & 2)

CIL Table (£sqm net additional)	Ph1 30% affordable	Ph2 30% affordable	Ph3 30% affordablle	Ph4 30% affordablle
Resi High Band	£100	£250	£450	£450
Resi Low Band	£90	£190	£400	£400
Office	£75	£75	£200	£200
Retail	£35	£35	£50	£50
Hotel	£75	£75	£150	£150
Industrial development across OPDC area (incl. Park Royal)	£0	£0	£0	£0

Table 1-14 Potential CIL per sq m (assuming affordable housing at 40% and assuming £155m of Social Housing Grant payable during phases 1 & 2)

CIL Table (£sqm net additional)	Ph1 40% affordable	Ph2 40% affordable	Ph3 40% affordable	Ph4 40% affordable
Resi High Band	£100	£250	£450	£450
Resi Low Band	£90	£190	£400	£400
Office	£75	£75	£200	£200
Retail	£35	£35	£50	£50
Hotel	£75	£75	£150	£150
Industrial development across OPDC area (incl. Park Royal)	£0	£0	£0	£0

2 INTRODUCTION

Context

2.1 This study aims to help London seize a major growth opportunity. The Old Oak and Park Royal area in West London will be one of the UK's best connected places, with direct access to central London, Heathrow, Wales and the West Country, Birmingham and the North of England. These connections come as a result of a new Crossrail station, a new HS2 station, a new stop on the Great Western Mainline, and potential new London Overground stations.

2.2 These new connections will fundamentally alter the economic geography of the area. The Further Alterations to the London Plan (2014) document sets out a planning response to this change. It sees 24,000 homes and 55,000 jobs being brought to the area, based on the amount of development included in the 'Vision for Old Oak' (June 2013) consultation document.[2]

2.3 This report uses the FALP development figures as a starting point, and provides a greater understanding of the scale, type, costs and funding of infrastructure required to support the proposed level of development at Old Oak. The work builds on earlier work by JLL on the viability of the masterplan concept.

2.4 Development Infrastructure Funding Studies (DIFS) work was pioneered by the GLA, and have been used at Vauxhall Nine Elms Battersea, White City and Croydon. The objectives of the studies has been to help de-risk investment by

- showing how the existing degraded infrastructure might be upgraded and improved;
- helping to spread information;
- helping to co-ordinate complex planning processes;
- helping to guide to the marketplace on the "right" land value by clarifying policy requirements; and
- clarifying the social benefits expected to be delivered by investment.

Date of research

2.5 The bulk of our primary research work was carried out in the summer of 2014. This report reflects the position at that point in time with regard to infrastructure costs and funding, and development costs and values. As is often the case with projects of this scale, views on the amount and type of infrastructure needed are likely to be modified as time passes.

[2] Greater London Authority (GLA), Transport for London (TfL) and the London Boroughs of Hammersmith & Fulham, Ealing and Brent (2013) *Old Oak - A Vision for the Future*

2.6 The report was complete in draft form before the Old Oak Opportunity Area Planning Framework (OAPF) consultation process started, and so does not benefit from sight of that document. However, our emerging findings have been fed into the OAPF.

Our scope

Thematic scope

2.7 The brief requires us to explain

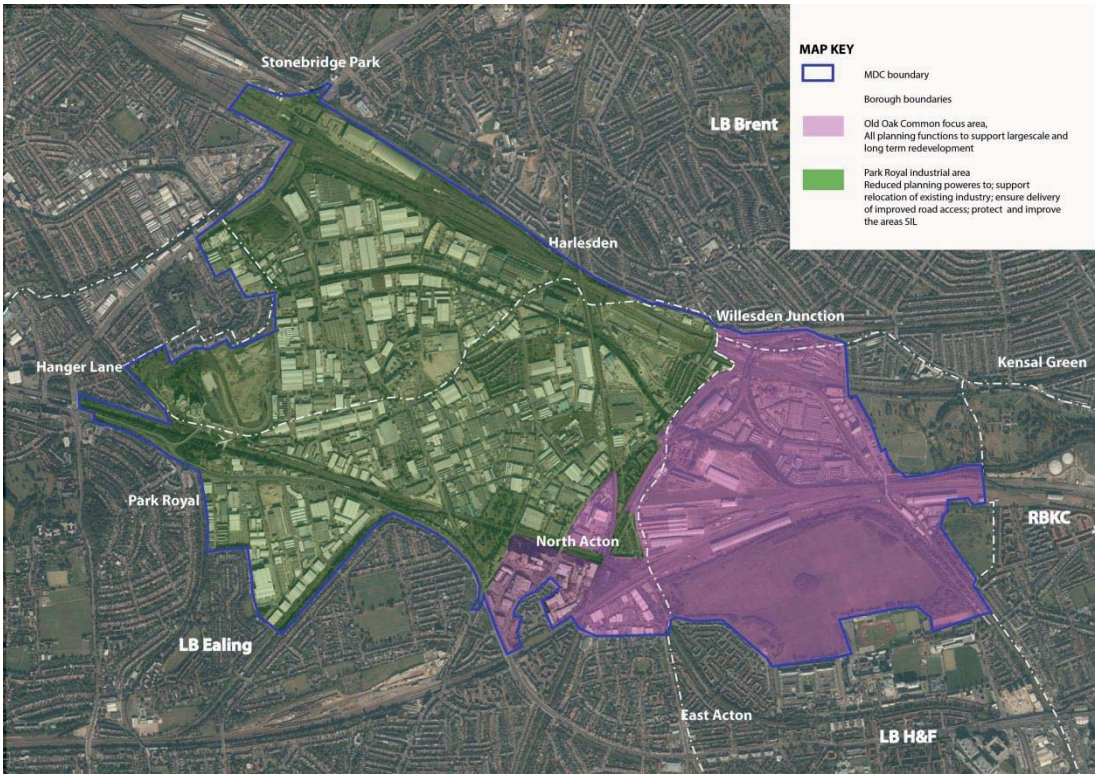
- the infrastructure requirements of growth at Old Oak;
- when the demands for infrastructure arise;
- how much those infrastructure requirements cost; and
- how those infrastructure requirements might be paid for.

Geographical scope

2.8 We are investigating the infrastructure implications of growth within the 155ha Old Oak 'Core Area' that is set out in the Old Oak Vision (see the area in pink on the map below). The infrastructure requirements arising might be physically located in the area in pink, or beyond.

2.9 We will also briefly look at development viability across the remaining Park Royal area (this area is shown in green on the map below).

Figure 2.1 Old Oak and Park Royal Opportunity Areas showing Core Area and wider Park Royal



Source: GLA

2.10 The focus of this study has therefore been to understand the impacts of development at Old Oak and what this would mean for the surrounding area. This study has not looked at additional growth across Park Royal itself.

Compliance with national policy

2.11 This work aims to contribute towards the evidence required for the Old Oak and Park Royal Opportunity Area Planning Framework and potential future Old Oak and Park Royal Development Corporation (OPDC) plans (although further work may be required as plans develop).

2.12 It is therefore important that we bear in mind the requirements of the National Planning Policy Framework (NPPF).

NPPF's requirements on infrastructure evidence

2.13 The NPPF requires work on infrastructure to cover the following areas. Our report has been structured to follow this broad approach.

- Infrastructure quality and capacity. Under the NPPF, infrastructure plans are required to focus on infrastructure 'quality and capacity', and 'take account of strategic infrastructure including nationally significant infrastructure'.[3] Infrastructure plans must understand the ability of infrastructure to meet forecast demands.
- Costs and funding. The NPPF states that it is important that local planning authorities understand development costs at the time Local Plans are drawn up.[4]
- Timing. The NPPF states that it is 'important to ensure that there is a reasonable prospect that planned infrastructure is deliverable in a timely fashion'. It is therefore necessary to understand when costs are incurred, and whether funding exists to support those costs at the right time.[5]

2.14 Infrastructure cross border working now features explicitly as one of the tests of soundness that the Inspector will be looking for in examining local plans (para 182) and implicitly (the effectiveness test).[6] We are not managing this process in this project, although the cross border nature of the commission may contribute towards evidence of joint planning.

NPPF's requirements on development viability

2.15 The National Planning Policy Framework (NPPF) advises that cumulative effects of policy should not combine to render plans unviable:

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3 DCLG (2012) NPPF (40)

4 DCLG (2012) NPPF (42)

5 DCLG (2012) NPPF (42)

6 DCLG (2012) NPPF (43)

> *'Plans should be deliverable. Therefore, the sites and the scale of development identified in the plan should not be subject to such a scale of obligations and policy burdens that their ability to be developed viably is threatened. To ensure viability, the costs of any requirements likely to be applied to development, such as requirements for affordable housing, standards, infrastructure contributions or other requirements should, when taking account of the normal cost of development and mitigation, provide competitive returns to a willing land owner and willing developer to enable the development to be deliverable'.* [7]

2.16 The key point is that policy costs should be kept sensible, the overall amount of infrastructure needed to support the plan over time should be affordable, and that plans should be backed by a thought-through set of priorities and delivery sequencing. This will allow a clear narrative to be set up around how the plan will actually be paid for and delivered.

[7] DCLG (2012) National Planning Policy Framework (41, para 173)

3 PART 1: GROWTH PLANS

This stage is important, because the amount and timing of development in the area will influence the amount of infrastructure required at a given point in time.

Growth plans also determine our overall property and delivery strategy.

4 WHAT KINDS OF GROWTH ARE PLANNED, AND WHEN?

Introduction

4.1 In this section, we examine the level of development that is planned in the area.

Old Oak today

4.2 Today, the Old Oak area houses a mix of land for transport functions (rail lines and depots); two large waste management facilities; a 22 hectare car sales and maintenance business; a number of small scale industrial and office buildings; and a small number of residential units around the periphery. The Grand Union Canal runs east west through the area. To the north is Willesden Junction station and Harlesden, to the east is St. Mary's Cemetery and Kensal Gasworks, to the south is Wormwood Scrubs, Wormwood Scrubs prison and Hammersmith Hospital while to the west is North Acton and the wider expanse of Park Royal Strategic Industrial Location.

4.3 The Park Royal area consists of largely private industrial uses housed in a range of industrial buildings of varying sizes and quality.

What growth is planned, and when?

4.4 Because this study focuses on the infrastructure requirements arising from the Old Oak area, we focused on plans in that area. We did not look at additional growth across Park Royal itself.

Further Alterations to the London Plan (FALP) sees housing and jobs growth at Old Oak

4.5 The Further Alterations to the London Plan (FALP; January 2014) has responded to strong projected levels of housing demand in London by planning for a very significant increase in housing output across London.

4.6 FALP plans for 55,000 new jobs and a minimum of 24,000 new homes in the Old Oak area. This is aimed at maximising the opportunity presented by a new High Speed 2, Crossrail and National Rail station at Old Oak. FALP is expected to be adopted in March 2015.

4.7 FALP intends to maintain and intensify employment uses at Park Royal and estimates an additional 10,000 new jobs and a minimum of 1,500 homes. Both Old Oak and Park Royal are seen by FALP as being distinct Opportunity Areas.

The Old Oak Vision and FALP growth numbers provided a starting point for this study

4.8 The development trajectory in the Old Oak Vision was used as a starting point for analysis. A number of amendments to the trajectory in the Vision were then made to take account of recent developments, and the approach taken in FALP.

4.9 The planned growth in housing and jobs on each development site was split into phases by officers. Phases were intended to be broadly congruent with anticipated plan periods in a forthcoming potential OPDC plan and London Plan.

Build out rates were provided on the basis of market absorption of traditional housing products. Other products (such as PRS) could see rates increase

4.10 Whilst FALP provided the total number of jobs and homes, the study needed to understand how quickly those homes and jobs could come to market. Officers provided a build out trajectory which averaged an annual output of around 700 homes every year. This number was informed by discussions with developers and experience at other large strategic sites in London (such as Vauxhall Nine Elms Battersea). The number assumed that homes produced would be classic owner-occupied, and social/intermediate products.

4.11 It is possible that other housing products (such as private rented sector (PRS) products or student accommodation) could see per annum housing output accelerate. This is because these products could reach consumers in different market segments. The main effect would be on rates of delivery, but a PRS component might increase demand, and reduce finance costs (because land is left idle for a shorter period, and PRS investors may be able to make money available at a lower rate). Together, this could have some positive effects on viability. If rates of output increased, the 24,000 homes envisaged in the FALP could be delivered more quickly than we assume here.

4.12 The broad approach in the early phases is the delivery of housing, concentrated around existing transport nodes. Once the Old Oak Common HS2 station is operational, job delivery rates will rise.

4.13 Note that the phasing trajectory provided is intended to be a broad indication only. Sites may come forward at any time, and this, and future studies may need to be adjusted in future to reflect this. However, delivery at some sites will be constrained by the delivery of large scale infrastructure such as HS2, and so without significant upfront investment, certain development sites can only come forward later.

Table 4-1 Summary indicative development trajectory by phase (housing)

Phase	Years	Total housing units
Phase 1	2016/17 – 2020/21	2394
Phase 2	2021/22 - 2025/26	5146
Phase 3	2026/27 - 2035/36	6955
Phase 4	2036/37 - 2050/51	8550
Unconsented housing units		23045
Homes already consented in the area (in North Acton)		1100
Total growth at Old Oak		24145

Source: GLA, PBA

Figure 4.1 Summary indicative development trajectory by year (housing units pa, consented and unconsented schemes)

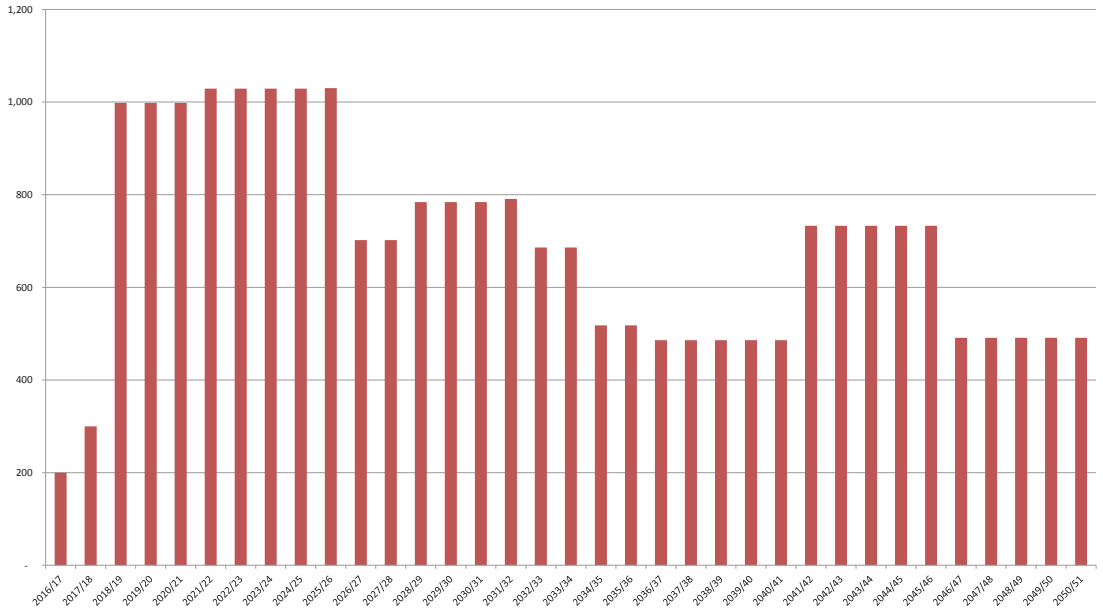
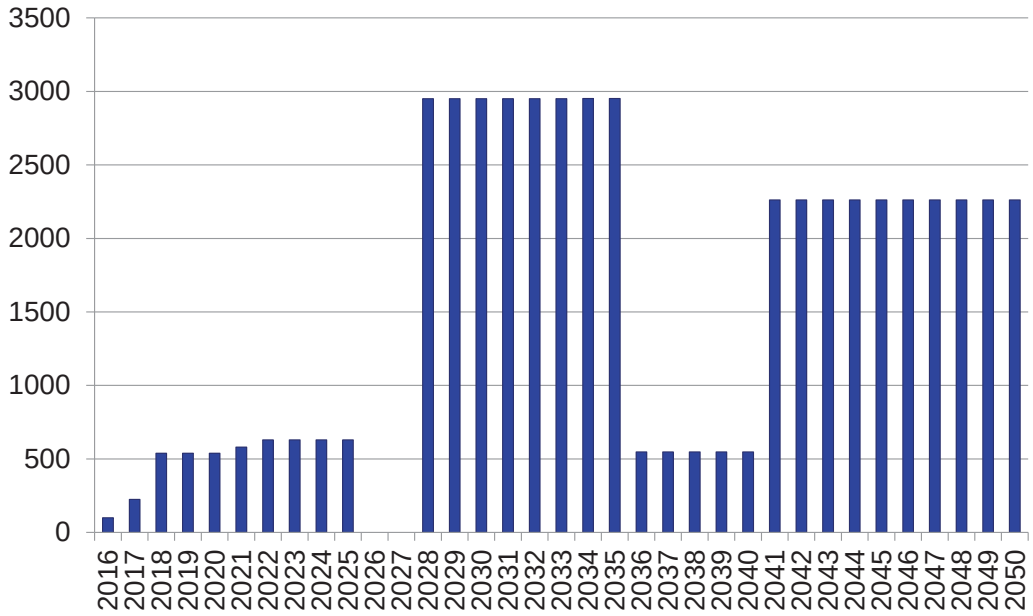


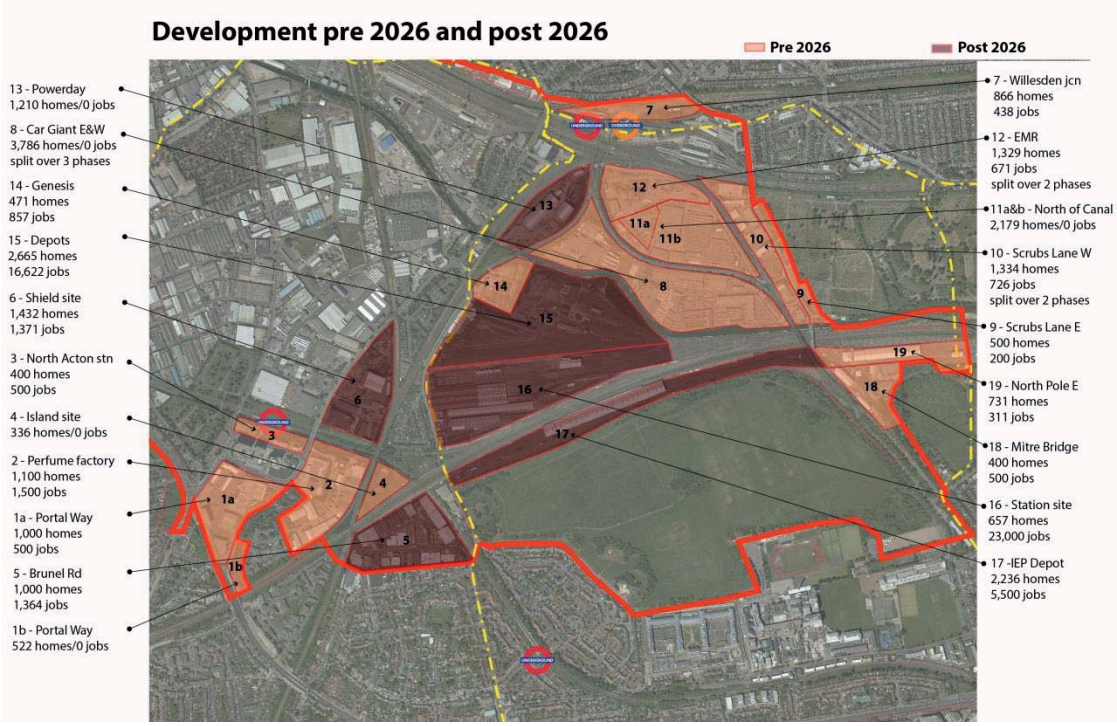
Figure 4.2 Summary indicative development trajectory by year (jobs accommodated pa, consented and unconsented schemes)



Source: GLA

4.14 This development can be mapped, as shown in Figure 4.3.

Figure 4.3 Indicative development trajectory map (excludes developments with already consented growth)



Source: GLA

4.15 For the avoidance of doubt, the above figures relate to gross additions to the stock. This means the amount of new floorspace space to be built, with no deduction for existing floorspace to be demolished and thus lost from the stock.

5 PART 2: WHAT INFRASTRUCTURE IS NEEDED TO SUPPORT DEVELOPMENT?

In this part of the report, we set out what infrastructure is required to support growth at Old Oak. We look at how much that infrastructure costs, when it is needed, and how it might be funded.

We begin by explaining our approach to these issues.

6 APPROACH

The types of infrastructure we are covering

We are focusing on primary and secondary infrastructure

6.1 We analyse primary and secondary infrastructure in this study.

- Primary infrastructure is infrastructure required to accompany development in order to allow new households and jobs to function within a wider community. This infrastructure will be largely used by the community living and working in the development but others would not be excluded from using these facilities.
- Secondary infrastructure is infrastructure intended to create accessible, serviced and developable sites. Secondary infrastructure will typically include internal access roads within sites, and connections to the mains for drainage, sewage, gas, electricity and telecoms. Developers are expected to pay for small scale open and play spaces together with on site and adjacent landscaping, and so this falls within the definition. Developers build these costs into their financial models for their development sites either at around 10% of construction costs, or as a rate per square foot of development.

6.2 A full itemisation of all secondary infrastructure costs and requirements as part of this assessment would be a) redundant and b) unacceptably complicated. However, these costs have not been ignored.

- We have built in generic costs or secondary infrastructure into our assessment of build cost externals, at a rate per square foot of development. This approach replicates the developer's general approach.
- We have undertaken specific costing exercises where secondary infrastructure costs exceed the levels which would typically be considered to be normal. However, we have only picked up these issues where information is available.

Affordable housing is dealt with through its effects on potential developer contributions

6.3 Affordable housing does not constitute primary or secondary infrastructure in its narrow sense. It is therefore not treated as such in this study. However, affordable housing requirements must be understood as part of an infrastructure study, because the levels of affordable housing demanded impacts on the viability of development, and thus on amounts of developer contribution available to fund infrastructure.

6.4 We take account of levels of affordable housing requirements through our assessment of viability and potential developer contributions. Our viability work is based on assumptions on levels of affordable housing to be required in the area. These levels have been provided to us. As part of this study we have tested the viability of delivering 20%, 30% and 40% affordable housing.

What infrastructure is required? Our approach

Service providers have been consulted

6.5 To understand levels of infrastructure requirements arising from growth, service providers were consulted. The benefit of such contacts was that providers – particularly addressing social infrastructure needs - could explore the potential for co-location of services and were able to provide a coordinated response.

6.6 The requisite information on infrastructure needs, costs, funding and phasing was provided by the stakeholders and collated. Clarification of any issues was provided through follow-up questions.

We have sought an efficient approach to infrastructure provision

6.7 In this assessment, we have tried to provide a pragmatic approach that balances deliverability against providing sufficient infrastructure to ensure the growth is properly catered for. We have tried to calibrate our method to help us gauge a realistic level of infrastructure provision, in the following ways.

- We have provided service providers with information showing the location and quantum of jobs and housing growth. We have invited them to explain what requirements they have, given this planned growth, and invited them to explain why this infrastructure is required. This process has built a realism and transparency into the approach.
- Our rough rule of thumb is that the infrastructure requirements for growth in this assessment should be broadly in line with the levels of infrastructure enjoyed by typical London residents and workers.
- We have attempted, wherever possible, to take account of service providers' existing spare capacity. We rely on service providers' expertise here. This has the effect of reducing infrastructure demands, and so their costs and funding requirements.

Service delivery is continually being reconfigured. Strategies change. This affects levels of infrastructure required to support new growth

6.8 Public services, and hence the infrastructure they demand for delivery, are in a constant state of flux. Policy or technology can change rapidly. Most service providers do not plan beyond three years, and so cannot by definition be expected to know their precise requirements in (say) ten years' time.

6.9 Public finances are also uncertain. They should recover at some point after 2019, but we are currently unable to predict the extent to which this might take place, or when.

6.10 This means that public service infrastructure requirements as a result of growth are difficult to predict and are necessarily subject to a considerable margin of error.

Total precision about the required infrastructure is not possible

6.11 It is important to point out that we are dealing with infrastructure requirements at a high level. In the great majority of cases, we are working far in advance of detailed masterplanning work at the individual sites in the area. This study – and the spreadsheet analysis that accompanies it - is designed to be updated as more information comes in over time.

Our requirements analysis was tailored to planning permission status

6.12 We took a different approach to social and utilities infrastructure when interviewing service providers.

- Social infrastructure providers were asked about infrastructure requirements for growth at Old Oak *without planning permission* (around 23,000 housing units). We took this approach because we were keen to ensure that social infrastructure demand was not over-estimated: we assumed that if housing already had permission, then sufficient infrastructure to cope with new demand had been already dealt with.
- Utilities providers have provided requirements for all jobs and housing growth at Old Oak (not across Park Royal), both *with and without* planning permission. We took this approach because the main risk in this was to under-estimate demand. In the past, utilities providers have frequently been less than perfectly informed about growth in an area, and so we wanted to ensure that the cumulative impacts of both permitted and unpermitted developments were understood.

6.13 In practice, the effects of this nuance were limited, simply because the number of permitted developments is so small.

When is infrastructure required? Our approach

We have used judgement to understand when infrastructure might be required

6.14 Where possible, we have attempted to estimate *when* infrastructure is required to support different sites and phases of development.

6.15 We caution that this is not always an exact science. Very much depends on economic cycles, funding availability, technological change, the delivery of other (non-OPDC) infrastructure, and so on.

We have not formally dealt with demographic changes, but have taken these into account informally

6.16 There are two demographic issues which need to be borne in mind with this assessment.

- The changing demographic profile of the area, such as changes in age profiles; and
- The relationship between new housing stock, and population growth.

6.17 These two factors mean that any given amount of housing growth can have different consequences for infrastructure demand.

6.18 The scope of this study does not allow us to deal with these issues formally. We have relied on service providers being broadly aware of issues in order to give us a "best estimate" picture of the infrastructure implications of growth at the area.

The effects of background growth and historic deficits

6.19 We have explained above that our objective is to understand how planned growth in housing and jobs affects infrastructure requirements at Old Oak. In theory, this might be understood to mean that we have to "tune out" changes in infrastructure requirements due to other factors. These could include

- Background trend growth. For example, growth in transport or energy demand might arise from the areas surrounding Old Oak, but affect Old Oak itself.
- Historic deficits. These may exist, and there may be pressure to resolve them.

6.20 However, even if it was desirable to "tune out" trend growth, it is extremely difficult at this stage in the planning process to do so with any level of accuracy. Whilst our general approach has been to concentrate on the implications associated with growth only, we are also seeking to understand what infrastructure is required to create a sustainable and effective future community at Old Oak.

What does infrastructure cost? Our approach

We cost the infrastructure required. We quote costs at current prices and exclude VAT

6.21 We have used service providers' and our team's estimates of infrastructure costs.

6.22 We are quoting capital costs and, where relevant, revenue (maintenance) costs separately in this study. However, we caution that sometimes the distinction between capital and revenue is difficult to make. It is the case that some public agencies meet capital costs through revenue expenditure, for instance through leasing or borrowing.

6.23 The major costs quoted in this study are at current real prices. No inflation is included in our cost calculations. This is because we do not know what the inflation rate will be in future, or exactly when items will be built. Costs may need to be revisited in future.

6.24 We exclude VAT on the assumption that it is recoverable by the infrastructure deliverer.

Our treatment of maintenance costs

6.25 'Maintenance' can mean different things to different people, but will usually involve the activities required to keep buildings open, statutorily compliant, safe to use and comfortable to occupy, and public realm and infrastructure clean, safe and operating in the manner intended by its design.

6.26 Cost analysis of maintenance should be undertaken at a strategic level in the early stages of a project and refined with increasing accuracy as more details of the project become available.

6.27 Where the project team has provided costings (rather than had them provided by the client group or other research) we have included two years' maintenance charges. We have done this in order to comply with the broad spirit of the (now superseded) 05/05 guidance:

> "...the costs of subsequent maintenance and other recurrent expenditure associated with the developer's contributions should normally be borne by the body or authority in which the asset is to be vested. Where contributions to the initial support ("pump priming") of new facilities are necessary, these should reflect the time lag between the provision of the new facility and its inclusion in public sector funding streams."[8]

6.28 Maintenance costs after the first two years are therefore assumed to be the responsibility of the mainstream service provider / owner, although we have made no formal statements about where future liability sits. This issue would need to be explored in more detail by the OPDC.

6.29 For the early stages of Old Oak Common project and in the absence of more information, we have used two methods.

- Industry standard benchmark methods such as £/m² or £/other unit rates (as appropriate) in order to estimate the expected costs for each asset type being considered. The rates used are drawn from Gardiner & Theobald's in-house database, and take account of the type and use of buildings and public realm asset, the client, and the expected form of service delivery where this is known, or can be reasonably anticipated.
- In the case of transport, a 10% maintenance sum has been included on all infrastructure elements specifically costed as part of the DIFS work, and where TfL costs have been used. This has not been applied where other costs have been provided by others in order to avoid the risk of double counting.

6.30 We have not allowed for 'soft facilities management' services in these maintenance cost build ups, by which we mean the costs for cleaning, pest control, security and other associated services. We have not allowed for energy costs or replacement life cycle costs in our build ups.

[8] Para B19

Our approach to certainty and uncertainty in costings

6.31 In a project such as this – which frequently concerns the costing of very broadly defined infrastructure projects to be delivered many years in the future – it is important to be clear about the level of certainty which can be attached to costings. In most cases (with some notable exceptions where projects have been driven directly by the development of HS2) the information on individual project scope is limited and mostly at pre-concept stage. Therefore all projects carry a degree of uncertainty and are at significant risk of influence from a range of external factors.

6.32 Our approach has been to build up a strategic view of costs from a range of sources. This has been necessary because we wished to maximise the use of available cost information, but also fill gaps in knowledge. For example, transport infrastructure components has relied on the following:

- The direct use of previous work completed by others for relevant Old Oak infrastructure elements.
- The review, use and adaption of the above information to apply it to similar infrastructure elements, where little or no previous detailed work has been undertaken.
- The use of specific summary information and costs provided directly by the GLA and/or TfL.
- Reference to in house resources such as cost databases and informed judgement of relevant senior engineers.
- Liaison with the GLA and TfL and where appropriate the agreement and use of experienced based judgements, where little or no definition of scope is available.

6.33 The varied sources and confidence in different cost estimates has led to an attempt to distinguish three distinct categories of cost certainty. Each project has been colour coded in line with one of three relevant criteria set out below.

Table 6-1 Levels of uncertainty in cost estimation – colour coding

BLUE	Medium cost certainty: Previous option development / feasibility work has been undertaken and a project defined and scoped in some form. Risk of change from a range of external influences remains.
AMBER	Low to medium cost certainty: some form of project scope established with broad assumptions. However significant elements of the project are less certain and/or carry more risk (for example projects where there are rail interfaces). Risk of change from a range of external influences remains.
RED	Low cost certainty: Little information currently available with which a project specification could be established within the scope and timeframe of the DIFS study. Costs have been estimated through discussion, and/or based on broad assumptions and judgements, with the need for follow up work noted. In some cases no meaningful contingency can reasonably be applied, until further work has been carried out.

Transport infrastructure and contingency

6.34 We have taken what is thought to be a pragmatic approach to the application of contingency and risk allowances, given the information available and the current stage of work.

6.35 Much of the highway works capital infrastructure elements are based in some form on previous work undertaken by TfL. Typical risk contingency applied to construction costs has been in the order of 35 to 40%. This contingency range has also been carried forward into other infrastructure elements where costs have been reviewed and developed from TfL information or informed from cost databases. TfL work excluded utilities and land costs, the latter being consistent with the wider DIFS approach. The work was also caveated that costs could vary by +/- 50%, reflecting the very early stage of work.

6.36 For the purposes of the DIFS work we felt it necessary to apply a further risk allowance for utilities for capital works infrastructure items estimated by the DIFS team and where TfL costs were used, rather than simply exclude this element. This in itself is recognised as a high risk approach, as without detailed information the cost of diverting or protecting utilities to accommodate new infrastructure can be significant and highly variable. It was however thought more appropriate to include some allowance for utilities at this stage.

6.37 Where there was an interface between new infrastructure (as defined above) and existing highway infrastructure a further risk allowance of up to 50% was applied to overall cost estimates. This was considered to reflect a robust position allowing for the potential variability of utility estimates. In other cases where there were no interfaces with highway infrastructure and new infrastructure was being delivered within development areas no further utility risk allowances were added, the

assumption being that site remediation and the absence of interfacing public highway would mean the risk of utility costs would be significantly lower.

6.38 The other particular risk item that was identified as necessary for consideration were the currently unknown factors associated with how level differences would be managed between development and provision of new crossings under or over railways, canals and roads. The team therefore added either £1m, £5m or £10m (per approach) to bridge cost estimates to reflect the management of level differences and associated development interfaces, based on a subjective judgement of the relative degree of complexity.

Social infrastructure and contingency

6.39 Where costed as part of this project, 10% contingency has typically been added to social infrastructure costings. This sum is considered reasonable. Risks are lower than transport projects, because costs can be carefully controlled.

6.40 Where we have been supplied with cost allocations or rough project allowances, we have assumed that contingency is within the figure provided to us.

Utilities and contingency

6.41 Where costed as part of this project, 20% contingency has been added to utilities estimates. Arguments could be made at this stage for including a higher contingency allowance, but this approach puts the utilities infrastructure contingency level between the 10% typically applied to social infrastructure and leisure, and the 35-40% applied to transport.

Treatment of optimism bias and ‘dedicated’ risks

6.42 Attention is drawn to the description of issues for further consideration at the end of DIFS transport chapter. This notes that specific “dedicated” risk allowances have not been made, for example, to account for the logistical complexities and local market conditions associated with the level of construction activity.

6.43 It is important to note that no overarching separate application of an allowance for optimism bias has been made in numbers created for this study. Arguably such considerations are in effect covered through the applied contingencies discussed above.

We have not included land costs – with two exceptions

6.44 With two exceptions, land costs are not included in these calculations. This is because we believe that the inclusion of land costs is likely to make the study less (not more) accurate, for the following reasons.

- When land is needed, its price will vary widely depending on development location and planned use. We cannot be certain what its value at that time and anticipated use is.
- In some instances, land is not needed, because infrastructure will be located on land already owned by the organisation or agency involved.

6.45 There are two exceptions to this general rule. The first is that of the all through school. This is expected to demand 1.5 ha of land. Omitting a potential cost of this scale would make the study less accurate. Land costs have therefore been included in this instance. The second is the cost of the London Overground stations, where we have been asked to use a cost which includes land costs.

6.46 Experience at Vauxhall Nine Elms Battersea suggests that land for sub-stations and pumping stations may also prove expensive. However, it is not yet possible to know who might provide land, and how much it might cost.

What funding for infrastructure might be sought? Our approach

6.47 Our aim in the sections on funding in this report is to show the funding available for the infrastructure at the area.

6.48 We explain our approach below.

Where possible, we assume that mainstream funding is the first funding to be used

6.49 We define mainstream funding as funding provided through the main public service provider organisations, either at local or national level.

6.50 It is the Government's intention to use CIL, S106 and S278 to fund infrastructure *after* sources of mainstream Government support have been identified. We therefore sought mainstream funding for infrastructure in the first instance. (As we will show, though, we were frequently unsuccessful in reliably identifying mainstream funding).

We have suggested that projects are funded in different ways

6.51 We have investigated which projects might be most suitable to receive CIL funding, paid for by a S106 agreement, or come forward as part of a development masterplan. In doing this, we are helping the proposed OPDC move towards the production of a Reg 123 list for the CIL examination, although more work will be needed here.

6.52 The distinctions between the funding categories are not always clean. Our general approach in each case has been as follows.

- Infrastructure assumed seeking CIL funding: these projects are assumed to be strategic in nature, and serve more than one development. These projects deliver the infrastructure seen as important for the overall delivery of the plan.
- Infrastructure assumed seeking S106 funding: these projects should be focused on addressing the specific mitigation required by a new development. S106 projects must be a) directly related to proposed development, b) reasonable in scale and kind and c) necessary to make the development acceptable in planning

terms.[9] We have not formally assessed projects against these tests, but instead used these tests as a general guide to the projects which are suitable for this category. Mindful of the restrictions on pooling S106 contributions, we have generally confined this category to projects funded by a single development only.

- Infrastructure assumed coming as part of a masterplan: this infrastructure would be required of a developer anyway, assuming that the developer was to create a saleable product, but would typically be in excess of what could be absorbed within a typical plot externals budget given the scale or complexity of the project.

6.53 There are unquestionably grey areas between these categories.

- A road through a site might provide both strategic transport links (suggesting CIL), and also allow developers to create a saleable product (suggesting direct developer delivery). One approach might be to attempt to apply CIL funding to pick the "extra-over" cost of upgrading the link for strategic use. This, though, would be a negotiation at a later date, outside this study.
- A developer might wish to develop strategic infrastructure such as a school (suitable for CIL) as part of a masterplan/S106 agreement, because that may give the developer a sales advantage, and provide certainty of delivery.

6.54 We have set out our suggested approach to funding for infrastructure both in the chapters of this report, and in the appendices. However it is important to understand that at this stage, it is not possible to be certain of these categorisations. There will undoubtedly be debate, and this report cannot provide a definitive answer. Further refinements of this work will need to be undertaken before any CIL examination and planning applications. Secondly, we cannot make definitive statements of how available funding should be allocated. This is a decision that should be made by elected members or their officers.

6.55 All categories of developer cost above are taken into account when we undertake viability testing.

Some infrastructure could be paid for through the HS2 petitioning process – but success is not assured

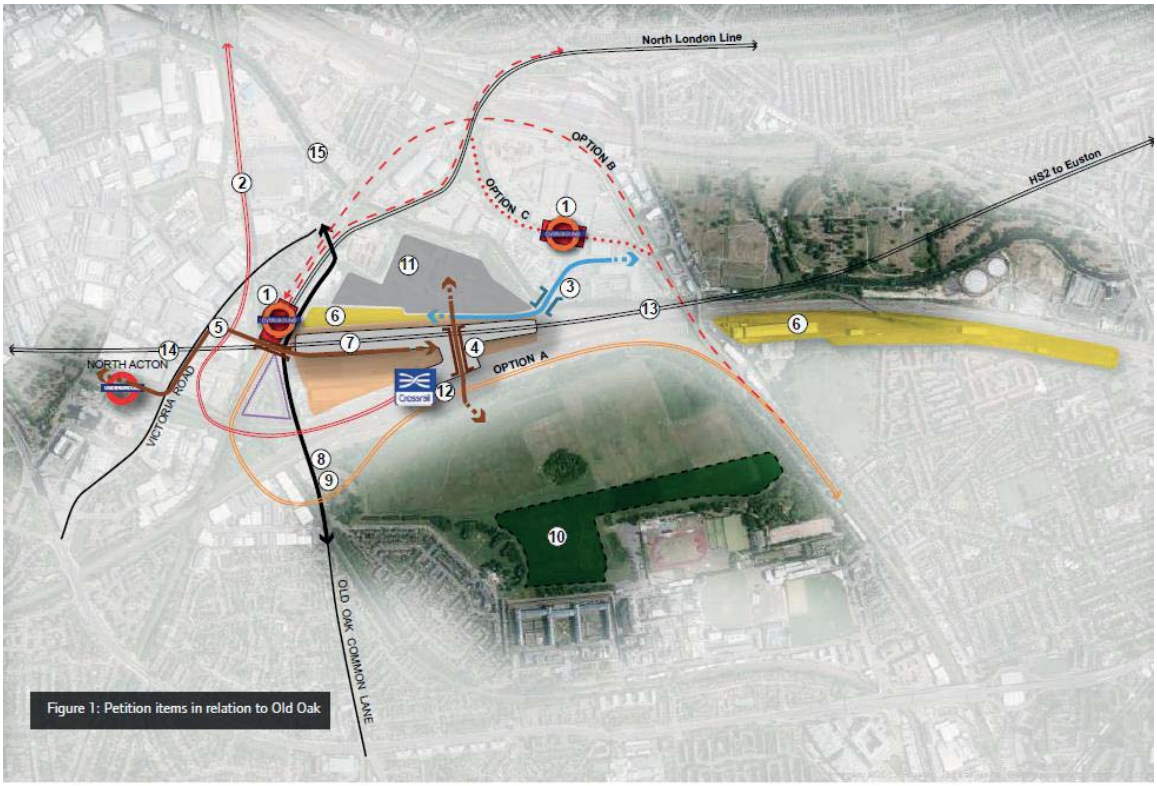
6.56 Petitions on the HS2 hybrid Bill are currently being heard by the House of Commons HS2 Select Committee. The Select Committee is currently considering issues geographically, starting in Birmingham and moving towards London Euston. It is anticipated that petitions on issues relating to Old Oak Common will be heard in summer 2015.

6.57 The GLA has petitioned for various infrastructure items at Old Oak to be paid for as part of the main HS2 project. The petition items are set out in Figure 6.1 below.

[9] These tests are now on a statutory basis under Regulation 122(2) of the CIL Regulations 2010 (continued in the CIL Regulations 2014). Although these Regulations are ostensibly about CIL, they apply to s106 in this instance.

6.58 However, if the HS2 petition is unsuccessful, some of these infrastructure ideas would not be implemented unless other public funding sources are identified.

Figure 6.1 Old Oak Common – all petition items (see key to petition items below)



Source: GLA

Table 6-2 Old Oak Common – all petition items – key to the map above

Spatial Petitioning Items	GLA	TFL	H&F	Brent	Ealing
1 London Overground Stations	x	x	x		x
2 Crossrail Spur to West Coast Mainline	x	x	x	x	x
3 New Eastern Access Road	x	x	x		x
4 North-South Pedestrian Link	x		x		
5 Cycle/Ped Route Old Oak-North Acton	x	x	x		
6 Heathrow Express Depot Relocation	x		x		
7 Old Oak Common Over-Station Development	x				
8 Old Oak Common Lane Closure		x	x		x
9 Bus Service 228 Suspension			x		x
10 Wormwood Scrubs Wetland Habitat	x		x		
11 Impact Crossrail Depot		x			
12 Early Crossrail Delivery			x		
13 HS1-HS2 link provision	x	x			
14 Compensation	x	x		x	x
15 spoil removal by rail / canal		x			

Source: GLA

Our approach to prioritisation

6.59 It is our objective here to prioritise which infrastructure projects are most important in allowing planned growth at the area to take place in a sustainable and well planned way. (Please note that this prioritisation process does not intend to *sequence* infrastructure investments in time order).

6.60 Ultimately, it will be necessary to prioritise both within theme areas (say, prioritising the most important transport projects) and also *between* theme areas (say, deciding to invest in community facilities, rather than transport). There is no definitively right answer here. Whilst these final decisions rest with elected representatives and their officers, it is our role to assist the *process* of making these decisions. We therefore have categorised different infrastructure spending into the following levels of priority, in the expectation that subsequent work, outside our brief, will review the choices made.

6.61 How funding is actually deployed depends on the amount of money that there is available to pay for infrastructure. (Tight budgets would mean that only essential requirements were met; more funding might mean that the other projects were funded).

The prioritisation categories

6.62 We are using the following categories for prioritisation, based on definitions used in previous work for the GLA:

1. Critical enabling. This category includes all infrastructure that is critical to facilitate a development. Without these works development cannot proceed.

2. Essential mitigation. This category includes all infrastructure that we believe is necessary to mitigate the impacts arising from the development. The usual examples of essential mitigation are projects which mitigate impacts from trips or population associated with a development, including school places, health requirements and public transport (service) projects.

3. High priority. This category includes all infrastructure that support wider strategic or site specific objectives which are set out in planning policy but would not necessarily prevent development from occurring, although that would need to be considered on a case by case basis.

4. Desirable. This defines all projects that are deemed to be of benefit but would not prevent, on balance, the development from occurring or from being acceptable if they were not taken forward.

Categories of infrastructure outside our scope

6.63 The following categories of infrastructure are excluded from this study.

- Nationally provided infrastructure (eg HS2, Crossrail, courts, prisons) is outside our scope.

- Privately owned “infrastructure” is outside our scope (eg petrol stations, pubs, post offices). Costs fall on the private sector, and so are excluded from this assessment.
- Care homes. These are excluded from infrastructure costs. Whilst there is an aspiration to support their delivery, care homes are part of a quasi-private market in older peoples’ residential care. Social care budgets pay for some places, whereas others are privately purchased.
- Adult social care. Mainstream budget allocations work on a per capita basis, so that a growing population will be broadly reflected in rising budgets.
- We have excluded some categories of health care from the study, as follows.
    - Acute health care (generally hospital) and community/cottage hospitals. We do not cover these types of provision in this report. The reason is that the ‘development of an area’ is unlikely to be of a scale that would require a major alteration or configuration of acute care services. Incremental change is more likely as the build-out is delivered. Note that in common with a number of state infrastructure providers, acute care provision has funding which adjusts for capitation, so funding should follow population growth.[10]
    - Pharmacies and Optometrists. The NHS does not financially support the initial provision or ongoing costs of pharmaceutical and optometric premises. This is a private sector function and is therefore excluded from our study.
    - Dental Premises. Dentists are contracted by the NHS to provide an agreed level of units of dental activity. For this they receive an income. Running costs are charged against this income.[11]

Caveats attached

6.64 There are a number of important points which must be borne in mind when using this document.

- Infrastructure providers reserve the right to update the information provided. As might be expected, there are some gaps in knowledge and understanding of what is needed and how it might be paid for. Estimates will need to be refined.
- The service providers are at different stages in their planning processes. In many cases further work is needed to identify specific infrastructure requirements.
- The estimates of infrastructure requirements, costs and funding provided here involve generalisation. It is not realistic to match resources, demand and location with the degree of precision necessary to reach perfectly reasoned conclusions on what infrastructure is required on any one given site or with any one service provider.

[10] There are a number of important nuances here, though - there are a number of other factors involved in the funding formula, such as clinical activity rates and deprivation.

[11] However, NHS can financially support the business rates for dental practices, the level of which is linked to the practices percentage of NHS work.

- This infrastructure assessment is not itself a policy document. Information included in the assessment does not override or amend the various agreed/adopted strategies, policies and commitments which local authorities and other infrastructure providers currently have in place.
- Our assessment of potential developer contributions from potential future development in the area does not purport to offer a valuation of any particular piece of land. They were prepared with the objective of estimating potential overall levels of contributions that could be secured from development to help fund infrastructure. They are not suited to any other purpose.
- Although this work can be used as a high level guide, developers and Local Planning Authorities will not be able to solely rely on this work to negotiate individual Section 106 agreements. Our analysis is not at the level of accuracy that allows this function to be performed.
- Further work after this study has closed will be necessary to refine infrastructure priorities.
- It will be important to allow sufficient flexibility around funding. In the case of the CIL or S106, for example, there may be changes to the way that these policies are used to pay for different infrastructure items that differ from this report.
- This report may make assumptions about how projects are funded. For example, it may assume that some projects are included as seeking CIL or S106. However, as projects proceed through the planning process, these projects may be sought as part of typical externals budgets, and thus receive no funding or offsetting allowance in viabilty calculations for S106 or affordable housing. This is an area-wide report which does not attempt to determine these matters, which will require site-by-site negotiation.
- Our analysis says nothing about whether a five year supply of housing is available. This would need to be determined separately.

7 TRANSPORT

Introduction

7.1 Here, we assess the transport requirements of growth at Old Oak Common.

7.2 We then look at the cost and prioritisation of that infrastructure (in terms of a phasing strategy), and how that infrastructure might be funded.

7.3 It is important that public transport, walking and cycling improvements are in place ahead of development so that early residents are not forced into car dependency, creating habits that are then hard to break.

7.4 It is important to note that the costs included in this report are likely to vary as detailed plans and development proposals emerge.

Project summary

7.5 The table below summarises the projects costed in this chapter, with their delivery phase and currently assumed priority. Additional detail is available under separate cover. The appendix provides colour coding to indicate the level of certainty we attach to each costing.

Table 7-1 Summary

About the infrastructure project	Infrastructure needed in which phases?	What priority attached?	Gross infrastructure cost (£000s)
T1 - A219 Scrubs Lane/Hythe Road Access Junction.	Phase 1	1) critical enabling	10,000
T5/6 - A219 Scrubs Lane/ Access 2 & Scrubs Lane Re-alignment.	Phase 1 and 2	1) critical enabling	11,000
T11 - Internal junction within Car Giant E & W - three arm roundabout on internal link road.	Phase 1	1) critical enabling	2,200
T8 and T10 - Internal junctions within Car Giant North.	Phase 3	1) critical enabling	7,700
T7 - New railway crossing over or under freight line and associated east-west link for new access on to Scrubs Lane.	Phase 2	1) critical enabling	25,000
T9 - Improved underpass under West London Line - links Hythe Road through to new access road from Scrubs Lane.	Phase 2 and 3	1) critical enabling	13,000
G6 -Ped/cycle link under West London Line and potential new West London line station.	Phase 1 and 2	1) critical enabling	13,200
T18 - Old Oak Common Lane (TfL 'Access Road 4') is a new link road running east-west through Car Giant East and West site.	Phase 1	1) critical enabling	8,000

About the infrastructure project	Infrastructure needed in which phases?	What priority attached?	Gross infrastructure cost (£000s)
T17 - Western Canal Crossing - links to Access	Phase 1 and 2	1) critical enabling	10,200
T16- Old Oak Common Lane junction to East-West Access link.	Phase 1	1) critical enabling	4,500
T12 Old Oak Lane improvement scheme. Scope to be confirmed. G11 junction dealt with separately.	Phase 2	2) essential mitigation	10,000
G11&12 - Access Roads to site 7 Willesden Junction homes and jobs.	Phase 2	2) essential mitigation	10,000
G5 - Willesden Junction bridge. Pedestrian & cycle bridge across WCML (Link from EMR to Willesden Junction Station).	Phase 1 and 2	1) critical enabling	40,000
T-STA - Willesden Junction Station Capacity Improvements.	Phase 2	1) critical enabling	60,000
T-STA - Two new stations on London Overground - assumed to be one new station on each of the North London Line (which is the westerly station) and West London Line (which is the easterly station).	Phase 1 and 2	1) critical enabling	260,000
T-STA - North Acton Station Capacity Improvements.	Phase 1	2) essential mitigation	20,000
G20 Pedestrian/Cycle link between HS2 and North London Line station.	Phase 2	1) critical enabling	8,000
G101 - Pedestrian/Cycle link between Victoria Road A4000 and North London Line new station.	Phase 4	3) high priority	4,000
T52, T22, T29 - Victoria Road widening to Old Oak Lane and low rail overbridge headroom increased.	Phase 2	1) critical enabling	50,000
T30/59 & G100. G100 is the pedestrian link from HS2 to West London Line overground station. T30/59 is the vehicular Eastern Canal Bridge, including a link from Hythe Road to HS2 hub.	Phase 1 and 2	1) critical enabling	91,000
T24 - Junction between Old Oak Common Lane and new Link Road.	Phase 4	1) critical enabling	6,000
G26 - East / West Road. Access road runs right through the IEP Depot site 17.	Phase 4	1) critical enabling	10,000
G27A - Concourse link to Wormwood Scrubs.	Phase 2	1) critical enabling	20,000
G27B - Concourse link to Wormwood Scrubs (CIL element).	Phase 4	1) critical enabling	11,000
T32 Access to sites 18 Mitre Bridge and site 19 North Pole East.	Phase 2	1) critical enabling	9,900
Mini-Holland standards adopted across the OOC core area.	Phase 1, 2, 3, 4	3) high priority	15,000

About the infrastructure project	Infrastructure needed in which phases?	What priority attached?	Gross infrastructure cost (£000s)
G25 - Pedestrian and cycle bridge across Grand Union Canal.	Phase 2	1) critical enabling	10,200
G104 - Pedestrian Link under North London Line. Links to G107.	Phase 4	3) high priority	11,000
G105 - internal roads accessing Powerday. Also provides access to EMR Site 12 and Car Giant North 11.	Phase 4	1) critical enabling	3,000
G106 - EMR tranche - internal roads for EMR Site 12 and Car Giant North Site 11.	Phase 2	3) high priority	1,500
G106 - Car Giant North tranche internal roads for EMR Site 12 and Car Giant North Site 11.	Phase 2	3) high priority	1,500
G102 pedestrian links under railway	Phase 3	2) essential mitigation	10,500
G107 pedestrian route associated with G104. This does not include crossing costs.	Phase 4	3) high priority	2,000
G103 Second pedestrian Crossing Link to Wormwood Scrubs.	Phase 4	4) desirable	18,750
High level assumptions for cycle hire; Legible London wayfinding and signage; nominal allowance for additional bus infrastructure at Overground stations.	Phase 2, 3, 4	2) essential mitigation	7,000
Bus operating revenue support for new services and compensation during construction.	Phase 2, 3, 4	1) critical enabling	53,250
Spur connect Xrail to West Coast Mainline. The cost presented includes spur enabling works. Further WCML upgrades are not included.[12]	Phase 2 and 3	1) desirable	225,000
A40 junction improvements. This is a contribution to a much larger package of measures addressing congestion on the A40. Costs will be refined following further TfL study.	Phase 1, 2, 3, 4	3) high priority	12,000
Wider area junction improvements (excluding A40 junction improvements)	Phase 1, 2, 3, 4	3) high priority	21,000
Total			**1066400**

[12] This cost is only for the physical works to make the connection to the WCML. It does not include optimism bias; does not include costs for the related supporting rail infrastructure required further up the WCML; and does not include operational costs.

Method

Stakeholders were interviewed and documents reviewed

7.6 We have reviewed a number of reports and supporting information sources. We met relevant stakeholders, most notably Transport for London (TfL), Network Rail, DfT and the High Speed 2 (HS2) team.

The TfL Strategic Transport Study has been used

7.7 Whilst there is no single source of definitive information, TfL have produced a comprehensive Strategic Transport Study, working in partnership with the GLA and the London Boroughs of Hammersmith and Fulham, Ealing and Brent.

7.8 The TfL Study provides an evidence base for transport infrastructure proposals included within an Old Oak to realise the delivery 24,000 new homes and 55,000 jobs. It responds to both HS2 and Crossrail major transport infrastructure, both of which are major drivers of change within the Old Oak Area.[13] This study included a list of costed transport interventions. Supporting information for related highway interventions was produced by Steer Davis Gleave in January 2014.

7.9 There may be smaller scale transport infrastructure improvements needed within Park Royal that have not been identified by this study. A more detailed transport study for Park Royal will be undertaken by GLA/ TfL.

Client team views were incorporated, and landowner views sought

7.10 The views of the project team and various landowners were sought. This has been captured through internal briefing notes produced through the study which have informed the commentary that follows, and particularly the prioritisation and phasing of transport infrastructure.

We used a variety of cost estimates and funding assumptions

7.11 Costings have come from various sources, including the TfL Strategic Transport Study; work undertaken by Steer Davis Gleave for TfL; GLA officers; and direct from TfL. The basic premise has been that previous cost work has been checked and validated outside this study. In some instances, though, established available cost information has been reviewed, with particular scrutiny given where information has been used as a basis for costing other infrastructure. Where necessary, the scope of costings have been investigated in order to clarify high level assumptions.

7.12 In a large number of instances, Gardiner & Theobald cost consultants arrived at estimates in liaison with the PBA team. Where appropriate, reference to a number of sources of information has been made in order to build up costs, where infrastructure

[13] Version 0.1.9 “Draft for DiF” (6.8.14) provides a key reference document for the DiF study, and relevant summary extracts are included where considered appropriate

has not previously been costed. This has included a mix of experience, rate databases and knowledge of the cost of delivering similar infrastructure.

7.13 Costs associated with canal towpath improvements are considered in the Green Infrastructure section of this report.

7.14 Costs have been set against possible funding sources. Main assumptions have been noted separately within the detailed costing spreadsheet.

Transport context

Transport demand in the area will rise strongly

7.15 The two most significant drivers of change for OOC will be the arrival of HS2 and Crossrail 1 services through the introduction of a new station at Old Oak from 2026, and the regeneration of the area facilitated by the Vision and forthcoming planning framework. This new interchange station will be located in zone 2/3.

7.16 The combination of new homes and jobs growth, HS2 passengers, and background trend rises in transport demand places will add to the existing pressure on the transport network in the area, both at the strategic and local level.

The TfL Transport Strategy responds to rising demand. A shift away from car dependency is required

7.17 TfL's transport modelling shows that the only way of coping with the level of jobs and housing growth sought is to make a significant shift away from car use. This includes ensuring consideration of servicing and related freight movements is fully integrated into the strategy from the outset.

Walking and cycling will be a fundamental way to relieve demand pressure

7.18 Given the large number of people moving in the area, it is vital to relieve pressure on transport capacity and connect key origins and destinations to sustainable modes, by encouraging high levels of walking and cycling. This also aligns with the Government's efforts to promote healthy New Towns.

7.19 This will be assisted by building high quality public spaces, complimenting development and providing an external environment people want to be in. This would include wide pavements, dedicated cycle ways, safe crossing points, high quality lighting, good signage and design approaches which robustly consider safety and security. There is a strong aspiration to deliver a high quality walking and cycle network based on the principles of a cycle mini Holland scheme.

7.20 People have a strong tendency to want to walk in the most direct route so it is important to provide new links under or over the railway lines and over the canal to minimise the deterrence of these barriers to movement in the area. Where possible early delivery of such elements will help set a precedent for sustainable modes.

Rail and bus will play a major role

7.21 Rail integration will be critical. The TfL Transport Strategy includes a number of proposals that will ensure that the planned transport super hub will function as both major interchange for HS2, Crossrail and the Great Western mainline and provide strong connectivity with other rail services within the area, including the London Overground and Underground lines and the West Coast Mainline.

7.22 Buses will also perform a vital role in distributing people close to their doorstep, office or retail destination. New bus routes can provide direct links in from other parts of London on corridors not served directly by rail or underground services, and ensure that the surrounding residential areas benefit from the new opportunities brought by development.

7.23 Consideration will need to be given to getting the right balance between the needs of cars and other surface modes such as buses. More work is required to identify the scope and extent of improvements needed.

Road junction improvements will be required

7.24 With the large scale of development there will also be a considerable increase in both the demand for travel by bus and deliveries. This, coupled with existing and future area wide network congestion pressures and an (albeit limited) increase in car trips, improvements to the highway network and junctions, both within the OA and in the wider surrounding area, will be required in some form.

Transport provision is complicated by severance issues

7.25 The core study area suffers from a significant degree of severance presented by linear features such as the railway network and the Grand Union Canal. Transport infrastructure proposals will need to take this into account. Overcoming these issues frequently requires costly infrastructure provision.

Transport requirements are determined by development phasing

7.26 The Old Oak Vision document suggested that the early stages of development will be concentrated in the North Acton area and Old Oak North (the area to the north of the Grand Union Canal), but the TfL strategy is flexible due to the need to remain responsive to change.

7.27 Some major dates have been taken into account.

- The delivery of development in the Old Oak South area is reliant on the timetable for the delivery of the major transport hub at Old Oak Common. The transport hub will not be delivered until 2026 at the earliest.
- The strategy regarding the rail depot sites is also critical to development phasing, particularly the Crossrail depot site at the core of Old Oak Common south. At a practical level current physical severance will also be a particular phasing consideration for the delivery of transport infrastructure.

What are the infrastructure requirements arising from development? What are the costs?

7.28 We have set out our approach to costs in paragraph 6.21 onwards. We liaised with TfL to use some of their research on some costings, whilst also using the expertise of the Gardiner & Theobald members of our project team. Costs were not produced with the direct involvement of DfT or Network Rail.

Rail capacity improvement projects have been costed

7.29 The following projects are proposed. Each is included in our numbers.

- Willesden Junction station capacity enhancements.
- North Acton station capacity enhancements.
- Provision of new Overground station(s) on the North London and West London lines. Three station options are under consideration currently and are subject to a GRIP Stage 3 report, yet to be produced. For the purposes of this study we have assumed that Option C (the provision of two new stations) will be chosen. .[14] Should a different London Overground option be taken forward then those costs would have to be included in the overall list of infrastructure costs and the costs would change accordingly.
- Pedestrian and vehicle links between Victoria Road, the HS2 station and the new West London Line station have also been included and to Wormwood Scrubs

7.30 It is also noted that there are committed Overground rail capacity enhancements, increasing train length and frequencies to improve capacity on the Overground network, to a maximum considered currently achievable when considering other line constraints. The costs of this committed scheme are not included in this study.

Costs associated with delivering HS2 and Crossrail have not been included, but we have included the Crossrail to WCML spur in our gross costings

7.31 In line with our general principles set out in Chapter 6, costs associated with delivering HS2 and Crossrail stations and track have not been included.

7.32 We have included the potential Crossrail to West Coast Mainline spur in the gross costs, on the basis that this provides a better picture of required investment in the area, but the project is not actually related to achieving growth plans at Old Oak.

[14] The TfL Transport Study to date has used and considered option A (a new station on the North London Line, as reflected in the current Old Oak Vision), which is the previously reported position. It is acknowledged that the preferred option may change. Discussions during this study have noted that option A potentially delivers the best pure transport solution especially in respect of interaction with HS2 and Crossrail. It is expensive in relative terms and has a number of deliverability challenges. An option to create both a new over ground station on the West London Line and one on the North London Line is seen by the project team to offer more potential in terms of greater permeability and rail accessibility in terms of the area wide regeneration. The indicative cost of this option (C) is significantly less than Option A.

7.33 This project allowing Crossrail trains to run on the West Coast Mainline, and will be potentially able to connect trains running from Tring in Hertfordshire into the central London network.

7.34 We have assumed costs of £200m and the enabling works at £25m. These costs are based on broad estimates for an above ground option. This cost is only for the physical works to make the connection to the WCML. It does not include optimism bias; does not include costs for the related supporting rail infrastructure required further up the WCML; and does not include operational costs. It is recognised that these costs may alter as more detailed work is carried out by TfL. If a tunnelling option proves to be necessary, early indications are that a £450m cost could be incurred.

We have allowed for the costs of relocating IEP and Crossrail depots. Costs are found from the land value, and are not seen as a separate project

7.35 The full or partial relocation and/or reconfiguration of the Crossrail depot (and, in the longer term, the IEP Depot) will be necessary to secure the comprehensive regeneration of the Old Oak area. If we are unable to deliver large scale regeneration of this land, then this failure will have a significant impact on the Mayor's vision for the area.

7.36 The DIFS has been progressed in advanced of a finalised solution for these sites, and as such is based on a set of assumptions. It must be recognised that the assumptions made about depot relocation are unlikely to reflect the true costs which could vary from those assumed here. As feasibility work is progressed it is likely that these assumptions will change and this will affect viability. The DIFS has assumed:

- That there is a cost of £300m at the Crossrail Depot site, and a cost of £150m at the IEP site. (This takes into account potential construction cost plus a risk allowance).
- That the relocation would be to alternative public sector owned piece of land so no land costs have been taken into account.
- That the cost of securing the full or partial relocation and/or reconfiguration of both depots would be borne by the development value of this land. As such when the final attributable costs are identified then this cost will need to be factored into the development costs for the land. We have taken this approach in order to replicate the process that a commercial developer would undertake.

7.37 This is perhaps a bold assumption to make given the unknown relocation costs of the depots and sidings. Further work will be necessary to understand the exact relocation costs for the depot and sidings once the depot feasibility study has concluded.

New bus capacity has been costed

7.38 The need for more bus capacity will arise even without planned development. The need will be much more acute with the development. New routing through the site needs to be developed on a phased basis.

7.39 We have included the following.

- We have made nominal allowances for additional bus standing areas / driver welfare facilities. Particular arrangements at future Overground stations will require further consideration.
- Operating (revenue support) costs provided by TfL have been included to reflect the need to establish and support new routes as early as possible to maximise use. This recognises that routes would take time to become commercially viable.
- Cost is also assigned to bus disruption during construction, recognising the possible need for more vehicles to maintain timetables during construction activities that impact on the local road network.
- The operating costs are based on some preliminary work by London Buses, which identified a possible future bus network post completion of all proposed development in the scope of this study. This end state identified the potential provision of three new routes and changes / extensions to three existing routes. Interim network phasing was not considered in detail and assumptions were therefore made on a profile for revenue support over the development phases.

7.40 Bus depot capacity may be a future consideration but no specific cost has been attributed to this currently. New canal bridges (east and west) are being promoted to enable bus routes to connect/permeate through the whole site. These have been costed separately.

Bridges and underpasses have been costed

7.41 Bridges and underpasses across existing barriers to movement will encourage walking and cycling, and provide essential connections and vehicular routes.

7.42 These infrastructure elements have been costed.

- Additional pedestrian/cycle bridges have been included, as these would ensure connectivity with adjacent development sites where existing barriers are present. There would be considerable time savings for pedestrians and cyclists and they would be experiencing a far more pleasant environment than that currently provided.
- A bridge from Old Oak North to Willesden Junction Station has been costed as part of a strategic spine of pedestrian and cycle connectivity. This bridge has been assumed to be a flagship 20m wide pedestrian and cycle bridge. Should the need for a bridge with bus access be required then this would be likely to increase costs, but there would be public transport improvements delivered as a result. This bridge would need to be delivered in association with works to improve the capacity of Willesden Junction.

- The tow paths on the Grand Union Canal are currently well used for walking and cycling, but the current environment needs improving to attract and cater for greater numbers. Tow path improvements have been costed as part of the green infrastructure section of this report.

7.43 In association with highway improvements noted below other bridges / underpasses are necessary to complete essential links for all transport modes. Key needs have been identified.

- A direct all-mode link from the east of the HS2 transport interchange connecting to Hythe Road and a dedicated pedestrian route to the new North London Line Overground station have been included. It is assumed that the associated cost is met through HS2, via the petitioning process, but it is important to point out that success in the petition is not certain. If the petition is unsuccessful, costs would have to be met in other ways, including CIL, S106 or government grant funding or borrowing.
- Significant feasibility work has also been undertaken by HS2 and TfL in relation to the provision of an unpaid pedestrian link across the transport super hub providing access to the green space in Wormwood Scrubs. The costs for this are assumed in part to be met through HS2, again via the petitioning process.
- The provision of an eastern pedestrian route (across the railway to Wormwood Scrubs) is essential and so a development specific cost has been included.

7.44 Transport infrastructure land take and ground levels will need to be carefully considered throughout the master planning process. Whilst robust cost allowances have been made at this stage this item has the potential for cost implications and variability.

Highway works have been costed

7.45 Work undertaken by TfL has included extensive evaluation of the performance of the highway network as a result of the end state of the proposed new Old Oak development, compared to a 2031 reference case. The reference case model provides a baseline which excludes development related growth at Old Oak (but includes funded and committed schemes as outlined in TfL's business plan). This evaluation, which has not yet considered phasing implications, provides demand for the eastern and western highway connections, and takes account of tidality (varying transport flows by time of day) and the impact of location of residential and commercial development. Work has included a number of sensitivity tests and select link analysis to understand how both the local and wider network responds to the demands of new development.

7.46 We do not intend to repeat the detail of this work here. The result of this work for the network local to Old Oak Common included a prioritised highways interventions list provided by TfL. These interventions (and their costs) have been included in our costings.

7.47 Considering the wider highway network, congestion may adversely affect the ability of the network to deliver new traffic to and from the proposed developments if not upgraded. This congestion takes place even under high public transport share conditions.

7.48 In addition to the preferred package of interventions, the Transport Study has also identified a number of areas where additional work should be undertaken in collaboration with stakeholders in order to further facilitate the planned development of the area. This included a review of what major junction / capacity improvements may be needed on the strategic road network including the A40 Westway, Hanger Lane Gyratory and the A406 North Circular to reduce the traffic impact. It is understood this work is underway but will not report in within the timeline of the conclusion of the DIF work. In the absence of defined schemes a judgement was made on an appropriate associated cost allowance to include within this study. The TfL Strategic Transport Study highlighted 11 locations (including four junctions on the A40) that would experience increased congestion and so a nominal cost of £3m per junction has been included. In reality a package of more costly interventions in the A40 corridor is likely to be required and so the £3m per junction would only provide a contribution towards mitigation costs. I It is recognised that the final road solution may need to be more ambitious to address road congestion along the A40 and TfL are currently progressing this and this will feed into future work for Old Oak and Park Royal.

7.49 The absence of information in this instance indicates a very low degree of cost certainty associated with this element and thus significant potential for costs to vary going forward, particularly if third party land is required. These costs will only be understood further when informed by ongoing work. For the purposes of costing infrastructure within the DIFS work, assumptions were agreed with TfL.

7.50 Integrated within highway network improvements are specific and committed highway improvements resulting from the new HS2 railway infrastructure. This includes new junctions providing access to the station interchange and a number of significant improvements to Victoria Road which are considered to deliver improvements also appropriate to the redevelopment of the Old Oak area. Costs for these elements are included but are allocated to HS2.

A “mini-Holland” approach to cycling has been costed

7.51 The Old Oak development is a significant opportunity to implement the Mayor's vision for cycling. The vision aims to achieve four key outcomes:

- A network of direct, high capacity, joined-up cycle tracks, many of which run in parallel with key underground, rail and bus routes.
- Safer streets for the bike. London's streets and spaces will become places where cyclists feel they belong and are safe. Spending will be targeted to deliver substantial improvements to the worst junctions and a range of radical measures will improve the safety of cyclists around large vehicles
- More people travelling by bike.

- Better places for everyone. The new bike routes are a step towards the Mayor's vision of a 'village in the city', creating green corridors, with more tree-plantings, more space for pedestrians and less traffic.

7.52 At the moment, it is difficult to estimate the cost of this provision. We have some precedent to guide us. In spring 2014, Enfield, Kingston and Waltham Forest boroughs were selected for full mini-Holland status, each receiving up to £30m for changes in and around their town centres. We have allowed a lesser amount at Old Oak, because:

- Costs may be lower if provision is designed in from the beginning of development, rather than being fitted retrospectively; and
- Both the Green Cross route discussed in the open space chapter of this report and the assumed infrastructure connections costed in this section will also provide for some cycle-ready infrastructure.

7.53 In addition to the above an allowance for establishment of cycle hire at Old Oak Common has been included as has legible London signs throughout the area. The assumed level of docking station provision for the Old Oak area is that similar to the Canary Wharf area.

Some smaller infrastructure requirements will need to come through planning permissions and the design process. These have not been costed here

7.54 Several key land-related aspects of a transport strategy for development at Old Oak will require robust and integrated consideration in the continued development of the master plan. These elements are seen as being captured through necessary developer compliance with relevant design standards.

7.55 Because these are generally matters of ensuring quality design, these elements are have not been costed within this study. Particular considerations include:

- Ensuring accommodation of adequate pedestrian and cycle infrastructure requires cycle parking areas, good sightlines and high quality public realm;
- Adequate space for specific transport services relating to the mobility impaired;
- Inclusion of taxi rank and drop off facilities at key locations; and
- Electric vehicles charging points.

Demand management through ‘smarter choices’ will be critical, but we have not costed them separately

7.56 There is a growing evidence base that it can be more cost effective to influence the level of demand for transport in an area rather than fully increasing the level of capacity of the transport network.

7.57 Demand influencing techniques can have an important contribution to make to the level and type of travel demand generated by development. The increasing use of travel planning and “softer measures”, often identified as “Smarter Choices”

techniques, offers a proven, cost effective method of maximising access and travel opportunities without increasing traffic impacts. A programme of 'smarter' travel measures would include personalised travel plans for residents, work place travel plans and other interventions to encourage car sharing, walking and cycling. In London TfL has supported a number of comprehensive Smarter Travel initiatives. Such projects have been previously implemented in Sutton and Richmond, for example.

7.58 This thinking could be applied effectively at Old Oak. Some funding of projects could be delivered as part of TfL's Smarter Travel programme and this matched by individual development sites contributions. These might include car sharing schemes, incentivising sustainable transport, and information boards within housing complexes.

7.59 In order to maintain the efficacy of a package of 'smarter choices' measures, the programme will require sustained and energetic action over time in the area, especially if there is a turnover of residents and employees in the area.

7.60 In discussion with TfL, costs associated with the 'smarter choices' initiatives in the area are anticipated to come through normal development processes and so have not been specifically included. Further thought may be required on whether additional costs should be included in light of the "max PT" transport approach.

When is infrastructure required?

7.61 Only the end state transport demand in the area has been modelled in the TfL Transport Strategy, so no modelled details are available of demand at particular points in time during the delivery period.

7.62 Although these issues reduce the certainty with which the transport model numbers can be used to ascertain exactly what transport provision will be required, it is possible to interpolate infrastructure requirements to arrive at a sensible estimate of when projects will be required. This interpolation is dictated by

- the logistics of construction and operational access;
- when development sites come forward;
- flexibility to manage impacts of surrounding development;
- railway depot relocation and requirements before and after 2026, when the major new rail infrastructure becomes operational; and
- consideration of issues that relate to optimising the value of development.

7.63 There are obvious tensions between some of the above objectives, and a natural tendency to front-load infrastructure requirements.

7.64 The current (GLA baseline) phasing schedule provided has been used as the basis of this work to date and a graphical representation of the infrastructure phasing can be seen in the Figure 7.1 and Figure 7.2. Phasing considerations have been identified graphically in terms of pre and post HS2. Costs have been put to timelines within the costing spreadsheet. Appropriate phasing considerations are noted in the detailed spreadsheets.

Figure 7.1 present day to 2026 transport plan and scheme list (scheme reference numbers cross refer to the summary table)

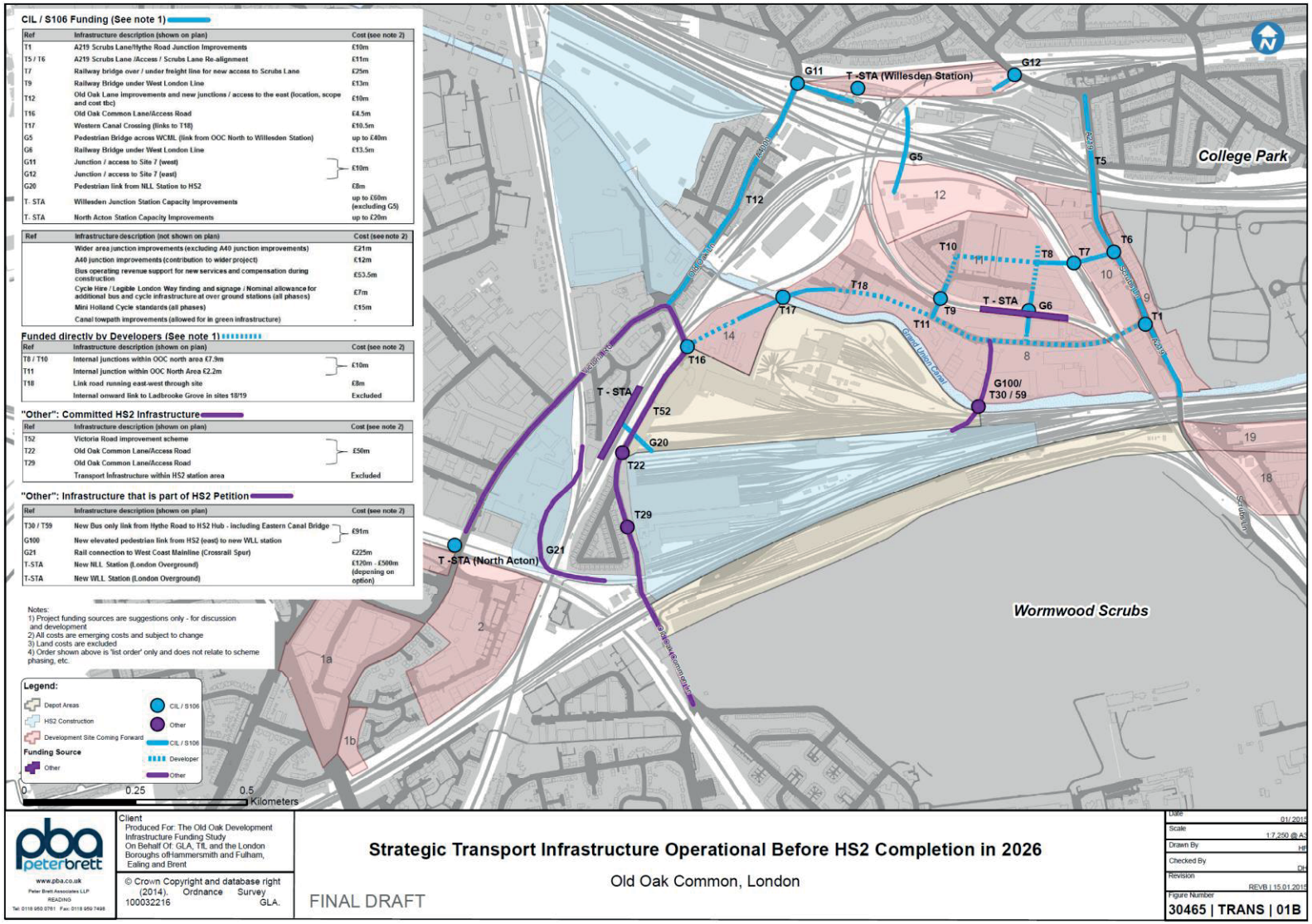
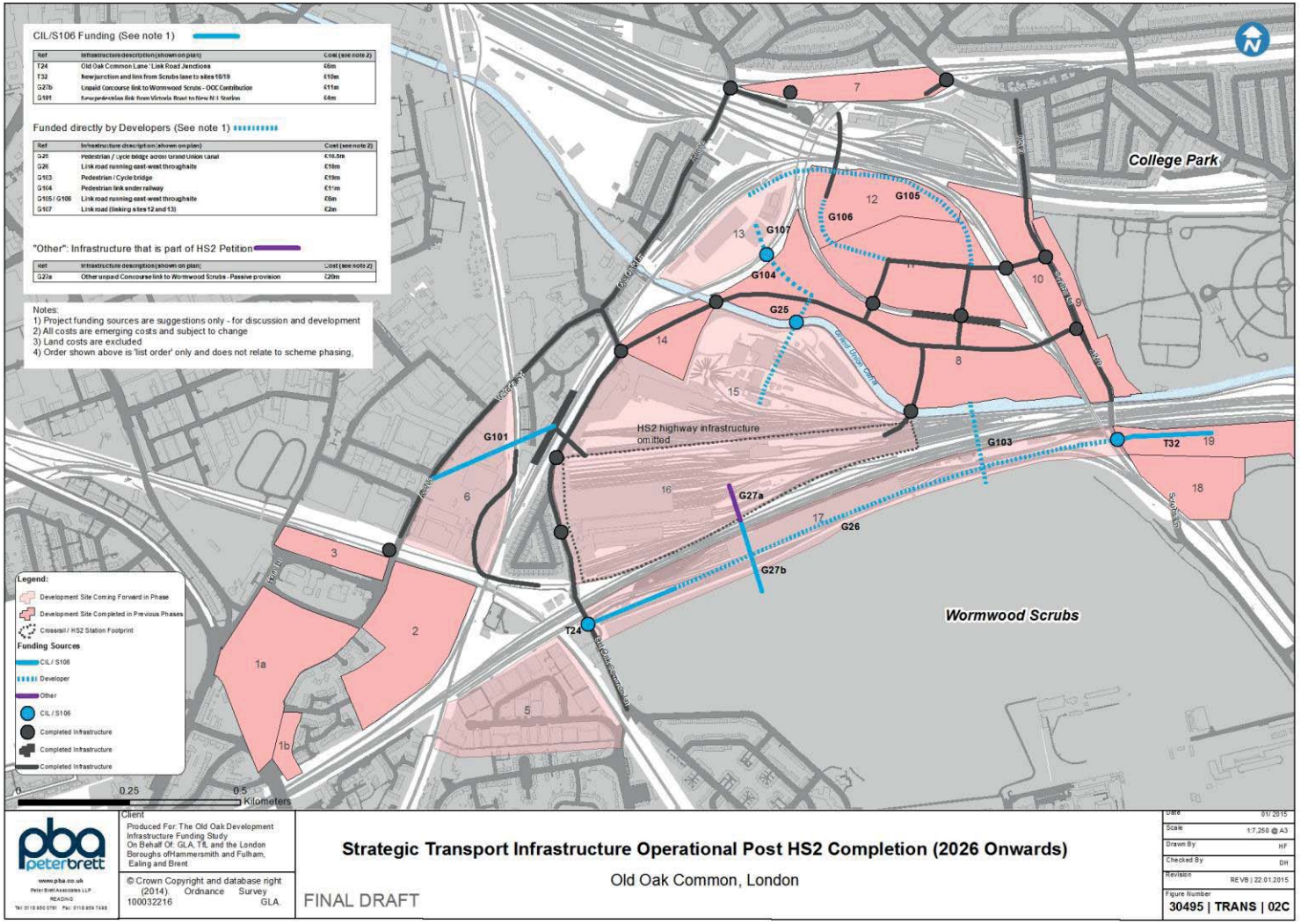


Figure 7.2 2026 to 2050 transport plan and scheme list (scheme reference numbers cross refer to the summary table)



One key consideration is the delivery of the Old Oak Common HS2 station

7.65 The HS2 station will not be operational until 2026 at the earliest and there will be major disruption during the construction phase of the station, HS2, Crossrail and related infrastructure. From existing HS2 proposals it is evident that there is significant work planned to Old Oak Common Lane to facilitate appropriate construction access. As a result it is likely that facilitating early access to the development sites from the east, via Scrubs Lane would be an ideal approach to maximise access flexibility.

7.66 As a general principle it is recommended that, where possible, those measures which support non-motorised modes of travel and smarter choices measures are provided in early stages. This will encourage the early adoption of more sustainable travel modes and assist in easing people's journeys while the construction works associated with the highways schemes and the Old Oak Common station are in progress. These will inevitably cause temporary increases in congestion and travel times by car and on buses.

7.67 The bus network can be increased in line with development. The delivery timescales of development in the Old Oak Common south area is tied in to the delivery of the Old Oak Common station transport super hub and the Crossrail depot strategy.

How can infrastructure be funded?

Provision through masterplans and site specific S106/S278 contributions will play a significant role

7.68 We expect significant amounts of provision to result from individual masterplans and through S106/S278 agreements on a site by site basis. Some projects are likely to seek CIL funding. These tend to be the strategic, cross site projects. We explain our approach to these funding streams in paragraph 6.51.

7.69 Should the proposed OPDC be established, a key part of its work will be related to securing funding to deliver the necessary pieces of infrastructure as set out in the DIF. We set out these more innovative funding streams in Chapter 24.

Innovative funding could have significant role

7.70 At Vauxhall Nine Elms Battersea, the Northern Line Extension (NLE) has been part funded using Tax Increment Financing. An Enterprise Zone (EZ) has been set up at the site in order to maximise the ability of TIF to capture business rates uplifts. The EZ will be created from 2016.

7.71 A similar approach to the funding of major transport infrastructure could be taken at Old Oak. We discuss this further in Chapter 24.

Issues, dependencies and barriers to growth

7.72 A number of issues are likely to need close management in future.

- Flexibility is critical if values are to be maximised. Delivery of transport infrastructure that realises early development value (and also facilitates minimum construction impacts on both new and existing communities) is key to viability. The situation is dynamic and strategy is being regularly challenged through the continuing development of stakeholder discussions, landowner interests and further work. The approach to infrastructure delivery must therefore remain as flexible and as responsive as possible.
- The *construction* impacts of HS2 and a new Crossrail station and depot represent a major and lasting transport impact in themselves. However, they are not yet fully understood. As more details emerge they are liable to significantly influence phasing. A pivotal influence on development phasing generally will be the date of completion of these major infrastructure works. This poses a threat to realising early development value, particularly if construction impacts pose a lasting and significant nuisance to residents or businesses. Development phasing and transport strategy needs to recognise this. We recommend that where the opportunity arises, development phasing to the east of the site should be reviewed, and should seek to maximise eastern site access flexibility as far as possible.
- Crossrail and IEP depot and depot relocation strategy has a particular impact on both development and the provision of transport infrastructure.
- Procurement strategies for early transport infrastructure will need work to ensure the right teams and resources are in place to facilitate timely delivery. This is especially relevant in the context of possible local / regional scarcity of some resources due to the anticipated concentration of construction activity within the Old Oak Area. Examples of this include influencing the early design of HS2 highway infrastructure (such as the Old Oak Common lane access) to ensure it is fit for purpose for the development as a whole. Some infrastructure elements will also have long lead in times, for example to identify and plan for rail possessions and secure other stakeholder approvals. Associated risks and timelines will require consideration alongside procurement strategies. Working with Developers as part of this process is important.
- Utility strategy and transport strategy will be interdependent, because transport infrastructure will frequently create the development arteries into which new services and supplies can be integrated. Early infrastructure coordination will assist in managing risks and identifying opportunities. The cost of utility diversions, required to accommodate new infrastructure, is also relevant to this integration as costs for utility diversionary works carries a high risk of significant variation until detailed liaison with Stakeholders has taken place and specific proposals developed.
- The use of soft measures to complement the hard infrastructure provision for pedestrians and cyclists in the area will improve the use made of these modes of transport. A Smarter Choices package should be introduced and maintained through the plan period to provide personal and workplace travel advice and pro-actively promote healthy travel patterns including walking, cycling and the

avoidance of unnecessary trips. An on-going programme to promote smarter choices will require revenue funding.

- Detailed engagement with local communities and stakeholders is necessary during the construction process to help mitigate construction effects.
- The HS2 petitioning process is ongoing. The outcomes may affect the funding assumptions made in this study. The petition may not be successful.

8 EDUCATION

Introduction

8.1 This chapter deals with early years and school age educational infrastructure.

Project summary

8.2 The table below summarises the projects costed in this chapter, with their delivery phase and currently assumed priority. Additional detail is available under separate cover.

Table 8-1 Summary

About the infrastructure project	Infrastructure needed in which phases?	What priority attached?	Gross infrastructure cost (£000s)
1FE expansion of existing primary school will be required - 210 pupils. If required, we have made the conservative assumption that some expansion capacity of existing schools to the north of the area will be required. Schools affected unknown. Expansion may not be required if north - south travel plans across canal are provided - this is currently under consideration by LBHF.	Phase 1	2) essential mitigation	4,500
New two form entry primary school - 480 pupils based on pupil yield. Could be located around North Acton. A specific site is to be confirmed.	Phase 2	2) essential mitigation	8,300
2 FE expansion to secondary school - 300 pupils. Officers would need to make further assessments to be sure how and where this takes place.	Phase 2	2) essential mitigation	9,800
All through school - 4FE Primary, 4FE Secondary, Early Years and Sixth Form provision. Located to allow use of open space, and with a view to the provision of shared services from the school site. Location to be confirmed.	0	2) essential mitigation	44,015
2FE Primary School - comprising 450 pupils each based on pupil yield. This might be best located in or around North Acton Shield site.	Phase 4	2) essential mitigation	7,800
2FE Primary School - comprising 450 pupils each based on pupil yield. This might be best located in or around IEP depot site.	Phase 4	2) essential mitigation	7,800
Total			**82,215**

Context

Educational reforms mean that academies and free schools have a role in school place provision and planning

8.3 The local authorities of Hammersmith & Fulham (H&F), Ealing and Brent are responsible for education infrastructure coordination. The Childcare Act 2006 places a duty on local authorities to ensure that there are enough childcare places to enable parents to work or train, and also sufficient funded early education places for all three- and four-year olds within the local authority area.

8.4 However, actual delivery of school places is no longer the sole responsibility of local authorities. Free schools or academies need to be involved.

- Creating places in new schools: current legislation dictates that whilst the local authority can build a school, there has to be a full published offer for either an academy or free school to run it.
- Creating places in existing free schools or academies: local authority is not able to expand free schools or academies to take additional children without the prior approval of these schools.

8.5 As demand for school places in the area grows, there will be a need for close liaison between local authorities and school providers.

Early years provision is frequently provided by the market – but we have planned for some provision

8.6 It is expected that for the early phases, much of the Early Years and Childcare needs will be met by private provision and existing capacity. However it is difficult to predict whether the market will continue to sustain private provision. With this in mind, phase three does factor in ‘all through’ provision from ages three to 19.

Assessing future school requirements

8.7 The requirement for school places is driven by the annual birth rate, the current school population, movement into and out of the local authority area, housing development, cross border travel to attend schools and the provision of private school places.

8.8 An important determinant in informing the education infrastructure requirement is the child yield assumption. This provides a view of the number of children likely to arise from a given amount of residential development, which in turn informs school place forecasts. Each of the local authorities in the study area has a child yield assessment formula based on local research.

8.9 During the school place forecasting work carried out for this study, great emphasis has been placed on taking a pragmatic approach. 3BM Education Partners work with local authorities on place planning, and (with agreement from Ealing and Brent) have used the Hammersmith and Fulham’s child yield assumptions to estimate the demand

for provision. 3BM have adopted fairly conservative child yield rates, based on past experience of similar regeneration development at Earls Court.

8.10 The following assumptions have been adopted for the assessment:

- Total unconsented development of 23,045 dwelling units (1,100 consented units within the Old Oak core area have not been included in the assessment as it is assumed that the relevant S106 contributions h been sorted already).
- Affordable housing assumptions[15]. We are aware that the final affordable housing policy may change, depending on development viability. At detailed planning application stage, the child yield calculation will be refined to reflect policy at the time.
- 15% leakage to private education provision.

Land take

8.11 We *have not* allowed for land costs of primary school provision. We have been informed by stakeholders that each two form primary and early years school will require land provision of around 0.5 ha. We have provided this estimate in order to give a general guide to the footprint of the sites required. This is a conservative estimate and reflects the scarcity of land in the area.

8.12 However, it is not necessarily the case that schools providers will need to purchase this land for the sole use of the school. Interesting example of how schools provision can be integrated into existing developments do exist, for example in Camden (Netley School). In such instances, residential developers have been able to support land purchase costs, so reducing the burden of infrastructure delivery on the public purse. There will be a requirement to provide play and amenity space on site to accommodate future population.

8.13 We *have* allowed for land costs of 1.5ha for the 'all through' school. A large site will be needed, of around 1.5ha. This is likely to be of a scale that renders co-location with residential development impossible. We have taken account of this in our numbers.

8.14 We set out our approach to land costs in Chapter 6.

What infrastructure is needed? How much does it cost?

Child yield calculation results

8.15 Table 8-2 provides a summary of the estimated child yield after allowing for leakage to private sector education providers.

[15] The current development mix is 65% owner occupier, 21% social rented and 14% shared ownership. This chosen as a central point to bridge a number of different site viability outcomes. The property mix is assumed 25% 1 bed, 50% 2 beds and 25% 3 beds – equally apportioned over the different tenures.

Table 8-2 Estimated child yields by age group (total)

	Early Years	Primary	Secondary		
Education Need in children (Early Years 3/4yr olds, and Forms of entry for Primary and Secondary) cumulative this includes 15% leakage to Private Sector	**1195**	**12.34**	**8.92**		
Age groups	Ages 0-3	Age 4-10	Age 11-15	Total	
Children totals gross cumulative	2812	3049	1574	7435	
Children cumulative net of leakage to Private Sector	2390	2591	1338	6319	

8.16 Table 8-3 takes this total yield by age, and breaks it down by development phase.

Table 8-3 Estimated child yields (total) by development phase

Summary of Child Yield	Total units	23045	Old Oak 14th September 2	
	Pre School 0-3	Primary School	Secondary	Total
At the end of Phase 1 we would expect to see child population increases of:	236	270	141	647
Extra Children Phase 2	537	578	298	1,414
At the end of Phase 2 we would expect to see a broad child population of:	773	848	439	2,060
Extra Children Phase 3	726	781	403	1,910
At the end of Phase 3 we would expect to see a broad child population of:	1,499	1,629	842	3,970
Extra Children Phase 4	891	962	496	2,349
At the end of Phase 4 we would expect to see a broad child population of:	2,390	2,592	1,338	6,320

8.17 In assessing future infrastructure requirements, stakeholders have taken account of known capacity to help meet the requirement and delivery strategy. The main requirements are set out below.

Phase 1 to 2020 (approximately 3,500 dwellings): 1FE expansion at existing primary school is required

8.18 Any capacity at existing secondary schools should be used before new provision is created. However, this is a dynamic situation which is changing rapidly.

8.19 With regard to primary provision, much will depend on the children being able to access schools with capacity. These are to the south of the area. The LBHF education team will undertake detailed transport planning to start to assess the ability to provide appropriate travel measures for children from the north to access schools to the south of the area.

8.20 New linkages are unlikely to be in place in early phases (although Scrubs Lane and Old Oak Lane will continue to provide north-south routes), and so a fall back strategy may be required to provide additional capacity in existing schools in the surrounding area, depending on child location and catchments. For now we have made the conservative assumption that 1 FE expansion capacity of existing schools to the north of the area will be required to meet the needs of growth, but this will need further work. It is not possible to be certain of which schools might be affected.

Phase 2 to 2025 (approximately 8,600 dwellings cumulatively) will require a 2 FE primary school and 2FE secondary school expansion

8.21 A new 2 FE primary school will be required.

8.22 An allowance for secondary school expansion has also been made, but officers would need to make further assessments to be sure how and where this expansion should take place.

8.23 In both cases, care will need to be taken to ensure that provision is properly located with regard to both need and access to local amenities such as open space.

Phase 3 to 2035 (approximately 16,000 dwellings cumulatively) will require a 4 form entry 'all through school' for 3-19 year olds

8.24 Phase 3 to 2035 will require considerable advance planning as significant new capacity will be required and lead in time for this major capital investment will be needed. Education services are looking to provide a 4 FE 'all through' school for 3 – 19 year olds.

8.25 Education officials prefer this school to be relatively centrally located. It will also be important to ensure that provision can take advantage of shared facilities (such as open space), as well as being suitably located to allow all members of the community to access the community sports facilities which will be provided at the site. A need for 1.5 ha of land is anticipated for this school.

8.26 In cost estimates for the provision, we have allowed for the provision of a large sports hall, (with the hall, and changing rooms capable of being used by the general public outside of school hours). Please refer to the Open Space chapter for more details here.

Phase 4 to 2050: (approximately 24,000 dwellings cumulatively) two new two form entry primary schools could be required

8.27 Phase 4 to 2050 is a very long term timescale to predict. Capacity created in phase 3 may accommodate the secondary needs for this phase, and possibly two new 2 FE primary schools could be required.

How can infrastructure be paid for?

8.28 Additional non-private school places are currently funded from three main funding streams.

- Developer contributions to meet growth related needs (though either S106 or CIL). There is a presumption by the DfE that all authorities will ask developers for a contribution of funds or land or buildings to assist with the impact on the local education infrastructure.

- Various ad hoc funding bids (to replace the Building Schools for Future Programme) stemming from the DfE. This provides a valuable source of funding, although it is highly unpredictable; and
- School Basic Need Capital Grant received from the Department for Education (DfE) to meet existing need.

8.29 Some funding for school places may be available from the Department for Education (DfE) based on known pupil numbers forecast forward taking agreed planning application pupil product into account. Grant funding is then awarded accordingly taking account of other funding sources.

The provision, management and funding of education infrastructure is going through changes at present

8.30 The Academies Act 2010 means that there is a presumption that all new schools will be Academies.

8.31 There is some uncertainty as to how and where future school provision will be due to the formation of Academies at both primary and secondary level. The role of the Education authority is changing, and whilst it has responsibility for existing schools, it may not for new schools.

We have assumed that all capital funding for education will be sought from CIL

8.32 Further refinements on which is the best mechanism to pay for this developer contribution (either from CIL or S106) will develop as scheme delivery advances. For this study we have assumed that CIL funding will be sought for education. CIL funding has the great merit of being able to be used flexibly to accommodate growth from across a range of sites, but equally we are aware that developers frequently wish to fund provision through S106, in order to be in control of delivery.

8.33 There may also be some role for CIL Payment In Kind, particularly for land. However, we note that there are restrictions on exactly how effective Payment In Kind facilities are likely to be. We say more in paragraph 28.40 onwards.

8.34 In the longer term, the introduction of the Academies Act and the recent changes in the funding and management of schools could introduce opportunities for new mechanisms for providing schools in the future.

Issues and recommendations

8.35 The education capacity data should be treated as a snapshot in time as the situation will be constantly changing.

8.36 Care was taken to identify cost saving measures involving the re-use of surplus capacity and classroom expansion instead of new build to arrive at the education cost calculations. In future there will need to be close liaison with neighbouring authorities as there are considerable ‘cross border’ movements.

8.37 Regular reviews of the IDP will be required to reflect the changing landscape in education provision and funding.

9 POLICE

Introduction

9.1 In this section we look at the police infrastructure necessary to support the growth at Old Oak Common.

9.2 We understand that the police are reviewing their existing provision. We have contacted the Metropolitan Police and have been directed to publically available information. We have used this to make estimates of the likely service patterns and infrastructure needs arising from the development at Old Oak. Given the long term nature of development at Old Oak, we can expect to see a number of cycles of service review taking place through the build out period. This means that the generic approach that we have had to adopt here will provide the information we need at this stage.

9.3 In line with the rest of this study, this section focuses on capital infrastructure needs, with some broad assumptions made for maintenance.

Project summary

9.4 The table below summarises the projects costed in this chapter, with their delivery phase and currently assumed priority. Additional detail is available under separate cover.

Table 9-1 Summary

About the infrastructure project	Infrastructure needed in which phases?	What priority attached?	Gross infrastructure cost (£000s)
425 sq m extension/intensification of existing police station incorporating custody centres, offices, public reception areas, evidence storage, police vehicle storage and so on. Total funding sought via CIL.	Phase 3	2) essential mitigation	2,000
425 sq m extension/intensification of existing police station incorporating custody centres, offices, public reception areas, evidence storage, police vehicle storage and so on.	Phase 4	2) essential mitigation	2,000
CCTV monitoring suite, housed in civic building plus infrastructure to operate monitoring service.	Phase 1	2) essential mitigation	138
Total			**4,138**

Context

Funding for new development is in very short supply

9.5 In line with the rest of the public sector, the London emergency services continue to be impacted by the Government's cuts to public sector funding. This forms a significant backdrop to the future planning of service needs, both in terms of identifying capital funding for projects in response to growth as well to the considerable revenue funding challenges.

Old Oak redevelopment creates a very different service demand profile – but population growth can bring increased central Government funding

9.6 The current pattern of development in the Old Oak Core Area, being largely industrial and commercial uses, presents very different circumstances for the emergency services compared to the proposed residential and office development.

9.7 The provision of the additional services set out in this section will require significantly altered revenue provision. This will be the responsibility of the providers themselves to cover, in line with their general resourcing requirements. Revenue provision can be broadly expected to rise in line with rising populations. Taking the total number of anticipated residential units in the OA of 24,000 and applying an average of 2.2 people per unit as suggested by the GLA, a total of 52,800 people will be expected to live in the OA once development is complete. This has therefore been used in determining the future community infrastructure requirements.

Police estates strategy emphasises shared facilities

9.8 Elements of the Metropolitan Police's activities (specifically contact points with the public) are affected by the drive to co-locate public sector services. Interface with local government services, health care professionals and others can be greatly eased for both customer and service provider alike by locating the client-facing parts of multiple organisations in the same building.

9.9 In respect of police services it is likely that there would be some customer-facing contacts in co-located facilities which are dealt with in Chapter 13 below.

What infrastructure is needed? How much does it cost?

We used existing provision levels to estimate likely future requirements

9.10 There are 140 police stations in London. These range from large borough headquarters staffed around the clock every day to smaller stations and contact points which may be open to the public only during normal business hours, or on

certain days of the week. Police stations incorporate custody suites and the contact points do not.

9.11 In the four London Boroughs the current pattern of service locations is shown in the following table. The contact points are typically either part of wider co-located community facilities or from conventional shop units.

Table 9-2 Pattern of police service provision across the four London boroughs

Borough	Police Station	Number of Contact Points
Brent	Kilburn Wembley	5
Ealing	Acton Ealing Southall	4
Hammersmith & Fulham	Fulham Hammersmith	1
Kensington & Chelsea	Kensington Notting Hill	4

9.12 The total (2011 census) population in the four Boroughs is 990,800 served by nine stations and fourteen contact points. Each station therefore serves around 110,000 people and each contact point 71,000 people. Taking the total future anticipated additional population of 52,800 people we can expect demand for additional service provision of about one-half of a police station (0.48) and three-quarters of a contact point (0.75).

9.13 Looking at comparable recent examples elsewhere, a modern police station is housed in a four-five storey building of about 1700 sq m GIA, comprising offices, custody suites, public reception, evidence storage, parking for police vehicles and so on. The majority of the building would be conventional offices but with some specialist accommodation for the custody suites incorporating interview rooms and so on equating to about 25% of the floorspace.

Two extensions/developments of existing police facilities are recommended – one in 2029, and one around 2045. Locations are to be confirmed

9.14 Given the current pattern of service provision (Table 9-2 above) and the incremental growth of population across the area during the period in question, it is likely to be inefficient to open a new, very small, police station immediately within the Old Oak area.

9.15 We therefore suggest that additional provision is delivered through two extensions or intensifications of existing facilities, each of 425 sq m. We understand that some existing station sites nearby have little opportunity to be extended, and so this requirement could be seen more flexibly, and allow the police to reconfigure service provision in the area more generally. The police will be able to select which facilities

should be extended at the time, bearing in mind that the suggested expansion will not take place for 15 years.

9.16 The requirement for the first extension arises at 12,000 units which, according to the current trajectory, is anticipated to be in the year 2029. It is therefore programmed for that date, in Phase 3. The additional extension would ordinarily be anticipated at the end of the growth period in 2050. However, in order to provide for any service flexibility so far in the future it has been programmed for 2045.

9.17 The locations would be decided by the Police's service planning teams closer to implementation of the projects.

9.18 Anticipated costs can be found in Table 9-1 above.

Contact points could be co-located with other provision

9.19 Given the move to integrate some customer-facing activities of the Police as part of wider co-located public service facilities, we do not suggest that new-build contact points are created. It is instead proposed to integrate the contact points within the co-located facilities provided within the Old Oak area. We have said more about these co-located facilities in Chapter 13.

9.20 As discussed below, this would mean that the staff would cover the police activities or a small number of police officers / PCSOs or civilian staff would be based at the facilities during part or all of its opening hours. There is therefore no additional floorspace or significant cost implication for those facilities (although a peppercorn rent may be in fact payable, it would likely be *de minimis*).

A CCTV monitoring suite should be provided

9.21 As requested by the brief, we have made assumptions regarding the installation of a CCTV monitoring suite. Although it is very difficult to project the type of technology likely to be required in the latter phases of development at Old Oak we have costed on the basis of a standalone monitoring suite of 25 sq m with the necessary equipment. This could be located securely within a community building, perhaps contact points.

How can infrastructure be paid for?

The extensions are likely to be conventional construction projects led by the Met's estates teams

9.22 In recent years a PFI deal between the Metropolitan Police Authority and John Laing PLC has delivered four new police stations across London, including 25 years of subsequent operation and facilities management. These facilities have been constructed to replace previous substandard accommodation as well as cater for growth, but given the uncertainty over the future for PFI/PPP, it is proposed that the two extensions to cater for growth at Old Oak Common be delivered as conventional construction projects let by the Metropolitan Police's Estates Team.

Funding for extensions and monitoring suite would be sought from CIL

9.23 In reality, the additional capacity may be delivered as part of a wider refurbishment or replacement of one (or two) of the existing stations identified in Table 9-2 above. However, the additional funding would need to be generated externally (from Police capital programmes). For simplicity therefore, it is anticipated that funding for the two 425 sq m extensions would be sought from developer contributions.

9.24 This is likely to be CIL rather than S106, as the growth requirements are incremental across the whole area and the sites on which are currently in the ownership of the Metropolitan Police (or to be acquired) rather than one of the key development sites in the OA.

9.25 We assume that the entire cost of the CCTV monitoring suite will be sought from CIL.

CCTV camera costs are expected to come as part of masterplan developments

9.26 It is assumed that developers will provide at their cost (likely to be *de minimis*) CCTV cameras which operate wirelessly and connect to the monitoring suite. We assume the cameras themselves would come through planning permissions, and so be absorbed within the build cost of the development as a whole. We have therefore not broken out a separate cost or funding line for this provision.

Issues and recommendations

9.27 We are not aware of issues and recommendations, other than those listed above.

10 FIRE SERVICE

Introduction

10.1 In this section we look at fire service infrastructure necessary to support the growth at Old Oak Common.

10.2 These services are delivered by the London Fire Brigade. The London Fire Brigade has worked with us to set out the current service patterns and assess the likely infrastructure needs arising from the development.

Project summary

10.3 The table below summarises the projects costed in this chapter, with their delivery phase and currently assumed priority. Additional detail is available under separate cover.

Table 10-1 Summary

About the infrastructure project	Infrastructure needed in which phases?	What priority attached?	Gross infrastructure cost (£000s)
New fire station comprising 1500m2 GIA building, 3 storey with 2 storey void over appliance bay (three of, within the building and an additional three bays in front of the opening doors). Externally a six storey drill tower is provided together with wash-down area, additional vehicle bays, storage bays and parking for staff and visitors.	Phase 3	2) essential mitigation	6,500
Total			**6,500**

What infrastructure is needed? How much does it cost?

Unlike Police and Ambulance services, there is no direct funding link between the population of an area and its fire service provision

10.4 The need for new infrastructure will reflect fire risk (with areas of new build housing generally much lower risk than established residential areas), along with the existing patterns of development and service provision.

10.5 In advance of a full fire risk assessment, we have looked at the existing pattern of service provision across the four Boroughs and considered the growth in resident population as a proxy for estimating the additional infrastructure needs, as follows.

10.6 In the four London Boroughs the current pattern of service locations is shown in Table 10-2 below.

Table 10-2 Pattern of fire service provision across the four London Boroughs

Borough	Fire Station
Brent	Park Royal Willesden Wembley
Ealing	Acton Ealing Northolt Southall
Hammersmith & Fulham	Fulham Hammersmith
Kensington & Chelsea	Chelsea Kensington North Kensington

10.7 The total (2011 census) population in the four Boroughs is 990,800 served by twelve fire stations. Each station therefore serves around 83,000 people. Taking the total future anticipated additional population of 52,800 people we can expect demand for additional service provision of about two-thirds of a fire station (0.64).

Park Royal fire station could be rebuilt on the same site at around 2035 – which will integrate with existing plans

10.8 The existing Park Royal fire station is within the OA. Whilst not as old as much of LFB stock, as shown in the photo below, it is not of the most modern construction. There is scope to demolish the existing facility and rebuild it as a larger facility on the existing site.

10.9 A modern fire station[16] comprises a three storey building of about 1500 sq m GIA, part of which has a two storey void over the appliance bay (three of, within the building and an additional three bays in front of the opening doors). Externally a six storey drill tower is provided together with wash-down area, additional vehicle bays, storage bays and parking for staff and visitors.

[16] See for example the new station built on the Old Kent Road, http://www.london-fire.gov.uk/Documents/Station_Briefing_Pack_-_Old_Kent_Road.pdf

Figure 10.1 Existing Park Royal Fire Station



10.10 One advantage of this approach is that elsewhere at Park Royal the LFB is having a new fire training facility built as part of its 25 year training partnership with Babcock. This development is unrelated to development at Old Oak. The Park Royal facility, on a brownfield site, will constitute a centre of excellence for fire training. Facilities will include a multi storey comprehensive firehouse with basement for fire behaviour and Breathing Apparatus training. The firehouse complex will incorporate variable internal doors to provide a range of training scenarios on each floor and between floors. The firehouse has been designed for realism and therefore incorporates a fully carbonaceous training environment. Adjacent to the real fire training facilities, there will be a training block containing classrooms, syndicate rooms, gym and welfare facilities.

10.11 New fire provision could be integrated with this training development. In order that there is no lag to provide the new fire station capability, the new facility is currently programmed for 2035, at the end of Phase 3.

How can infrastructure be paid for?

PFI has been responsible for delivering recent fire station upgrades

10.12 In recent years a PFI deal between the Metropolitan Police Authority and the Kier Group is delivering nine new fire stations across London, including 25 years of subsequent operation and facilities management. These facilities have been designed to ensure that the new stations support:

- Exemplary design and are operationally fit for purpose;
- Energy efficiency, meeting as a minimum a BREEAM Excellent rating at design stage and completion;
- Community focus and engagement by providing designated space with access to the public; and
- Making London a Safer City by minimising risks, social and economic costs of fire and other hazards.

10.13 The new fire stations have been constructed to replace previous below-standard accommodation as well as cater for growth, but given the uncertainty over the future for PFI, the new facility at Park Royal to cater for growth at Old Oak Common may be delivered as a conventional capital project let by the Fire Brigade's Estates Team. It is too soon to be certain.

We assume that funding will be sought from CIL and mainstream funding

10.14 Two-thirds of funding could be sought from CIL (since need for new facilities arising from Old Oak can only be demonstrated for the equivalent of 2/3 of a fire station).

10.15 The developer contributions are anticipated to come from CIL rather than s106 as the growth requirements are incremental across the whole area and on a site which is currently in the ownership of the LFB rather than one of the key development sites in the OA.

10.16 However, a capital funding gap equivalent to the remaining third of the cost of the new build facility would arise, plus the costs of demolishing the existing facility. This would have to be met from mainstream fire bridge funding including LFB capital growth programmes.

Issues and recommendations

10.17 The Park Royal fire station is located within Strategic Industrial Location. Its expansion is not consistent with Brent’s existing Core Strategy policy for SIL. However, the FALP acknowledges SIL may be an appropriate location for community safety infrastructure.

10.18 The policy approach will need to be reviewed through the Old Oak Park Royal Local Plan before any conclusions can be drawn on the future of a larger facility.

11 AMBULANCE SERVICE

Introduction

11.1 In this section we look at the ambulance infrastructure necessary to support growth at Old Oak Common.

11.2 We have obtained public information from the London Ambulance Service, and have used this to make estimates of the likely service patterns and infrastructure needs arising from the development at Old Oak.

Project summary

11.3 The table below summarises the projects costed in this chapter, with their delivery phase and currently assumed priority. Additional detail is available under separate cover.

Table 11-1 Summary

About the infrastructure project	Infrastructure needed in which phases?	What priority attached?	Gross infrastructure cost (£000s)
Extension to an exisitng ambulance station, comprising 625m2 of offices, stabling for vehicles, equipment storage, rest rooms and so on.	Phase 4	2) essential mitigation	2,231
Total			**2,231**

Context

11.4 The London Ambulance Service (LAS) is a National Health Service trust that is responsible for answering and responding to medical emergencies in Greater London. It has 70 ambulance stations across the capital and is divided into three operational areas: south, east and west. Our study area falls within the west area. There are six ambulance stations within the four Boroughs, as follows:

- Brent
- Chiswick
- Fulham
- Hillingdon
- North Kensington
- Wembley

What infrastructure is needed? How much does it cost?

We used existing provision levels to estimate likely future requirements

11.5 The 70 ambulance stations across London served a total population of 8,173,900 in 2011. Thus each station serves slightly in excess of 115,000 people. Growth at Old Oak Common will bring an additional 52,800 people or the equivalent of about one half (0.45) of an ambulance station.

11.6 In 2009, the Brent ambulance station was opened in two industrial units on the Falcon Industrial Park, Neasden Lane, NW10, to the north of the study area. At 13,500 square feet (1250 sq m), it is now the second largest ambulance station in London and a base for approximately 70 members of staff including paramedics, emergency medical technicians, A&E support, urgent care, administration and management. It replaced two older, smaller stations at Park Royal and Willesden.

11.7 Taking the Brent station as an example of a modern facility, the growth at Old Oak Common can be seen to generate demand for about 625 sq m of ambulance station, comprising offices, stabling for vehicles, equipment storage, rest rooms and so on.

Additional provision could be made by extending existing ambulance stations around 2040 (after delivery of around 18,000 homes). Location is to be confirmed

11.8 Given the current pattern of service provision (above) and the incremental growth of population across the area during the period in question, it is currently proposed to deliver the additional provision through an extension to one of the existing stations.

11.9 The additional extended facility would ordinarily be anticipated at the end of the growth period in 2050. However, in order to provide for any service flexibility so far in the future it is programmed for 2040 in Phase 4.

11.10 The location would be decided by the London Ambulance Service planning teams closer to implementation of the project. It could be on one of the existing sites or, as with the Brent example, housed in converted light industrial units.

How can infrastructure be paid for?

11.11 Funding for the extended facility will be sought from developer contributions.

11.12 These are anticipated to come from CIL rather than s106 as the growth requirements are incremental across the whole area and likely to be on a site which is currently in the ownership of the LAS rather than one of the key development sites in the OA.

Issues and recommendations

11.13 We are not aware of issues and recommendations, other than those listed above.

12 PRIMARY HEALTHCARE

Introduction

12.1 In this section we look at the health care needs arising from development of the Old Oak Core Area.

Project summary

12.2 The table below summarises the projects costed in this chapter, with their delivery phase and currently assumed priority. Additional detail is available under separate cover.

Table 12-1 Summary

About the infrastructure project	Infrastructure needed in which phases?	What priority attached?	Gross infrastructure cost (£000s)
Primary health care facilities, generic GP surgery - project 1. The funding line assumes that provision would be built by a developer, but leased back to the NHS to at least cover the developer's costs.	Phase 2	2) essential mitigation	5,027
Primary health care facilities, generic GP surgery - project 2.	Phase 2	2) essential mitigation	5,027
Primary health care facilities, generic GP surgery - project 3. .	Phase 3	2) essential mitigation	5,027
Primary health care facilities, generic GP surgery - project 4. .	Phase 4	2) essential mitigation	5,027
Primary health care facilities, generic GP surgery - project 5.	Phase 4	2) essential mitigation	5,027
Total			**25,135**

Context

Commissioning of primary health care services is now the responsibility of a Clinical Commissioning Group

12.3 NHS commissioning in England has undergone significant reorganisation since 2010. In April 2013, under the terms of the Health and Social Care Act 2012, reorganisation of the NHS took place. Bodies such as primary care trusts (PCTs) and strategic health authorities (SHAs) were abolished, with new organisations called Clinical Commissioning Groups (CCGs) taking their place.

12.4 CCGs now commission most of the hospital and community NHS services in the local areas for which they are responsible. Commissioning involves determining what services a population is likely to need, and ensuring that there is provision of these services. The CCGs are overseen by NHS Commissioning Board (NHS CB) which was established on 1 October 2012 as an executive non-departmental public body. NHS CB is also known as NHS England and also has the responsibility for commissioning primary care services such as GP and dental services, as well as some specialised hospital services.

Service delivery is being reconfigured

12.5 There are a number of significant changes planned across North West London to acute and community–based services that colleagues in the NHS wish to flag.

12.6 Many of these changes will have implications for the future configuration of heathcare services at Old Oak. In this study, we do not attempt to replicate or pre-empt this work, and have costed for what would now be considered typical provision. As with all infrastructure, service providers reserve the right to redesign service delivery, and to apply developer contributions in the most efficient way possible.

What infrastructure is needed? How much does it cost?

Around 30 GPs will be needed, equivalent to around five surgeries

12.7 A rough rule of thumb used in calculating primary healthcare needs across the country is that there should be one GP, together with supporting staff, for every 1,800 people. Economies of scale operate so that a modern GP practice would expect to provide 5-6 GPs, therefore serving some 9000 - 10,800 people. These surgeries will be required to deliver a range of primary and some acute care in line with the direction of travel for health care provision in England.

12.8 Taking the eventual additional population of 52,800 people in the area and dividing by 1,800 means we can expect a total requirement across the area of almost 30 GPs in total (29.33). Thus we can expect a total of 5-6 surgeries or primary health care facilities. The term 'surgery' is used here as shorthand for the modern primary healthcare facility as described. Some of these are likely to be provided as part of a wider community hub, and some as stand-alone facilities. The CCGs have confirmed that there is unlikely to be significant capacity in existing surgeries to absorb much of the growth but it is reasonable to assume that the lower figure of five surgeries is the total likely requirement.

One surgery is required on delivery of around 4,500 units, at around 2021, then 2025 (around 8,600 dwellings cumulatively) and 2031 (13,000 dwellings), 2040 (18,000 dwellings), and 2047 (22,600 dwellings)

12.9 By calculating back to the number of residential units (9,900 people as the midpoint population served, divided by 2.2 people per unit[17]) a surgery would therefore be required on completion of each tranche of 4,500 units. In reality this will depend upon the rate of delivery across the area, but for our current purposes it is acceptable to phase provision in this way.

12.10 A new surgery will most efficiently be constructed in a single phase and it will be inefficient if the space is not filled as early as possible. By matching against the housing trajectory, we have calculated that the first surgery will be required in 2021, at the start of phase 2. Further facilities are then likely to be required in 2025 (the final year of phase 2); and 2031, 2040, and 2047.

12.11 Based upon experience elsewhere, the floorspace requirement is approximately 200 sq m per GP. Whilst additional facilities to enable some acute care provision will be required, the realities of capital and revenue funding in the NHS (see below) mean that a larger facility is unlikely to be deliverable through the cocktail of funding available. Thus each facility is assumed to be 1200 sq m in size.

12.12 To maximise the efficiency of land use, it is assumed that this space is provided in a three-storey building with lifts to permit DDA access to all parts.

Co-located premises could contribute a revenue stream, or anchor a community hub

12.13 A pharmacy or dental surgery at ground level could create an additional revenue stream. This would also help to create an active street frontage for the development and increase footfall overall. For the purposes of the costing exercise however no such assumptions have been made.

12.14 Where new primary health care facilities are being provided (such as GP surgeries) these can form part of a wider community hub, alongside a co-located facility with an 'anchor tenant' such as a library. In our costings, we have assumed that surgeries are provided outside these community hubs, but we suggest that efficiencies could be found if services were integrated.

12.15 Some elements of the co-location agenda for public services impact on health care. In particular this could involve public health campaigns, fitness or exercise classes and so on.

[17] Assumption as advised by client group derived from London Plan

Revenue costs are excluded

12.16 Although the HUDU methodology for calculating health infrastructure includes revenue items, we have excluded revenue costs here. We make the assumption that the health funding formula which allocates population-related funding to local areas will adjust, and provide mainstream support for these revenue costs. We further note that there are legal hurdles to S106 and CIL payments picking up non-infrastructure revenue costs

How can infrastructure be paid for?

No specific mainstream budget is set for developing new surgeries

12.17 Advice on procuring and delivering new GP surgeries has been produced by the BMA.[18] Funding for health services is provided to CCGs on per capita basis. However, they CCGs do not receive a specific budget for new premises *developments* as such. Funding for new facilities has to be within the confines of this budget.

12.18 In practice, this mechanism creates a problem for the CCG, whose budgets are extremely tight. Firstly, facilities will need to be built in advance of the full realisation of the population increase, and secondly, there will be a subsequent time lag before Health Service revenue funding catches up with the population growth.

12.19 Capital funding is based on spending plans submitted via the NHS planning processes and the availability of national resources. This funding is not automatic and resources are likely to be extremely limited in future.

There are various development models available

12.20 In respect of the funding and development of new facilities, there are a number of options:

- The developer could provide fully fitted out premises, built to NHS design standards and leased to the Health Service (this could be the CCG or GP practice, Community/Acute Trust). This approach has been agreed in principle in the Clapham Park regeneration scheme in LB Lambeth.
- The developer could provide a shell at a peppercorn rent for conversion into a new healthcare facility, possibly with funding to fit the shell out agreed as part of the tariff or S106 agreement. This model has been used in LB Tower Hamlets.
- A site could be provided (at nominal cost) and then developed either by the NHS, or more likely through a third party developer brought in by the NHS.

12.21 In addition, there may be other permutations which can be developed in discussions with developers. Given the lack of capital funding likely to be available to provide

[18] BMA's GPC, March 2010 *The Future of GP practice premises -Guidance for GPs*

such facilities, the preference of the CCGs is generally for a third party to provide the capital to develop new facilities, with the NHS/CCG funding the rental (revenue) implications.

We assume that new facilities will be built by the developer and leased back to the public sector. This assumption should be reviewed over time

12.22 An assumption has to be made on the most appropriate way that the capital facilities will be provided. Based on models used elsewhere in London, it is assumed that a major site developer - or a suitable partner - will provide a fully serviced facility and will then lease this to either the CCG or the GPs (who would then claim the rental costs back from the CCG). This is the first of the options set out in the passage above. Equally, though a fit-out-and-peppercorn rent model could be sought, as we understand was successfully achieved at Earl's Court. Much depends on local circumstances at the time.

Funding sources and phasing of lease costs will require further work

12.23 The share of costs allocated to CIL (or S106) will depend on the state of NHS capital budgets at the time of delivery, and other infrastructure funding priorities.

12.24 It is noted that NHS resources for revenue funding are limited and so there may be issues, depending on the phasing of facilities (and therefore the phasing of payments), for covering the lease costs. It will be important that the further modelling work identifies the precise requirements and costs in order that the CCGs can properly plan for these in future spending plans.

12.25 Our summary spreadsheet is not tailored to deal with a project of this complexity, so we have represented it as a one-off project expenditure which receives a one-off funding payment.

Issues

Further analysis is required to more fully assess the impact on healthcare services

12.26 Likely issues are as follows.

- Emerging service models (perhaps including of polyclinic and 'cottage hospital' models) might usefully be investigated further at Old Oak. Work is proceeding in the NHS on this issue.
- The opportunity for co-location with other community facilities should be explored as more detailed plans emerge.
- The proportion of social housing and the mix of housing types and sizes, particularly family housing, will affect health demands. CCGs are likely to seek additional information and Health Impact Analysis as plans emerge.

- The ability of people to register at GPs near their place of work, increasing demand in this area with staff of new offices, will affect demand for GPs.
- Proposals for the new primary schools may have implications for the school nursing service.
- The new population will create increased demand for emergency care, a large percentage of which could be provided for in a locally based urgent care centre within the development, if there is not to be additional pressure on Hammersmith Hospital.
- The expected child yield will have implications for midwifery, health visiting and child health services. These issues are outside our scope here.
- We exclude major revenue costs from the tariff. But they are significant and must still be addressed. We note that, if we had adopted the HUDU model, revenue costs estimated by the HUDU would be significant. It is doubtful as to whether these costs can be included in a S106 or CIL. However, each case must be based on its merits, in which case this would be a matter on which legal opinion may need to be sought. It is important to note that, even though these costs have been excluded from this study, they are still costs that will need to be addressed in order to ensure that the necessary healthcare provision is made to support the proposed growth. Further discussion will be needed between the client group and local Clinical Commissioning Groups to determine how these costs can most appropriately be addressed.

13 INTEGRATED COMMUNITY FACILITIES (LIBRARIES, YOUTH SERVICES, COMMUNITY CENTRES, ARTS)

Introduction

13.1 In this section we look at the need for infrastructure to support service provision across libraries, community centres, youth services and arts & culture.

13.2 Boroughs have statutory responsibility for the delivery of library services to their communities. They also provide non-statutory youth and arts & culture services and are joined in this respect by a multiplicity of organisations in the private and third sectors.

13.3 We have dealt with these services together. This is because of the way that the physical delivery of these services is already integrated, and seems very likely to be even more integrated in future.

13.4 Representatives of the service departments in each of the Boroughs have been contacted and asked to provide an input into the study. The assessment of infrastructure needs set out below reflects the complex and evolving pattern of service provision in the area.

Project summary

13.5 The table below summarises the projects costed in this chapter, with their delivery phase and currently assumed priority. Additional detail is available under separate cover.

Table 13-1 Summary

About the infrastructure project	Infrastructure needed in which phases?	What priority attached?	Gross infrastructure cost (£000s)
Flexible co-located public and third sector service delivery buildings, customer contact points, anchored by a library or similar tenant.	Phase 2	2) essential mitigation	9,600
Flexible co-located public and third sector service delivery buildings, customer contact points, anchored by a library or similar tenant.	Phase 4	2) essential mitigation	9,600
Total			**19,200**

Context

These services are at the heart of the co-location agenda for public and third sector service provision

13.6 There is a drive for providing multiple use and joined up service provision which benefits both the customer (as a number of service interactions are possible at the same time) and the service provider alike (by facilitating those interactions and potentially targeting 'hard to reach' customers). This approach is being adopted both in London and across the country.

13.7 Multiple use facilities typically include a wide range of services including health, police customer contact points, adult learning, skills training provision and so on.

The physical delivery of services is changing rapidly in response to funding changes and societal change

13.8 The Government's austerity measures have put a strain upon these type of services, which are also attempting to respond to changes in the way society requires support and evolving patterns of work, living and enjoying leisure time.

13.9 For instance, the Libraries services have had to change significantly in the twenty years since the internet was established: predicting the drivers of change in such services for the next forty or so years is difficult.

13.10 Each service has been evolving in response to its own drivers and/or other regeneration projects which have enabled the provision or relocation of existing facilities in surrounding communities. These include the following:

- Ealing Libraries are outsourced to an external provider. Acton library (the closest main facility in LB Ealing to the OA) has been relocated to a leisure centre. In the longer term relocation to a larger, co-located, facility will be sought;
- Similarly, Acton youth centre is being temporarily relocated as part of the South Acton regeneration initiative. In the longer-term (five years plus) a co-located facility is sought;
- The Roundwood Centre in Harlesden, Brent opened in November 2012 using Myplace Big Lottery funding. It provides an excellent resource for young people aged 13-19 in that part of the Borough with many programmes based there, including voluntary sector provision; and
- The focus for Arts & Culture provision in this part of London has moved away from bespoke facilities and into the provision of services as part of a co-located public service point. This could include temporary exhibitions, workshops and ‘meantime uses’. Recent examples of good practice in a twenty-first century library include Shepherd’s Bush library (which was secured through Westfield S106).

13.11 All of these factors come into play in attempting to assess future service needs.

Co-located services may have disadvantages – but these can be managed

13.12 Co-located service provision may create be some penalties. One may be around flexibility – for example, school premises would not be available during the school day (even though that is relatively short). Another is that there could be a change in the management ethos: community centres are currently run by local management committees on behalf of their communities as a community resource. Even so, the potential savings can make a good case for tolerating these disadvantages.

13.13 The actual configuration, cost and management of these will vary considerably in each area, and would need to be investigated as masterplanning processes developed.

There is little provision which can be built on

13.14 Coupled with these general drivers of change, the Old Oak warrants particular attention due to its historic and current patterns of land use. The large areas of traditional employment uses have not placed any demand upon these types of services. The Old Oak Core Area is on the margins of each of the Borough Council areas, where traditional service delivery has not previously had to reach.

What infrastructure is needed? How much does it cost?

Provision could be delivered as part of two wider community ‘hubs’

13.15 Given the context identified above, this study suggests providing for two co-located public service facilities in response to the growth.

13.16 Whilst the costs below isolate the particular needs of these co-located services, in reality these facilities would best be provided as part of a wider community 'hub' encompassing perhaps healthcare facilities, a primary school and potentially other facilities including police and others.

13.17 In attempting to size and cost the facilities, we have looked at recent comparable examples and considered the direction of travel of public policy.

The library is likely to be the ‘anchor tenant’

13.18 The most successful buildings all commonly house an 'anchor tenant', typically a library. Whilst the provision of public libraries is statutorily required of local authorities, there is no national minimum standard for facilities to be provided in response to growth. However, the figure of 30 sq m of library floorspace per 1000

head of population has been commonly adopted by local authorities across the country[19].

13.19 Taking the figure provided by the GLA of 52,800 people arising in the area as a result of the growth, if this 'standard' is taken it suggests a total requirement of (52.8*30 sq m) = 1584 sq m of new library floorspace. This would typically equate to the size of two branch libraries. Because of the existing service provisions and direction of travel of library policy it is unlikely that all of this provision would be required in a single facility (or would be split across more than two locations).

13.20 It is reasonable to suggest that this total requirement would be flexibly used but for convenience we assume that each library would be provided in a multi-use community hub with each one occupying about 30% of the floorspace. This is a reasonably figure for floorspace (GIA) occupied by the ‘anchor tenant’ of such facilities. The total floorspace of each facility would therefore be (800/0.3) = 2600 sq m.

13.21 Alternatively, if when these facilities are being designed there is not sufficient demand (and revenue funding) from other services / providers to operate at 2600 sqm then a smaller one could be provided whilst still incorporating the branch library facilities. One option might be to provide a combined convenience retail / public service facility, an increasingly popular model.

Service profiles may change within this space

13.22 It is not possible to predict how these facilities would be used in ten years' time, let alone at the end of the period of growth of the OA. The term 'library' may be effectively redundant by then, but it is likely that other services would step in to fill the gap of lower floorspace needs by the 'anchor tenant'. The following types of space are likely to be required:

- Library comprising reference and lending areas, ICT facilities; bespoke children’s and young people's areas;
- Classroom areas which can be broken down into a range of sizes to facilitate adult learning, or community centre-type uses such as exercise classes, skills training and so on;
- Customer contact area involving a range of services providing advice and guidance to clients; and
- 'Back office' facilities including staff areas, touch-down / hot desk space and so on.

13.23 No specific locations have been identified for these two facilities as yet. This would need to be assessed in conjunction with service needs in the wider area. It is

[19] From the Museums, Libraries and Archives Council report “Public Libraries, Archives and New Development: a Standard Charge approach” (2008).

assumed that the land is to be provided as part of the package of contributions arising from the development in question, with a wider contribution from the CIL pot.

13.24 We have not specifically costed for art gallery or exhibition space. We have assumed that this type of provision could be folded into library circulation space and foyer areas.

If seen as a stand-alone library, the first facility could be needed around 2030 (12,000 homes) – but this could vary widely

13.25 The timescale for provision of the facilities could be linked to the need for provision of library space. This would suggest that the first facility is needed upon occupation by 26,400 people or 12,000 dwellings - around 2030 in the current trajectory. However, with a specification of services which is inherently flexible this would be unnecessarily precise. All that is necessary is a reasonable mass of population to create footfall for the facility.

Facilities may be better delivered as part of a community hub, around 2025 – or earlier, if library premises were to be used as a construction training centre

13.26 The first facility is currently proposed to be provided as part of a 'community hub', perhaps incorporating a healthcare facility (which has been separately costed for), programmed for 2025. In line with the proposals on employment and training (see below) for the first few years it would be possible to operate the building as a temporary construction training facility, prior to final fit-out. The final phasing will ultimately depend upon the location chosen.

The second phase of facility delivery could be required around 2040

13.27 In a similar vein, the second facility is therefore programmed for 2040, when a healthcare facility is also to be provided. The co-located part would have potential for use as a construction training centre in the early years.

No public art costs are included, but we assume art display space could be integrated into the hub building

13.28 Note that there is doubt whether public art on its own is “infrastructure”. After taking legal advice, the IXIA (a public art think-tank) thought it would be possible to deliver public art via CIL only as part of wider infrastructure projects.[20]

13.29 We assume gallery space and exhibit areas could be integrated into the community hub design.

[20] http://ixia-info.com/files/2009/01/ixia-Public-Art-CIL-Planning-Obligations-Note-Oct-20112.pdf

Costs are shown in the table below

13.30 Costs are shown in Table 13-1. We have costed for standalone facilities.

13.31 Provision of these facilities as part of a wider 'community hub' may result in lower costs than the standalone facilities which have been costed. Nevertheless, since the exact nature of the community hubs or their location cannot as yet be identified we have not made any such cost reductions at the current time. To reduce land-take and reflect the approach taken in relation to healthcare it is assumed that buildings will be three storey including lifts to enable DDA access to all parts.

How can infrastructure be paid for?

13.32 We have assumed that that CIL pays for this infrastructure. CIL is likely to be a preferable source of funding to S106, because this infrastructure is strategic in nature and is likely to serve the Old Oak development as a whole.

Issues

13.33 There would be significant revenue costs in running these facilities. The funding for this would have to come from existing revenue budgets, uplifted in line with the increase in population in the area.

13.34 Delivery experience from Vauxhall Nine Elms Battersea suggests that it may be valuable to use the planning system to deliver a modest arts cinema or similar. This could be commercially provided.

14 PUBLIC OPEN SPACE, PLAY AND SPORTS FACILITIES

Introduction

14.1 This section covers the provision of public open space, play space and sports space. It is important to be clear what each of these broad areas covers:

- Public open space – mainly green open space, e.g. parks, play areas and civic squares,
- Sport – space for both indoor and outdoor formal sports provision i.e. sports halls and pitches.

Project summary

14.2 The table below summarises the projects costed in this chapter, with their delivery phase and currently assumed priority. Additional detail is available under separate cover.It is important to note that these costs do not include land costs but rather are a cost associated with physical construction. Depending on the final design, location and size these costs are likely to vary.

Table 14-1 Summary

About the infrastructure project	Infrastructure needed in which phases?	What priority attached?	Gross infrastructure cost (£000s)
Green Cross Public Realm (excluding towpath) assumed in Car Giant North site.	Phase 2	2) essential mitigation	303
Green Cross Public Realm (excluding towpath) assumed in Car Giant East & West site.	Phase 1	2) essential mitigation	303
Green Cross Public Realm (excluding towpath) assumed in Depots site.	Phase 4	2) essential mitigation	784
Green Cross Public Realm (excluding towpath) assumed in EMR site.	Phase 2	2) essential mitigation	303
Green Cross Public Realm (excluding towpath) assumed in station site.	Phase 2	2) essential mitigation	784
Towpath upgrade project. We assume this runs alongside the Canal from Scrubs Lane to Old Oak Common Lane, around 1.1 km in length.	Phase 1	2) essential mitigation	1,581
Improvements to existing Nature Reserve. May involve costly ground level changes.	Phase 1	2) essential mitigation	5,000

About the infrastructure project	Infrastructure needed in which phases?	What priority attached?	Gross infrastructure cost (£000s)
Access along canal northern towpath. Quality landscaping and hard surfacing treatment. Delivery with Car Giant E&W.	Phase 1, 2	2) essential mitigation	5,000
Car Giant North tranche - Provision of a public open space north of the Grand Union Canal to serve the public open space needs of development. Provision funded by developer.	Phase 1, 2	2) essential mitigation	2,500
EMR tranche - Provision of a public open space north of the Grand Union Canal to serve the public open space needs of development. Provision funded by developer.	Phase 1, 2	2) essential mitigation	2,500
Play space (offsite). Facilities for under 5s (onsite): assumed included in typical external budgets, so not included as a separate cost.	0	2) essential mitigation	17,788
Sensitive upgrades to public space at Wormwood Scrubs.	Phase 2, 3, 4	2) essential mitigation	15,000
Total			**51,845**

What infrastructure is needed? How much does it cost?

14.3 The Old Oak Vision document has identified a range of specific provision for public open space. The main open space provision identified is the existing Wormwood Scrubs and a series of public green spaces forming linear routes and various public squares. The proposed schemes are outlined below.

Sensitive enhancements to Wormwood Scrubs are included

14.4 Wormwood Scrubs is a major metropolitan park of some 200 acres split between sports area and nature area (Local Nature Reserve and Site of Importance for Nature Conservation). It provides natural habitats, informal recreation and formal playing fields for local schools and community groups, including the Linford Christie Stadium which includes facilities for football, rugby and hockey.

14.5 There may be an opportunity to deliver some sensitive improvements to Wormwood Scrubs including improved access and improvements to the areas drainage. Any works to the Scrubs would need to be agreed with the Wormwood Scrubs Charitable Trust and discussed in detail with local residents and community groups, such as the Friends of Wormwood Scrubs.

School facilities can provide accommodation for indoor sports

14.6 We suggest that, in order to maximise the efficient use of capital, indoor sports provision for this development should be provided at the proposed schools in the area. These facilities will be for use by the general public outside of school hours. Sport England endorse such an approach, stating that 'schools are uniquely placed to provide access to opportunities and facilities to energise and revitalise local areas and make a significant contribution to life'.[21]

14.7 The implications for this multiple use should be considered at the start of the design process. It will be necessary to provide adult changing facilities, secure storage for valuables, and possibly a separate foyer. Designs will also need to ensure that other parts of the school apart from the sports hall are not accessible to the general public. The sports hall should be designed so that it has its own heating and lighting arrangements independent of the school. There will also need to be space to store equipment for a range of sports activities to serve the general public.

14.8 The indoor sports provision could be provided by ensuring an enlarged school hall is included in the design which is of sufficient size to accommodate 4 badminton courts and a floor suitable to accommodate a range of other sports. The education cost allowance includes for indoor sports provision to take account of this requirement. No separate public indoor sports provision has been included for this assessment.

14.9 Current indoor sports facilities are managed through outsourced contracts. This position is likely to continue.

Towpath improvements are included

14.10 The Grand Union Canal runs through the centre of the area. Development alongside the Canal will take advantage of its attractive waterside setting and help to further increase its accessibility and opportunities for leisure and recreation. The Canal already provides a popular east-west route for pedestrians and cyclists. However the Canal acts as a barrier to north-south movement and opportunities could therefore be exploited to improve connectivity across the canal by providing improved access.

14.11 We have costed for improvements to the towpath on the full length through the site from Scrubs Lane to Old Oak Lane. Please refer to Table 14-1 for details.

Green cross route enhancements are included

14.12 High quality planting and high environmental improvements are sought for the areas immediately adjacent to the north-south and east-west links (see Figure 14.1). This is a string of pedestrian friendly green linear routes and nodes along the 'Green Cross' - connecting the existing public transport nodes (eg Willesden Junction), development opportunities, the Grand Union Canal, Wormwood Scrubs, various nature reserves and green spaces to the Old Oak Common High Speed 2 Station.

[21] https://www.sportengland.org/media/162732/Comunity-use-of-schools-facilities-guidance-Darlington.pdf

14.13 We have made some assumptions on the upgrades needed in this study. Please refer to Table 14-1 for details.

Nature Reserve upgrades and open space north of the Grand Union Canal is included

14.14 The Nature Reserve to the south of grand union canal has also been identified as a part of the public open space infrastructure in need of improvement as part of this development. We have made some assumptions about possible developer contributions to support some basic upgrades needed in this study. Please refer to Table 14-1 for details.

14.15 Provision of a public open space north of the Grand Union Canal to serve the public open space needs of development is also included. This is part of the Vision and will be part of future policy. We have conservatively included this as a developer cost (which therefore has an effect on our viability calculations), but it should be noted that the GLA would expect this to be provided as part of the typical externals from a development, and not via S106/CIL.

Children's play facilities are included

14.16 Each of the three local authorities have local strategies on open space and play provision. Each refer to the Mayor of London Supplementary Planning Guidance (SPG), the latest version being *Shaping Neighbourhoods Play and Informal Recreation* (September 2012). The SPG states that existing national standards are too high for practical application in London. London boroughs have been using more realistic and achievable figure as a benchmark standard for London. The SPG recommends that 'the benchmark or the locally derived standards should be applied to the forecast child population of the area. The proposed benchmark standard of a minimum of 10 sq. m per child regardless of age is recommended as a basis for assessing future play space requirements arising from an increase in the child population of the area. If there is the opportunity from the new development to access existing provision that has excess capacity or is capable of enhancement from the new development, the benchmark standard of 10 sq. m per child does not need to be applied'.[22] This standard will generate the minimum dedicated play space per child. However, account needs to be taken of the proximity and quality of existing provision and whether there is an existing deficiency in the area.

14.17 Applying policy – and making the relatively safe assumption that there is little existing provision in the area - means that 7.4 ha of playspace is required.[23] This is considerable, and may need review. In line with the broad approach of this study, we have not costed for land, because we expect that a considerable proportion of the

[22] SPG para 4.24 – 4.25

[23] We have used the GLA's playspace calculator at https://www.london.gov.uk/priorities/planning/publications/shaping-neighbourhoods-play-and-informal-recreation-spg. The calculation of child yield resulting from the use of this calculator differs fractionally from the child yield assumed in education calculations. The difference is not significant at 2% variance in child yield.

playspace can be physically accommodated within existing open space (such as Wormwood Scrubs), and other open space coming forward within masterplans themselves. However, we have costed for the play equipment itself.

14.18 We have taken the following approach to funding.

- Facilities for under 5s (onsite): Developers typically pay for small scale open and play spaces together with on site and adjacent landscaping, paying for that provision from externals budgets. We therefore note this cost to developers, but have excluded it from our costing and funding lines, given that it should form part of a typical externals budget.
- Facilities for ages 5 to 11 (onsite and offsite). Some of these facilities are likely to be provided onsite, whilst others will be offsite. We have assumed a 50-50 split between onsite and offsite provision, and assume that offsite playspace costs are sought from CIL, whilst onsite costs form part of typical externals budget (and are thus excluded here).
- Facilities for over 12s (offsite): we assume that all provision for over 12s is offsite, and is thus seeking funding from CIL as a strategic cross-site cost.

14.19 There may also be an opportunity to provide small play spaces as part of the provision of outdoor play facilities at the proposed schools.

Public squares are assumed to come through HS2 funding

14.20 A series of squares will be created primarily at the station sites. The Old Oak Common High Speed 2 station, at the centre of the Green Cross will be designed so that it forms the hub of this network of spaces. We assume that HS2, Crossrail and London Overground public realm will be paid for by the station schemes.

Allotments are excluded from costings

14.21 The Old Oak vision document does not include any allocation for allotment space. Adopting the Ealing space standard for allotments would result in a requirement of some 8 ha for allotments. Given the complexity and viability issues with delivering allotments in this area more innovative solutions should be investigated at the masterplanning stage to include community open allotments. For the purposes of this study we have not costed for this separately.

North Acton Square and station upgrades are in the pipeline, but not included here

14.22 Plans exist for improvements to open space associated with the North Acton tube station, accompanied with an upgrade of the station (a new entrance and façade, better internal layout with more gatelines, and DDA access via lifts).

14.23 Costs and funding of this project are not included in our calculations because this project is already in the pipeline. Some funding is already assembled. We assume that the project will be in place shortly, so have therefore excluded this project, because otherwise we risk double counting. Existing S106 monies are available to

cover this project in part, resulting from development already permitted nearby the station. LB Ealing have informed us of an approximately £5m cost estimate, and that £3.7m S106 funding is available.[24]

Maintenance costs have been included

14.24 There would be revenue costs attached to this additional provision which the boroughs have reported would cause financial problems if not addressed by the developers. Where costs have been included, we have made an allowance for maintenance costs. We explain our approach in paragraph 6.25.

[24] Email from LB Ealing 20/10/14

Figure 14.1 Structure of key open space, public realm routes based around the 'Green Cross' connectivity



Note: this image is taken from the Old Oak Vision. It has been superseded by the OAPF, but this image has been retained as it most accurately depicts the scale of development priced for in this study.

How can infrastructure be paid for?

Facilities will need to be developer funded through CIL and S106. Some provision will come as a part of masterplans

14.25 Mainstream public funding is unlikely to be committed to open space and sports items. It is therefore considered that funding for these items will come from development. This is likely to be a mix of S106 and CIL.

14.26 Some items are expected to come through the process of individual masterplans. We have estimated a possible split between those two sources in the summary table below.

Funding for maintenance

14.27 We have set out our broad assumptions on maintenance costs in paragraph 6.25. We expect that maintenance costs will revert to local authorities over time. This may be subject to negotiation.

Issues and recommendations

14.28 The main findings from this infrastructure review, is that applying generic standards for assessing requirement for open space provision is not sensible due to the limited supply of land. Innovative solutions to the creation and multi-use of open space and sports provision will be essential, in addition to maximising the efficiency of existing provision.

14.29 As work progresses, a detailed open space, sports and play strategy will need to be assembled to ensure that a more co-ordinated approach is prepared and followed.

14.30 The OPDC and LAs need to discuss and agree some principles on how best to deal with the relatively land-hungry issue of playspace and open space provision, so that they have a clear understanding of the trade-offs involved, and more efficient use of the green cross and blue corridor.

15 AFFORDABLE WORKSPACE, EMPLOYMENT AND TRAINING FACILITIES

Introduction

15.1 This section addresses the workspace, employment and skills infrastructure requirements which arise from development at the Core Area.

15.2 The scale of the development proposed will provide a significant opportunity to maximise the number of local residents working on its construction and to access the longer term permanent employment opportunities which result from it.

Context

Workspace provision is provided by the private sector

15.3 In recent years the market for business support and workspace provision has grown and new organisations have been challenging the more well-established players.

15.4 There are already private sector-provided facilities targeting the creative[25] and media[26] sectors either within or close to the Core Area.

15.5 It is expected that OPDC will seek the provision of new work space of a range of values and types to meet a varied market requirement in the area.

Construction skills training needs are met by the private sector

15.6 Construction skills training has also moved rapidly away from public sector regulation or oversight in recent years. The needs of construction businesses and employees are met by private sector companies often working under the framework of construction sector networks which have grown out of the former LSC and DfE-funded provision. The proposed OPDC will include planning policy requirements for local apprenticeships and training as part of construction and post construction works.

15.7 There are also a range of apprenticeship programmes which blend college-based provision with on-site training.

15.8 The College of North West London has a training facility close to the study area in Harlesden which focusses on construction training. There is an opportunity to work with local colleges in addition to developers to deliver training programmes.

[25] See for example http://www.workspace.co.uk/london-commercial-property/offices/north-west-london/chandelier-building/

[26] http://www.tcnpp.co.uk/tcncorp/en/tcn_projects/projects/ugli.html

What infrastructure is needed? How much does it cost?

We assume that the market will provide workspace facilities

15.9 Given the context identified above, we consider that the private sector will step in and provide adequate levels of affordable workspace in or close to the OA, without the need for public sector intervention, funding or provision; however, this may be something that would require further consideration as part of the OPDC's Local Plan.

15.10 Some of this provision is likely to be demanded to comply with planning requirements for mixed use provision and to re-provide for some workspace that has been lost..

We assume that the market will provide training facilities

15.11 Similarly, we do not consider that there are grounds for identification of bespoke construction skills or training facilities, notwithstanding the significant levels of growth proposed for the OA. Contractors on site are likely to need to comply with a range of training and local labour provisions, and will more than likely work with local colleges or other training providers as part of this effort. We assume that they will be able to provide such facilities as necessary without further state intervention or funding.

15.12 However, early provision of the community facilities (perhaps as part of a wider community hub) could be offset by their temporary use for construction skills training, prior to final fit-out for their eventual use.

Temporary facilities or community spaces could be used to deliver skills training

15.13 Often the key inhibiting factor is adequate space in which to deliver construction skills training, with temporary facilities on site often having to be used.

15.14 To address this need, it is possible to imagine that library or community hub buildings could be provided early, to allow these facilities a temporary training use.

15.15 This would create a financing issue, because up-front funding for the construction of parts of the community hub building would have to be found earlier than otherwise anticipated.

15.16 A large developer may be able to provide these facilities up front as part of package of local labour and apprenticeship agreements. These might come as part of a major planning permission. However, such a project would need further detailed costing. We have not undertaken this exercise here.

Issues and recommendations

15.17 No infrastructure needs are identified in this section.

16 UTILITIES: POTABLE WATER SUPPLY

Introduction

16.1 Thames Water (TW) is responsible for the provision and maintenance of the potable water supply infrastructure / distribution networks. This includes the treatment of raw water for potable supply purposes.

16.2 Thames Water heavily caveat their inputs. They state that there is a need to undertake detailed modelling outside this study. This modelling will identify what if any spare capacity exists in the local catchments to facilitate early occupation ahead of upgrades. A detailed phasing plan would then be required to be drawn up linked to further upgrades before any further occupation could occur. Thames Water would in this instance seek the support of the local planning authority in attaching a Grampian style planning application to support this process.

Project summary

16.3 The table below summarises the projects costed in this chapter, with their delivery phase and currently assumed priority. Additional detail is available under separate cover.

Table 16-1 Summary

About the infrastructure project	Infrastructure needed in which phases?	What priority attached?	Gross infrastructure cost (£000s)
New 250mm dia main from 30" No4 in Old Oak Lane to centre of site	Phase 1	1) critical enabling	484
New 200mm dia main from 21" in Scrubs Lane to centre of site	Phase 2	1) critical enabling	258
New 150mm dia main from 21" in Scrubs Lane to centre of site	Phase 3	1) critical enabling	158
New 250mm dia main from 30" No4 in Old Oak Lane to centre of site	Phase 3	1) critical enabling	397
New 200mm dia main from centre of site 12 to centre of site and connect to new main in centre of site 8	Phase 3	1) critical enabling	219
New 200mm dia main from centre of site 16 to centre of site	Phase 4	1) critical enabling	374
New 150mm dia main from 21" in Scrubs Lane to centre of site and connect to new main in centre of Site 8	Phase 4	1) critical enabling	534

Total			**2,424**

What infrastructure is currently present?

16.4 There are a number of distribution mains crossing the Old Oak development area

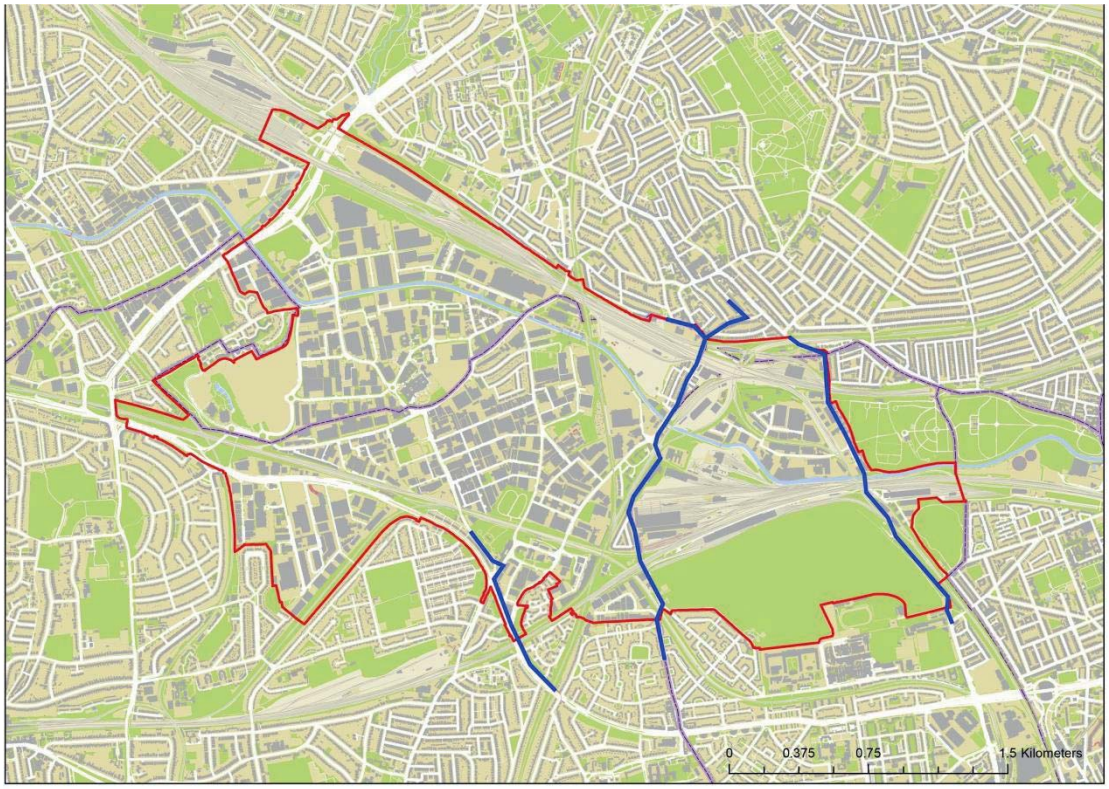
16.5 TW's existing mains generally follow the route of the public highway network and provide supplies of potable water to both residential and commercial properties.

16.6 There are a number of strategic water supply mains to the east and west of the main Old Oak core area as follows and as identified schematically in Figure 16.1 below.

- Within Old Oak Common Lane to the west of the site there are cast iron mains identified as 30 inch No. 4 main and 30 inch No. 5 main. To the north of Willesden Junction the routes of these mains split. 30 inch No. 4 main follows the A404 and the No. 5 main decreases in diameter to 24 inch and heads west along Acton Lane.
- Within Scrubs Lane, to the east of the site, there are two cast iron mains identified as 16 inch and 21 inch.
- Certain lengths of these mains have been replaced by more modern materials of comparable diameters, presumably where repairs have been necessitated.

16.7 TW has not advised of any significant industrial water users within the Core Area.

Figure 16.1 Existing potable water mains



Does anything need to be moved or protected to allow development to happen?

16.8 We do not envisage that any significant diversion works will be required to the existing strategic cast iron mains. Appropriate protection measures may be required where these mains are affected by highway improvement works.

16.9 We envisage that the existing distribution mains within the main Old Oak core area will be decommissioned as development progresses whilst ensuring that existing supply agreements are maintained.

16.10 New distribution mains will be constructed to supply the proposed development within the development highway network.

What infrastructure is needed? How much does it cost, where relevant?

Understanding upstream improvements to the water supply will need further work

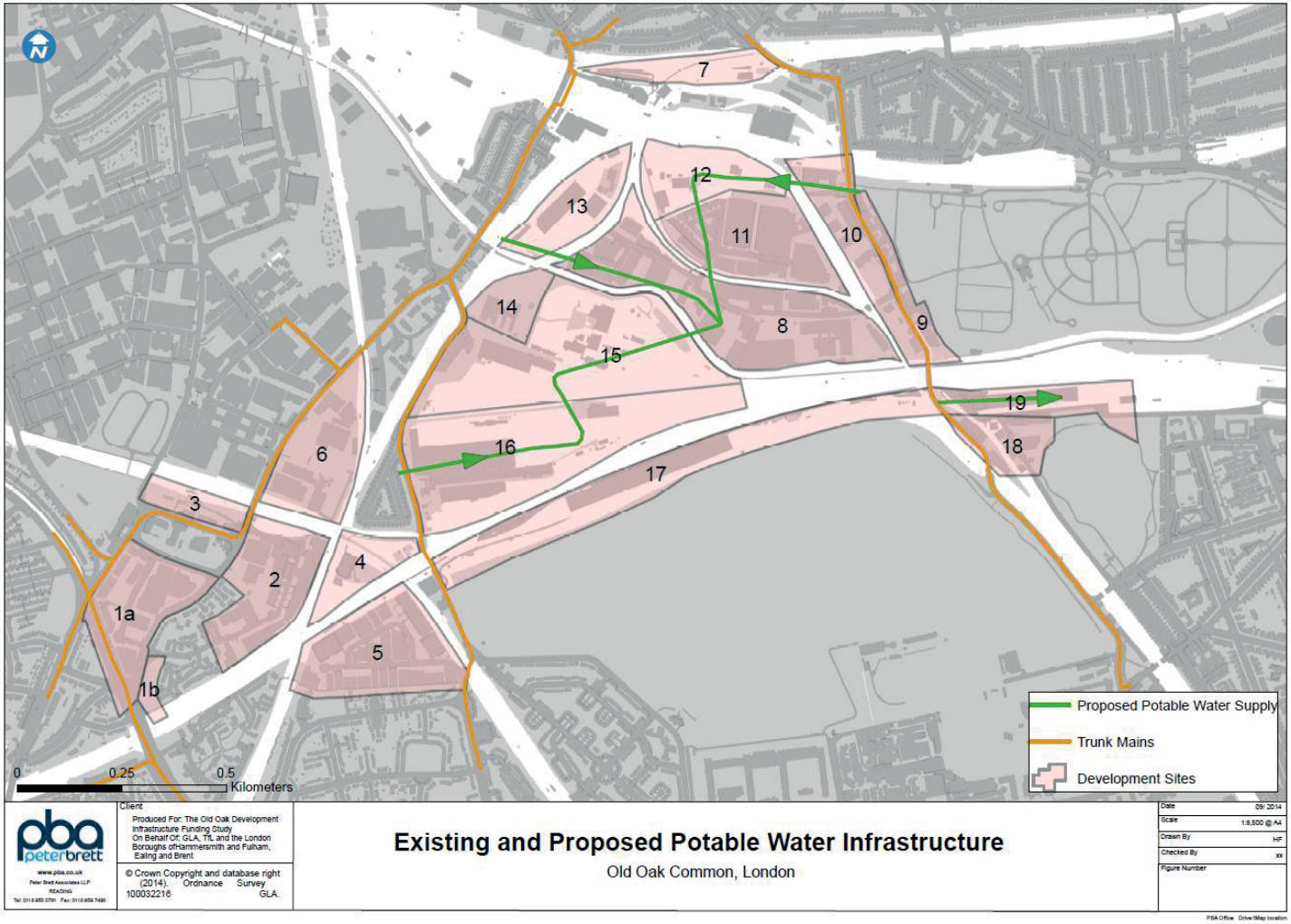
16.11 TW have stated that a full understanding of the adequacy of overall water supply to the area would require a detailed investigation. This would have to be part of a separate study.

Reinforcement of the strategic water mains network will be required to cater for the proposed scope of development

16.12 We have obtained strategic information from utility providers. We have then taken this information and the used our experience of other strategic developments and our engineering judgement to understand what infrastructure might be required. At this stage, work can only provide an overview for the purposes of strategic planning and broad cost calculations. Further detailed work will be needed.

16.13 We have set out our suggestions in Figure 16.2, and provided further detail at a project level in Table 16-1.

Figure 16.2 Existing and proposed potable water infrastructure (layout for estimate purposes only - further work needed)



How can infrastructure be paid for?

16.14 The commentary below is intended to explain the general funding structure of the water industry. We have not directly investigated specific cases.

The delivery of systemic upgrades of the water network

16.15 If a systemic upgrade of the water network is required, this may be delivered in one of two ways. Upgrades can come either via a) Thames Water's five year business plan; or b) via a cost sharing arrangement between the developer and Thames Water.

16.16 With sufficient notice, it may be possible for water companies to factor upgrades into their Asset Management Programme (AMP) as agreed with Ofwat. This will offset construction costs for a new water main against the predicted income generated from the new water main (based on a relevant period).

16.17 This offset will come either in the form of an asset payment (where the new main is provided under the self-lay option), or a commuted sum (where the new water main is laid by the water company).

The developer will pay for local connections to mains supply

16.18 New water mains infrastructure to connect the new development to the local network is the financial responsibility of the developer. Water companies may make some investment into the local water network infrastructure but generally will be expecting developer contributions through the requisition process to fund new mains infrastructure and provide adequate capacity for specific developments.

16.19 New (off-site and on-site) water mains can be requisitioned from water companies through Section 41 of the Water Industry Act 1991 with the requisitioner responsible for paying the water company's costs for providing the water main.

Infrastructure at Old Oak could be delivered by Inset Agreement

16.20 For a development of the size and scale anticipated at the Old Oak, it could be feasible to procure the proposed water supply through an Inset Agreement. This would see a third party organisation takes responsibility for the arrangement of a bulk supply from Thames Water for the construction, operation and maintenance of the water supply network within the Old Oak. This may still require the delivery of offsite upgrades which would have to be requisitioned from TW.

16.21 Inset agreements are not part of a Section 41 agreement. An inset agreement allows for sites within an existing undertaker's area to be served by another undertaker. Where an alternative undertaker is appointed, an inset appointment is made by Ofwat.

16.22 There are three circumstances in which an inset appointment can be granted:

- Where the premises of one or more customers is supplied (or is likely to be supplied) with at least 50 mega litres of water per year. The same criterion applies for water recycling services.

- Where no premises within the area are already served by an appointed company i.e. the site is ‘unserved’. This includes areas which are supplied by private, unregulated supplies. This criterion has to be met for both water and water recycling services.
- If the existing appointed company consents to the transfer of that area.

16.23 The alternative supplier (the “inset appointee”) will hold an Instrument of Appointment and therefore have all the same duties and responsibilities to the customers within the inset appointment site as the previous statutory supplier.

16.24 Every inset appointee must have access to adequate water resources and/or water recycling facilities in order to service the customers on the site. If the inset appointee does not have direct access to its own water resources and/or water recycling facilities, these services can be purchased from TW.

16.25 For water, this is purchased in the form of a bulk supply of water delivered to an agreed point, usually at the site boundary.

Issues and recommendations

We have a number of overall recommendations to make regarding the delivery of utilities, in particular the issue of upstream supplies. Please refer to Chapter 30

17 SEWERAGE AND DRAINAGE

Introduction

17.1 Thames Water (TW) is responsible for the foul water sewer network, maintenance and treatment / disposal of foul sewage. Initial consultations have been made with TW regarding the provision of foul sewerage for the proposed development.

17.2 Thames Water heavily caveat their inputs. They state that there is a need to undertake detailed modelling outside this study. This modelling will identify what if any spare capacity exists in the local catchments to facilitate early occupation ahead of upgrades. A detailed phasing plan would then be required to be drawn up linked to further upgrades before any further occupation could occur. Thames Water would in this instance seek the support of the local planning authority in attaching a Grampian style planning condition to support this process.

Project summary

17.3 The table below summarises the projects costed in this chapter, with their delivery phase and currently assumed priority. Additional detail is available under separate cover.

17.4 There is a possibility that the costs identified here are a significant underestimate. In this chapter, we set out a scenario which sees the potential for efficiencies in the way that the surface water and foul sewerage systems could work together more effectively. However, we are aware that these efficiencies may be difficult to achieve in practice. As we explain in this chapter, an Integrated Water Management Strategy should be pursued to add more detail to the list of requirements and costs below.

17.5 Additional costs may increase costs to developers. An impact on viability is conceivable, although sufficient buffer has been left in CIL calculations to cope with significant cost variance**.**

Table 17-1 Summary

About the infrastructure project	Infrastructure needed in which phases?	What priority attached?	Gross infrastructure cost (£000s)
Surface Water Pumping Station to Grand Union Canal - Peak Capacity 200 l/s	Phase 1	1) critical enabling	137
Off Site sewer to PS on Site 8 say 300mm dia	Phase 2	1) critical enabling	333
Off Site sewer to PS on Site say 300mm dia	Phase 2	1) critical enabling	396
Surface Water Pumping Station to Grand Union Canal - Peak Capacity 240 l/s	Phase 3	1) critical enabling	145

Off Site sewer to PS on Site 8 say 375mm dia	Phase 3	1) critical enabling	200
Off Site sewer to PS on Site 8 say 225mm dia	Phase 4	1) critical enabling	158
Off Site sewer to PS on Site 16 say 450mm dia	Phase 4	1) critical enabling	480
Off Site sewer to PS on Site 16 say 450mm dia	Phase 4	1) critical enabling	198
Total			**2,047**

What infrastructure is currently present?

The area is served by a combined sewer network, conveying both foul and surface water sewage

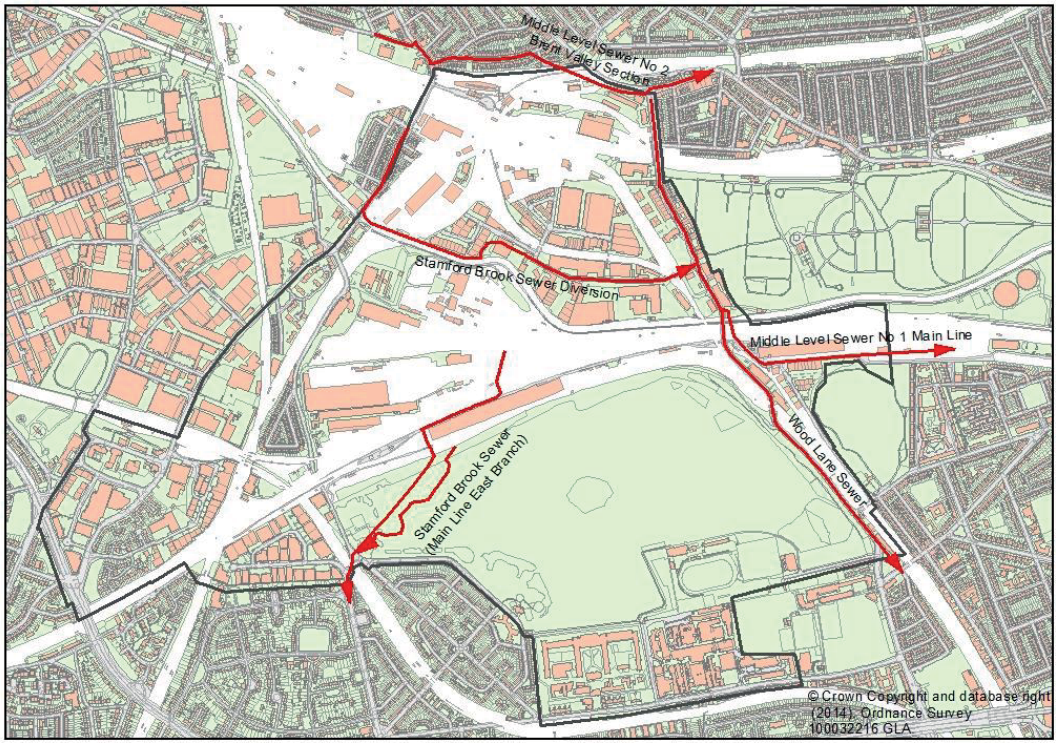
17.6 Inspection of TW's sewer records for Old Oak show that whilst there are some minor surface water sewers in the area (presumably where redevelopment has recently occurred), the whole of the area is served by a combined sewer network, conveying both foul and surface water sewage.

17.7 There is a significant network of combined sewers collecting foul and surface water sewage from the existing development within Old Oak. These sewers are at comparatively shallow depths and generally follow the routes of the existing highway network. These shallow sewers connect to the deeper strategic sewer network at various points.

17.8 There are five principal strategic combined sewers in the vicinity of the Old Oak Core Areas shown schematically on the figure below.

- Middle Level Sewer No. 2 Brent Valley Section flows in an easterly direction to the north of Old Oak;
- Stamford Brook Sewer (Main Line East Branch) flows in a southerly / South westerly direction across the centre of Old Oak. This follows the approximate route of the former Stamford Brook. Whilst it is less clear from the sewer records, it can also be assumed that the same has happened to the former Counters Creek.
- Stamford Brook Sewer Diversion flows in an easterly direction across the centre of the site and connects to the Wood Lane Sewer;
- Wood Lane Sewer which flows in a south easterly direction down Wood Lane;
- Middle Level Sewer No. 1 Main Line flows in an easterly direction to the south of the Great Western Railway line.

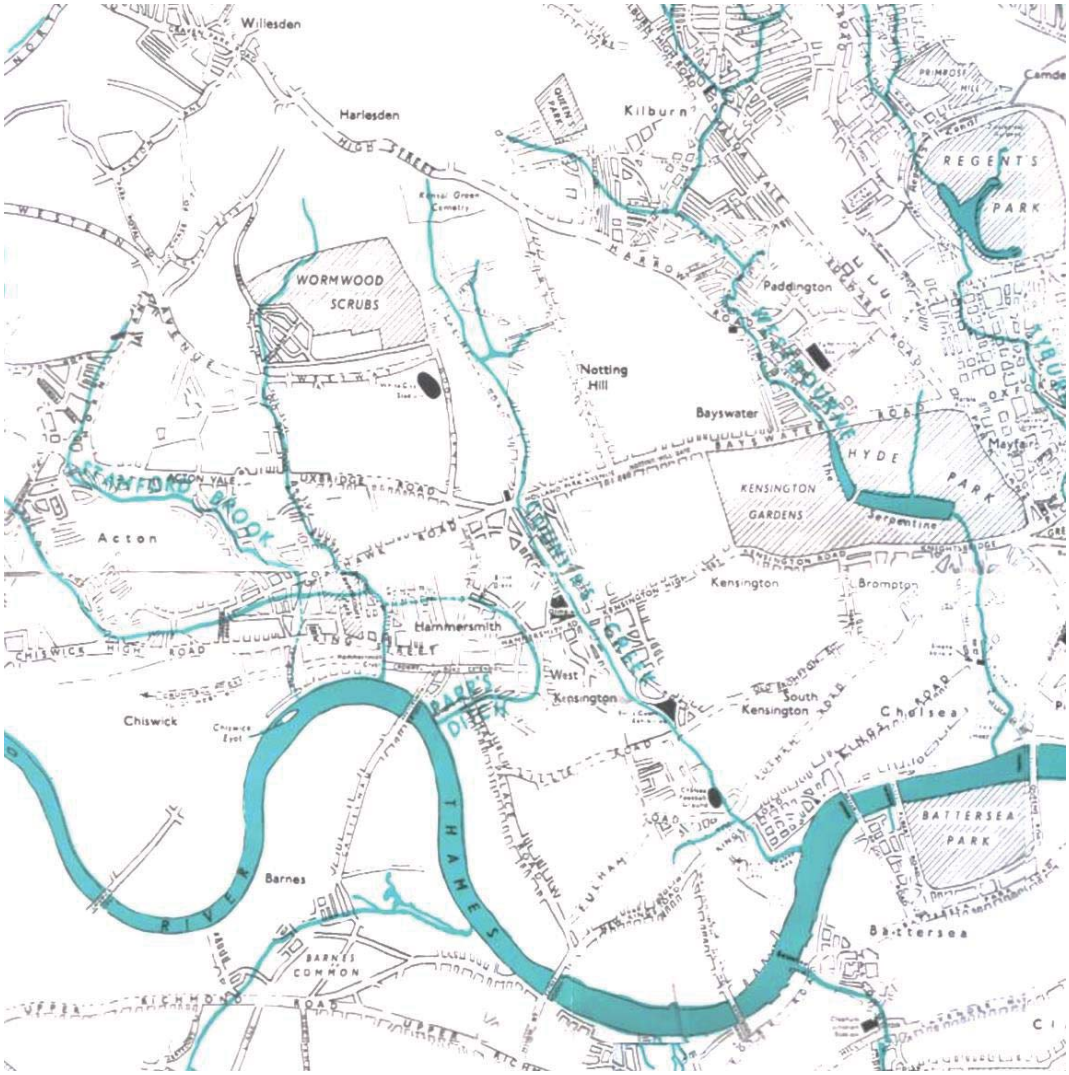
Figure 17.1 Existing underground principal strategic combined sewers



Historic mapping

17.9 Historic mapping of the area shows that there were two watercourses which used to flow from North to South in the vicinity of the site, ultimately discharging to the River Thames. The routes of these watercourses, Stamford Brook and Counters Creek, are shown in the figure below. The Grand Union Canal is also in the vicinity.

Figure 17.2 Watercourses – historic mapping



Does anything need to be moved to allow development to happen?

HS2 are undertaking diversion works for their own purposes

17.10 HS2 are undertaking diversion works on the sewer beneath the Crossrail depot prior to Crossrail depot opening – in line with the TfL petition.

17.11 HS2 need to divert the sewer in order to construct their station box.

Consideration will need to be given to how the Stamford Brook sewer diversion and the Stamford Brook sewer (Main Line east branch) can be accommodated

17.12 The Stamford Brook sewers (diversion and Main Line East Branch) need consideration. The range of options include:

- Providing easements for the sewers within the proposed development layout (which will place constraints on the proposed development layout);
- Concluding Build Over Agreements with TW;

- Diverting the sewers to coincide with proposed highway alignments within the proposed development;
- Diverting the sewers around the boundary of the proposed development.

17.13 The first two options are preferable from a cost perspective and should be pursued with TW as part of the next stage of the Old Oak project.

What infrastructure is needed? How much does it cost, where relevant?

The London Plan requires SUDS to reduce surface water flows

17.14 The London Plan requires proposed regeneration projects to aim for greenfield run-off rates through the application of a hierarchy of sustainable drainage measures, of which discharge to the combined sewer system is at the bottom of the hierarchy. It does however recognise that greenfield rates are not always possible. In addition, existing LBHF Core Strategy/DM Local Plan also has stringent targets in terms of SuDS requirements.

17.15 Failure to deal effectively with surface water will mean less capacity is available in the combined sewer for foul flows, and increases flood risk from both surface water and sewers. Only once all other SUDs options been considered should connection to the surface water network and finally combined network be considered. This issue is particularly relevant to the Old Oak Common area as it sits toward the top of the Counters Creek combined sewer catchment which has well documented capacity and flooding problems further down the catchment.

An integrated water management strategy could be drawn up

17.16 GLA officers state that previous experience at Vauxhall Nine Elms shows that an integrated water management strategy is an essential part of planning for sewerage and drainage at Opportunity Areas. This allows sewerage and drainage to be seen area-wide, allowing an understanding of the cumulative impact of development.

17.17 At the time of writing, an integrated water management strategy is being scoped out, with the objective of maximising water efficiency and recycling, minimising surface water discharge to combined sewer, and creating the foul drainage capacity.

A wide range of sustainable drainage techniques are possible at Old Oak

17.1 A number of measures should be introduced to improve integrated drainage at Old Oak.

- The use of a strategic rainwater harvesting system across the redevelopment area would capture rainwater and reduce surface water discharges and potentially could also lead to reduced water demand and ultimately operational cost savings across the sites. Greywater harvesting costs have been built into build costs.

- Green roofs and brown roofs will further reduce rainwater discharge.
- New landscaping and public/private spaces should be designed to infiltrate and absorb rainwater wherever possible.

17.2 There will be limitations on the use of infiltration SUDS techniques although infiltration may be suitable in some locations. This is for two reasons.

- Firstly, the historic industrial uses of the majority of the Old Oak area mean that there is likely to be ground contamination. In these instances, the Environment Agency may prohibit the uses of infiltration drainage techniques due to concerns over contamination. In some areas this may be remediated and mean that infiltration is acceptable, and in other areas ground investigations may show that there is little or no contamination.
- Secondly, the underlying soils and geology are generally clay based which can limit permeability.

17.3 Development proposals should also consider the implications of severe storm conditions and seek to design in areas which will temporarily store rainwater in such events with minimal damage and disruption and a clear plan for recovery. This design theme is known as “designing for exceedance”.

17.4 The viability modelling undertaken includes greywater harvesting costs in the assumed build costs.

Subject to the findings of the Integrated Water Management Strategy, significant efficiencies could be released if the current combined system becomes a pure foul system, and the surface water system is redesigned

17.5 Most of the surface water drainage currently shares the London combined sewerage system. If surface water could be redirected away from the foul sewerage system, then significant capacity in the foul system could be opened up, meaning that the foul system may not need to be upgraded to cope with planned growth.

17.6 TW advise that this would need to be checked with detailed modelling work. Some of the western parts of Old Oak are understood to have existing separated drainage systems.

17.7 Once the separated surface water system is in place, and all reasonable measures to limit the volume and rate of discharge have been designed into the developments, opportunities to direct the discharge to the Grand Union Canal (Paddington Branch) can be explored.

17.8 Discharge to the Grand Union Canal would be in line with GLA strategy, given that discharge to a waterway is well placed in the “drainage hierarchy”.

A series of measures are likely to be required

17.9 We have obtained strategic information from utility providers and used our experience of other strategic developments and our engineering judgement to understand what infrastructure might be required. At this stage, work can only provide a strategic

overview for the purposes of strategic planning and broad cost calculations. Further detailed work will be needed.

17.10 We have set out our suggestions in Figure 17.3, and provided further detail at a project level in Table 17-1 above.

17.11 The required measures would be as follows.

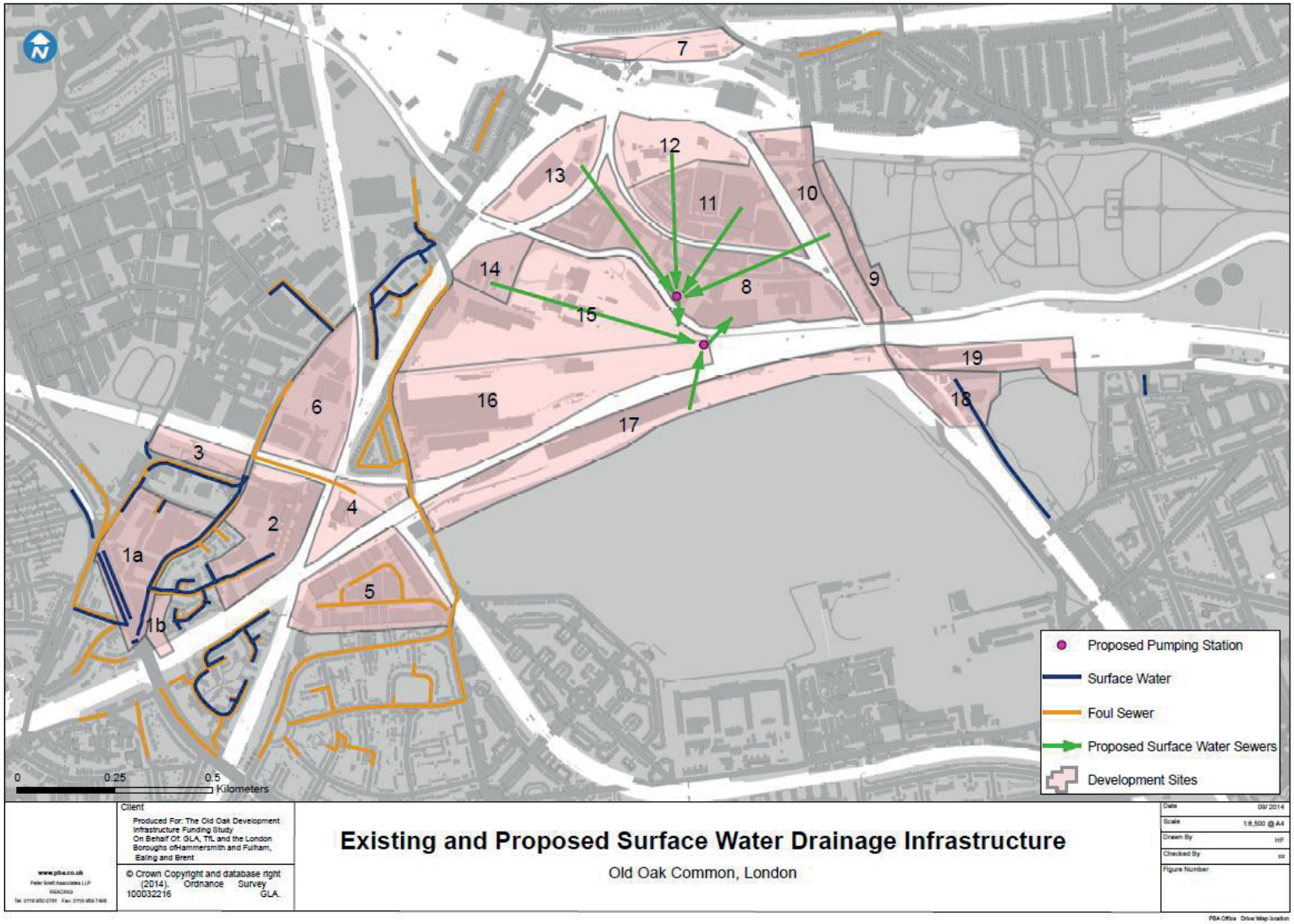
- The opportunity to implement an area wide rainwater harvesting system, possibly combined with a grey water recycling system, should be explored at a strategic area wide level in the Integrated Water Management Plan and implemented via individual planning applications.
- Run-off rate reduction using green infrastructure will be required on all sites and also needs to be considered at an area wide level. This will include green and brown roofs and storage / attenuation facilities. Storage facilities should take the form of open surface level features built into landscaping but may include storage tanks or oversized pipes under roads or buildings. Designing for exceedance may mean that some public spaces, loading areas or roads are designed to fill with rainwater for the heavier storms.
- Drainage redesign: surface water must be redirected away from the foul/combined sewer system into a separate surface water system. This would be likely to be relatively straightforward, and is the method commonly used outside inner urban areas and will mean that a new surface water drainage system is required across most or all of the Old Oak Common area.
- Outfall destination: the most likely feasible outfall for the residual surface water for the Old Oak is the Grand Union Canal. This is the responsibility of the Canals and Rivers Trust (CART). It will also be important to explore the possibility of directing some rainwater toward surface water systems draining to the River Brent and toward open spaces for temporary storage and/or infiltration. New development proposals may offer other options.
- Pumping station creation: assuming that the Grand Union Canal is chosen as the outfall, two pumping stations will be required. Land will be required for pumping stations. Note that in line with our approach elsewhere in this document, we have not costed for land.

17.12 We note that TW is presently developing proposals for the construction of the Counters Creek sewer. This project is being proposed as a solution to sewer flooding in the Counters Creek combined sewer catchment. Therefore it is not a viable destination for surface water from the Old Oak Common area.

Other costs may be uncovered by the Integrated Water Management Strategy

17.13 If commissioned, the Integrated Water Management Strategy is likely to uncover more costs, many of which are likely to need to be picked up by developers. At this stage, we do not know what these are likely to be. The cost and requirements identified here are likely to be an under-estimate. The additional costs may be significant.

Figure 17.3 Existing and proposed surface water drainage (layout for estimate purposes only - further work will be needed with utilities companies)



Beckton STW appears to have sufficient capacity

17.14 TW has also confirmed that Beckton Sewage Treatment Works (STW), which caters for all flows arising in this part of London, has sufficient capacity to cater for the proposed development.

Flows to Beckton STW could be further reduced, at a cost

17.15 A more progressive approach to discharging flows to Beckton STW would be to promote the provision of a dedicated sewerage system for the collection, treatment and recycling of greywater within the area. Greywater recycling (from uses such as showers and hand basins) has been shown to work in relatively large scale, high density developments such as the Olympic site and Greenwich Peninsula, but does have cost implications due to the duplication of pipework involved, and the installation of greywater treatment facilities.

17.16 Grey water harvesting costs have been built into build costs so as to comply with policy.

How can sewerage be paid for?

We have assumed that surface water drainage is paid for by developers

17.17 Infrastructure is generally delivered in one of two ways. Delivery can be either a) via Thames Water's five year business plan, or b) via a cost sharing arrangement between the Developer and Thames Water (such as requisitions).

- Run-off reduction will be paid for by individual developers. The sensible approach to on-site storage this is that each developer deals with the issue locally within their site boundary or on other land under their control.
- Alterations to drainage design would need to be incorporated into individual developers' designs, and so would be dealt with by developers. Joint work would need co-ordination.
- The pumping stations would be paid for through a commuted sum by developers, and then potentially run by the local authority, Thames Water, or a MUSCO. For a development of the size and scale anticipated at Old Oak, it would be feasible to propose surface water sewerage to be provided through an Inset Agreement whereby a third party organisation takes responsibility for the construction, operation and maintenance of the network within the Old Oak. In some instances the Inset Organisation has borne the cost of all related funding aspects on the basis of the future revenue from sewerage charges related to the development. We cannot at this stage anticipate the precise outcome of these discussions, so have made a conservative assumption that pumping station costs would be paid by developers.
- Where piped surface water networks to the public system are the only option, provided they meet sewers for adoption standards, they can be offered for adoption and would be managed by the sewerage company, in this case Thames Water

Developers will generally pay for any foul water sewerage upgrades required

17.18 As we have stated above, we are assuming that the existing combined system has capacity to deal with foul sewage flows arising from development if surface water drainage is removed from the system. Work may therefore be minimal.

17.19 If foul system upgrades are required, TW generally requires extensions to and reinforcement of the foul water sewerage network to be funded by the proposed development.

Some systemic works may be covered by the industry

17.20 With sufficient notice, systemic works may be delivered via the 5-year AMP cycle. Any charges to be met by the developer will be determined via a Section 98 agreement under the Water Industry Act (duty to comply with sewer requisition). Again as with the Section 41, there are two payment mechanisms for meeting any financial obligation to be met by the developer (ie, a capital contribution and a requisition arrangement).

17.21 Where foul water sewers are constructed to Sewers for Adoption 7th edition they can be offered for adoption under Section 104 of the Water Industry Act to the sewerage undertaker.

17.22 Once TW get greater certainty about development (such as inclusion in a Local Plan/ planning approval) then this information will help support any future investment submission to the OFWAT regulator. An Integrated Water Management Strategy would support such a submission.

A third party could deliver any foul sewer upgrades required

17.23 For a development of the size and scale anticipated at Old Oak, it could be feasible for the foul sewer network to be provided through an Inset Agreement whereby a third party organisation takes responsibility for the construction, operation and maintenance of the network within Old Oak.

17.24 In many instances the Inset Organisation has borne the cost of all related funding aspects on the basis of the future revenue from sewerage charges related to the development. However, any such upgrade costs would be wrapped up in the Inset offering to the client. The Inset Organisation would still have to pay TW for any upgrades to the sewer network. This could also include greywater recycling systems.

Issues and recommendations

17.25 We have the following recommendations.

- As set out in the introduction to this chapter, TW state that there is a need to undertake detailed modelling. This modelling will identify what if any spare capacity exists in the local catchments to facilitate early occupation ahead of upgrades. A detailed phasing plan would then be required to be drawn up linked to further upgrades before any further occupation could occur.

- GLA should prepare an Integrated Water Management Strategy as part of the next stage of the Old Oak project. This may uncover significant costs in addition to those identified here. As we explain above, additional costs may increase costs to developers. An impact on viability is conceivable, although sufficient buffer has been left in CIL calculations to cope with significant cost variance**.**
- Discussions will need to be held with the Canals and River Trust (CART) with regard to the discharge of surface water to the Grand Union Canal. This may need the involvement of the GLA in order to demonstrate the strategic importance of this issue, particularly in that outfall to the Canal would be a highly cost-effective way of opening up capacity in the foul system.
- In the event of the failure of negotiations with CART, then Counters Creek could be considered as an alternative.
- Discussion will be needed with the Environment Agency regarding the use of infiltration drainage techniques in some sites around Old Oak.
- Discussions will be needed with TW and the London Boroughs regarding the reinstatement of the Stamford Brook and Counters Creek historic watercourses.
- As plans mature, there will need to be discussions with Thames Water re build over agreements, diversions, and inset agreements.
- Developers may need to explore the possibilities offered by onsite treatment and grey/green water recycling.
- Further consideration and investigation of SUDS could be made.

17.26 We have a number of overall recommendations to make regarding the delivery of utilities in particular the issue of upstream supplies. Please refer to Chapter 30.

18 UTILITIES: GAS

Introduction

18.1 National Grid (NG) is the incumbent gas transporter in the vicinity of the Old Oak development site.

18.2 Rather than use the national grid to supply all needs, there could be scope in this area for developments to set up one or more energy centre where heat, electricity and cooling can be generated locally by using Combined Heat and Power units, and then distributed via a heat network. We have dealt with this opportunity under Chapter 21.

Project summary

18.3 The table below summarises the projects costed in this chapter, with their delivery phase and currently assumed priority. Additional detail is available under separate cover.

Table 18-1 Summary

About the infrastructure project	Infrastructure needed in which phases?	What priority attached?	Gross infrastructure cost (£000s)
Gas governor off existing medium pressure main in Western Avenue.	Phase 1	1) critical enabling	108
New Medium Pressure Main from Kensal Green/Canalside plus pressure governor	0	1) critical enabling	1,089
Off site main from centre of site 8	Phase 2	1) critical enabling	180
Off site main from centre of site 8	Phase 2	1) critical enabling	494
Off site main from centre of site 8	Phase 3	1) critical enabling	685
Off site main from centre of site 12	Phase 4	1) critical enabling	404
Off site main from centre of site 13	Phase 4	1) critical enabling	527
Off site main from centre of site 16	Phase 4	1) critical enabling	143
Total			**3,630**

What infrastructure is currently present?

Old Oak has a network of low pressure gas distribution mains

18.4 There is a network of low pressure gas distribution mains crossing the Old Oak development area which are owned and operated by NG. These generally follow the route of the public highway network and provide supplies of gas to residential and commercial properties, particularly for domestic purposes and for heating.

18.5 NG has not advised of any significant gas users within the Old Oak core area.

18.6 There are also a number of medium pressure gas mains within the vicinity of the Old Oak. From inspection of the National Grid Gas record drawings, none of these fall within the proposed development area itself.

Does anything need to be moved to allow development to happen?

Diversion works are likely to be modest

18.7 We do not envisage that significant diversion works will be required to the existing medium pressure iron mains. Appropriate protection measures may be required to any mains which are affected by highway improvement works.

18.8 However, it may be necessary to decommission some of the low pressure distribution mains as the development progresses. New low pressure distribution mains will be laid within the public highway network to supply the proposed development.

What infrastructure is needed? How much does it cost, where relevant?

A series of local reinforcement measures are likely to be required

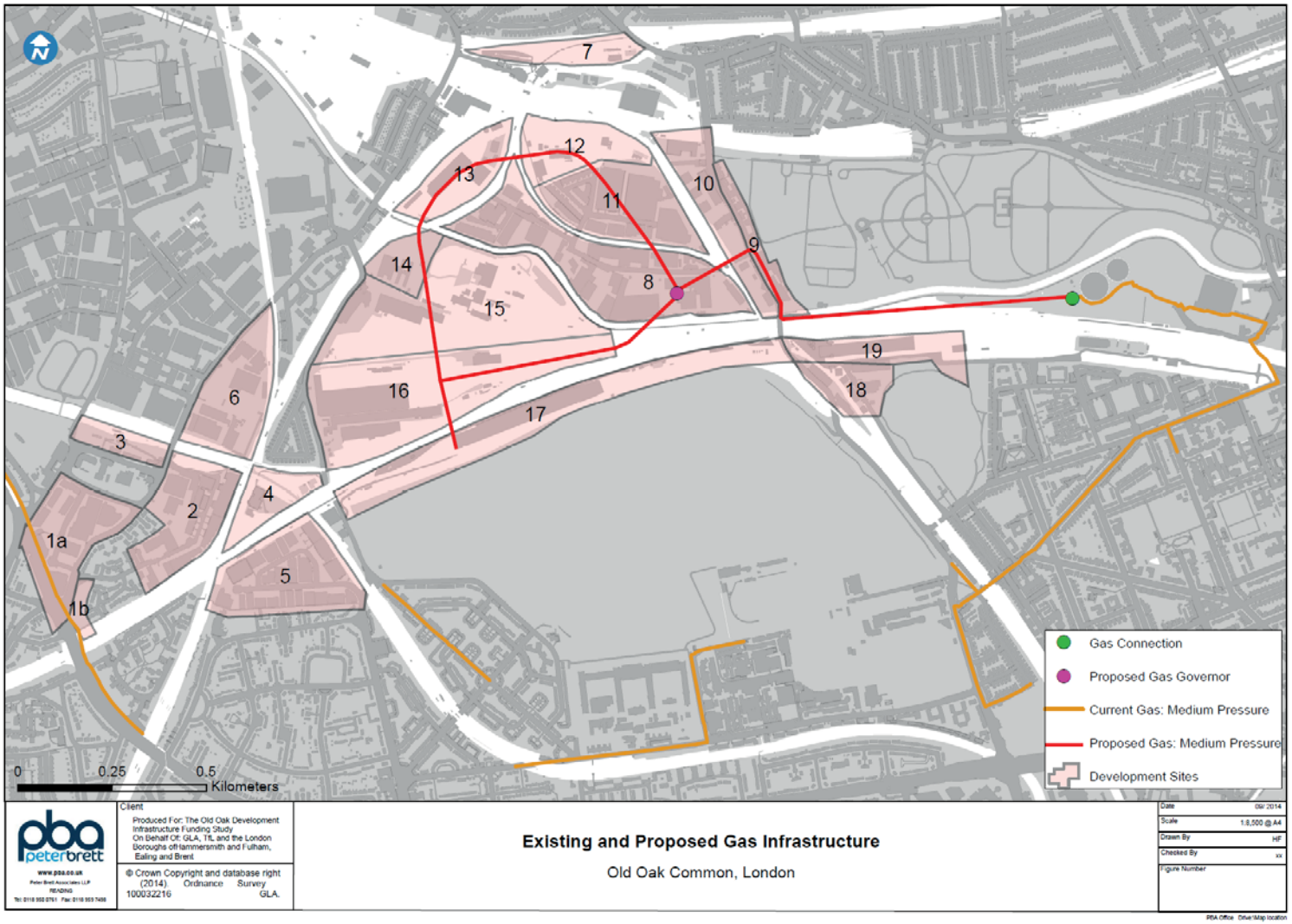
18.9 We have obtained strategic information from utility providers and used our experience of other strategic developments and our engineering judgement to understand what infrastructure might be required. At this stage, work can only provide a strategic overview for the purposes of strategic planning and broad cost calculations. Further detailed work will be needed. We have set out our suggestions in Figure 18.1 and provided further detail at a project level in Table 18-1. The map does not intend to provide any indicative layout.

18.10 The main elements of gas reinforcement measures are as follows.

- Medium pressure mains upgrade; NG has advised that capacity improvements will be necessary to the existing mains network. The nearest main (Medium Pressure) is 1000 metres from the Old Oak core area boundary. However this main has insufficient capacity for the requested demand and will require reinforcement. (Note: there are other medium pressure mains around Old Oak but they are unlikely to provide a suitable connection point – because they are further away from high pressure main).
- A new medium pressure main into the site. Existing pipework may not be of the correct diameter to supply the required demand of the proposed development, and may have to be upgraded. A new main will be required to run from the location of the proposed Connection Charging Point (adjacent to the gas holders off Canal Way at Kensal Green) to the core area. This is shown in relation to Old Oak on the figure below. To avoid the route of the new main to the site crossing third party land we have adopted a route which follows the public highway network along Harrow Road (A404) and Scrubs Lane (A219) before entering the central development area along Hythe Road.

- Gas governor upgrade; a gas governor will be required within the area to reduce the operating pressure from medium to low for distribution and connection to the residential and commercial development.
- Local site connections; these will be required from the local distribution network onto sites.

Figure 18.1 Existing and proposed gas infrastructure (layout for estimate purposes only - further work will be needed with utilities companies)



Upstream reinforcement works could be required. They are not costed here

18.11 At present, we are unable to provide an estimate on the cost of the upstream reinforcement works (any reinforcement works would be subject to an economic test, and as such it could be the case that NG shoulders the cost).

18.12 NG would need to study the supply requirements in detail to understand the effect on the upstream gas distribution network. A study could take between 2-3 months, and a charge of around £20k may be required.

How can infrastructure be paid for?

18.13 Gas infrastructure can be paid for in different ways, depending on the precise infrastructure in question.

- Local on-site connections: these are paid by the developer.
- Governor and new medium pressure mains: National Grid Gas' "Statement of Principles and Methods to be Used to Determine Charges for Gas Distribution Connection Services for Distribution Networks: Effective Date 7th April 2014" requires the costs associated with the medium pressure pipework and governor from the Connection Point to Old Oak to be funded by the development.[27]
- Main reinforcement costs upstream of the Connection Charging Point: there will be an apportionment of costs between the developer and the National Grid. This apportionment is subject to a separate economic analysis exercise. This contribution will be equal to the excess of the costs associated with the new load over the capitalised transportation revenue. Contributions are made by means of an up-front payment.[28] Note that these costs would require separate investigation, and we have not covered them here.

[27] National Grid Gas Effective Date 7th April 2014 *Statement of Principles and Methods to be Used to Determine Charges for Gas Distribution Connection Services for Distribution Networks*

[28] National Grid (ibid) states that "We apportion the cost of Specific Reinforcement according to its location in relation to the Connection Charging Point. Specific Reinforcement downstream of the Connection Charging Point is charged to the customer. Subject to the Economic Test, in respect of Distribution Network System reinforcements, we will fund Specific Reinforcement upstream of the Connection Charging Point. The Economic Test is used to identify new requests for capacity on the gas distribution network where the level of investment would be considered 'uneconomic', and so avoids existing customers on the distribution network subsidising the new load. The Economic Test compares the cost of distribution network reinforcement and additional operating costs of accommodating the new load with the additional distribution transportation revenue from the load. The annual transportation revenue and operating costs are capitalised over the agreed appraisal period at the rate of return allowed in the Price Control. Where the aggregate additional reinforcement and capitalised operating cost is greater than the capitalised transportation revenue, the transportation revenue will not provide the allowed rate of return on the investment. To avoid this deficit being recovered by increased charges to other customers, the customer is requested to pay a contribution towards the cost of the reinforcement. This contribution will be equal to the excess of the costs associated with the new load over the capitalised transportation revenue. Contributions are made by means of an up-front payment, enabling the standard transportation charges to be applied when the new load is connected."

Issues and recommendations

18.14 We have a number of overall recommendations to make regarding the delivery of utilities. Please refer to Chapter 30.

19 UTILITIES: ELECTRICITY

Introduction

19.1 National Electricity transmission mains are the responsibility of National Grid (NG). Local distribution networks in the vicinity of Old Oak are owned and operated by both UK Power Networks (UKPN) and Scottish & Southern Energy (SSE).[29] The Old Oak site itself sits within the supply area of UKPN.

19.2 Supplies to both of these Distribution Network Operators (DNO's) are made from the national grids via NG's Willesden 275/132kV and 275/66kV substation supply points.

19.3 No account is made here of the demands created by running trains on HS2 or Crossrail.

19.4 Rather than use the national grid to supply all needs, there could be scope in this area for developments to set up one or more energy centre where heat, electricity and cooling can be generated locally by using Combined Heat and Power units, and then distributed via a heat network. We have dealt with this opportunity under Chapter 21.

Project summary

19.5 The table below summarises the projects costed in this chapter, with their delivery phase and currently assumed priority. Additional detail is available under separate cover.

Table 19-1 Summary

About the infrastructure project	Infrastructure needed in which phases?	What priority attached?	Gross infrastructure cost (£000s)
Revisions to Existing 6.6kV network to suit proposed development layout	Phase 1	1) critical enabling	474
Spur off existing 11kV network	Phase 1	1) critical enabling	231
132kV main from Willesden GSP via existing cable tunnels to site 14. New 132kV Main Substation + 11KV Loop Within Site 7	Phase 2	1) critical enabling	30,681
Revisions to existing 6.6kV + 11kV network to suit proposed development layout	Phase 2	1) critical enabling	479
Off Site 11kV from Site 12 (or nearby, to be confirmed)	Phase 2	1) critical enabling	1,221
Off Site 11kV from Main Substation on Site 14 (or nearby, to be confirmed)	Phase 2	1) critical enabling	5,746

[29] Ealing and West are supplied by SSE; Hammersmith & Fulham and sites to the east are supplied by UK Power Networks.

About the infrastructure project	Infrastructure needed in which phases?	What priority attached?	Gross infrastructure cost (£000s)
Off site 11kv reinforcement works allowance	Phase 3	1) critical enabling	363
Off Site 11kV from Main Substation. Site location TBC.	Phase 3	1) critical enabling	6,174
Off site 11kv reinforcement works allowance	Phase 3	1) critical enabling	181
Off Site 11kV from Site 14 (or nearby, to be confirmed) and Site 12 (or nearby, to be confirmed)	phase 3	1) critical enabling	4,914
Revisions to Existing 6.6kV + 11kV network to suit proposed development layout	phase 4	1) critical enabling	479
Revisions to Existing 6.6kV network to suit proposed development layout	Phase 4	1) critical enabling	290
Off Site 11kV from Main Substation	Phase 4	1) critical enabling	5,080
Off Site 11kV from Main Substation. Site location TBC.	Phase 4	1) critical enabling	9,040
Off Site 11kV from Main Substation. Site location TBC.	Phase 4	1) critical enabling	5,123
Total			**70,267.5**

What infrastructure is currently present?

Most of Old Oak is within UK Power Network's (UKPN) area

19.6 The majority of the Old Oak core area falls within UKPN's London Power Network (LPN), Willesden Regional Area.

19.7 The LPN EHV networks supplied from Willesden 275/132kV and 275/66kV Grid Supply Points (GSP's) have an aggregated demand of circa 390MW across five LPN 11kV, five London Underground (LUL) and three Network Rail substations. Willesden 132kV additionally supplies the EPN Leicester Road Grid substation increasing the demand on the GSP by a further 60MW.

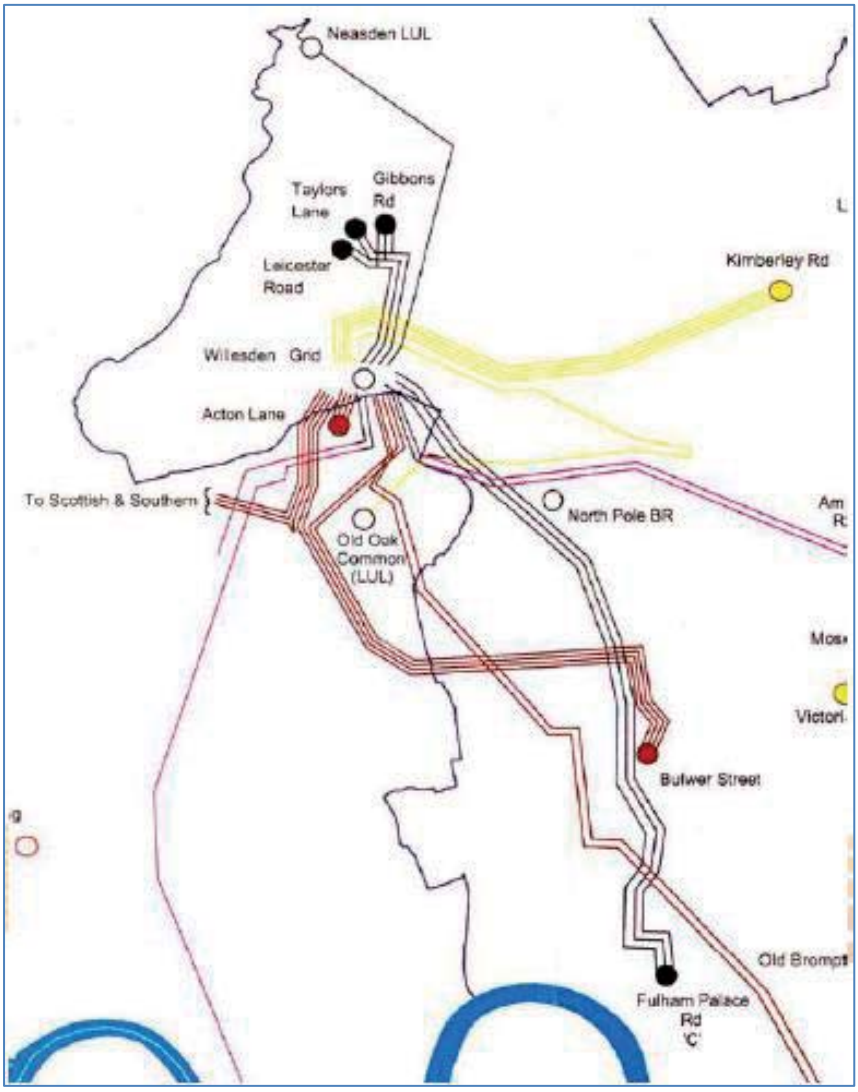
19.8 The network is composed entirely of underground cables the majority of which was installed between late 1930's and 1960. A relatively new addition was the establishment of Fulham Palace 'C' in 1997 supplied by 132kV cables installed in a deep cable tunnel measuring 6km in length.

UKPN's Regional Development Plan for 2015-2023 is with OFGEM

19.9 UKPN's LPN Regional Development Plan has been submitted to OFGEM for development over the forthcoming Rio ED1 period which will extend from 2015 – 2023. A response from the regulator to these plans is currently awaited. UKPN's LPN Regional Development Plan also describes the improvement works which will be

required to their networks to facilitate the proposed developments at Earls Court and White City.

Figure 19.1 Electricity infrastructure in and around Old Oak



Source: UKPN: Willesden LPN Regional Development Plan No 1, March 2014, Appendix A: Geographical Diagram

Does anything need to be moved to allow development to happen?

We do not envisage that any significant diversion works will be required

19.10 We do not envisage that significant diversion works will be required to the existing strategic networks as these are in cable tunnels at depth below the site. They will need to be considered at the design stage in order to safeguard their integrity.

19.11 Appropriate protection measures may be also be required where the cable networks are affected by highway improvement works.

19.12 We envisage that the existing local networks distribution networks and associated substations within the main Old Oak area will be decommissioned as development proceeds. New distribution networks will be constructed to supply the proposed development within the development highway network.

What infrastructure is needed? How much does it cost, where relevant?

19.13 We have had a constructive dialogue with UKPN with regard to electricity supply to Old Oak.

19.14 There may be a minimum amount of spare capacity to connect new customers. Generally this would in the order of less than 5MW in total for the area.

There are a number of requirements to uprate the network in response to growth

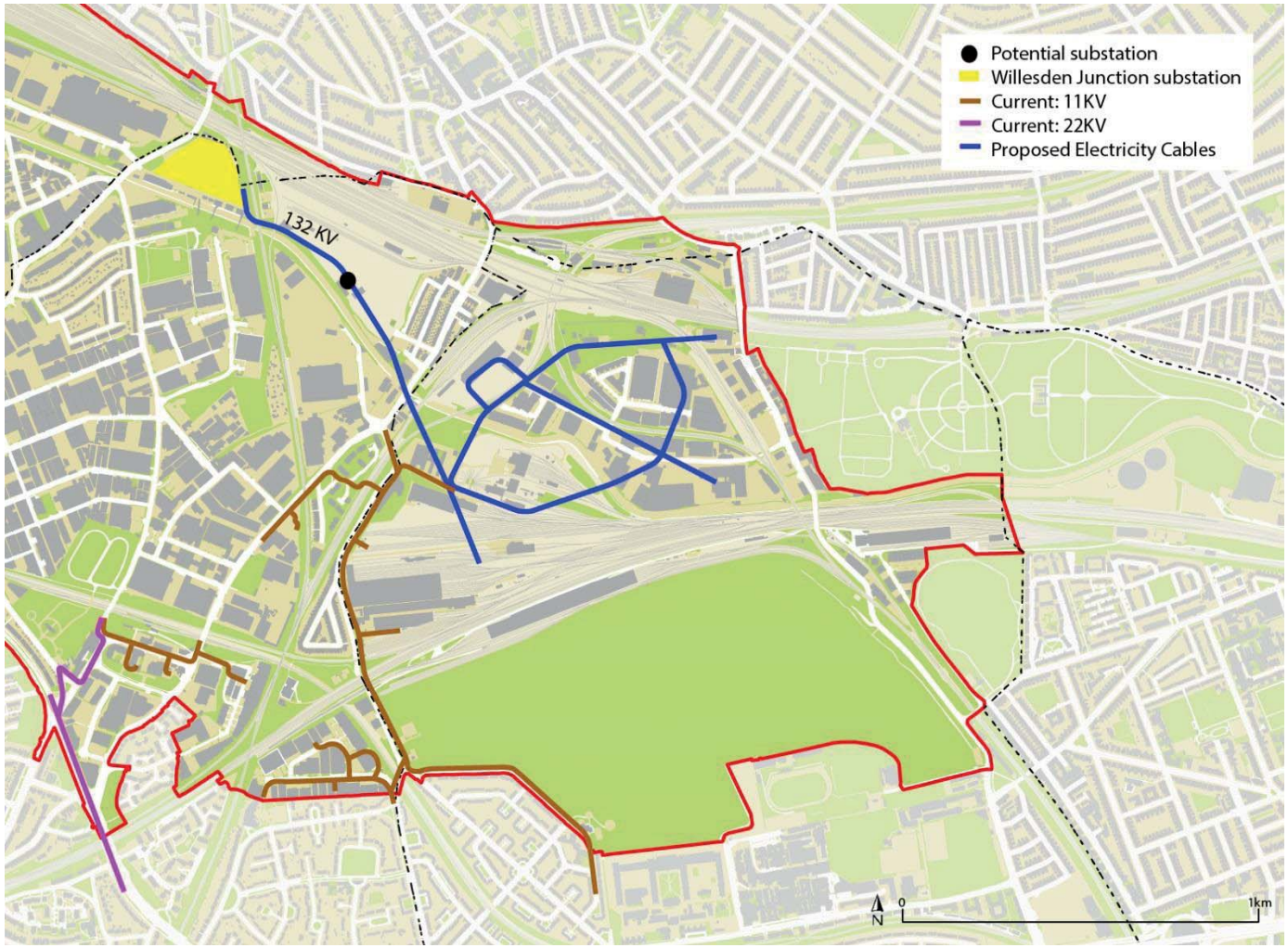
19.15 A new 132kV line; UKPN have also confirmed that a new 132kV line will be required from NG's main substation at Willesden to a new 132kV substation.

- A new 132kV main substation; UKPN have advised that Old Oak would eventually need a new main substation to feed this development. They are 132/11kV and would require a footprint of at least 1800m2. This would consist of up to three 132/11kV 66MVA transformers which would give a firm cyclic capacity of 177MVA. They can be developed in phases with two transformers installed initially with the third to follow at a later date (it is not possible to be more precise, because much depends on trend background change in energy consumption). The development of a new main substation would take three years from the granting of planning permission having identified a suitable site. There may be a need for upstream reinforcement by national grid which would take a minimum of the same period if not longer, depending on what is required. UKPN have advised that the cost of the substation alone is likely to be between £10m and £15m. This cost will have to be funded by developers.
- The other issue regarding the provision of this facility is its location and land-take requirement. The indicated size is in the order of 40m x 45m and this needs to be accommodated within area. The facility is not an ideal neighbour from an aesthetic and public perception perspective and so the location needs to be carefully planned. Factors to bear in mind include:
  - The proximity of the cable tunnel to the existing Old Oak Common sub-station and Willesden substation
  - Neighbouring uses
  - Anticipated delivery timings for sites demanding power.
- 11kV substations; there will probably be a need for around 50-60 11kV substations dispersed within the development. Currently the area has a number of 11kV / low voltage substations to feed existing customers.

19.16 We have obtained strategic information from utility providers and used our experience of other strategic developments and our engineering judgement to understand what infrastructure might be required. At this stage, work can only provide a strategic overview for the purposes of strategic planning and broad cost calculations. Further detailed work will be needed.

19.17 We have set out our suggestions in Figure 19.2 and provided further detail at a project level in Table 19-1.

Figure 19.2 Existing and proposed indicative electricity infrastructure (substation could be located on site 14 or 8, but this would be subject to further investigation. Layout for estimate purposes only - further work will be needed with utilities companies)



How can infrastructure be paid for?

19.18 On-site connections and connections between mains supply and individual developments are the responsibility of developers.

With 132kV Grid Substation and cable infrastructure, there are three possible funding scenarios

19.19 These scenarios are entirely dependent on the designed capacity of the substation and the provision of this capacity for third parties.

- Scenario 1: This scenario occurs when a developer utilises all of the agreed capacity installed to serve their development. In this scenario, the developer would bear the full cost of providing the additional capacity and associated infrastructure.
- Scenario 2: If the developer does not utilise all of their agreed capacity (as per Scenario 1) and a third party requests loading from the substation, then the original developer could potentially receive a refund for part of their original payment. This payment would be proportionally linked to the amount of load released.
- Scenario 3: If the distribution network operator determines that infrastructure required to meet a developer's capacity requirement also serves to reinforce the existing supply network and better their security of supply, then the costs associated with providing this infrastructure will be apportioned between the network operator and the developer. This payment would be proportionally linked to the amount of load required for both parties.

19.20 To date, UKPN has advised that the costs would need to be met by developers. However, as outlined above there may be ways of putting strategic infrastructure into the industry investment planning cycle, and perhaps getting costs apportioned between developers and power companies.

11kV substations, cable infrastructure and low voltage infrastructure would be funded entirely by the developer

19.21 There is no possibility of splitting funding for 11kV infrastructure. Developers will need to cover all costs.

Issues and recommendations

19.22 Highways network design will need to ensure that existing deep cabling is taken into account in design stages.

Further utilities recommendations

19.23 We have a number of overall recommendations to make regarding the delivery of utilities. Please refer to Chapter 30 onwards.

20 UTILITIES: TELECOMMUNICATIONS

Introduction

20.1 Telecommunications networks are provided by a range of operators including BskyB, BT, Colt, Instalcom, Verizon, Virgin Media, Cable & Wireless and Vodafone.

What infrastructure is currently present?

There are a number of Telecommunications providers who have plant in the vicinity of the Core Area

20.2 The networks / plant generally fall within the existing public highway network.

20.3 There is a major telecommunications mast operated by Cable & Wireless adjacent to the Powerday site at the north of the Old Oak Core Area. BSky B have advised that they also have equipment routes along the Grand Union Canal Southern Tow Path.

The Core Area is covered by three different exchange areas

20.4 Exchanges serving the area are Acton in the South West, Harlesden in the North West and Kensal Green in the East. All of these exchanges are understood to be superfast broadband enabled and services are currently being rolled out. However, there are shortcomings with the provision of Broadband in Park Royal that need to be addressed.

Does anything need to be moved to allow development to happen?

We do not envisage that any significant diversion works will be required to the existing networks

20.5 Appropriate protection measures may be required where these networks are affected by highway improvement works or by proposed crossings of the Grand Union Canal.

20.6 We envisage that the existing networks within the main Core Area will be decommissioned as development proceeds. New networks will be constructed to supply the proposed development within the development highway network.

What infrastructure is needed? How much does it cost, where relevant?

20.7 New superfast broadband networks will be required to service the proposed Core Area from the three exchanges. These networks will generally be routed along the public highway network and in wider Park Royal

How can infrastructure be paid for?

BT Openreach is likely to cover infrastructure costs

20.8 BT will normally require developers to excavate and lay the necessary ducts and joint boxes, which BT Openreach provide free of charge, and construct the necessary chambers as part of the general highway construction works. All other works are typically undertaken by BT Openreach at their expense, provided each individual connection does not exceed £3,400.

20.9 In a dense development such as Old Oak, it is unlikely that this cost will be exceeded and we can therefore assume that there will be no cost to developers.

Issues and recommendations

20.10 It is not anticipated that the supply of telecommunication lines will represent a 'show stopper' given improved cable technology and the fact that BT Openreach will be making a substantial investment in their own network to serve the area.

20.11 As with the other utilities, the key factor will be the timely dialogue with BT Openreach so that works can be planned and implemented well in advance. Clearly, the provision of thousands of new lines will require planning and implementation that will span years rather than months.

21 FUTURE ENERGY

Introduction

21.1 The previous energy and utility chapters have reviewed the local utility capacity to ensure that sufficient conventional energy supplies can be provided. This demonstrates deliverability of the development by providing confidence that the development can connect to conventional energy supplies.

21.2 This section provides an overview of infrastructure associated with delivering low carbon energy - in particular heat networks - in light of current GLA policy requirements.

21.3 Energy infrastructure requires an element of resilience in planning to ensure that the needs of future occupants are not impacted by unintended consequences of the way development is brought forward today. This requires infrastructure to be open and adaptable to innovation. In this regard further exploration of smarter energy infrastructure has also been undertaken.

Project summary

21.4 The table below summarises the projects costed in this chapter, with their delivery phase and currently assumed priority. Additional detail is available under separate cover.

Table 21-1 Summary

About the infrastructure project	Infrastructure needed in which phases?	What priority attached?	Gross infrastructure cost (£000s)
Heat and power network consistent with existing London Plan approach, assuming £7,500 / unit cost.	Phase 1, 2, 3, 4	1) critical enabling	172,838
Total			**172,838**

Context and approach

21.5 The future energy strategy for Old Oak will be required to fit within a hierarchy of international, national, GLA and local policy. This alone creates complexity when estimating how buildings will function in the future and ultimately the burden placed on local utility infrastructure.

International and London policy commitments require the UK's electrical network to be decarbonised over the next 40 years

21.6 This is reflected within GLA policy targets for London's CO_2 emissions, with a target of achieving a 40% reduction in CO_2 (from 1990 levels) by 2020[30].

21.7 As such, the London Plan includes a number of energy related policy interventions relating to the delivery of sustainable energy. These are outlined in "Delivering London's Energy Future" (2011). Over a number of years a body of evidence has established a wide range of approaches that can both reduce demand and provide lower carbon energy options at a local level.[31] One of the cornerstones of this is to plan energy distribution more effectively across the city.

The GLA's policy focuses on heat networks. We follow that lead

21.8 The argument for the use of Combined Heat and Power Networks are that they capture waste heat from the electricity generation process that would have otherwise been 'vented' to the atmosphere. Electricity and gas represents 80% of London's total greenhouse gas emissions, and in practice heat networks offer between a 5% to 30% reduction on carbon emissions associated with heat when compared to gas.

21.9 From this evidence base the GLA have established environmental policies (as outlined above) within the London Plan that require developers to consider installing heat networks. Within the The Mayor's 2010-2011 study to assess the potential for low and zero carbon supply in London it is argued that over half of the overall opportunity for decentralised energy in London is through medium and large scale heat networks. The aim of the policy is to generate heat network capacity across London that can potentially interconnect in the future to sources of waste heat, and therefore decarbonise the supply of heat.

21.10 Because of this policy stance, our consideration of an energy strategy for OOC first focuses on the delivery of heat networks for the development site. However, the study providing the evidence base for the current heat strategy policy is now several years old. New national policy is emerging which reflects significant innovations in the way we generate, distribute, store and use energy.

Heat Networks

21.11 This section reviews developing a district heating/cooling network.

Heat network option 1: A multi-source heat network model

21.12 The new development at Old Oak has the opportunity to establish a heat network that can be designed to expand beyond the red line boundary to provide the needs of an area of old building stock with heat and any OOC Heat Network could connect into

[30] https://www.london.gov.uk/sites/default/files/Energy-future-oct11.pdf

[31] London Energy Partnership (http://www.lep.org.uk/)

other area networks that develop in Hammersmith and Fulham, e.g. in White City Opportunity Area..

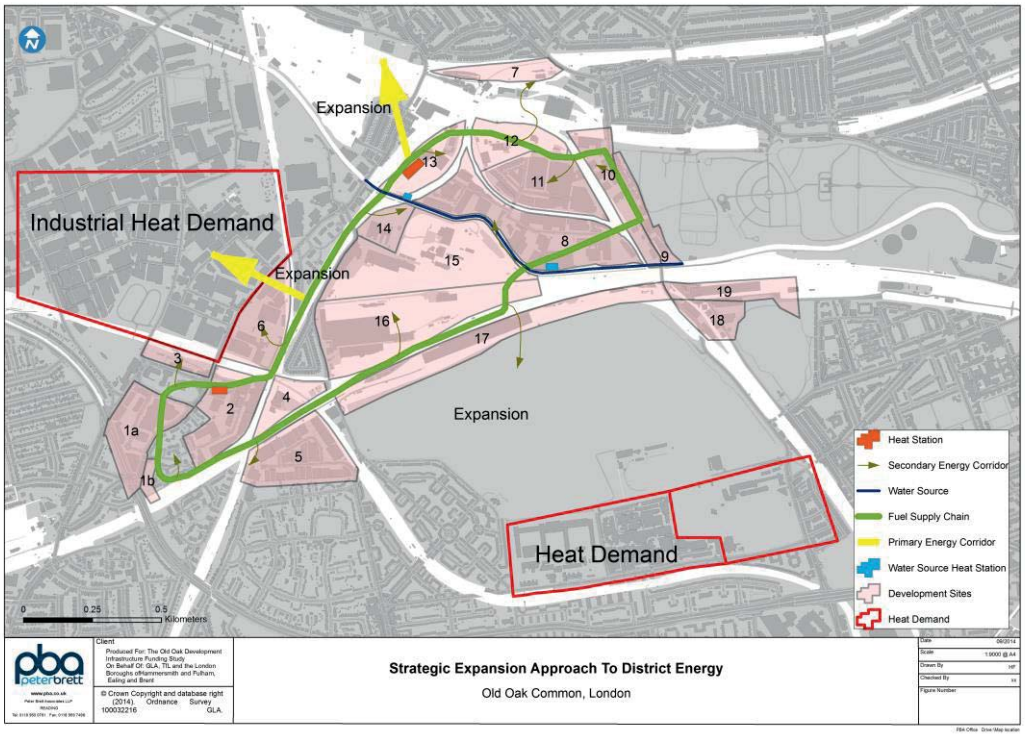
21.13 This approach would require establishing a heat main through the site that connects all the development phases and scaled to expand beyond. This approach is similar to that of the Olympic Park Heat Network which is currently successfully creating new connections across East London.

21.14 A regeneration project of this scale can accommodate a number of sources of heat supply if a district wide heat network is delivered. There is therefore some potential to generate a market in heat supply which may also include connection to offsite waste heat sources. The more these attempts to create a competitive market in heat supply are successful, the more likely it is that the price of heat can remain competitive, and this will have further benefits including reducing the impact of fuel poverty.

21.15 With the aim of developing an expansive heat network that allows market competition across it, Figure 21.1 below illustrates how a district wide heat main could potentially link the entire development area to multi-point sources of heat as well as link to areas of high heat intensity beyond the red line boundary (potentially including industrial heat demand users at Park Royal and, if viable given the distance, the prison site).

21.16 Potential sources of heat can come from areas such as water source heat extraction in the canals, sewage waste (which is typically warm), and a local energy centre burning natural gas. In addition there may be potential opportunities for local waste companies such as Powerday, to establish supply chains for refuse derived fuel (RDF). It has been noted that annually there could be in the region of 50,000 tonnes of available waste for RDF locally, supporting potentially around 3-4MW of thermal capacity which would equate to around 5% of total site heat demand.

Figure 21.1 District heat network, showing possible heat export areas



Heat network option 2: Autonomous Energy Cell Model

21.17 Another way to deliver heat and energy infrastructure is to consider the development phases as a series of cells bounded geographically by the existing rail and canal networks to reduce costs associated with bridging existing barriers.

21.18 This strategy is focused on delivering decentralised energy projects on a single or adjacent development site basis. An illustration of how these energy cells could be formed across Old Oak is presented below in Figure 21.2.

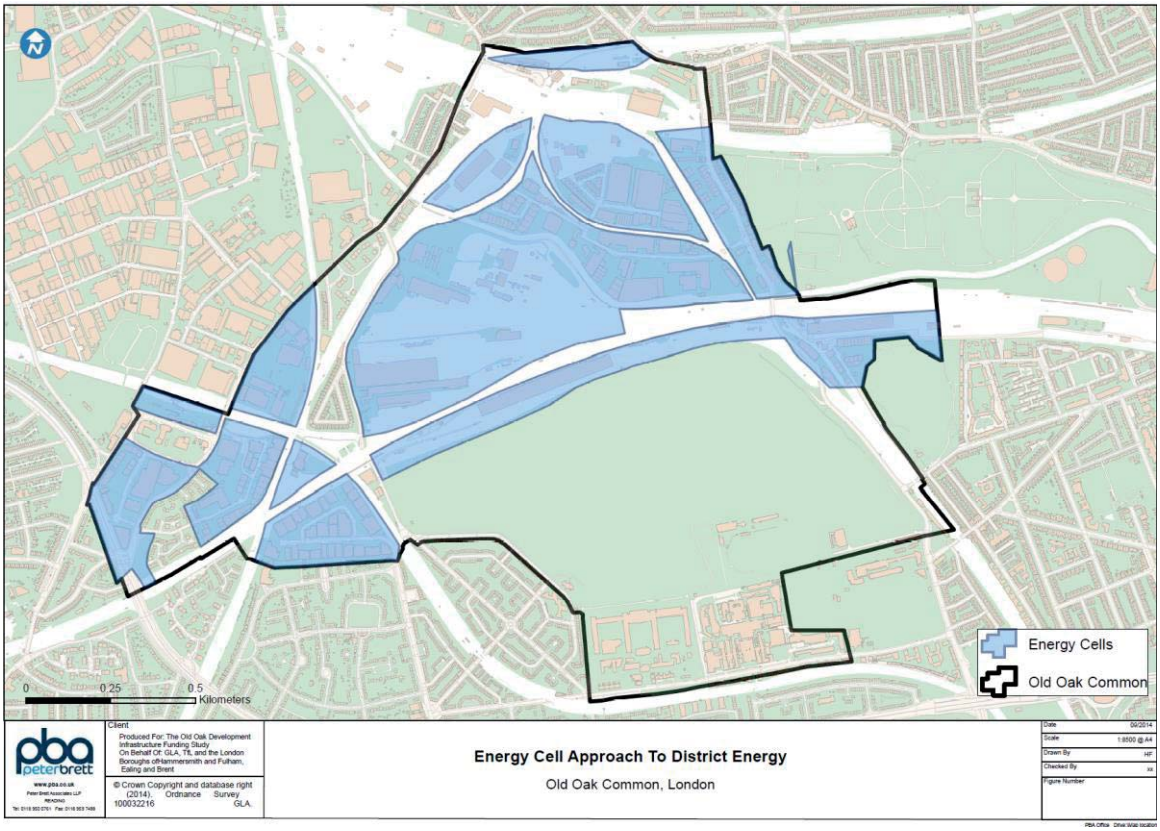
21.19 Across Old Oak the delivery of energy within each of these cells can be planned either by their natural assets such as heat pump technologies associated with water and sewage, or heat networks associated with refuse derived fuel or energy from waste. Ultimately how each cell is delivered will need to consider the energy and heat demand of the proposed development within it. For example if a particular cell is proposed for highly efficient 'passivhaus' design homes only with little heat demand, then simple electrical heat would easily accommodate end user needs. Conversely a cell with a high heat user and heat density may suit larger centralised supply through heat networks.

21.20 Ultimately a series of energy strategies could be delivered and managed in line with end user needs across particular development phases. This would potentially reduce the risks of a 'one size fits all' approach on a single supply route (whether gas, heat network or electricity).

21.21 From a place making perspective, the energy strategy could ultimately reflect the character of areas being designed. This could include setting performance specifications for each cell to contribute to the overall sustainability objectives of the scheme.

21.22 This could also include potential use of solar power building cladding technology creating 'solar city cells' or 'circular economy cells' which uses residual waste streams for energy generation.

Figure 21.2 Energy cell approach to district energy. (layout for estimate purposes only - further work will be needed with utilities companies)



What infrastructure is needed? How much does it cost?

In order to follow the London Plan, here we assume that a heat network is put in place

21.23 The costs associated with delivering heat networks are well known, and the supply chain of heat pipes and associated infrastructure is now well established. Typically the majority of cost associated with heat networks relate to the market costs of the insulated metal water pipes and electric system pumps (which can be large).

21.24 Estimated costs of installation of heat networks and the associated infrastructure can range from £5,000 to £10,000 per dwelling depending on development density. The variations in costs are directly related to the length of primary and secondary heat pipes and the quality of piping.[32] [33] Additional costs in the Old Oak area are likely to be associated with bridging rail, water and highway infrastructure.

21.25 Based on the median figure of £7,500 per unit the network would cost in excess of £173 million.

[32] Pöyry Energy Consulting and Faber Maunsell (2009) *The potential costs of district heating networks.*

[33] Brinkerhoff, P. (2009) *Heating Supply Options for New Development – An Assessment Method for Designers and Developers.*

How can infrastructure be paid for?

Heat networks create an income.

21.26 The delivery of energy infrastructure in the land development sector traditionally focusses on connection and supply as a cost burden, and does not ordinarily recognise the end value of the energy market. Therefore the planning, phasing and delivering of energy infrastructure is often considered as a burden on development viability.

21.27 However, Old Oak Common will establish a large new energy market that has a long term intrinsic value. Assuming each home has an energy bill of roughly £500 a year (typical of a modern energy efficient home) the development of 24,000 homes will generate an annual income in excess of £12,000,000 a year (slightly less if we take the number of homes without planning consent only). This makes it an attractive proposition to energy suppliers and investors.

Because the heat network creates an income, some infrastructure costs (£120m) can be picked up by an energy supplier. The remaining costs are absorbed by the developer within build costs (£52m)

21.28 In London the traditional model for establishing heat networks for new development projects is for a developer to fund some or the entire infrastructure with a third party contributing the remaining costs in order to adopt and own the network to supply heat energy.

21.29 Typically, around 25-30% of the costs of a heat network could be picked up by the developer, and the remainder by an energy supplier. This defrays the initial impact on development viability, but energy suppliers will recover the balance of the costs through compensating higher end user charges.

21.30 Over the entire scheme, costs for developers remain significant. Of the total cost of £172m, we assume that around £120m is met by energy suppliers (for recovery through consumer charges) and £52m comes from developers, as additional build costs.

Issues and recommendations

21.31 We have outlined and costed a heat network that will be able to serve Old Oak and (potentially) parts of the surrounding area. We have shown how the income-generating potential of this infrastructure may defray the expenditure on the heat network. We have therefore complied with the London Plan approach.

Key considerations

21.32 Assuming London Plan compliance, key recommendations are as follows.

- An Energy Masterplan will be required in order to design interconnecting infrastructure properly;
- Infrastructure will need to be planned early with stakeholders;

- Early work at the local authorities will be required in order to shadow OFGEN responsibilities, and those of the Energy Ombudsman; and
- Ensure revenue from energy infrastructure is considered through early planning. To potentially create this revenue opportunity, it is important that energy infrastructure is strategically planned early in the process to ensure that all stakeholders are aligned to the same objectives and timetable. This may also include early engagement with the energy regulator (OFGEM) to ensure network operators are meeting their forward planning and network investment requirements.

Recommendations if alternative approaches are investigated: a smarter grid

21.33 Rather than designing infrastructure based on a supply first approach (as with a heat network), an alternative and more efficient way may be to design energy infrastructure based on a demand first approach.

21.34 The following section sets out what a smarter grid network may look like at Old Oak, as well as how it will influence carbon reduction standards and cost.

The grid is going to decarbonise

21.35 As previously noted the UK as a nation is on a low carbon trajectory that is intended to deliver an almost zero carbon electrical grid network by 2050. By this date energy from electricity will be lower in carbon intensity than both gas or heat networks, which is important considering the timescales for delivery of Old Oak over the next few decades.

21.36 This zero carbon electricity grid will be delivered through a combination of new nuclear power generation, offering the UK a zero carbon power baseload, together with a national renewable strategy providing intermittent power.

21.37 When developing major projects over time frames that are similar to national policies, planning energy infrastructure needs to reflect how the UK will be operating its national infrastructure. This is important when considering the energy demand profiles that a new energy efficient development will be bringing to the network, as it will dictate both the carbon intensity and cost of electricity used.

A 'smart grid' will accompany this shift

21.38 To balance issues associated with intermittent generation and peak demand the Government is also investing in a smarter National Grid network[34].

21.39 This smarter network will balance demand and generation through a combination of power storage, peaking plants and shedding loads off the network (i.e. remove unnecessary load during periods of peak demand) to name a few approaches.

21.40 A smarter grid at Old Oak will also allow more efficient distribution and management of intermittent renewable energy during peak generation periods across the site to

[34] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/321852/Policy_Factsheet_-_Smart_Grid_Final__BCG_.pdf

where there is a demand. For example at peak demand, energy power can be directed from a sites internal supply, retrieved from storage devices or, where technology allows, the demand can be actively managed downwards to balance available supply. The result is the optimal use of the generation capacity on the site, and approach which will also yield the best economic return, as it means the site is not continually 'buying' high cost National Grid peak power.

Why deliver smarter grid infrastructure?

21.41 Smart grid infrastructure will be rolled out across the UK, irrespective of choices around CHP/ Heat Networks at Old Oak.

21.42 The question is the extent to which this technology undercuts the rationale for the additional capital expenditure on heat networks in an environment where very highly insulated housing needs very little heat. Most buildings designed to the highest levels of energy efficiency, such as the PassivHaus standard, are heated through electric led systems. Such properties need very little space heating which is typically provided through simple (and very cheap) electric panel heaters which operate at 100% efficiency or through balance mechanical heat recovery ventilation systems. Highly efficient buildings are not compatible with heat networks due to the mismatch of supplying and selling heat in high volumes against a negligible demand.

- Monitoring of smarter grid systems have shown that through simple control and understanding of energy demand (through smart meters) carbon savings in addition of 20% can be achieved.[35]
- With major innovation occurring in building design (including power over Ethernet technology which is now providing low voltage power to lights and appliances) balanced heat recovery systems and heating controls that compensate to weather variations, new buildings are also establishing lower peak demands through construction techniques, material choice, and internal design. Lower peak demands are critical for a number of reasons including:
- A flatter energy load is easier to supply by local networks requiring less associated infrastructure (such as substations which are sized against peak demand not total annual use);
- Flat energy load can be supplied by the UK nuclear base load electricity supply which is ultimately zero carbon; and
- The majority of innovation in the energy sector is focused on the electrical supply and use which can be planned into a new development. Ultimately and relevant to development economics, adopting an approach that allows for this innovation will mean all energy provision can come through a single power line.

21.43 Reducing infrastructure ultimately reduces costs. Smart grid provision will:

- Reduce build costs, and so create headroom for additional CIL, S106 or affordable housing contributions;
- Reduce capital charges, and so reduce end user costs;

[35] The Smart Grid: An estimation of energy saving and carbon benefit, 2010 PNL.

- Reduce co-ordination costs which will accompany the high levels of complexity during the development process, by reducing the need for interconnections between sites; and
- Reduce ongoing management costs at the local authority (where the local authority will effectively be drawn into substituting for OFGEM in providing some kind of consumer oversight in a monopoly situation).

21.44 We have made further recommendations on heat networks. Please refer to chapter 30.

22 PART 3: HOW MUCH FUNDING IS AVAILABLE?

This section investigates how infrastructure at Old Oak can be paid for.

We look at the scope to charge a Community Infrastructure Levy (CIL), when taking account of other requirements such as affordable housing. We also look at how other more innovative funding streams might be used.

23 TOWARDS A COMMUNITY INFRASTRUCTURE LEVY

Introduction

23.1 This chapter seeks to understand how a Community Infrastructure Levy (CIL) might be combined with other planning obligations, including affordable housing and other policy requirements, whilst maintaining economic viability. It makes outline recommendations about what CIL might be charged on different types of development at Old Oak.

23.2 However, whilst this report contributes to an understanding about a future CIL charge, it is not a CIL evidence base. Other work will need to take place in order to provide an evidence base suitable for a CIL examination.

23.3 The development appraisal advice offered in this report does not constitute a valuation and can neither be regarded nor relied upon as a valuation. It does provide a guide for feasibility in line with the purpose for which the assessment is required.

About CIL and developer contributions

CIL is intended to pay for strategic infrastructure in an area

23.4 CIL is just one part of a wider funding package that needs to be brought together and managed in order to facilitate infrastructure delivery in an area. It will not pay for all infrastructure.

23.5 It is critical to understand that CIL is set with reference to local development viability, not the scale of the infrastructure demanded. We cannot respond to a large infrastructure bill by simply setting CIL very high. Regulations make clear that CIL should be set at a level consistent with what the bulk of planned development can afford, given local market conditions.

Prudent developers will anticipate CIL and affordable housing policy

23.6 Developers may seek to compare the consequences of a residual land value calculation with the price that they have actually paid.

23.7 There is the danger that when buying land, developers make assumptions about future rising values, or that the planning permission will be granted that is not fully in accordance with existing or emerging policy. In those circumstances, they could pay more than they might if they had assumed a scheme to be fully policy compliant. It has been known for developers then to argue that they cannot afford to pay the very same policies, although this is effectively a circular argument.

23.8 This matter has been the subject of appeals to the Secretary of State and there are decided cases. In the decision in respect of land at Clay Farm, Shelford (February 2010) the Secretary of State and the Inspector both refused to accept that the historic

price paid for the land should result in a lower level of affordable housing being provided.

23.9 When making bids for land, prudent developers should be anticipating planning policy requirements, even before a planning policy for the proposed OPDC is formally established. Existing planning policy for the area should be the starting point.

Method of calculating CIL

We have followed the Harman report, NPPF, and CIL Regulations

23.10 In arriving at our suggested levels of CIL in this chapter, we have followed both the Harman report and the NPPF in our approach to a) the concept of viability, and b) our approach to ensuring that the cumulative effects of policy do not combine to render plans unviable.[36] We have therefore factored in known and likely policy costs (such as Mayoral CIL and London Plan energy policy, greywater recycling, S106, and affordable housing requirements) into our calculations to ensure that the CIL rates suggested do not render development unviable.

We have struck an 'appropriate balance' when advising on CIL levels

23.11 In suggesting CIL rates, we have struck what statutory guidance calls an 'appropriate balance' which maximises the delivery of development in the area. If the CIL charging rate is above this appropriate level, there will be less development than planned, because CIL could make potential developments unviable.

23.12 Conversely, if the charging rates are set below the appropriate level, development could also be compromised, because insufficient funding could be available to pay for the supporting or enabling infrastructure.

We include a 'buffer'

23.13 Note that the levels of CIL suggested here do not attempt to extract every last pound for CIL. In line with guidance, we include a buffer, or safety margin, that will help to ensure that individual developments are able to cope with unexpected costs, or market downturns. In this, we have followed Government guidance which advises that CIL rates should not be set at the very margin of viability, partly in order that they may remain robust over time as circumstances change:

'…it would be appropriate to ensure that a 'buffer' or margin is included, so that the levy rate is able to support development when economic circumstances adjust.' [37]

[36] National Planning Policy Framework (para. 173) 'The costs of any requirements likely to be applied to development, such as requirements for affordable housing, standards, infrastructure contributions or other requirements should, when taking account of the normal cost of development and mitigation, provide competitive returns to a willing land owner and willing developer to enable the development to be deliverable'.

[37] DCLG (February 2014) *Community Infrastructure Levy Guidance* (Section 2:2:2:4)

23.14 We have explained our method in Appendix A, and the assumptions used in our viability testing in Appendix B.

A structure for CIL charging

23.15 CIL Regulations (Regulation 13) allows the charging authority to introduce charge variations by geographical zone in its area, by use of buildings, by scale of development or a combination of these three factors. (It is worth noting that the phrase 'use of buildings' indicates something distinct from 'land use').[38]

We explored the viability of different building uses

23.16 This study has followed the Vision to examine the viability of the main building uses expected by the Vision document. These were residential uses, retail uses, hotels and office uses.

23.17 We set up typologies that would allow us to test the viability of these uses at the relevant sites. We agreed these typologies with the client team. The typologies were all taken to be compliant with the London Plan existing standards, as the intent is to establish the ability of the schemes to provide for a level of contribution after these requirements are met.

23.18 The typologies used are shown in Appendix B.

We explored the effects of different value areas on potential developer contributions

23.19 Viability is sensitive to both the value of the product sold, and the costs (such as contamination remediation and the build costs themselves) incurred in the construction process.

23.20 Values achievable differ from site to site and over time, fluctuating dependant on a number of factors including the proximity and accessibility to transport links, local amenities and open recreational space. Value can also be influenced by a site's immediate surroundings, such as whether a site is near an undesirable neighbouring use, or has a poor view. When analysing the viability of development in the vision, and thinking about the proposed phasing, we have had regard to the impact of neighbouring uses, the delivery of infrastructure upgrades, and place creation as the development progresses.

23.21 We recommend that there should be two CIL value zones for residential development, and one CIL value zone for office and retail development. Our reasoning is as follows.

- Residential uses. In order to scrutinise viability we applied values based on both a geographical location and a time basis factoring in the progress and phasing of

[38] The Regulations allow differentiation by "uses of development". "Development" is specially defined for CIL to include only 'buildings', it does not have the wider 'land use' meaning from TCPA 1990, except where the reference is to development of the area, in which case it does have the wider definition. See S 209(1) of PA 2008, Reg 2(2), and Reg 6.

the Vision. We have broken residential uses down on a site by site basis. We recognise there could be differing values, in order to address this we analyse assuming a high value and a low value zone.

- Commercial (retail and employment) uses. Based on the Vision trajectory and its proposed locations for growth, we concluded that the CIL for retail, hotels and office use should not be adjusted for geographical location within the proposed OPDC boundary. This is because the bulk of development is located in one location. Geographically differentiated charges would create unnecessary complexity.

23.22 All other things being equal, the higher value areas will be more viable and as such can pay more CIL.

How we deal with rising values over time to estimate a total CIL receipt

23.23 CIL and S106 policy must be set on the basis of today's market. The CIL set by the proposed OPDC in the coming period will therefore have to reflect current values.

23.24 However, it is desirable to know how much CIL and S106 infrastructure funding might be available in future, because we wish to estimate the total receipts from CIL over the development period. Old Oak is a long term development project. Residual land values can be expected to rise over time, as the prospect of improved transport connections and area regeneration become more immediate. Development in each future phase will tend to become more viable, other things being equal.

23.25 Any CIL and S106 policy is likely to respond to rising values. Regulations and statutory guidance suggests that the CIL should be revisited when there are significant changes in markets.

23.26 As we show above, we have adopted assumptions that suggest that residual land values rise at Old Oak over time. These rising values are the result of rising demand as the development progresses. (They should not be confused with background retail price inflation). We have not assumed that threshold values for land rise in the same way. Instead, we assume that CIL and S106 policy will hold values down. This is because in the future – in say, 2020 - the CIL will have been in place for some time. Those who own or control land that is purchased for redevelopment will have had ample opportunity to factor in/price in the cost to their calculations and negotiations, reflecting fully both existing and emerging policy.

23.27 In our judgement, in most cases the base threshold land values already include a large premium above current or existing use value. There is, therefore, already a considerable incentive for landowners to release sites for development built in to the calculations, and at the present time we see no reason to seek to increase it for the purpose of this exercise.

23.28 In those cases where the base land value is higher, (perhaps because there is an existing building) then it will be open to the applicant at the time of the planning application to argue that their proposed scheme may not be able to meet the full affordable housing policy as well as the required (non-negotiable) CIL.

Towards a possible CIL charging schedule

23.29 These rates have been suggested on the basis of our viability modelling. However, further detailed work must be carried out on these rates must before a CIL examination. The rates are presented for the purpose of this report, which is an outline view of possible infrastructure funding at Old Oak.

The CIL is set with reference to the viability of development, and is unrelated to infrastructure requirements

23.30 There is no relationship between the CIL level set and infrastructure requirements. A big infrastructure bill does not require us to set a commensurately high CIL level.

23.31 Instead, CIL Regulations and legislation makes clear that CIL can only be calculated with reference to the *viability of development* within a charging area, after all other policy costs are paid.

The charging schedule provides an indication of a possible approach to CIL in the forthcoming CIL examination

23.32 Below, we set out a high level draft CIL under different scenarios.

23.33 Using the evidence put forward for the Brent, Ealing and Hammersmith and Fulham CILs, we conclude that there is no CIL available from industrial development across Park Royal. We do not see this situation changing after the arrival of Crossrail and HS2. Industrial uses are insensitive to this type of infrastructure provision. However, the situation could be reviewed in future years.

23.34 We therefore focus on residential, retail, hotel and office uses.

Affordable housing and CIL are extracted from the same pool of funds. More affordable housing means less CIL, and vice versa.

23.35 When an affordable housing policy is already in existence, CIL should be set after affordable housing policy is taken into account.

23.36 However, at the proposed OPDC, there is no affordable housing policy set. Any affordable housing policy set by the proposed OPDC in its local plan would be in general conformity with the London Plan. We have therefore shown the effects of different levels of affordable housing on the CIL charge set. Our assumptions on the tenure split have been agreed with officers and are set out in Appendix B.

23.37 Our approach here has been to assume that rates of CIL per sqm of development stay relatively steady under the different affordable housing scenarios presented (at 40% and 30% we assume that levels of CIL are maintained at the same rate, but at 20% affordable housing are able to rise somewhat). We have done this in order to maintain a level of funding for infrastructure.

23.38 At this point in the study, we have assumed that Social Housing Grant may be able to support commercial development viability in the 40% and 30% scenario – but as we explain, this may not be a safe assumption to make.

At 40% affordable housing, development would only be commercially viable if it received significant public sector subsidy (eg through Social Housing Grant), or if delivery started after 2026

23.39 We have shown above that the NPPF states that policy requirements should not be so onerous as to push developments into unviability.

23.40 Assuming that CIL receipts were levied at the rates shown in Table 23-1 and 40% affordable housing was required, our analysis suggests that developers would not be able to proceed with their development due to a lack of commercial development viability. (This point relates to the *development viability* of a typical site; the overall infrastructure funding gap is a separate issue. As we show, there is a very substantial infrastructure funding gap under any scenario investigated).

23.41 However, developers would be able to proceed with development if a) a large Social Housing Grant was made available, or b) if residential development started after 2026, when values are assumed to have risen to a point where development becomes viable.

23.42 In the absence of Social Housing Grant, the first two phases are insufficiently viable for us to be confident that development at Old Oak would proceed on the trajectory set out, if affordable housing at 40% was levied. Arguably, there is little prospect of obtaining this grant at the scale required, and so housing would be unlikely to come forward. CIL receipts would still be available on commercial development in theory, but the overall vision – which depends on housing - would be unlikely to be delivered. This is because the success of the commercial development relies on the early phases being built to create the momentum to give office occupiers the confidence to locate in an untested location.

Table 23-1 Potential CIL per sq m (assuming affordable housing at 40% and assuming £155m of Social Housing Grant payable during phases 1 & 2)

CIL Table (£sqm net additional)	Ph1 40% affordable	Ph2 40% affordable	Ph3 40% affordable	Ph4 40% affordable
Resi High Band	£100	£250	£450	£450
Resi Low Band	£90	£190	£400	£400
Office	£75	£75	£200	£200
Retail	£35	£35	£50	£50
Hotel	£75	£75	£150	£150
Industrial development across OPDC area (incl. Park Royal)	£0	£0	£0	£0

23.43 In this scenario, CIL receipts are estimated at £357m to 2050.

At 30% affordable housing, development will need approximately £70m of Social Housing Grant to make it viable

23.44 In this scenario, CIL receipts are estimated at £415m to 2050. However, £70m of Social Housing Grant subsidy is required to make development viable enough to proceed on a commercial basis, if this rate of affordable housing is required.

Table 23-2 Potential CIL per sq m (assuming affordable housing at 30% and assuming £70m of Social Housing Grant payable during phases 1 & 2)

CIL Table (£sqm net additional)	Ph1 30% affordable	Ph2 30% affordable	Ph3 30% affordablle	Ph4 30% affordablle
Resi High Band	£100	£250	£450	£450
Resi Low Band	£90	£190	£400	£400
Office	£75	£75	£200	£200
Retail	£35	£35	£50	£50
Hotel	£75	£75	£150	£150
Industrial development across OPDC area (incl. Park Royal)	£0	£0	£0	£0

At 20% affordable housing, development is viable so can begin without any Social Housing Grant. A higher CIL can be charged whilst maintaining viability

23.45 In a 20% affordable housing scenario, no subsidy is required from social housing grant. Development is sufficiently commercially viable to proceed without further subsidy3. The lower rate of affordable housing also allows a higher CIL to be set on each square metre of development.

Table 23-3 Potential CIL per sq m (assuming affordable housing at 20%)

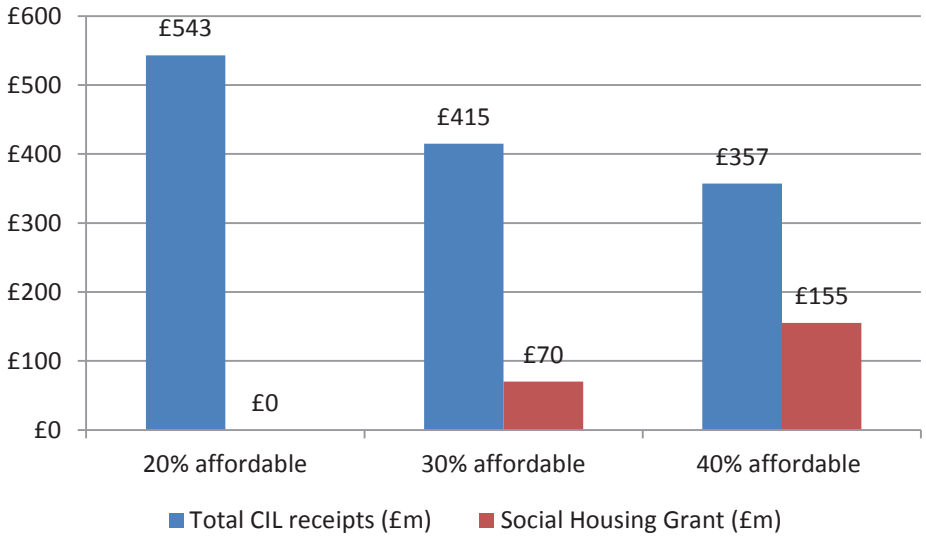
CIL Table (£sqm net additional)	Ph1 20% affordable	Ph2 20% affordable	Ph3 20% affordablle	Ph4 20% affordablle
Resi High Band	£115	£290	£520	£520
Resi Low Band	£105	£215	£460	£460
Office	£75	£75	£200	£200
Retail	£35	£35	£50	£50
Hotel	£75	£75	£150	£150
Industrial development across OPDC area (incl. Park Royal)	£0	£0	£0	£0

23.46 In this scenario, CIL receipts are estimated at £543m to 2050.

Total CIL receipts rise as affordable housing levels fall

23.47 Figure 23.1 shows estimated CIL receipts to 2050, and required levels of Social Housing Grant needed to achieve this level of affordable housing under each scenario.

Figure 23.1 Estimated total CIL receipts to 2050, showing Social Housing Grant required to render development viable at each affordable housing rate (£m)



Pulling together the overall developer contribution

23.48 To get a view of the total available developer contribution, we must add together

	Factor 1: the value of S106 contributions
Plus	Factor 2: the value of infrastructure provided through masterplans
Plus	Factor 3: the value of CIL contributions

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Table 23-2 Potential total contribution from Old Oak (assuming affordable housing at varying levels)

	CIL at 40% affordable in all phases **(assumes £155m SHG to create commercial development viability)**	CIL at 30% affordable in all phases **(assumes £70m SHG to create commercial development viability)**	CIL at 20% affordable in all phase **(no SHG needed to create commercial development viability)**
CIL receipts	£357m	£415m	£543m
Value of infrastructure delivered through S106	£33m	£33m	£33m
Value of infrastructure delivered through developer masterplans	£203m	£203m	£203m
TOTAL	£593m	£651m	£779m

Source: JLL/PBA

24 OTHER FUNDING FOR INFRASTRUCTURE

Introduction

24.1 Having looked at CIL/S106 funding in the sections above, in this section we examine other ways in which funding might be provided for the necessary infrastructure at Old Oak.

Our approach

24.2 In some instances, the funding sources covered here are not considered to be useful in raising funding for Old Oak infrastructure. Where this is the case, we say so.

24.3 In other instances, there may be a role for certain types of funding or financing. Many would need detailed work to reliably quantify the potential level of contributions, although we have made some assumptions in this study to broadly quantify the potential scale of contribution that could be made.

24.4 There are necessarily limits to what can usefully be provided at this stage.

- Many pieces of infrastructure covered in this report will not be needed for many years. We expect that many changes will be made to funding streams and policies in the intervening period. That means that it is not helpful to go into too much detail at this stage.
- Experience suggests that the best approach is not to simply aggregate all of the possible funding sources and them match them to aggregate needs, or to simply hunt around for possible sources of funding on an opportunistic basis, but rather to identify financial problems as precisely as possible before seeking solutions from the more limited range of possibilities that are specifically suited to addressing them.

Business Rates Retention /Tax Increment Financing

24.5 Tax Increment Financing (TIF) relates to a loose collection of ideas, so we have dealt with this issue together with the related matter of Business Rate Retention.

24.6 Existing legislation allows between 50% and 100% of business rates to be retained for increments above existing levels of business rates payable in the area. (50% retention is available generally, whilst 100% rates retention is possible in designated Enterprise Zones). Non-Domestic (Rates Retention) Regulation 2013 and the Non-Domestic (Designated Areas) Regulation 2013 set out the current rules.

24.7 Enterprise Zone status would be a potential major advantage in this regard. The bulk of commercial space is delivered after 2026 (following the arrival of HS2/Crossrail) but the trajectory assumes that useful amounts of commercial floorspace are delivered in the period 2016 to 2025, meaning that a prompt start on obtaining Enterprise Zone status could be advisable.

24.8 Business rates go to the Boroughs, so there would need to be agreement for the sums to be passed on to the PROPOSED OPDC. Such an arrangement was agreed at Vauxhall Nine Elms Battersea. There would also have to be an appetite for borrowing at the GLA: at Battersea, GLA borrowing for the Northern Line Extension is be serviced through a combination of developer contributions raised by the boroughs across the wider VNEB Opportunity Area, and incremental business rates generated and retained within the Enterprise Zone (EZ) in Battersea.

24.9 Risks also relate to the uncertainty of relying on business rates in their current form (a review of Business Rates was announced in the 2014 Autumn Statement) and on the continuation of existing rates retention schemes. In addition there is a planned Rating Revaluation in 2017 with an antecedent valuation date of April 2015.

Significant business rates could be generated once the site is occupied. This could support significant TIF borrowing

24.10 Estimating the likely reward to the OPDC is difficult. We calculate a very high level estimate of enhanced rates income building up to £70m pa plus when all the proposed commercial space is occupied. Either 50% or 100% of this £70m pa could be captured, depending on whether Enterprise Zone Status had been achieved or not. Much more detailed work is needed to expand on this and GLA/OPDC have now appointed consultants to advise on this.

24.11 This is a realistic attempt at estimating the business rates liability. The extent to which this uplift could be retained locally would be dependent on Enterprise Zone status, prevailing business rate levels, and the retention rules prevailing at the time. The scale of the opportunity is very significant when seen in the context of the per annum funding gap.

24.12 However, It is only possible to obtain retain business rates in this way once the commercial space is in place. On its own, this funding stream does not provide a way of funding infrastructure needed in advance of the commercial space being built.

24.13 This problem could be overcome by borrowing against this income stream (in a Tax Increment Financing (TIF) arrangement). A TIF has been put in place to pay for the Northern Line Extension at Battersea. The GLA has taken out a loan of up to £1 billion to fund the project. Future growth in business rates revenue within the Nine Elms Enterprise Zone, CIL and s106 revenues will be used in combination pay back the loan, which has been backed by a repayment guarantee provided by the UK government.

24.14 If a TIF was to be pursued, a study would be required to investigate the economic additionality of development proposed. It would be necessary to show that the estimated uplift in business rates would come from new business growth, rather than simply from businesses relocating from other nearby areas.

Affordable Homes Programme

Issues

24.15 In London, the GLA administers the Affordable Homes Programme alongside the National Affordable Housing Programme.

24.16 The Affordable Homes Programme (AHP) aims to increase the supply of new affordable homes in London. It may be possible to obtain this funding, or its future equivalent.

We assume no funding from this source

24.17 At the moment, we assume that no funding is available, given that it is in short supply. If AHP, or a future version of AHP was available, then a higher level of affordable housing would be possible, whilst maintaining a given level of viability.

Central mainstream funding and financing

Government has provided cash and loans elsewhere

24.18 In announcements being made as part of the 2014 Autumn Statement process the Government has shown itself willing to provide cash or loans to assist in funding (or financing) where large scale regeneration is proposed.

24.19 The National Infrastructure Plan, published ahead of the Chancellor's Autumn Statement announced significant investments and loans in infrastructure. For example, £200m was set aside to provide infrastructure and land remediation at Ebbsfleet. A £55m loan was offered to assist in the funding of a £190m heavy rail extension to Barking Riverside and support was offered in principle to assist in facilitation the residential element of the Brent Cross Cricklewood scheme. The common thread between all these initiatives is that they promise a major addition to housing stock in London. The Treasury has also invested £141m in the 'Olympicopolis' cultural regeneration scheme in Stratford, creating a new dance theatre, museum and two university campuses

24.20 The OPDC could look at existing budgets to meet more expenditure (including free school funding, which we have not included in our main calculations because of the uncertain long-term status of the programme), Network Rail/DfT capital expenditure budgets and HS2.

Significant funding may be possible, but is impossible to predict reliably

24.21 Again, this is very difficult to calculate. But looking at experience at Ebbsfleet Garden City, which has 15,000 homes (very much fewer than the 24,000 homes at Old Oak), then significant direct funding may be possible (upwards of £200m).

24.22 In addition if the area was given Enterprise Zone status, there may be access to a capital grant fund directed to funding works within Enterprise Zones.

Loans from EIB or commercial banks and prudential borrowing

Borrowing has to be repaid – but can help with cashflow issues

24.23 As well as the Central Government, there are other entities that could assist in financing. These would, in effect, provide a banking facility to allow money to be spent on infrastructure ahead of likely receipts from CIL or S106. This could potentially include

- Loans from commercial banks/ European Investment Bank ("EIB"). Currently the EIB has existing lending priorities focussed on affordable housing (through its JESSICA programme) and on sustainability objectives. Consideration might therefore be given to EIB loans applications to support increasing affordable housing provision, or a programme focussed on sustainability (for example, a smart cities programme).
- Local authority prudential borrowing. Prudential borrowing is the set of rules governing local authority borrowing in the UK. Under prudential borrowing, the amount of debt and other liabilities most local authorities can incur is no longer capped by an upper limit. Instead borrowing must conform to the Prudential Code which (among other things) requires that borrowing be affordable. Although prudential borrowing counts against the Public Sector Borrowing Requirement, we understand that HM Treasury is tacitly encouraging local authorities to borrow to finance local projects. There may be a role for prudential borrowing at Old Oak. However, more work would be needed to understand the relationship between the Boroughs (which we understand would be the accountable body for the borrowing) and the proposed OPDC.

We have not assumed a contribution

24.24 This is financing, rather than grant funding, so would have to be repaid. We have therefore not calculated a possible yield. However, financing can be very significant in dealing with a cashflow problem – so helping pay for infrastructure required in the advance of other infrastructure receipts.

24.25 Borrowing may be partnered with TIF arrangements.

Wider transport charges

The scale of the potential contribution needs more work

24.26 Any growth in farebox income is likely to be reabsorbed into TfL and HS2 coffers, so the scope for additional funding here is relatively limited. However, the vision document assumes very low car use. There is perhaps potential for car use charges which both raise revenue and modify car demand, and which could be retained locally.

24.27 At this stage, we do not know the scale of this potential contribution, or the extent to which other priorities may have first call on the income uplift. Future business case and financial planning work may clarify this.

New Homes Bonus

We do not see this as an available funding stream

24.28 In a similar manner there is currently a grant paid by central Government to local Councils called the New Homes Bonus. It is paid for 6 years and is based on the incremental council tax receipts. The risks are that the scheme may be curtailed, not extended and/or caps on annual/total funding may impact on the possibility of achieving the theoretical total.

24.29 However, we do not believe that it is possible to rely on this as a way of funding strategic infrastructure at Old Oak. This is because New Homes Bonus was created by central Government by cutting funding previously allocated to Local Authorities in the Housing and Planning Delivery Grant and Local Authorities formula grant.

24.30 Given that a) the NHB replaces a large amount of mainstream funding to local authorities, and b) local authorities will have flexibility on how to spend this (un-ringfenced) grant, we think it highly unlikely that local authorities will be willing or able to use NHB to pay for infrastructure at Old Oak.

24.31 As set out above, we do not suggest that it is possible to rely on this as a funding stream. As a guide to the scale of funding generated by growth at Old Oak, though, we have calculated that £600m funding will be created over the life of the Old Oak project, calculated based on an average £4,500 per unit for each of six years.

24.32 This per unit sum is derived from the average new homes bonus in the London Borough of Hammersmith & Fulham in 2014/2015, rounded down having regard to the average of New Homes Bonus over the last four years.

Recommendations

24.33 A specific exercise on financing and funding could be required as part of the ‘roadmap’ initiative recommended in Chapter 30.

24.34 This exercise may recommend early investigation of setting up an Enterprise Zone at Old Oak, in order that business rate retention/ TIF opportunities may be maximised.

25 PART 4: WHAT IS THE FUNDING GAP?

This section puts costs and funding together, to see if there is enough money to pay for the infrastructure required.

26 INFRASTRUCTURE COSTS, FUNDING AND CASHFLOW

Introduction

26.1 This section pulls together our findings. We discuss the requirements for infrastructure to cope with growth, the resulting costs, and funding. It provides an outline cashflow for infrastructure investment.

Infrastructure to realise the Mayor's vision

Gross infrastructure costs are around £1.5 billion

26.2 Realising the Mayor's Vision for Old Oak requires co-ordinated infrastructure delivery. Different levels of Government (national, city and borough) will be involved, along with a number of state agencies, notably Network Rail, HS2 and Transport for London. A range of private sector actors will also be needed, including developers and utility companies.

26.3 Adding the total cost of this infrastructure together gives us a gross cost figure. This is summarised in Table 21-1 below. Gross infrastructure costs include all known items required to deliver development in and around Old Oak, and therefore the WCML to Crossrail Spur and a series of items which HS2 has already committed to funding as part of the station package. However, these gross costs exclude the HS2 station and Crossrail stations themselves.

A small number of large projects account for a large proportion of the infrastructure costs

26.4 There are a small number of very big ticket infrastructure projects that have been identified as required to facilitate growth. Large projects such as this will need to demonstrate clear value for money in project appraisals if they are to go ahead.

26.5 The twelve biggest projects account for over £1b-worth of costs, which is equivalent to two-thirds of the total gross costs.

26.6 It is important to recall that the Crossrail and IEP depot projects are expected to be funded through the land value of the sites themselves (so reflecting the likely development scenario). They therefore do not appear on this list below. Please refer to paragraph 7.35 onwards for more detail.

Table 26-1 "Big ticket" projects – the top twelve project costs (gross infrastructure requirement) (£000s) (incl maintenance)

Rank	Project	£ (000s)
1	T-STA - Two new stations on London Overground - assumed to be one new station on each of the North London Line (which is the westerly station) and West London Line (which is the easterly station).	260,000

2	Crossrail to West Coast Mainline Spur[39]	225,000
3	Heat and power network consistent with existing London Plan approach, assuming £7,500 / unit cost.	172,838
4	T30/59 & G100. G100 is the pedestrian and vehicle link from HS2 to West London Line overground station	91,000
5	T-STA - Willesden Junction Station Capacity Improvements. Redevelopment of station buildings and concourse plus gateline improvements.	60,000
6	Bus operating revenue support for new services and compensation during construction. Assumed pooled as a CIL cost. S106 is not suitable because of pooling restrictions.	53,250
7	Victoria Road widening to Old Oak Lane and low rail overbridge headroom increased. Essential road widening proposed as part of HS2 plans to improve access on the main access link from the south	50,000
8	All through school - 4FE Primary, 4FE Secondary, Early Years and Sixth Form provision. Located to allow use of open space, and with a view to the provision of shared services from the school site. Location to be confirmed.	44,015
9	G5 - Willesden Junction bridge.	40,000
10	132kV main from Willesden GSP via existing cable tunnels to site 14. New 132kV Main Substation + 11KV Loop Within Site 7	30,681
11	T7 - New railway crossing over or under freight line and associated east-west link for new access on to Scrubs Lane.	25,000
12	Wider area junction improvements (excluding A4 junction improvements)	21,000

Source: PBA

Costs presented include contingency at appropriate levels. Costs for moving Crossrail and IEP depots are dealt with through land value

26.7 We have explained our approach to contingency and risk in paragraph 6.31 onwards. In summary, we have included contingency at appropriate rates, depending on the type of infrastructure being costed.

[39] This cost is only for the physical works to make the connection to the WCML. It does not include optimism bias; does not include costs for the related supporting rail infrastructure required further up the WCML; and does not include operational costs.

26.8 It is worth pointing out that the costs of moving depots (at Crossrail Depot and IEP depot site) will be substantial, because of the need to move existing operations. We have treated this as a site preparation cost that is deducted from land value, rather than an infrastructure project in itself. This replicates the likely real-world scenario, and means that these costs do not appear in the infrastructure project cost table below. This is a major issue, and the reader should refer to our explanation in paragraph 7.35 onwards for more detail.

Table 26-2 Estimated gross infrastructure costs located at Old Oak by infrastructure category (£000s) incl maintenance

Theme	Sub-theme	Gross cost incl maintenance
Transport		1,106,400
	Bridges & crossings	142,600
	Roads & junctions	221,800
	PT, cycle & pedestrian	742,000
Utilities		251,415
	Energy & heat networks	243,314
	Gas	3,630
	Potable water	2,424
	Sewerage & drainage	2,047
Social		191,264
	Ambulance	2,231
	Education	82,215
	Fire	6,500
	Healthcare facilities	25,135
	Integrated community facilities	19,200
	Open space & leisure	51,845
	Policing	4,138
Grand Total		1,549,079

Costs presented here may be an under-estimate

26.9 In particular, we are aware that utilities and drainage costs may rise following further work. Increased utilities costs may be funded by utilities providers (and so not affect development viability) but higher flooding and sewerage costs could affect development viability negatively. Our outline suggestions around CIL include a significant 'safety margin' that can allow significant costs to be absorbed without fundamentally affecting viability.

26.10 Land for sub-stations and pumping stations may also prove expensive: it is not yet possible to know who might provide land, and how much it might cost following negotiation.

Funding of £727m - £913m has been identified, depending on the affordable housing policy chosen

26.11 Table 26-3 sets out the funding identified, assuming 20% affordable housing.

26.12 Table 23-2 sets out the funding identified, assuming 40% affordable housing.

26.13 In these tables, we have not included an estimate for TIF funding or HS2 petition funding. This is because we cannot be certain at this stage that this policy will be pursued.

Table 26-3 Estimated gross infrastructure funding (£000s) assuming 20% affordable housing

	Gross cost (£000s)
Value of infrastructure delivered through S106 and S278	32,500
Value of infrastructure delivered through developer masterplans	202,096
Mainstream funding via public agencies	14,778
Innovative funding and financing	nil assumed
Other funding assumed (including HS2 petition)	nil assumed
Funding assumed from utility provider	120,986
Projected CIL receipts at 20% affordable housing/ nil SHG	543,000
Total funding	**913,360**

Table 26-4 Estimated gross infrastructure funding (£000s) assuming 40% affordable housing

	Sum (£000s)
Value of infrastructure delivered through S106 and S278	32,500
Value of infrastructure delivered through developer masterplans	202,096
Mainstream funding via public agencies	14,778
Innovative funding and financing	nil assumed
Other funding assumed (including HS2 petition)	nil assumed
Funding assumed from utility provider	120,986
Projected CIL receipts at 40% affordable housing/ assuming £155m SHG	357,000
Total funding	**727,360**

Putting costs against funding allows us to understand the 'funding gap'. Using gross costs, a funding gap of between £635-£821m remains (assuming 20% and 40% affordable housing respectively)

26.14 The funding gap remaining is shown in Table 23-2 below onwards. If more affordable housing is required, then CIL receipts will fall. This will increase the funding gap.

Table 26-5 gross infrastructure funding gap (£000s) assuming 20% affordable housing

		(£000s)
a	Gross infrastructure cost incl maintenance	1,549,079
b	Funding	913,360
c	Aggregate funding gap (a-b)	635,719

Table 26-6 gross infrastructure funding gap (£000s) assuming 30% affordable housing

	(£000s)
Gross infrastructure cost incl maintenance	1,549,079
Funding (assuming affordable housing at 30%, and £70m of SHG to achieve commercial viability)	785,360
Gross aggregate funding gap (a-b)	763,719

Table 26-7 gross infrastructure funding gap (£000s) assuming 40% affordable housing

	(£000s)
Gross infrastructure cost incl maintenance	1,549,079
Funding (assuming affordable housing at 40%, and £155m of SHG to achieve commercial viability)	727,360
Gross aggregate funding gap (a-b)	821,719

26.15 This is important, because this funding gap justifies the existence of CIL. A CIL evidence base requires that the existence of the CIL should be justified by showing that an *aggregate funding gap* exists in the provision of 'infrastructure needed for the development of the area'.[40] The aggregate funding gap is the total cost of infrastructure minus funding from other sources excluding CIL. [41]

There are significant cashflow issues to 2025

26.16 Up to 2025, infrastructure costs far exceed infrastructure funding. There is a clear financing issue that will need to be addressed through borrowing or grant funding. Early phases create heavy infrastructure funding demands, but frequently see relatively modest infrastructure contributions.

- Up to 2020, there are heavy demands for roads and bridge investment.
- Negative flows between 2020 and 2024 are caused by large sums spent on new London Overground stations, the new eastern bridge from HS2 to north of the Canal, and the Willesden Junction station upgrade and bridge, Victoria Road to

[40] Charge Setting Procedures (7)

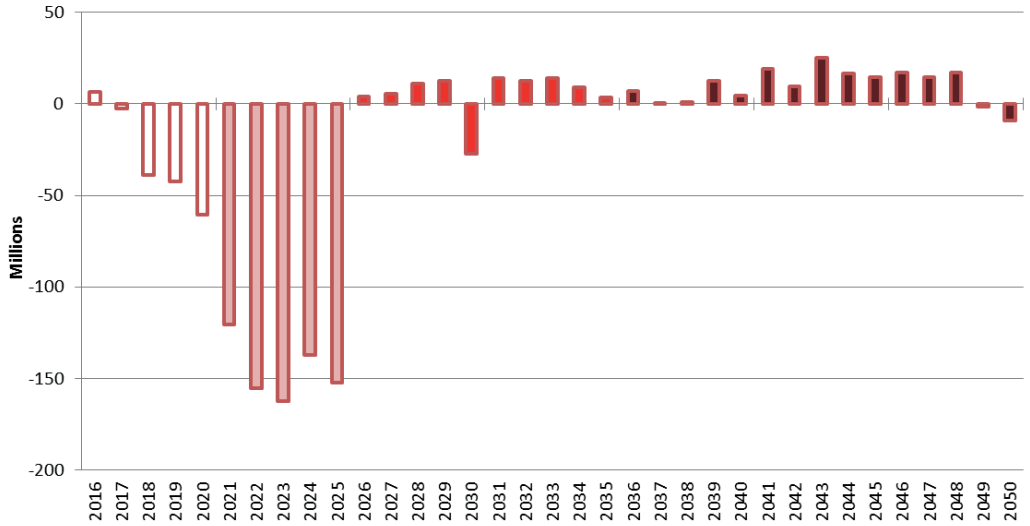
[41] The CIL funding gap number can relate to the infrastructure needs of the area generally, rather than the infrastructure costs specifically related to growth.

Old Oak Lane widening and low rail overbridge headroom increases, and the Crossrail spur.

- 2029/30 sees the costs associated with the all-through school arise.

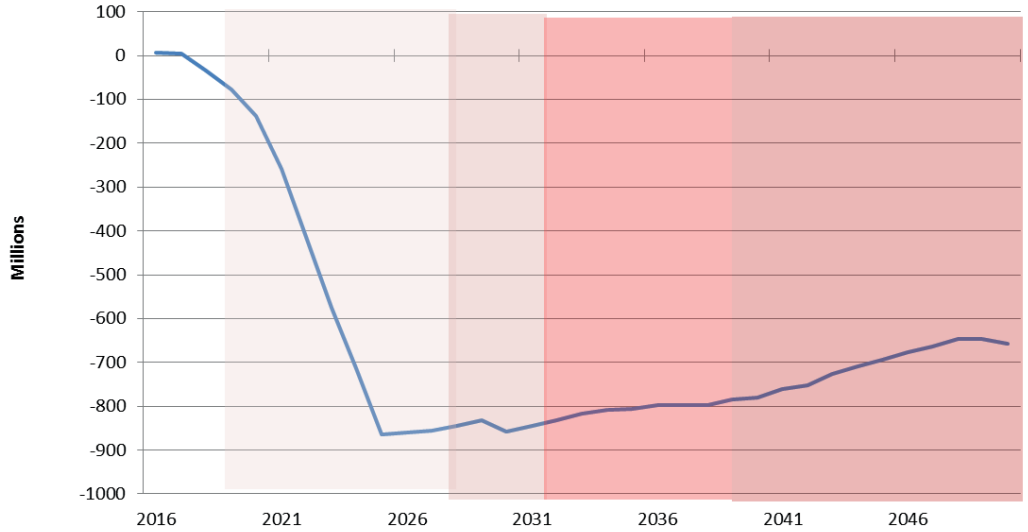
26.17 Assuming that Old Oak development was supporting these gross costs (which in itself would not be particularly fair, given that gross costs include national infrastructure unrelated to Old Oak development) then by 2025, Figure 26.2 shows that the total funding deficit would be over £800m.

Figure 26.1 cashflow showing known funding against gross infrastructure costs (£)



Source: PBA/ JLL

Figure 26.2 cumulative cashflow showing known funding against gross infrastructure costs (£)



Source: PBA/ JLL

A more detailed look at the findings, using costs attributable to Old Oak growth

Moving from *gross* infrastructure costs (for all infrastructure at Old Oak) to costs *attributable to growth* at Old Oak

26.18 Above, we have shown gross infrastructure costs. These figures include costs which cannot be directly attributed to growth at Old Oak itself, including the West Coast Mainline to Crossrail Spur (£225m)[42] and Victoria Road to Old Oak Lane widening and low rail overbridge headroom increases (£50m).

26.19 We now focus on costs that *are* attributable to growth of homes and jobs at Old Oak. This is a more useful number for purposes of local planning and CIL evidence, which is more concerned with the infrastructure required to deliver local infrastructure requirements.

26.20 For the purposes of a CIL evidence base, infrastructure evidence should concentrate on what CIL is likely to be spent on. CIL is likely to be spent on things which deliver its purpose, which is to "support the development of an area".[43] The development of the area is the development described in the Local Plan. CIL must be applied by a planning authority only for "…funding the provision, improvement, replacement, operation or maintenance of infrastructure."[44]

Infrastructure costs attributable to growth at Old Oak amount to £1.3b

26.21 Table 26-8 breaks out the costs of infrastructure attributable to growth by broad theme and sub-theme.

[42] This cost is only for the physical works to make the connection to the WCML. It does not include optimism bias; does not include costs for the related supporting rail infrastructure required further up the WCML; and does not include operational costs.

[43] Section 205(2) of The Planning Act 2008 sets the purpose of CIL

[44] Regulation 59, as amended following Localism Act changes to S216(1) the Planning Act

Table 26-8 Estimated infrastructure costs attributable to growth at Old Oak by infrastructure category, incl maintenance (£000s)

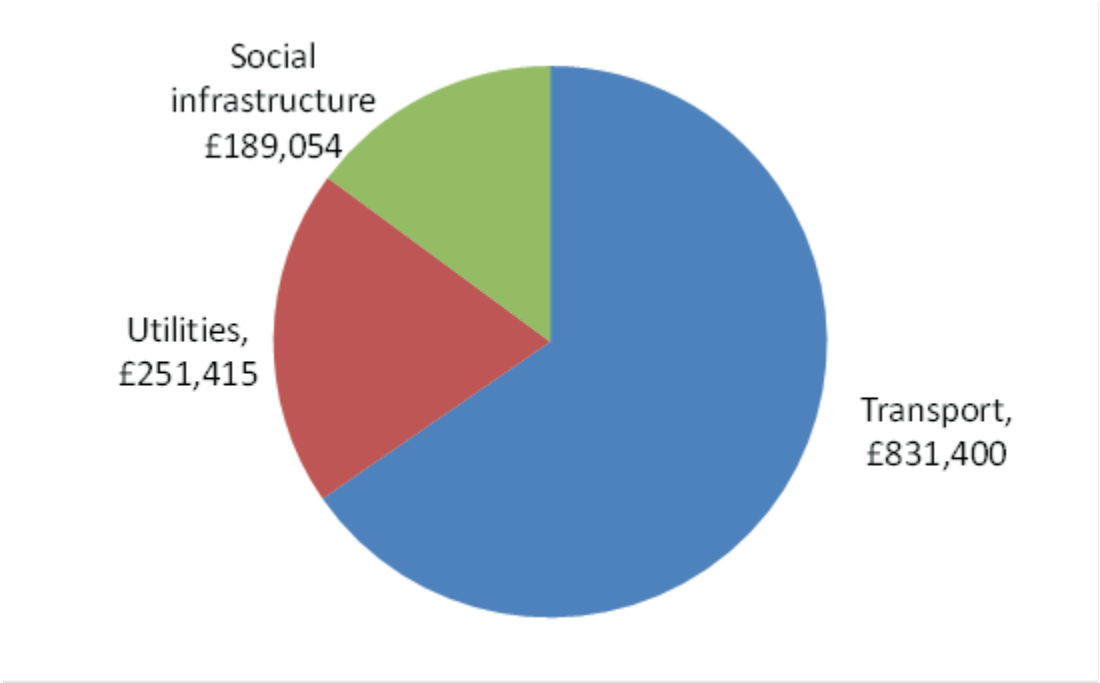
Theme	sub-theme	Cost attrib Old Oak incl maintenance (£000s)
Transport	**Bridges & crossings**	£142,600
	Roads & junctions	£171,800
	PT, cycle & pedestrian	£517,000
Utilities	**Energy & heat networks**	£243,314
	Gas	£3,630
	Potable water	£2,424
	Sewerage & drainage	£2,047
Social	**Ambulance**	£2,231
	Education	£82,215
	Fire	£4,290
	Healthcare facilities	£25,135
	Integrated community facilities	£19,200
	Open space & leisure	£51,845
	Policing	£4,138
Total		£1,271,868

26.22 Figure 26.3 below shows estimated infrastructure costs by category.

26.23 The figure demonstrates that the great majority of infrastructure costs attributable to growth are transport costs.

26.24 Utilities costs take up a substantial proportion of total costs. The bulk of utilities costs are associated with the heat and power network.

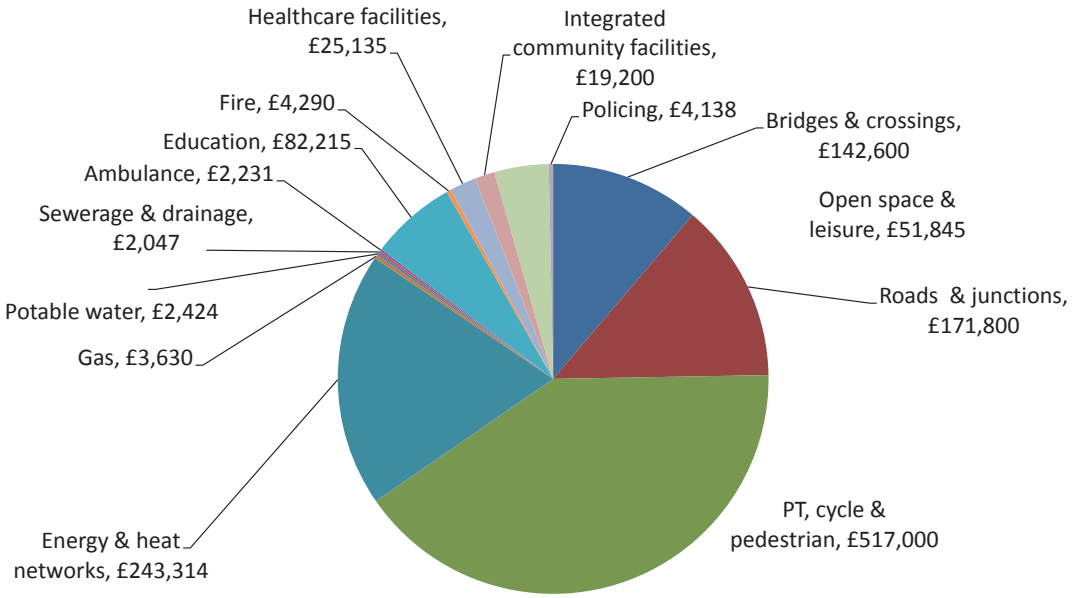
Figure 26.3 infrastructure costs attributable to Old Oak by broad infrastructure category, including maintenance (£000s)



Source: PBA

26.25 Figure 26.4 adds further detail to the infrastructure costs presented above.

Figure 26.4 infrastructure costs attributable to Old Oak including maintenance (£000s) (further detail)



Cost-engineering larger schemes could reduce infrastructure costs

26.26 Cost-engineering larger projects might yield substantial savings, but we caution that that this process would have to be carried out carefully, because good quality

infrastructure can raise values, as well as create costs. Cutting infrastructure costs might mean cause sales values to fall. This might not improve the viability position. In these circumstances, cutting infrastructure costs would be a false economy.

Prioritising projects could reduce infrastructure costs

26.27 We have analysed the proposed infrastructure items by levels of priority. The prioritisations presented below are very high level, and a more refined approach would be needed in association with the Local Plan and CIL

26.28 It may be possible to reduce the funding gap through that more careful review of priorities. At the moment, our high level prioritisation suggests that 92% of costs are in the top two prioritisation categories, and so the scope for cost savings is limited. Even so, if projects in the bottom two categories were dropped, savings of the order of £87m could be made.

26.29 These are high level conclusions. Any prioritisation that does take place needs to be undertaken carefully to ensure that the removal of infrastructure projects does not have a detrimental impact on values, and thus overall scheme viability.

Table 26-9 Infrastructure costs attributable to Old Oak by priority (incl maintenance) (£000s)

Type	1) critical enabling	2) essential mitigation	3) high priority	4) desirable	Total
Ambulance		2,231			2,231
Bridges & crossings	142,600				142,600
Education		82,215			82,215
Energy & heat networks	243,314				243,314
Fire		4,290			4,290
Gas	3,630				3,630
Healthcare facilities		25,135			25,135
Integrated community facilities		19,200			19,200
Open space & leisure		51,845			51,845
Policing		4,138			4,138
Potable water	2,424				2,424
Roads & junctions	72,300	50,500	49,000		171,800
Sewerage & drainage	2,047				2,047
PT, cycle & pedestrian	472,250	7,000	19,000	18,750	517,000
					0
Total	938,565	246,554	68,000	18,750	1,271,868
Share of total	74%	19%	5%	1%	100%

Source: PBA

Infrastructure costs are heaviest in the first two phases of development

26.30 The table below shows the estimated timing of infrastructure costs, given the development trajectory we were provided with (see Chapter 4). It is highly likely that the phasing of growth will not exactly match this trajectory in the real world, meaning

that the timing of infrastructure requirements will also change. This has an effect on the cashflow of infrastructure funding. We say more later in this section.

Table 26-10 Estimated timing of infrastructure costs attributable to Old Oak development by category (incl maintenance) (£000s)

Type	Sum of Phase 1	Sum of Phase 2	Sum of Phase 3	Sum of Phase 4
Ambulance				2,231
Bridges & crossings	12,200	113,400	6,000	11,000
Education	4,500	18,100	44,015	15,600
Energy & heat networks	30,760	64,622	63,795	84,137
Fire			4,290	
Gas	1,197	674	685	1,074
Healthcare facilities		10,054	5,027	10,054
Integrated community facilities		9,600		9,600
Open space & leisure	14,232	14,861	11,152	12,384
Policing	138		2,000	2,000
Potable water	484	258	774	908
Roads & junctions	53,200	51,400	26,700	40,500
Sewerage & drainage	137	729	345	836
PT, cycle & pedestrian	40,171	400,697	31,071	45,062
Grand Total	**157,018**	**684,395**	**195,853**	**235,385**

Source: PBA

Analysing estimated funding

We have analysed funding available

26.31 The infrastructure funding analysed in the course of this study is as following.

- Funding from mainstream public sources. We have assessed the potential availability of mainstream public funding to pay for the infrastructure requirements resulting from the growth.
- Infrastructure assumed to be provided through development masterplans. This represents the value of infrastructure provision which can be reasonably anticipated through the course of the masterplanning process.
- Infrastructure assumed to be provided through S106/S278. This represents the value of infrastructure provision which we are instructed will be provided through site development.
- Funding from other sources (incl HS2/TfL). We have made no presumptions about funding from this source at this stage.
- Funding from innovative sources. Again, we have made no presumptions about funding from this source at this stage.
- Funding assumed from utility companies.
- Funding from CIL. We have assumed that developer contributions are available through CIL, and have calculated total receipts on the basis of our understanding of development viability using affordable housing assumptions at different levels.

26.32 We cannot quantify all of these funding sources at this stage, but have set out the main elements below.

Significant amounts of infrastructure delivery are delivered by developers as part of the masterplanning process (£202m)

26.33 In this study, we have assumed that significant amounts of infrastructure are delivered through the planning process. This is because developers will frequently provide a range of infrastructure that will allow them to create a saleable, attractive development. Sometimes, this infrastructure may be the subject of a S106 or S278 agreement. Much depends on the approach of the planning authority.

Developer contributions towards infrastructure through S106 forms an important component of infrastructure funding (£33m)

26.34 We have assumed that S106 funding covers infrastructure which mitigates the impacts of a single development – although we have not formally assessed these projects using the S106 'tests'.

Estimates of CIL receipts vary, depending on the amount of affordable housing required (£543m-£357m). Social Housing Grant is required in some scenarios

26.35 Along with S106, CIL and affordable housing are funded from the same 'pool' of funding. The pool of available funding is finite, and so higher demands for affordable housing mean that less CIL for infrastructure can be afforded (and vice versa).

26.36 The funding available under different affordable housing policy conditions is highlighted in the tables below. The will need to strike the right balance between affordable housing and infrastructure funding. "Whole plan viability" work may be necessary to help arrive at a settled policy position which balances the two priorities effectively.

26.37 It is important to recall that obtaining a CIL receipt at 30% and 40% housing requires Social Housing Grant subsidy in order to make development commercially viable. No Social Housing Grant is required at 20% affordable housing to make the development commercially viable. (Commercial viability here refers to the ability of a private developer to make a sufficient return on a project; this is a distinct issue to that of the infrastructure funding gap at Old Oak level).

Table 26-11 Estimated CIL receipts for infrastructure, assuming different levels of affordable housing (£000s) showing required Social Housing Grant support

	Total CIL receipts (£m)	Social Housing Grant (£m)
20% affordable	£543	£0
30% affordable	£415	£70
40% affordable	£357	£155

Source: JLL

Obtaining TfL funding or HS2 petition funding could be an important funding source

26.38 This study has assumed that some major infrastructure items are required to support the delivery of growth at Old Oak.

26.39 The most obvious examples are the London Overground stations (£260m), the Eastern Canal bridge (which provides access to the HS2 station) and the pedestrian link between the HS2 stationand the West London Line Overground station (together £91m) delivery of the West Coast Main Line connection, enabling works for Over Station Development and high quality publicly accessible route the new HS2 station

26.40 A good case could be made that these projects represent a London-wide strategic priority..

26.41 However, the HS2 petitioning process has not yet decided and work between GLA, TfL and HS2 is underway to consider how best to address existing petition items.

Other funding sources may provide a valuable income stream

26.42 We cannot be certain of relying on more innovative funding streams, but it appears that there are potentially major opportunities arising from the use of Enterprise Zone business rate capture.

26.43 The sums of money involved are potentially significant. Around £70m pa could be obtained from business rates at the site once all employment space was in operation. If an Enterprise Zone had been implemented, all of these rates could be captured locally. This income would be sufficient to finance a significant TIF borrowing. We have not put a figure to this amount at this stage. Further work can provide a more accurate picture.

Putting costs and funding together

Depending on affordable housing requirements, there is a funding gap of between £358m-£544m on infrastructure attributable to Old Oak (which excludes Crossrail Spur). Seeing the funding gap on a per annum basis makes the gap appear more tractable

26.44 Whilst there is a large funding gap, it should be borne in mind that this plan runs until 2050. Assuming a start year of 2016, that equates to a funding gap of between £10m-£16m pa.

Table 26-12 estimated headline costs and funding, showing residual funding gap (assuming CIL receipts at 20% affordable housing) (£000s)

Total infrastructure cost attributable to Old Oak incl maintenance		**£1,271,868**
comprised of	Transport	£831,400
	Utilities	£251,415
	Social	£189,054
Total identified infrastructure funding		**£913,360**
comprised of	Mainstream funding	£14,778
	Value of infrastructure assumed delivered through developer masterplans	£202,096
	Value of infrastructure assumed delivered through S106 and S278	£32,500
	Other funding (incl HS2 petition/ TfL)	nil assumed
	Innovative funding and financing	nil assumed
	Funding assumed from MUSCO/ ESCO	£120,986
	Projected CIL receipts **at 20% affordable housing, assuming nil SHG**	£543,000
Funding gap for Old Oak attributable infrastructure		**£358,508**

Table 26-13 estimated headline costs and funding, showing residual funding gap (assuming CIL receipts at 30% affordable housing) (£000s)

Total infrastructure cost attributable to Old Oak incl maintenance		**£1,271,868**
comprised of	Transport	£831,400
	Utilities	£251,415
	Social	£189,054
Total identified infrastructure funding		**£785,360**
comprised of	Mainstream funding	£14,778
	Value of infrastructure assumed delivered through developer masterplans	£202,096
	Value of infrastructure assumed delivered through S106 and S278	£32,500
	Other funding (incl HS2 petition/ TfL)	nil assumed
	Innovative funding and financing	nil assumed
	Funding assumed from MUSCO/ ESCO	£120,986
	Projected CIL receipts **at 30% affordable housing, assuming £70m SHG**	£415,000
Funding gap for Old Oak attributable infrastructure		**£486,508**

Table 26-14 estimated headline costs and funding, showing residual funding gap (assuming CIL receipts at 40% affordable housing) (£000s)

Total infrastructure cost attributable to Old Oak incl maintenance		**£1,271,868**
comprised of	Transport	£831,400
	Utilities	£251,415
	Social	£189,054
Total identified infrastructure funding		**£727,360**
comprised of	Mainstream funding	£14,778
	Value of infrastructure assumed delivered through developer masterplans	£202,096
	Value of infrastructure assumed delivered through S106 and S278	£32,500
	Other funding (incl HS2 petition/ TfL)	nil assumed
	Innovative funding and financing	nil assumed
	Funding assumed from MUSCO/ ESCO	£120,986
	Projected CIL receipts **at 40% affordable housing, assuming £155m SHG**	£357,000
Funding gap for Old Oak attributable infrastructure		**£544,508**

There are significant cashflow issues in the first five years

26.45 We used our work to look at particular cost and funding "pinch points" – for example, the times where up-front infrastructure requirements and costs run ahead of funding.

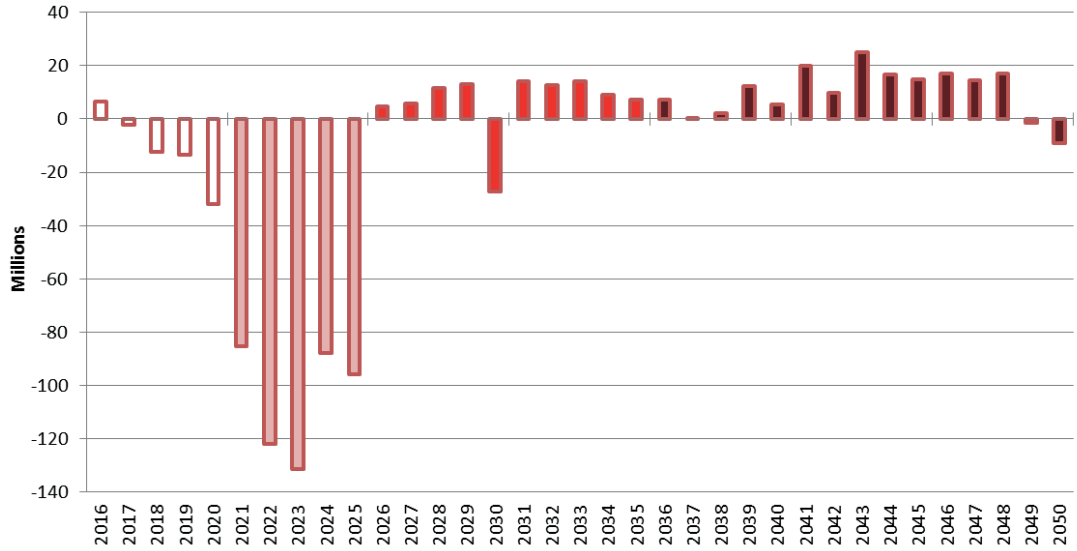
26.46 The success of delivering the vision will, to a large degree, depend on the ability to deliver the infrastructure required in the first five to ten years. One of the fundamental requirements therefore is that the necessary funding is in place to fund infrastructure required in the short term. If a development is clearly not viable in the first five to ten years, it is unlikely that a developer will proceed. Given the greater level of uncertainty about what is likely to happen after the first five years, developers are typically less concerned with the detail of how these phases will be brought forward.

26.47 The chart below shows the infrastructure cashflow situation. It is important to be clear that this is not an individual developer's cashflow for a development. Rather, it is a simple view of the total infrastructure costs attributable to Old Oak development set against the available funding receipts).

26.48 We have taken the per annum position shown in the figure below, and then shown this cumulatively (see Figure 26.6). This diagram shows a peak deficit of almost £600m which may need to be funded from alternative sources.

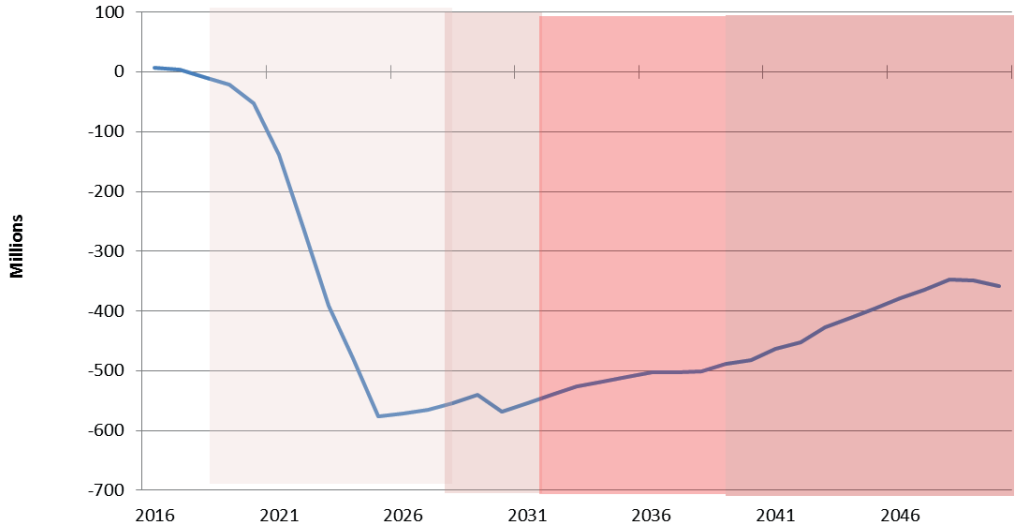
26.49 This view assumes that no funding is received through HS2 petitioning, TfL or a TIF. As we state in Chapter 24, there is a potentially important role for TIF in covering this cashflow shortfall.

Figure 26.5 Infrastructure cashflow per annum showing infrastructure costs attributable to Old Oak development, against infrastructure funding (20% affordable housing)



Source: JLL, PBA. Figures are rounded. Affordable Housing is assumed at 20% across all phases

Figure 26.6 Cumulative infrastructure cashflow per annum showing infrastructure costs attributable to Old Oak development, against infrastructure funding (20% affordable housing)



Source: JLL, PBA. Figures are rounded. Affordable Housing is assumed at 20% across all phases

27 PART 5: WHAT ARE THE IMPLICATIONS FOR THE OLD OAK AND PARK ROYAL MAYORAL DEVELOPMENT CORPORATION PLAN?

This part of the report works towards providing an evidence base for the proposed Old Oak and Park Royal Mayoral Development Corporation (OPDC) Local Plan, and provides some delivery recommendations.

We have also looked at some alternative development scenarios which may form part of the plan.

28 TOWARDS A POTENTIAL OPDC PLAN

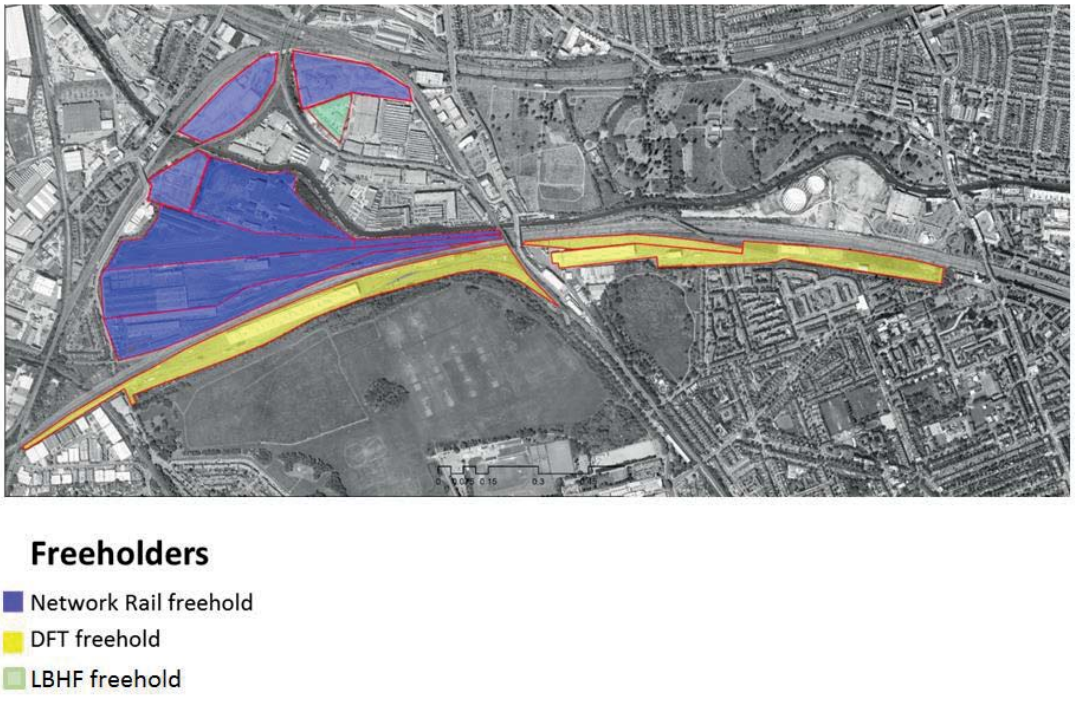
Introduction

28.1 This study can provide a large amount of evidence for the potential OPDC plan.

The importance of an integrated approach to public sector land

28.2 Understanding land ownership (and particular, public sector land ownerships) may be critical to developing a successful plan at Old Oak. Very large areas of land have a public sector freeholder at Old Oak. A co-ordination mechanism and overarching public sector land strategy is essential. If co-ordinated, this creates a very significant opportunity both for economic return of revenues to the taxpayer, and for the economic development of the area.

Figure 28.1 Public sector land freeholders



Source: JLL

Next steps for CIL, S106, and affordable housing policy in the proposed OPDC plan

28.3 Until relatively recently, CIL, S106, affordable housing policy and infrastructure planning have been seen as being distinct policies, each of which needed a separate evidence base.

28.4 The NPPF represents a significant step forward because (in our view, correctly) it sees the intrinsic links between each of these policies. This perspective has been called 'Whole Plan Viability'. According to the logic of the NPPF (and CIL legislation,

which anticipated the NPPF approach), a Plan and CIL examiner will need to be shown that, if taken forward, the Local Plan is a going concern. That means that the proposed OPDC creates a strong overarching narrative to the plan which shows how growth and infrastructure are related, and how the local authority and developers will work together to actually deliver the plan on the ground. Examiners certainly understand that the OPDC does not have a crystal ball on the economy, and that the OPDC will not know where all the infrastructure funding is coming from. However, the inspector will also want to see that the prospective OPDC has thought about alternatives, and has thought about how to shrink the funding gap in order to show that the plan is thought-through and resilient. A pragmatic view will be taken but the examiner will expect that there is an intellectual coherence to the proposed OPDC's approach.

28.5 Creating that coherence will require the proposed OPDC to

- Understand and quantify the infrastructure requirements of the emerging plan. (This study provides much of this evidence, though may need review, depending on the eventual content of the proposed OPDC Plan. We are aware, for example, that the trajectory may change).
- Understand how infrastructure can be funded. A CIL is likely to be set, but that CIL must work alongside an affordable housing and S106 strategy. (Again, this study shows the outlines of this approach, but will need further work to pass examination).
- Show that the overall development of an area should not be put at serious risk once an Authority has taken account the cumulative burden of policy costs (including space, CHP and design standards) and build costs (including decontamination and infrastructure connections).

28.6 The CIL, S106 and affordable housing policies can only be set together, because they use funding from the same pool of developer contributions. A sensible trade-off between raising funding for infrastructure (CIL and S106) and obtaining affordable housing must be made.

28.7 We think that there will then be a process of 'tuning' the Plan and its policies to get the right balance between different variables. Significant risks and variables are:

- The extent to which sites with major costs (such as the costs of moving existing users) will be incorporated in the CIL schedule. Although there is no requirement for all sites to remain viable after a CIL is set, the CIL should not obstruct the delivery of 'strategic' sites. The final CIL schedule could reduce or entirely avoid CIL charging on some sites if viability was particularly problematical (this might perhaps cover the Crossrail depots site, or the IEP depots site). Alternatively, if a single landowner is in possession of sites with varying viability, a lack of viability on one site could be met by superior viability on adjacent site.
- The precise geographies of a geographically distinct CIL charge, and the extent to which this could be evidenced.
- The extent to which other funding for infrastructure is available. If all HS2 petitioning was successful, for example, it might be possible to adopt a higher

affordable housing requirement. No such funding might mean that affordable housing rates should be set low, in order to allow CIL charges to rise.

- The extent to which CIL should be preferred either to S106 or developer delivery. We say more on this relationship in the passage below.

28.8 We therefore suggest that a Whole Plan Viability Study be commissioned, that will pull together the CIL, S106 and affordable housing issues to arrive at this balance. The Viability study should take a detailed look at the above issues in the context of the delivery of the plan overall, and be the vehicle by which the proposed OPDC arrives at an internal agreement about the right balance between the competing demands it is under. The work should be required to submit findings to examination standard. This work can be commissioned in advance of the existence of a formal Local Plan and use the OAPF as a basis.

Towards a S106 policy

S106 is still in operation, but subject to tight conditions

28.9 Under CIL Regulations (which also cover Section 106), Section 106 is now expected to be targeted at mitigating the impacts of individual developments.

28.10 The CIL Regulations say that the use of S106 contributions – whether subsequently pooled or not - must be a) directly related to proposed development, b) reasonable in scale and kind and c) necessary to make the development acceptable in planning terms. Any other approach is unlawful. From recent research we have undertaken elsewhere on S106 case law, we found that inspectors are now looking at:

- How the authority has taken account of infrastructure requirements (taking account of capacity evidence);
- How the authority has arrived at a formula for the infrastructure requirement;
- What account has been taken for exactly where the infrastructure will be delivered.

S106 requirements must be based in planning policy

28.11 The S106 must be clearly based on policy for S106 use: a charging authority must be able to refer to a Local Plan policy, supporting S106 SPD, AAP for the site or similar formal policy document which says that as a matter of policy that a Charging Authority would require the S106 costs it is taking into account.

28.12 The Charging Authority is required by the CIL guidance to revise S106 policies as necessary to fit with CIL and the R123 list (see para 87) and present the policies as background information at the examination.

Five or more separate S106 agreements cannot be pooled to pay for infrastructure. S278 can be pooled

28.13 Five or more separate S106 agreements cannot be pooled to pay for infrastructure. Because of this fact, there is a risk that a large development could be broken into five or more separate planning permissions, and escape paying for necessary supporting

infrastructure. To an extent, this risk can be managed by being clear about directing S106 payments to discrete elements of supporting infrastructure, but care needs to be taken.

28.14 S278 can be used for some (not all) highways works, and can be pooled. S278 is therefore a potentially useful tool for strategic transport infrastructure.

Towards a Community Infrastructure Levy policy

28.15 This report is not an evidence base for a CIL study. However, it should be an important step towards this evidence base.

Using CIL to collect funding for strategic infrastructure

28.16 CIL is intended to collect money for strategic infrastructure. The CIL sets an area-wide charge that is necessarily not closely tailored to the viability of individual sites. It works particularly well where there are relatively large areas of similar sales values and land values. It works less well in areas where land values rise and fall in a relatively small geographical area.

28.17 The advantages of CIL are as follows.

- Because the charge is pre-set, the CIL does not rely on the strengths of individual negotiators. It can translate into land values relatively easily. It saves planning officers' time because it allows the amount of negotiation to be reduced.
- CIL is a powerful tool for funding strategic infrastructure. CIL can be used very flexibly by local authorities to fund infrastructure in the way that they see fit. However, this might not be an important advantage, if a package of strategic infrastructure required to support the plan is relatively modest, or might be funded from elsewhere.

28.18 The disadvantages of CIL are as follows.

- The CIL has to be set in such a way that it allows the majority of development in the Local Plan to come forward. In practice, that means that the CIL has to be set quite cautiously, in such a way that the less viable sites retain some viability. In areas of the country where viability is relatively low, this is particularly problematical, because it means that very low or even negligible charges might be set. Therefore the more viable sites in an area might escape making a higher level of development contribution, even though they may be able to contribute more.

The importance of clear signals on developer contributions

28.19 It is important that a CIL/S106 strategy is put in place promptly. This for the following reasons.

- Creating more predictable land prices: as land will be increasingly traded at prices which include these hope values, it will become progressively more difficult to capture rising values for wider community investment without substantial

landowner resistance. However, if we are clear on developer contribution strategy from the very early days of planning at Old Oak, then developers will be able to more effectively build the required level of CIL/S106 funding into their bids for land, ensuring that the 'right' land price is paid that allows sufficient allowance for developer contributions.

- More certainty will help to ensure that infrastructure provision can be planned with a proper lead-in time. It will also help to overcome free-rider problems where in the past under a traditional S106 arrangement, for example, the first or last developers on a site have to pick up major costs for infrastructure capacity that other developments use, but have avoided having to pay for.

CIL examination will require an up-to-date infrastructure plan

28.20 Any Local Plan must identify the scale and type of infrastructure needed to deliver the area's local development and growth needs.[45] This study will support this evidence base, but may need to be updated to reflect circumstances at the time.

28.21 In turn, any CIL evidence base will draw on this infrastructure plan. For a CIL examination, there will need to be evidence provided on the size of its infrastructure funding gap.

28.22 The Government recognises that there will be uncertainty in pinpointing other infrastructure funding sources, particularly beyond the short-term. Charging authorities should focus on providing evidence of an aggregate funding gap that demonstrates the need to put in place the levy.

28.23 The aggregate funding gap is the total cost of infrastructure minus funding from other sources excluding CIL. The residual funding gap is calculated by subtracting the projected CIL income from the aggregate funding gap and is required for a charging authority to be able to charge CIL.

Exceptional Circumstances Relief is limited in usefulness

28.24 Changes to regulations mean that exceptional circumstances relief will be possible in more cases, where an authority sets a policy to accept claims for exceptional circumstances.

28.25 However, the State Aid limits still apply, so any developer will only be able to receive 200,000 euros worth of this and other similar State Aid qualifying reliefs across Europe in a rolling three year period.

28.26 These limits reduce the usefulness of this relief for large developments.

CIL receipts from development in North Acton must be spent in North Acton

28.27 Under the terms of agreement setting up the Old Oak and Park Royal Development Corporation, CIL receipts raised in North Acton must not be spent in other locations.

[45] paragraphs 162 and 177 of the National Planning Policy Framework in England

Towards a Regulation 123 list for CIL examination

What is on the Regulation 123 list?

28.28 A Regulation 123[46] (R123) list is required if a planning authority wishes to still use S106 to pay for some infrastructure alongside CIL. The Regulation requires charging authorities to set out which mechanism (whether CIL, or S106, or some S278) will be used to pay for significant pieces of infrastructure.

28.29 The list is derived from the infrastructure planning process.

28.30 The legal purpose of the list is to stop S106/CIL double charging for the same infrastructure. It does not positively commit an authority to spending CIL on infrastructure. This means that the list does not bind an authority to spending CIL on the things it contains, but it does prevent the authority from seeking 106 contributions for them. **It is best considered as being a list of things that the charging authority will not spend S106 receipts on.** So, if an infrastructure item is on the R123 list, the charging authority is in effect saying that "we will definitely not ask for planning obligations on these things".

28.31 Tactically, maximum room for manoeuvre may be maintained by keeping the R123 list relatively short. If an item is not mentioned on the R123 list, then the charging authority keeps its options open regarding the way that a given piece of infrastructure may be funded. However, this cuts against the obligation on a charging authority to 'show and explain' how the balance has been struck between providing infrastructure and maintaining viability. Because the balance struck can be challenged by an examiner (or a judge), Charging Authorities will need to be ready to tell a coherent story about what growth will happen, where and when, what infrastructure will be needed to support it, and how that will be paid for. This requires a coherent explanation of how the S106/CIL mix will work in the charging area.

28.32 The list must have a close connection with the OPDC infrastructure priorities. The Guidance is clear in advising charging authorities to "think strategically in their use of the levy to ensure that key infrastructure priorities are delivered to facilitate growth and the economic benefit of the wider area" (Paragraph 011 - Reference ID: 25-011-20140612). The list should have a clear link to the positive purpose of supporting the development set out in the relevant plan, for example, showing how funds will be used to help unlock and / or support strategic site delivery which is so critical to the Plan.

28.33 The 123 list will also now regulate the use of S278. S278 cannot be used for items on the 123 list. But this will not apply to the Highways Agency using S278 for Trunk Roads, and there will be no pooling limit on S278.

[46] Regulation 123 of the Community Infrastructure Regulations 2010 (as amended)

The draft Regulation 123 list must be presented at CIL examination

28.34 The 2012/13 guidance change required a R123 list to be presented at examination. A R123 list is to be regarded as “appropriate evidence”. The list itself is not subject to examination, but (as set out above) the Charging Authority will be required to ‘show and explain’ how it has struck a sensible balance between viability and infrastructure provision.

28.35 The Regulation 123 list is not subject to the same procedural requirements that have been set out for the CIL Charging Schedule. The Regulations only require that the 123 list is published, without the need for consultation or formal procedures.

28.36 After the draft list has been presented at examination, the list must be finalised. The Regulation 123 list is finalised as part of the CIL adoption process. The final Regulation 123 list will “be based on the draft list that the charging authority prepared for the examination of their draft charging schedule”. Therefore, the final list will be based on the one submitted to examination.

A project need not appear on a Regulation 123 list if it is to receive CIL funding

28.37 The R123 list is not a commitment to spend, and nor can CIL only be spent on the things listed there. The October 2013 consultation paper on CIL changes made it clear this would remain the case. It said at Para. 28: "It has never been the Government's intention to restrict charging authorities to only be able to spend the levy on items included in their list, and we are not proposing to remove this important flexibility now."

28.38 This flexibility exists because CIL has always been a hypothecated local tax. Tax policy purists generally argue that excessive hypothecation (aka ring-fencing) leads to sub-optimal spending and loss of value for money. It is no doubt for this reason that the government has retained a degree of flexibility over spending choices.

How can the Regulation 123 list be updated?

28.39 A R123 list can be changed relatively straightforwardly. A planning authority has to do ‘appropriate consultation’ to change it. What is ‘appropriate’ is at the discretion of the local authority. The consultation can be expected to include utilities, neighbouring authorities, and business developer interests. But the nature of consultation and length of time is up to the local authority.

‘Payment in kind’ for CIL

28.40 The 2014 regulations allow developers to reduce their CIL liability by a ‘payment in kind.’ This might be the provision of land, buildings or both.

28.41 However, there are important limitations on this ability.

28.42 The policy principle is that a developer is required to deliver planning obligations to make the development acceptable in planning terms and to pay CIL where CIL has been implemented.

28.43 As a consequence, a Charging Authority cannot accept a CIL payment in kind which delivers a planning obligation requirement, otherwise the Charging Authority is simply allowing the developer to evade S106 obligations. Key here is the Charging Authority's policy document for PIK and what it identifies as PIK infrastructure they will accept – this should be infrastructure they plan to spend CIL on and may be the 123 list.

28.44 Where a charging authority chooses to adopt a policy of accepting infrastructure payments in kind, they must publish a policy document which sets out conditions in detail. This document should confirm that the authority will accept infrastructure payments and set out the infrastructure projects, or types of infrastructure, they will consider accepting as payment (this list may be the same list provided for the purposes of Regulation 123).

28.45 New Reg 73(B) in the 2014 Regulations does not actually require the authority to link the list of things it will accept as 'payment in kind' to the R123 list - it just says "this may be done by reference to the charging authority's infrastructure list".

A draft Reg 123 list – or, infrastructure likely to seek all or part funding through CIL which will not receive S106 funding

28.46 This study has set out an outline approach to what might appear on the Reg 123 list. This list can be produced from the detailed spreadsheet analysis, but has not been presented here. Please see Appendix C.

29 TESTING DIFFERENT DEVELOPMENT SCENARIOS

Introduction

29.1 As set out in Chapter 4, this study has used the growth trajectory provided to us as a basis for calculating infrastructure costs and the potential CIL that could be captured as a base case.

29.2 However, we are well aware that development at Old Oak may take a different path to that envisaged.

29.3 We have therefore tested a small number of different scenarios in order to investigate the impacts on infrastructure requirements, costs, and funding. This work is necessarily a high level estimate, because it is frequently difficult to be exact about the implications of a new scenario on infrastructure requirements, or to successfully disentangle the infrastructure requirements of one site from the broader requirements of the whole development area.

Scenario 1: including a stadium

29.4 The base case tested assumes that no stadium is provided.

Table 29.1 Scenario 1 (including a stadium) against the base case (no stadium)

Base case assumption	The stadium concept was included in the Vision document as an option. It did not form part of the base case assumptions of this study. This study worked to the trajectory set out in Part 1 of this report. This assumes that development at the Crossrail Depot site begins around 2041 because the land is vacated.
New scenario assumption	This scenario concerns a variation which delivers a stadium concept. Whilst we have not been provided with a scheme we have been told the stadium can maintain the same number of homes and jobs to that of the Vision and trajectory. This would be achieved by raising densities to compensate for the land-take required for the stadium and its curtilage.
Change in infrastructure requirements compared to base case	Infrastructure requirement is assumed to be neutral when compared to the base case. This is because Willesden Junction Bridge as specified in this report could be sufficient to service the peak flows created by a stadium crowd. (These are very high level indications, which we strongly caveat would need separate confirmation. We

(transport, utilities, social infrastructure)	have not modelled the technical transport requirements that would be derived from any stadium proposal. Much would relate to whatever the wider dispersion strategy would be for a stadium). Willesden Station gate line could be a pinch point, but improvements have already been costed in this study. Again, the technical requirements will need specific investigation, but here we assume that impacts could be managed, and thus cost neutral when compared to the base case. The social infrastructure requirement is considered to be similar, given that we are anticipating the same size living and working population.
Change in sales values and build costs compared to base case	The overall effect on development viability to be broadly neutral in this scenario, when compared to the base case. This is because the additional cost of constructing the stadium is assumed to be covered by development receipts / release of value from the re-location of the team's previous stadium and/or further equity injection by the occupiers of the stadium. We have assumed that the higher build costs found in the taller buildings (required if the stadium scenario is to achieve similar housing numbers to the base case) are broadly offset by the higher sales values available from residential development on higher floors. Viability is therefore broadly unchanged. Irrespective of higher sales values of residential flats on the higher floors of tall buildings, we have not assumed an uplift or reduction in the general tone of value on affected sites due to the “stadium effect”. This is because there are so many potentially counteracting variables that it is very difficult to isolate a demand and price effect of the stadium itself. We are aware that one interested party is proposing a rafted solution. We have not been supplied with sufficient information to assess this. The major catalyst for development at Old Oak is the Crossrail station (and to a lesser extent the HS2 station). Another major project could conceivably have a (more modest) positive impact on early place making aspirations and so could be beneficial in achieving higher sales values at an earlier stage. However, these effects would not be confined to a Stadium. This a broader point about a large catalytic use at Old Oak.
Change in developer contributions compared to	We have made the assumption that the same quantum of homes and jobs are delivered and consequently the same quantum of floorspace delivered. This would suggest that CIL receipts would be similar under either

base case	this scenario or the base case. However, a stadium CIL could be possible. Overall, within the sensitivities of this high level review, the effects here are judged to be broadly neutral.
Change in wider economic impacts compared to base case	We expect that the economic development impacts of the stadium scenario to be broadly neutral when compared to the base case. This is for the following reasons. In line with information received from one party looking at this option, we understand that the jobs created would match the Vision although the type of jobs might change. Benefits could come forward at a similar pace. Place-making opportunities could come forward with or without the stadium proposal. Private Rented Sector (PRS) housing could be used to accelerate the pace of development with or without a stadium proposal. The Vision expects that the majority of jobs delivered from Car Giant E&W site and EMR (the main sites affected by stadium siting assuming the location in the Vision) are from a hotel use. A stadium development could also contain a hotel and therefore we have assumed the jobs profile and floorspace does not change. A Hotel operator / retailers could look more favourably at the stadium approach, given the possible increase in demand from stadium visitors. This could see other forms of employment replaced, or net additional jobs created. It is not possible to be sure at this stage.
Risks and issues	Assuming that the stadium scenario was able to deliver the same level of housing and jobs as the base case would imply that development can take place at a higher density. If higher densities are considered possible in planning terms under the stadium scenario, then these could be applied also to the base case. This could see higher housing and/or jobs numbers delivered at the site.

Scenario 2: Powerday stays in operation

Table 29.2 Scenario 2: Powerday stays in current operation against the base case

Base case	The base case tested assumes that the Powerday site accommodates 1,210 new homes and zero jobs. To make this site

assumption	viable does however require cross-subsidy from other sites. This may not occur.
New scenario assumption	A variation which sees the Powerday site remain in operation. This has a consequence of reducing the homes delivered at Old Oak Common by 1,210. The Vision does not assume that any new jobs are delivered on the Powerday site. However, if Powerday was to be retained, then jobs at the Powerday site would be safeguarded in this location.
Change in infrastructure requirements compared to base case (transport, utilities, social infrastructure)	Infrastructure requirements are expected to vary as follows. - Social infrastructure requirements will fall, due to the fall in residential population. A rough pro-rata calculation suggests that social infrastructure costs could reduce by around 5%, equating to a reduction in Social Infrastructure costs of approximately £8m. Similar reductions have not been applied to transport and utilities because they are not as sensitive to change. This saving would not take place until Phase 4, because the trajectory suggests that residential development at Powerday takes place after 2036. - Utilities provision is likely to remain broadly similar, because this provision is not particularly sensitive to change. - Transport provision is unlikely to be particularly sensitive to Powerday staying in operation. The main upgrades will be required whether or not Powerday comes forward. Upgrades of Old Oak Common Lane and associated junction improvements are likely to be needed irrespective of options at the site. Powerday remaining in operation will not require additional cost measures/lost development for neighbouring plots to enable access as it is assumed that it remains in operation until 2036 in any event.
Change in sales values and build costs compared to base case	At present Powerday is relatively well shielded by rail infrastructure and banking. Whilst some impact on values at neighbouring sites by Powerday staying in operation is possible, we do not consider Powerday remaining to have a particularly significant impact on the surrounding values. We would expect views of Powerday could be designed out in order not to have material / negative impacts on the sales values achievable. This could have implications for build costs, but it is not possible to say what these might be at this stage.
Change in developer contributions	A reduction of 1,210 homes results in a potential loss of developers contributions of circa £20m if the proposed CIL levels were to be

compared to base case	charged. This is counteracted by avoiding costs associated with the need to relocate the Powerday facility. Powerday is one of the weakest sites in viability terms. This is because of the high costs of moving existing plant and equipment at the site, and so allowing the land to come forward for development. If Powerday remains in its current activity, we remove one of the weaker sites from a viability perspective (given the cost of relocating Powerday's capital investment in machinery). We expect that this would allow us to set a generally higher rate of CIL in that geographical zone. It is difficult to quantify the level of change. It should be pointed out that any level of uplift in CIL is not expected until 2036, because the trajectory expects to the site to remain in operation until then.
Change in wider economic impacts compared to base case	CIL is expected to be a relatively simple area wide charge. We have set out suggestions for geographical differentiation in this report, but the fact remains that the weaker sites in an area frequently drag down the level of CIL that can be set in that area. This is because regulations require that strategic sites remain viable after policy costs.
Risks and issues	Powerday provides a possible opportunity to deliver CHP solutions on their site and handle construction waste from the whole of the Old Oak and HS2 construction process. Containing all these uses in a site which is segregated and isolated by rail lines could be a positive factor for the wider site regeneration.

Scenario 3: the depot site comes forward in 2026, not 2041

Table 29.3 Scenario 3 against the base case

Base case assumption	The base case tested assumes that the depot site comes forward in 2041, after the relocation of depot and marshalling activities. Our base case assumption is that the site accommodates 2,670 homes and 19400 jobs (as the Vision and Trajectory).

New scenario assumption	A variation delivering vacant possession 15 years earlier than the base case of 2041. Vacant possession would be obtained in 2026 under this scenario. The same number of homes and jobs are to be delivered under this scenario. Homes and employment floorspace delivery on this site could begin after 2026.
Change in infrastructure requirements compared to base case (transport, utilities, social infrastructure)	There could be a cost benefit through economies of scale if infrastructure is delivered the at one time, rather than over an extended period of time. Providing the rate of market absorption is the same, infrastructure requirements are assumed to be the same, although brought forward in time.
Change in sales values and build costs compared to base case	There is a major risk that the lack of development at such a central site until 2041 may damage market perceptions of the Old Oak site as a whole. Early delivery of the Depot site creates a series of wider benefits - There are highly significant positive impacts on site coherence (such as, for example, severance between the north and south of the site) - There are significant positive impacts on particular neighbouring sites (due to bad neighbour problems: for example, the depot is expected to operate under floodlights and potentially having train movements around the clock). - Sites north of the canal will be able to access Crossrail and HS2 stations directly. This access would be rendered highly problematic until 2041 under the base case due to the severance created by the depot. - Potentially greater viability benefits are likely to arise not from the accelerated removal of a bad neighbour on the depots site, but from the sense that new residents and employers are participating in the birth of a major new office and residential location, where benefits will be realised within a realistically short timeframe. This creates a sense of momentum and development confidence. Under this scenario, different sites will experience different effects. - Car Giant E&W (8): this acceleration scenario is likely to have positive impacts on the residential and commercial values on the southern fringe of Car Giant E&W, which will be delivered through this period. This will be from the

	improvement of neighbouring uses. Car Giant E&W at mid-point in phase 2 and all of phase 3 is likely to benefit from either the prospect or reality of greater connectivity back to HS2 Crossrail. This should have a positive impact on values. The difficulty of measuring the effects of this impact on CIL receipts is that it depends on when this decision on the depot is made and whether this is before or after Car Giant secures planning permission and establishes its CIL liability. If this change led to an increase in residential CIL rates of 10% (and we cannot be sure that it will) then this would create a c.£2.6m increase in residential CIL receipts at the Car Giant E&W sites (assuming 20% AFH). - Stations site (16): under this scenario, the stations site will have better neighbour sooner, and thus, other things being equal, will have potentially improved viability due to higher sales/rental values. This site has both commercial and residential uses planned, and each will be affected differently. - Stations (residential uses). Residential users may be sensitive to bad neighbour issues, particularly where residential users look over the depot site itself. However, relatively few residential units are expected at the site (620), so this effect could be more limited. These residential units will 'look' to the south, being dependent on Crossrail and HS2 for transport, and with leisure needs provided by Wormwood Scrubs. Overall, though, we expect that, if the depot site is brought forward sooner, the overall development will bring the critical mass of the site together at an earlier point in time, meaning that the residents at the stations site will have a sense of being in a new quarter of London very much sooner than they otherwise would. The development of residential at Stations site would, under this scenario, be contemporaneous with development at the depot, meaning that shops, restaurants and leisure provision would be provided sooner. This would underpin values at the stations site. It is very difficult to price these advantages. If this change led to an increase in residential CIL rates of 10% (and we cannot be sure that it will) then this would create approximately a £2.1m increase in residential CIL receipts at the station site(assuming a 20% AFH scheme). - Stations (commercial uses). This site is dominated by employment uses (seeing 24,000 jobs being delivered through phase 3) and these uses can be expected to be less sensitive to the removal of depot uses themselves. Instead, we anticipate that they are likely to be more affected by the general massing of office uses in the area, and the extent to

	which office users are therefore able to enjoy externalities such as a vibrant after-work social scene and agglomeration benefits such as labour market benefits and tacit knowledge. It is very difficult to be certain about the effects on developer contributions but the quantum and scale of development and associated supporting infrastructure will make this location more attractive for developers and occupiers. If this change led to an increase in Commercial CIL rates of 10% (and we cannot be sure that it will) then this would create a c.£0.5m increase in receipts at the station site. Timing does matter, insofar as infrastructure contributions are concerned. - We believe that this is not simply a case of bring forward developer contributions and requirements by fifteen years; in some instances, it will be the difference between capturing the value created by the improvement at neighbouring sites, or missing this value increase entirely. Our logic is that if the relocation of the Depot happens *after* the bulk of development on neighbouring sites takes place, then any value uplifts which do take place will be experienced as a windfall gain to the owners of existing development at the time. The public sector will then be unable to capture these benefits, except as the marginal increase through hope values which are priced in anticipation of change. If, on the other hand, Depot relocation can take place *before* development on neighbouring sites, then the resulting uplift is more likely to be captured through CIL and S106. There may also be material differences in the quality and type of development possible.
Change in developer contributions compared to base case	£5.2m of additional CIL receipts could be achievable as described above, if this scenario results in a 10% uplift in CIL receipts as described above.
Change in wider economic impacts compared to base case	Other things being equal, benefits of homes and jobs would be experienced fifteen years earlier than anticipated at the Depot site itself. However, it is important to note that developing this site earlier than anticipated may have impacts on our ability to successfully sell space at other neighbouring sites. We are unable to calculate a GVA benefit as part of this study, but this would be substantial.

	Tax revenues would rise fifteen years earlier than under the base case (although deadweight and additionality would need to be incorporated into such a calculation). The rise in confidence created by the emergence of a recognisable new quarter of London may mean that the pattern and nature of development might be materially better than otherwise would be experienced.
Risks and issues	Bringing forward such a substantial amount of development at the same time as the station development raises questions over absorption rates. Approximately 43,000 out of the 54,000 jobs in predominantly office space would be made available. As a result, it is conceivable that the build out of office space at the Stations and Depot site may need to be rephased over a longer timeframe (even though overall, this would be unlikely to negate the benefits of sorting the Depots site early). There could be costs which would be incurred by penalty clauses in existing operations contracts. We have not examined these possible costs. If it is not possible to bring forward the Depot site early, we advise that careful thought is given to designing out views and aspects overlooking the depot focusing them elsewhere. The public realm could also provide for a buffer.

Scenario 4: the depot site stays as a depot, and is not developed

Table 29.4 Scenario 4 against the base case

Base case assumption	The base case tested assumed that the depot site comes forward in 2041, after the relocation of depot and marshalling activities with the site accommodating 2,670 homes and 19,400 jobs.
New scenario assumption	A variation sees the Depot site remaining in operation as a depot, with no homes and jobs being produced. There would thus be a reduction of 2,670 homes and 19,400 jobs against the base case.
Change in infrastructure requirements	Social infrastructure required would be reduced, because no new population would be present (saving approximately 10%, or £15m in

compared to base case (transport, utilities, social infrastructure)	social infrastructure costs). Transport infrastructure requirements would be profoundly altered and may need to be rethought. The Old Oak Core Area sees significant reductions in north/south permeability. The rationale for the G25 eastern canal bridge would be weakened, although it would still be desirable for access to the nature reserve from Car Giant E&W. The rationale for pedestrian access over the HS2 Great Western Mainline through the HS2 station (G27a, b) would be weakened. Access to open space at the Scrubs would be weakened. Utilities demands would be likely to fall, given the scale of the site involved. However, utilities *costs per unit* could rise, because utilities provision would be required to circumnavigate the site.
Change in sales values and build costs compared to base case	There is a major risk that the lack of development at such a central site would damage market perceptions of Old Oak as a development location. Loss of the Depot site to homes and jobs development creates a series of wider costs. - If the depot site was retained in depot use, that the residents at the stations site will lose the sense of being in a new quarter of London. Development will be considerably more fractured. - There are severe impacts on site coherence (such as, for example, severance between the north and south of the site) - There would be no substantial prospect of the replacement of the depot's 'bad neighbour' activities. This would damage the 'hope' price in residential sales. However, we anticipate that the site could be screened to a certain extent. - The loss of the Depot site to development would reduce momentum and development confidence. Under this scenario, different sites will experience different effects. - Access times from the north western parts of both Car Giant sites, and all of EMR to Crossrail and HS2 would be greatly extended, so reducing the economic impact of Crossrail. These sites would instead effectively rely on Overground and Willesden Junction. - Overground and Willesden Junction would remain important links, but the sales (and economic impact) benefits of Crossrail would be very significantly eroded. - The area north of the canal is of sufficient scale to be

	developed even if the Depot site remained in depot use, and important links to HS2 and Crossrail would remain effective for the south eastern parts of the area. - Stations (residential uses). Residential users may be sensitive to bad neighbour issues, particularly where residential users look over the depot site itself. Design measures could attempt to screen out views of the depot. It is very difficult to price these disadvantages. Our analysis suggest that the impact on CIL receipts from this site could be marginal, particularly if the market expected the depot to close but in fact it did not. - Stations (commercial uses). This site is dominated by employment uses (seeing 24,000 jobs being delivered through phase 3) and these uses can be expected to be less sensitive to the continuing presence of depot uses themselves. Instead, we anticipate that they are likely to be more affected by the general loss of agglomeration massing of office uses in the area, and the extent to which office users are therefore able to enjoy externalities such as a vibrant after-work social scene and agglomeration benefits such as labour market benefits and tacit knowledge. It is very difficult to be certain about the effects on developer contributions, and as stated above, we consider the impact would be marginal on CIL, particularly if the market expected the depot to close but in the final analysis did not. If this change led to a decrease in residential CIL rates of 5% (and we cannot be sure that it will) then this would create a c.£1m decrease in receipts at the station site (assuming 20% AFH). - Genesis (14): is completed as per the trajectory, then development will have taken place by 2020, so viability at the site will be unaffected compared with the base case. There would be no hope value resulting from the prospect of the loss of the Depot as a neighbour. There may also be material differences in the quality and type of development possible.
Change in developer contributions compared to base case	CIL lost at the station site because no development takes place is estimated to be £1m CIL lost from the depot site, because no development takes place (assuming 20% AFH) is estimated at £103m

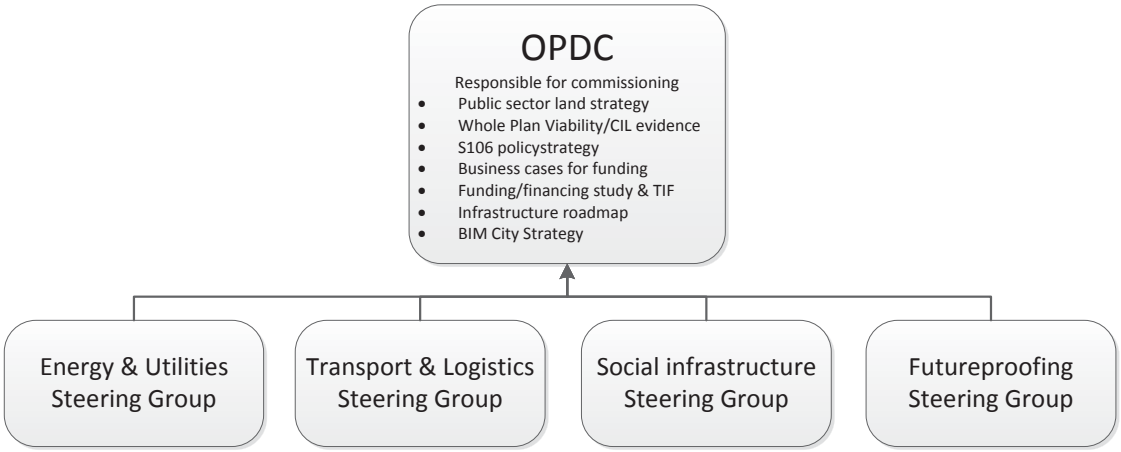
Change in wider economic impacts compared to base case	The Old Oak area would fail to function as a coherent whole in the way described in the Vision. Instead, the area would be bisected. The area around the north of the canal would function relatively independently to the station site, with HS2 and Crossrail provision being seen as something of an annex to the south, rather than an integrated part of a new quarter of London. This could reduce values across the site. The business case for Overground stations would be damaged due to the highly significant loss of 19,400 jobs and 2,670 homes on the site although we do not know the scale of these effects without further study. The economic impact of Crossrail investment would be reduced. The ability to increase development density described in Further Alterations of the London Plan (FALP) would be reduced at the site, and other things being equal, economic benefits of homes and jobs at the site would not be experienced. Tax revenues from homes and jobs at the site would not arise. We are unable to calculate the GVA lost as part of this study, but this would be very substantial.
Risks and issues	In the short term, it may be easier for individual site owners to develop offices at the site, due to the reduction in competing supply. However the offices which were produced may be of a lower quality, given that the critical mass and momentum which would otherwise underpin the delivery of a wider commercial office market would not be in place. If it is not possible to bring forward the Depot site early, we advise that careful thought is given to designing out views and aspects overlooking the depot focusing them towards and over the scrubs site. The public realm could also provide for a buffer. This would seek to reduce the potential negative impact on values by the functioning depot.

30 DELIVERY RECOMMENDATIONS

30.1 Detailed recommendations and issues have been picked up in the subject chapters. We have not reiterated those here. Instead, we have attempted to identify the overarching matters which will need to be dealt with by the proposed OPDC.

30.2 The OPDC will need to deal cover a huge range of very detailed issues and make good decisions in little time. The OPDC may need to set up a structure that will help to bear some of the load that those stresses generate. Our suggested structure is set up in the diagram below. We explain the structure in this chapter.

Figure 30.1 Suggested Infrastructure Delivery Steering Groups



30.3 There will be frequent linkages between these different groups. For example, utility strategy and transport strategy will be interdependent, because transport infrastructure will frequently create the development arteries into which new services and supplies can be integrated.

30.4 There will also be major overlaps between the Energy and Utilities Steering Group, and the Futureproofing Steering Group. We have separated these here because we think that the 'pure' utilities agenda is likely to be so large that the futureproofing agenda will get somewhat lost – but this suggestion may need review.

General recommendations

The Crossrail depot and sidings site needs very early attention

30.5 We believe that the biggest risk to the delivery of the Vision is that the Crossrail depot and sidings site will remain in rail use, rather than being relocated (decking may or may not be part of a Crossrail solution, but we do not address that here). At the moment, no relocation site has yet been identified. If not redeveloped, the site could blight significant areas of the central Old Oak area, dragging down the values of neighbouring sites and damaging the ability to provide the north-south and east-west links that would render the Old Oak area coherent as a living and working environment. The proposed OPDC should obtain a clear idea about what will happen

to the Crossrail depot and sidings as soon as possible, and push for the earliest possible redevelopment.

A public sector land strategy is needed, which could see sites assembled and/or retained in public ownership

30.6 Very large areas of land have a public sector freeholder at Old Oak. A co-ordination mechanism and overarching public sector land strategy is essential. If co-ordinated, this creates a very significant opportunity both for economic return of revenues to the taxpayer, and for the economic development of the area. If the development process is left to uncoordinated action by individual public sector agencies, outcomes at Old Oak could be disappointing.

30.7 Full freehold rights or ground rents could be retained, providing a long term income to the public sector. The Hong Kong MTR "rail plus property" model has been shown to help recoup the cost of investing in rail transit and create a profit over the longer term.[47]

30.8 Sites could also be assembled, allowing an integrated approach to be taken.

30.9 The Crossrail depot and sidings site issue could be considered as part of this land strategy.

Public sector sites could be serviced by the public sector, and income obtained from utilities supply

30.10 Our utilities work in this report has assumed that the classic mechanism of utilities delivery at Old Oak will be rolled out, and that the main utilities companies will be asked to develop the necessary infrastructure. They would typically charge developers for the installation and connection of this equipment (sometimes significant amounts), then gain the benefit of income from long term supply contracts. It is becoming more common for them to be prepared to offset some of this cost through negotiation in lieu of future revenues.

30.11 However, there are alternative models which could be explored.

30.12 The Development Corporation could itself take part in the delivery of infrastructure at Old Oak. If the Development Corporation retained an interest in the infrastructure network, this would allow the creation of a long term asset, which could be used to create an income stream for use in the area. The Development Corporation could take the place of the utility company.

30.13 This approach would not negate the need for any off-site utilities upgrades or reinforcement needed to accommodate the overall demands of the development area. However, once the proposals form part of the adopted development plan, then the strategic utilities providers (such as UK Power Networks as DNO) have a duty to provide that capacity.

[47] Cervero, Murakami (2008) *Rail + Property Development: A model of sustainable transit finance and urbanism* UC Berkeley

30.14 The provision of local infrastructure would need up-front financing, either from the OPDC itself or from the local authorities. Whilst the approach would entail some risk, there would be opportunities in obtaining a long term, reliable revenue streams from network user charges.

Income streams from utilities or ground rent from retained holdings could help finance an innovative approach to community development

30.15 If a long-term income stream arose from utilities provision, it is possible to imagine a community trust of the type set up in the original Garden Cities. Letchworth Garden City Heritage Foundation, for example, is able to use income from ground rents to fund a variety of local projects and services. The Development Corporation could evolve over time in a similar way. Alternatively, income could be ploughed back into service provision at the boroughs or even to the UK exchequer.

30.16 Even if there was no interest in providing utilities networks, the case for a co-ordinated cross-agency public sector land strategy remains very strong.

Work should start on narrowing the funding gap and addressing cashflow difficulties

30.17 The first five years will be the critical period for getting development momentum going at Old Oak. However, this period shows that there is a major funding gap, with attendant cashflow difficulties, extending right up until around 2026. Fundamentally, there are three solutions to a funding gap and cashflow problem: raising more funding (including borrowing), cutting costs, or delaying spend.

30.18 The outcomes of the HS2 petitioning process will clarify a great deal. But even if the infrastructure projects are successful in obtaining HS2 funding, other avenues should be sought.

30.19 Costs could be clarified in the following ways.

- Infrastructure could be prioritised, and lower priority infrastructure dropped. We have outlined some broad priorities in this report, but expect that more work in this area will be needed. We suggest that the proposed OPDC may need to prioritise both within theme areas (say, prioritising the most important transport projects) and also between theme areas (say, deciding to invest in open space, rather than transport, or vice versa). Properly, these decisions rest with elected representatives and their officers on the basis of good quality information about what is realistically possible.
- Value engineering could reduce infrastructure costs. However, we caution that, if done badly, this process could destroy more value than it saves in costs, leaving the development in a worse position overall.
- Affordable housing requirements could be reduced, or reprofiled to increase the amount of intermediate rather than social rented stock;
- Combined heat and power requirements create significant costs, and other equally effective but more cost efficient methods of carbon reduction could be

sought, whilst retaining opportunities for revenue generation from utilities delivery.

30.20 Funding analysis could be sharpened in the following ways.

- Funding for Overground stations costs could be sought, possibly from DfT;
- Some of the least viable sites (such as Powerday) could remain in operation, meaning that (other things being equal) CIL charges on the remaining sites may be able to be set somewhat higher, thus increasing receipts.

Enterprise Zone status and a TIF should be investigated

30.21 In many ways, the work undertaken at Vauxhall Nine Elms Battersea (VNEB) is a good model to follow at Old Oak. At VNEB, an Enterprise Zone established, which allowed the retention of business rates in the area.

30.22 Enterprise Zone status allows the potential for local retention of 100% of business rates. We have shown that, when fully built out, business rate revenue will be substantial. At VNEB, this income stream was securitized with a Tax Increment Finance (TIF) scheme, which has allowed the up-front financing of infrastructure requirements including the Northern Line Extension. A Treasury debt guarantee has proved to be a critical part of the scheme, allowing credit risk to be reduced and thus the cost of borrowing to fall. The TIF finance has been complemented with funding from S106 and CIL.

30.23 We recommend that a study investigating the costs and benefits of Enterprise Zone status is pursued, along with scoping work for a TIF.

Local Development Order and Mayoral Development Orders could be considered

30.24 Local Development Orders and Mayoral Development Orders are made by local planning authorities and give a grant of planning permission to specific types of development within a defined area. They streamline the planning process by removing the need for developers to make a planning application to a local planning authority. They create certainty and save time and money for those involved in the planning process. Similar methods were used at Canary Wharf, and were an important component in encouraging investment.

30.25 The proposed OPDC may wish to investigate the potential to set up these orders.

Business cases need developing to assist bidding for funding (eg Housing Zone)

30.26 We suggest that the proposed OPDC may wish to work further on the economic benefits that investment, particularly in transport, may bring. These are likely to be very substantial. This would the generation of a funding case.

30.27 This work could be seen together with a review of opportunities for Business Rates Capture or direct grants. One emerging opportunity is the London Housing Zone funding, which can be spent on for transport, schools, land preparation, energy infrastructure and community facilities, as long as it directly unlocks housing supply.

CIL needs to be put in place as early as possible

30.28 Clarity on CIL and S106 policy will allow developers to bid for sites in the knowledge of what they will be paying in infrastructure contributions – allowing them to pay the 'right' price for the land they need, and so avoid future disputes about developer contributions and viability. CIL legislation does not require a Local Plan to be in place before a CIL can be examined. There is no need for the publication of a formal Local Plan before a CIL can be put in place.[48]

In advance of CIL and S106 policy, policy intentions should be communicated consistently and clearly

30.29 Prudent developers must build in sensible assumptions about policy requirements in advance of the policy platform being in place. This report can be used to guide expectations to an extent. Existing borough policy can also be taken as a guide. The OPDC may also guide developers in advance of the CIL and S106 policy.

Planning policy and strategy must remain flexible

30.30 There is a need to stay flexible enough to cope with changing market and economic conditions. One example of how this might be applied in practice is by delivering lower levels of affordable housing in the early phases in order to pump-prime the infrastructure. There is not one right answer to creating development conditions at Old Oak.

A narrative could be created that shows how benefits will be shared across the proposed OPDC area

30.31 We suggest that the proposed OPDC would need to be able to show how the regeneration of Old Oak Common enhances both Park Royal industrial areas, and neighbouring residential areas to the north, south and east. For example, some CIL money could be put aside for regeneration and upgrade of infrastructure at Park Royal.

Relationships are important, and need maintenance and development

30.32 We understand that GLA/interim OPDC officers are already working closely with developers and public sector infrastructure providers, and relationships with utilities providers are developing. These links are essential, and need to be maintained and developed. Efficient creation of the necessary infrastructure for the area will require public services across the three boroughs to work jointly. Equally, there will need to be close collaboration between the public sector and the private sector. The proposed OPDC could very usefully sponsor this joint working.

[48] CIL Regs 2013, Part 3 (6) (1). As long as the Mayor can point to coherent plans for the future (and the anticipated OAPF and a R123 list would probably be sufficient) a new CIL could be examined and adopted.

The forthcoming OAPF could be translated into an infrastructure delivery 'Roadmap'

30.33 The Roadmap would need to be a very practically orientated project plan that would help to get infrastructure actually in place. It would take a very direct, task-oriented approach to delivery. It would undertake the following tasks.

- Identify tasks on the critical path, set dates for those issues to be resolved, and clarify delivery roles and responsibilities for different organisations and individuals;
- Identify and help manage delivery risks. These are substantial – in particular, the risk of inaction at the Crossrail depots site. Other risks include cost escalation, the provision of land and powers for proposed infrastructure projects, the assessment of the financial and business cases, and the identification and co-ordination of utility provision.
- Focus on how any problems will be resolved – in a very head-on way;
- Define issues in time sequence. This would allow the focusing of resources on short term issues and a process of active planning for medium term issues. Longer-term problems (where it is clear that fundamental changes in funding regimes or market conditions are required) could be left for future work;
- Help the political process by clarifying decisions that need to be taken, when they need to be taken, and what the ramifications of choices might be.

30.34 This could have a very important role in getting projects delivered.

Recommendations on delivering transport infrastructure

30.35 We have made a series of detailed recommendations in the Transport Chapter. This section deals with the overarching issues.

A Transport and Logistics Steering Group will be important

30.36 Transport infrastructure is the biggest cost at Old Oak. Much more detail will need to be developed. It would make more sense to do this in collaboration with landowners / developer and other stakeholders. It may therefore be useful to establish a Transport and Logistics Steering Group.

30.37 The broad shape of the Group's future agenda is likely to include the following areas.

- Freight servicing, freight consolidation and movement of construction materials all need to be considered.
- A framework for travel behaviour management and introduction of new transport technology will need to be established
- Funding will need to be sought from a range of sources and a basis to present the economic case for investment needs to be established.
- The transport position will change over time and it would be good to establish an agreed basis for updating forecasts and requirements.

Freight consolidation measures will be a major issue

30.38 Costs associated with possible freight consolidation initiatives are not currently included but it is recognised both by TfL and through this work that further consideration to this aspect is required going forward, especially considering the adjacent functions of the wider Park Royal Area. Significant importance will be attached to the concept in the Old Oak OAPF.

30.39 The concept of freight consolidation in urban areas is promoted by local authorities as a means of reducing the number of delivery vehicles visiting an area of operation. As a consequence it also supports:

- reductions in the number of vehicle kilometres
- better vehicle and driver utilisation for suppliers as a result of quicker turnarounds (and a potential reduction in the number of drop locations) and for deliveries through easier access to loading and unloading facilities at drop locations
- improvements in volume/weight utilisation rates for vehicles on deliveries from the centre (and potentially for inward flows from suppliers too), thereby reducing the unit costs of transportation for the final delivery stage
- fewer vehicles required within the area served by the consolidation centre
- the ability to separate trunk movements from local deliveries, making the use of alternative modes and vehicle types more feasible (e.g. environmentally friendly vehicles such as bikes or electric vans within the urban area, and rail for trunk movements into the consolidation centre)
- ease of access for suppliers to drop-off goods, reducing the time spent driving to the delivery address and accessing the point of delivery by the driver, who may only have a small quantity or a single item to deliver in any case
- opportunities for revenue earning return loads.

30.40 The physical size of the consolidation facility does not have to be large, since the aim is to cross-dock consignments in a short timeframe (e.g. a day or two). Consequently, the freight consolidation centre (FCC) can be a modest building, starting at about 650m2 for a dedicated facility. Some FCCs are set up utilising spare capacity in a larger warehouse which is a shared user approach. Here the facility would be much larger (e.g. 10,000m2), but the FCC would only occupy a very small portion of that space. Larger facilities can offer value added services such as providing secure stockholding areas for retail users, or removing packaging and packaging waste.

30.41 The cost associated with an FCC is very dependent on the rental cost of light industrial or warehouse units, but in London for a 900m2 unit, this might range between £20,000 and £85,000 p.a., plus operating costs. An FCC can operate successfully with one warehouse operative, two drivers and an administrator. In general figures, the first and second year could be £80K-£100K for marketing and development costs; on-going operating costs c £250k per year, depending on contract with third party logistics operator and potential income from user fees. A greater number of users could significantly reduce the operations cost.

30.42 The greatest challenge with the provision of consolidation centres will be ensuring that it is attractive for potential users and ensuring that it is self-financing. This will need to be developed through a Construction Logistics Strategy and partnership working with logistics firms and local business organisations.

Recommendations on delivering utilities infrastructure

30.43 We have made a series of detailed recommendations in each utilities chapter. This section deals with the overarching issues.

An Energy and Utilities Steering Group will be important

30.44 Delivering utilities infrastructure at Old Oak generates some formidable costs. These costs are difficult to absorb because a) in many cases they will be incurred in advance of sales, and will therefore needed financing upfront, and b) they are of a sufficient scope to affect a number of different landowners, and will therefore require careful co-ordination between actors.

30.45 We recommend that a Utilities Steering Group be set up. This could look at a number of issues.

The steering group could manage information flows to provider companies

30.46 Utility Providers are generally required by their respective Regulators (Ofwat, Ofgem, Ofcom etc) to produce a range of periodic plans detailing their asset management and improvement proposals for their networks. The length of coverage of the plans varies according to the utility but they are generally of between five and seven years duration.

30.47 It will be highly beneficial to all stakeholders (the Local Planning Authority, the utility network providers and developers) if strategic developments such as Old Oak are brought to the fore at the earliest opportunity.

The steering group could co-ordinate upstream reinforcements

30.48 In our work on gas, potable water and electricity, we have been able to very broadly investigate the level of connection costs and infrastructure upgrades within the Old Oak area.

30.49 However, it is not possible to understand the extent to which upstream reinforcements of utility networks (which supply the Old Oak Park Royal area as a whole) will be necessary. This is because this understanding would require a network study.

30.50 It has become apparent from our discussions with the utility providers that they have not undertaken a comprehensive network analysis for the quantum of development that is detailed in this study.

30.51 Without a firm commitment (demonstrated through the planning process) the utility providers are reluctant to commit to any resource to a comprehensive network review. They will however undertake such analysis if their costs are met.

30.52 This analysis would be sensible, because it means that utility companies can

- Properly identify and plan reinforcement and upgrading works for the entire development, rather than doing ad-hoc works to cater for particular elements within it.
- Better understand of the spend profile against time and understand potential benefits to be gained from an integrated approach.
- The issue of who finances such works can also be dealt with. (Broadly, we assume that upstream reinforcement is the responsibility of utility companies).

30.53 The steering group could be used to co-ordinate this additional work. We would venture to suggest that the costs of doing this work in a timely way would be exceeded by the benefits of co-ordination and inclusion of future utility requirements in Asset Management Plans.

The steering group could co-ordinate an Integrated Water Management Strategy

30.54 The steering group may also wish to be involved with the Integrated Water Management Strategy which is likely to be commissioned by the OPDC.

30.55 The core role of this job will be to get a better handle on drainage costs, which we suspect may currently be underestimated.

The steering group could help to organise finance for up-front infrastructure costs

30.56 The main issue is common to many of the utilities matters - this is the need for an equitable spreading of costs that are not capable of being borne by the utility providers across site developers. In providing supply reinforcements to a strategic site, there is a risk that all the costs will fall either on the first developer(s) or on the later ones (if new mains only become essential at that stage). It will be important to ensure that the costs are equitably borne by all the developers.

30.57 There are a number of examples of dealing with this problem.

- A forward funding arrangement can see the cost recovered through a charge per dwelling.
- Some infrastructure contractors with stronger balance sheets have been willing to fund infrastructure up front in this way (ie with return on investment through a charge per dwelling) or similar.
- We are also aware of emerging agreements around the country which see a consortium of developers forming to requisition network improvements from a water supplier. This reduces the risk of major network improvement costs falling on an individual developer.

- This group may wish to investigate how the utilities delivery in the area may obtain loan finance from public sector 'revolving' or 'evergreen' funds.

The steering group could help organise the provision of land for the electricity sub-stations and pumping stations. This could be a major issue

30.58 As the provision of land for the sub-station facility could impact significantly on one of the development parcels, some consideration also needs to be given as to how this should be dealt with equitably. This might include:

- compensation for the loss of developable area within that parcel through a land equalisation arrangement;
- credit to the developer against S106 Agreement or CIL contributions; or
- the power company could purchase a suitable site at market rates. Given the cost of land, it is not expected that this would be a feasible option.

30.59 As the provision of land for the sub-station facility could impact significantly on one of the development parcels, some consideration also needs to be given as to how this should be dealt with equitably. We expect that further work will be required on this issue through the proposed Energy and Utilities Steering Group.

30.60 Recent best practice examples – such as Highbury sub-station – allow sub-station land take to be dramatically reduced in comparison to land requirements even five years ago, and allow the production of housing units in close proximity to the sub-station. Even so, we are aware of recent experience at Vauxhall Nine Elms Battersea which suggests that this could be a major issue.

The OPDC could consider policy on decentralised energy

30.61 There are considerable costs in connecting developments to CHP networks. Whilst some of these costs can be successfully passed on to the customer, a proportion remains with the developer. This depresses viability, and so depresses the amount of funding which might be directed towards the provision of other types of infrastructure, or affordable housing. Large scale decentralised energy would be deployed where it is demonstrated to be the most viable energy supply arrangement based on whole life costing.

30.62 With the Steering Group, the GLA could investigate how carbon emissions might be most efficiently reduced at the site. This would also be explored by an Energy Masterplan undertaken as supporting evidence to the future OPDC Local Plan. The same or better carbon reduction may be achieved by using other methods. An electricity-only solution might mean that gas provision to the site might be entirely avoided; if partnered with highly insulated development, this might both reduce energy costs and investment costs in the long term.

30.63 However, this approach might not be compliant with the letter of the London Plan.

Recommendations on a Futureproofing Steering Group

30.64 New technologies are being developed which, over time, are likely to have a disruptive effect on current policies and infrastructure design. The OPDC is in an excellent position to take advantage of technologies as they develop, with the objective of rendering infrastructure delivery more efficient, and reducing carbon consumption.

30.65 A Futureproofing Steering Group could work alongside the OPDC and undertake the following tasks.

The Steering Group could develop Building Information Modelling (BIM) techniques to improve the efficiency of infrastructure delivery

30.66 Building Information Modelling (BIM) techniques could be used to ensure a highly efficient approach to utilities delivery at Old Oak. The full application of BIM techniques can need finalised building designs, but the approach we are describing here seeks to apply BIM concepts to the planning and delivery of infrastructure, potentially as part of a 'Roadmap' type project described in paragraph 0. A BIM approach to infrastructure planning could be run through a GIS based model then later transferred to a full 3D modelling package once a masterplan 'fix' is reached (at least for the primary infrastructure). This would highlight major delivery, cost and cashflow issues over time, and by place.

30.67 The benefits of this approach could be as follows.

- Cost control: integrated building and infrastructure design in a BIM format can drive cost modelling, allowing better cost control.
- Cashflowing investment: the output allows total cost and cost phasing to be understood more accurately, allowing better control of cashflow.
- Site sequencing: together, the costing and phasing information may influence phasing of infrastructure delivery decisions around how, which and when particular land parcels are delivered.
- Intelligent co-ordination of delivery: BIM techniques mean that it is possible to spatially plan infrastructure more effectively. This will stop the often uncoordinated approach to laying utilities which results in roads being dug up and re-laid multiple times.

30.68 BIM techniques could also have important applicants in designing the strategy for the transportation of construction waste.

The steering group could help the early adoption of 'Smart City' concepts at Old Oak

30.69 Smart city approaches could be adopted early at Old Oak. Key 'smart' sectors might include transport, energy, health care, water and waste. Smart systems are integrated and managed digitally in order to both influence and match user demand

and infrastructure supply. The primary purpose of 'smart' is to better use system capacity by shifting demand peaks and therefore avoid or mitigate system investment costs. Consumers shifting their usage pattern may financially benefit as well. A consequence may be to reduce energy consumption and therefore CO2 reductions.

30.70 Much has been written on smart city systems. However, there is frequently relatively little definition of exactly what creating a smart city might involve, since they are more about the sum of the parts than any specific individual measure. Our approach is to try to think in output terms about how adopting a smart city approach might actually alter the built environment – and therefore what we need to be planning for now. At Old Oak, our findings suggest that smart systems could (for example)

- reduce energy demand by influencing use and better matching energy demand with supply, thereby reducing both end user costs carbon emissions;
- potentially remove the need for the gas utilities grid to be put in place, so reducing build costs and therefore creating more headroom for affordable housing and infrastructure contributions. (An intelligently managed electricity grid using the low carbon nuclear base load could mean that gas provision would be redundant);
- manage sewerage and drainage demand and storage systems, again reducing the need for infrastructure spending;
- integrating sensors (such as traffic flow and air quality sensors) and information output systems into furniture such as street lighting; and
- manage transport demand by influencing behaviour and smoothing peak demand flows at interchanges and across network hot-spots

30.71 EU funding is available for some proof of concept work, and could be separately investigated.

Smart city work will require very high quality telecoms networks. Planning should start now

30.72 Given that an entirely new network will be needed at Old Oak, it is highly likely that the most up-to-date telecommunications systems will be put in place.

30.73 However, it may be advantageous for the OPDC to contact BT or a similar telecoms provider early in order to ensure that Old Oak forms part of investment plans. BT runs a number of exemplar projects across the UK, and could be encouraged to see Old Oak as a testbed for new G-Fast technology, which offers 80-500mbps speeds. These speeds are far beyond those available even to Ethernet users.

30.74 If G-Fast is not available, developers could be encouraged to install Ethernet connections to individual blocks of flats. This would provide very high speed access both on upload and download.

30.75 BT have stated that they would like to see telecommunications provision planned in early, to reduce complexities around permission for streetworks. Vacant ducting/reserve channels could be provided for future rental/one off charges to reduce the need to dig up roads later.

The OPDC and steering group could knit together BIM, smart city methods and an economic development strategy into a coherent whole

30.76 Above, we have suggested that the OPDC look at using BIM methods, 'smart' infrastructure, and ultra-fast G-Fast telecommunications provision. Rather than seeing these elements separately, the OPDC could bring these together as an integrated Old Oak 'BIM city' strategy. This would pull together these technologies and approaches and also integrate these methods into an overall economic strategy for the Old Oak area. For example, Christchurch in New Zealand is integrating smart city provision into its £40b 'sensing city' rebuilding programme, and using this to create a new digital economy for the city's future.

Recommendations on a Social Infrastructure Steering Group

30.77 We have made a series of detailed recommendations in each social infrastructure chapter. This section deals with the overarching issues.

Service providers remain under great pressure to deliver services for less money. This is likely to continue to force significant innovations in service delivery and estates strategies

30.78 A steering group will be able to keep the OPDC informed of these changes and ensure that the future infrastructure is tailored to future delivery strategies.

30.79 For example, there is a good practice example in one London authority of a group that aligns infrastructure delivery to capital programmes. The group has been successful in co-ordinating and improving communication between services and determining service priorities. For the first time, there is a mechanism which aligns service priorities, the capital programme, the Community Infrastructure Plan and service delivery.

APPENDIX A VIABILITY TESTING METHOD AND ASSUMPTIONS

A.1 Approach

We intend that CIL and S106 should moderate future land value increases

As we show below, we have adopted assumptions that suggest that sales values rise at Old Oak over time, as the development matures and infrastructure improves. If no CIL or S106 policy existed, this would transmit through to higher residual land values, and would then feed through to increased threshold land values. In effect, taxpayer funded infrastructure would have the effect of transferring wealth to landowners.

We intended that as values at Old Oak rise, CIL and S106 policy will be revised upwards. Where a planning permission is phased, each phase of the development is treated as if it were a separate chargeable development for levy purposes (see Regulation 8(3A) as amended by 2014 Regulations). This may apply to schemes which have full planning permission as well as to outline permissions.49 This suggests that new phases will be subject to the CIL prevailing at the time of commencement of each phase. Separate legal advice should be taken on this point.

The effects of these upward revisions in CIL and S106 will ensure that public investment in transport infrastructure is recycled into rising CIL and S106 receipts, for reinvestment in the infrastructure and affordable housing that the area needs. This will tend to moderate the rate of increase in residual and threshold land values. Policy is able to respond in this way: Regulations and statutory guidance suggests that the CIL should be revisited when there are significant changes in markets – which at Old Oak could be quite frequently, given the fact that the area will be subject both to macro property market changes, and to more localised regeneration.

By clearly signalling this intent, we hope that those who own or control land that is bought for redevelopment will have had ample opportunity to factor in the cost to their calculations and negotiations, and to ensure that their assumptions reflect fully both existing and emerging policy.

A.2 Understanding land values

To understand viability, we need to understand two things. The first is the residual land value. The second is the 'threshold' land value. These numbers matter a great deal, because if the residual land value exceeds the threshold land value, the site is viable – and may even be able to make developer contributions such as CIL and

[49] PAS CIL event slides: http://www.pas.gov.uk/documents/332612/1099317/CIL+event+2014+-+CIL+knowledge+implementations/d5274045-9e73-4267-9cea-60b8443f6571. Paragraph 056 of the online guidance states that "Large scale developments which are delivered over a number of years face particular issues in relation to cashflow and the delivery of on-site infrastructure. The regulations allow for both detailed and outline permissions (and therefore 'hybrid' permissions as well) to be treated as phased developments for the purposes of the levy. This means that each phase would be a separate chargeable development and therefore liable for payment in line with any instalment policy that may be in force. The principle of phased delivery must be apparent from the planning permission." We reason that if payment is in line with a prevailing instalment policy, then it would be in line with prevailing rates too.
http://planningguidance.planningportal.gov.uk/blog/guidance/community-infrastructure-levy/collecting-the-levy/

S106. If the residual land value does not exceed the threshold land value, then the site is not viable and the scheme will not take place without subsidy.

- The residual land value is the value of the land to a developer, assuming that affordable housing and other policy costs are paid, and the developer makes a target profit.
- The 'threshold' land value denotes the price that a landowner will require to supply a development-ready site. In other words, this is the price needed in order to obtain the site for development. Such a site will be reasonably clean, level, and serviced for its future use. It would either be with planning permission, or with very good prospects of obtaining permission. (Note that a landowner might in reality receive less than the figure we quote here – for example if the site is poor quality, or contaminated; or receive more, if there are special reasons to compensate the landowner before the site is released, for example if existing capital equipment cannot be moved and will need to be replaced at an alternative location).

If the residual land value exceeds the threshold land value, there is scope to obtain CIL or S106 funding. We cannot attempt to capture all of this difference in CIL or S106 funding, however: we need to leave a buffer for the variances that might be apparent when more detailed site specific studies are undertaken, or when market conditions change.

This study is attempting to judge the ability of developments to pay for policy costs (which will force down residual land values), whilst simultaneously making it worthwhile for a landowner to sell his or her land for new uses envisaged.

This will allow development to happen, and wider benefits to society to be delivered.

A.3 Estimating a threshold land value

Broadly speaking there are two different approaches to arrive at an appropriate threshold land value:

1. Assessing the *uplift from an existing or known alternative use value*. The uplift will be required in order to incentivise the landowner to sell the site. Existing Use Value (EUV) is the market value of the site assuming a continuation of the current use with no prospect of a change of use. Alternative Use Value (AUV) is the market value of the site on the basis of any planning permissions that may exist for alternative uses or the hope value that might be paid on the prospect of planning permission being granted.
2. Assessing the discount from the *market value* of a site in a market *without* planning policy, and then adjusting downwards to allow for the costs of planning policy, sufficient to incentivise the owner to sell.

At most sites in Old Oak, we have proceeded using the first method, with an eye on the second. We make an assessment of vacant possession capital value per sq ft of built accommodation using comparative examples relative to its use to assess EUV and then incorporate a margin on top to provide the incentive to move. Our modelled threshold land values include in most cases a large premium above current or existing use value. There is, therefore, a considerable incentive for landowners built

in to the calculations, and at the present time we see no reason to seek to increase this even if the residential values rise over time.

However, we cannot be blind to market sentiment, because the threshold land values must be sufficient to incentivise landowners to sell. We have therefore have applied our market understanding to our results. But relying entirely on the market value of the site would not be appropriate: that might tend to mean that the study makes an unrealistically large allowance for hope values arising from public transport investment at the site.

A.4 Reflecting existing investments at sites

At some sites, we have adjusted our threshold land value approach. This is to reflect the fact that some users have invested in plant and machinery at their site, and so will need some form of replacement costs reflecting in their threshold value. Their Threshold Value would need to exceed comfortably the cost of an alternative site and re-provision of the plant and machinery needed to undertake their business. We have taken broad account of this necessity in our calculations, although clearly more detailed work would be necessary before S106 negotiations or even Compulsory Purchase Order proceedings could take place. We have been able to provide this additional accuracy because we have had interviews with some of the major site owners in Old Oak.

It will be open to any applicant at the time of the planning application to argue that the scheme may not be able to afford the proposed S106 or affordable housing contribution.

A.5 Estimating residual land value

A residual valuation has been carried out. The assumptions used in the residual valuation can be found in Appendix B.

Residual valuation testing needs inputs on development costs and development value. In order to get these inputs, a property market assessment was carried out which analysed comparable residential and commercial schemes, and prevailing sales and rental values and yields. An assessment of comparable land sales for residential and commercial uses was also undertaken.

In assessing the values of schemes we had regard to a range of data including Land Registry sale prices and evidence from the sale of new and second hand residential property. This was supplemented by discussions with JLL agents and private developers, and JLL's experience in selling, acquiring and advising on development sites throughout London.

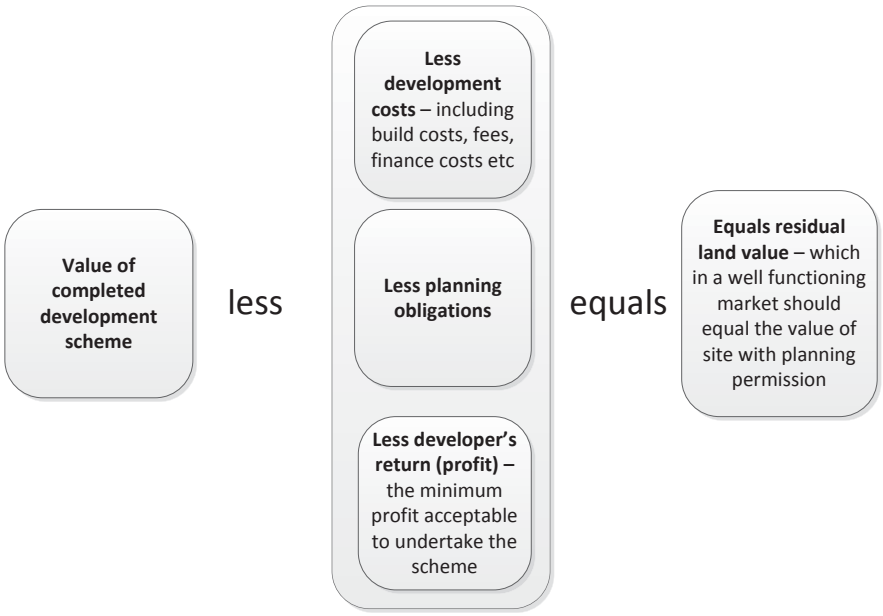
Our viability assessments are based on development appraisals of hypothetical schemes, using the residual valuation method. This approach is in line with accepted practice and as recommended by RICS guidance50 and the Harman report[51.]

[50] RICS (2012), *Financial Viability in Planning, RICS First Edition Guidance Note*

Residual valuation is applied to different land uses and where relevant to different parts of the area, aiming to show typical values for each. It is based on the following formula:

- Value of completed development scheme
- Less development costs - including build costs, fees, finance costs etc
- Less developer's return (profit) – the minimum profit acceptable in the market to undertake the scheme
- ***Less* policy costs** – building in (for example) Section 106 costs and other policy requirements
- *Equals* residual land value

Figure 30.2 Residual value calculation



For each of the development categories tested, we use this formula to estimate typical residual land values, which is what the site should be worth once it has full planning permission. The residual value calculation requires a wide range of inputs, or assumptions, including the costs of development, the required developer's return.

The arithmetic of residual appraisal is straightforward. However, the inputs to the calculation are hard to determine for a specific site (as demonstrated by the complexity of many S106 negotiations). Therefore our viability assessments are necessarily broad approximations, subject to a margin of uncertainty.

A.6 Understanding the value of the completed scheme

Viability testing and CIL/S106 policy must be set on the basis of today's market. However, Old Oak is a long-term development project. Residual land values can be expected to rise over time, as the prospect of improved transport connections and

[51] Local Housing Delivery Group Chaired by Sir John Harman (2012) *Viability Testing Local Plans*

area regeneration become more immediate. All other things being equal, development in each future phase is likely to become more viable, as this "new" location matures, the urban realm is created, and the critical mass and supporting retail and leisure uses take shape.

If this effect takes place as expected, CIL and S106 receipts might be expected to rise over time, even after inflation has been taken into account. This will mean that there will be more infrastructure funding available in future to support growth than is available at the present time. It is desirable to know how much CIL and S106 infrastructure funding might be available in future, because this might materially change the approach to the funding and financing of the scheme.

This is a difficult question to answer with any accuracy, because so much rests on factors that are currently unknowable. We have made assumptions on values and costs by benchmarking the individual sites considering their characteristics and positioning within the Vision against comparable schemes, transactions and developments that exist today.

In doing this, we have avoided inventing some kind of 'regeneration' uplift factor to attach to sales values. Instead, we have stuck to the important principle that we are using today's values to inform our assumptions. We have therefore used comparables taken from existing sites across London which offer a similar development type, transport connectivity, and quality expected in Old Oak in future. By way of example, a small office building in the early phases is unlikely to attract significant demand from occupiers. However, by Phase 2 and 3, where there is significant transport infrastructure upgrades, nearby residential development completions, social infrastructure and critical mass with access into Paddington at a reported six minutes, Old Oak Common attractiveness as an office location will improve and therefore command higher rents. We have used today's comparable evidence to show this shift in the viability model.

A.7 Understanding development costs (decontamination)

One of the major determinants of development costs in an area such as Old Oak is land contamination. We have undertaken a desktop study of land contamination (available under separate cover) which has been factored into our viability testing on the strategic sites.

APPENDIX B VIABILITY TESTING ASSUMPTIONS

B.1 Generic development schemes tested

Six typical schemes are identified as typical of proposals that might come forward in the various phases. These schemes form the basis of viability testing. They were devised and agreed with the Client Project Team.

The schemes tested are as follows.

- Scheme 1: Medium residential (50 Dwellings c.6 storeys)
- Scheme 2: Tall residential (200 Dwellings 10+ storeys)
- Scheme 3: Small / Medium office (4,645 sqm / 50,000+ sqft GIA up to10 storeys)
- Scheme 5: Large office (27,870 sqm / 300,000 sqft GIA c.20 storeys)
- Scheme 7: Hotel (200 rooms, 5,600 sqm / 60,278 sqft GIA)
- Scheme 8: Budget Hotel (100+ rooms, 2,100 sqm / 22,604 sqft GIA)

B.2 Strategic site testing

We have looked at certain landholdings and schemes within the Core Area in more detail which involved meeting the landowners for interviews/ meetings. These are

- Car Giant
- EMR
- Powerday
- QPR
- SEGRO holdings (Victoria Way)
- Network Rail
- HS2

30.80 Where additional viability testing on these schemes has been carried out, we may have derogated from the standard assumptions used for the generic testing. We have done this in order to tailor the exercise to the individual circumstances of the development in question.

B.3 Scenarios tested

The base case is delivering the Vision and Trajectory provided to us by the GLA and different scenarios have been tested. The results are found in the body of the report.

B.4 Viability testing assumptions

We have set out the viability testing assumptions we have used in generic testing as follows.

Construction Costs

Using BCIS as a starting point and in consultation with Gardiner and Theobald the appointed cost consultant, we have derived these rates from comparable evidence in line with the expected standard of development.

Category	£/sqm	£/sq ft
Medium Private Residential	£2,098	£195
Medium Affordable Residential	£1,991	£185
Tall Private Residential	£2,368	£220
Tall Affordable Residential	£2,152	£200
Retail	£915	£85
Small / Medium Office – 10 storeys	£2,341	£218
Large Office – 20 storeys	£2,476	£230

We have made a further allowance of £20 per sq ft for external costs.

Site decontamination costs

We have derived these decontamination costs from a desktop study of the area. We have used mid values in our viability testing. Please refer to Appendix C for more details.

Area	Site	Plot	Contamination Potential	Decontamination Cost Range £,000/Plot		
				Low	Mid	High
North Acton	Portal Way & A40	1a/1b	A	263	463	663
North Acton	Perfume Factory	2	B	1493	2490	3487
North Acton	North Acton Stn	3	A	67	118	169
North Acton	Island Site	4	A	109	201	293
North Acton	Brunel Rd	5	A	347	611	874
North Acton	Shield site	6	B	1366	2279	3191
Old Oak North	Willesden Junction Stn	7	A	157	276	395
Old Oak North	Car Giant East & West	8	B	3130	5472	7814
Old Oak North	Scrubs Lane East	9	A	73	128	183
Old Oak North	Scrubs Lane West	10	B	1088	1815	2541
Old Oak North	Car Giant North	11	A	596	1097	1598
Old Oak North	EMR	12	C	1149	1819	2489
Old Oak North	Powerday	13	A	302	556	810
Old Oak South	Genesis	14	A	129	227	324
Old Oak South	Depots (xrail, GW,HEX)	15	C	4833	7651	10468
Old Oak South	Stations site	16	C	5442	9290	13138

Old Oak South	IEP depot	17	A	398	699	1001
Old Oak South	Mitre Bridge	18	B	683	1139	1596
Old Oak South	North Pole East	19	C	879	1391	1903
Park Royal	Twyford Tip		D	1680	2953	4225

Professional and legal fees

We have derived these values from industry standard charges and current stamp duty rates.

Fee	Amount
Professional Fees	12.00%
Contingency	10.00% on construction costs
Letting Agent Fees	10.00%
Letting Legal Fees	5.00%
Sales Agent Fees	1.00%
Sales Legal Fees	0.50%
Purchaser's Stamp Duty	4.00%
Purchaser's Agent Fee	1.00%
Purchaser's Legal Fees	0.80%
Finance Costs	6.50%
Developer's Profit	20% on cost

Value Inputs – residential value ranges adopted

We have derived these values from comparable evidence. We have used today's values.

Use – Residential	Capital Value £ per Sq M (Ph1/Ph2/Ph3)	Capital Value £ per Sq Ft (Ph1/Ph2/Ph3)
Private Residential	£5,920 / £6,548 / £7,535	£550 / £600 / £700
Affordable Residential (60% of Private)	£3,552/ £3,875 / £4,521	£330 / £360 / £420

Value Inputs – Residential site specific

We have derived these values from comparable evidence and benchmarking.

£/Sq ft

Plot	Site Name	Homes	Phase	High Value	Low Value
1a	Portal Way	1,000	1	625	575
1b	A40 Site	522	1	625	575
2	Perfume Factory	1,100	2	675	625
3	North Acton Station	400	1	675	625
4	Island Site	336	3	675	625
5	Brunel Road	1,000	4	725	675
6	Shield Site	1,430	4	725	675
7	Willesden Junction	866	2	650	600

8	Car Giant East & West	3,783	1	700	650
9	Scrubs Lane East	501	1	550	500
10	Scrubs Lane West	1,330	2	575	525
11	Gar Giant North	2,179	3	625	575
12	EMR (over two phases)	1,320	2	575	525
13	Powerday	1,210	4	625	575
14	Genesis	471	1	575	525
15	Depots	2,670	4	775	725
16	Station Site	656	3	775	725
17	IEP Depot	2,240	4	725	675
18	Mitre Bridge	400	2	625	575
19	North Pole East	730	3	600	550

Value Inputs – commercial rents

We have derived these values from comparable evidence.

Use – Commercial	Rent £ per Sq M			Pent £ per Sq Ft		
	Ph1	Ph2	Ph3	Ph1	Ph2	Ph3
Retail	£215	£269	£323	£20	£25	£30
SME	£323	£377	£431	£30	£35	£40
Medium Office – 10 storeys	£377	£431	£484	£35	£40	£45
Large Office – 20 storeys	£377	£431	£484	£35	£40	£45

Value Inputs – Commercial Capitalisation Rates

We have derived these values from comparable evidence.

Use – Commercial	Capitalisation Rate (Ph1/Ph2/Ph3)
Retail	6.50% / 6.25% / 6.00%
SME	6.5% / 6.5% / 6.25%
Medium Office – 10 storeys	NA / 6.00% / 5.75%
Large Office – 20 storeys	NA / 6.25% / 6.00%

Value Inputs – Hotels (capitalisation rate)

We have derived these values from comparable evidence.

Use	Capitalisation Rate (Ph2/Ph3)
Hotel (3 Star)	6.50% / 6.25%
Medium Budget Hotel	5.25% / 5.00%

Value Inputs – Hotels (income per room)

We have derived these values from comparable evidence.

Use	Income per room (Ph2/Ph3)
Hotel (3 Star)	£8,000 / £8,500
Budget Hotel	£5,500 / £6,000

B.5 The phasing of schemes

Each phase of development will be tested separately. The schemes tested will be tailored to the type of development expected in each phase.

We have prepared the viability testing based on the following timescales, using the development trajectory provided to us.

Scheme phasing

Phase	Timing	Jobs	Homes
Phase 1	2016-2021	1,139	3,494
Phase 2	2021-2026	3,100	5,146
Phase 3	2026-2036	23,610	6,955
Phase 4	2036-2050	23,355	8,550
TOTAL		53,204	24,145

B.6 Policy costs assumed

30.81 The following policy costs are assumed.

- Affordable housing policy. We test affordable housing at a range of points to understand the relationship between affordable housing, infrastructure funding and viability. We start at 40% affordable housing, and then undertake sensitivity testing at 30%, and then 20%. There is a 60:40 split between social rented and intermediate tenures in each case.
- Residential density standards. The Vision sets out the target number of homes on a given site. Density used in this study is derived from the Vision.
- Floorspace standards. We have assumed that one residential unit has on average floorspace of 72 sq m (internal floor area of the dwelling). This is consistent with the London Design Guide (2 bed 4 person single storey dwelling)[52].
- Mayoral CIL at the prevailing rate.

[52] GLA (2010) *London Design Guide*
https://www.london.gov.uk/sites/default/files/Interim%20London%20Housing%20Design%20Guide.pdf

APPENDIX C INFRASTRUCTURE SUGGESTED PROVIDED THROUGH CIL

Funding assumed from CIL

Data Label	Funding sought from

Theme	Type	Project	Sum of 2016	Sum of 2017	Sum of 2018	Sum of 2019	Sum of 2020	Sum of 2021	Sum of 2022	Sum of 2023	Sum of 2024	Sum of 2025	Sum of 2026	Sum of 2027	Sum of 2028	Sum of 2029	Sum of 2030	Sum of 2031	Sum of 2032	Sum of 2033	Sum of 2034	Sum of 2035	Sum of 2036	Sum of 2037	Sum of 2038	Sum of 2039	Sum of 2040	Sum of 2041	Sum of 2042	Sum of 2043	Sum of 2044	Sum of 2045	Sum of 2046	Sum of 2047	Sum of 2048	Sum of 2049	Sum of 2050
Transport	Bridges & crossings	T17 - Western Canal Crossing - links to Access Road 4 above. Costings cover the bridge and associated approaches. Source: SDG drawing 226376 201.			2,100	2,100	2,000	4,000																													
		G27A - Concourse link to Wormwood Scrubs. This is passive provision to be completed with G27B. This is effectively phase 1 of the WSP/Farrells study. It set up a link from the HS2 hub across tracks for non-paying passengers. This tranche is the eleme							5,000	5,000	5,000	5,000																									
		T7 - New railway crossing over or under freight line and associated east-west link for new access on to Scrubbs Lane. Working assumption from NR that crossing goes over rail lines. Costs cover the length of road from T8 to T6. Strategic junction improving access to whole of eastern Old Oak area, together with T6 and T5. Therefore assumed to be CIL funded.						4,000	4,000	5,000	4,000	8,000																									
		T9 - Improved underpass under West London Line - links Hythe Road through to new access road from Scrubbs Lane. Strategic infrastructure creating flows around sites and to station.									2,000	5,000	6,000																								
		G6 -Ped/cycle link under West London Line and potential new West London line station. Precise location and alignment tbc.					1,000	1,000	2,000	3,000	6,200																										
		G25 - Pedestrian and cycle bridge across Grand Union Canal. This bridge would a critical part of the improved internal connectivity within the northern OOC area. Would form part of a direct pedestrian/cycle link between Willesden Junction station, OOC station and Wormwood Scrubs. Although the full route depends on access through the Depots site, the phasing of this bridge has been brough forward in order to facilitate access to the Nature Reserve, which comes as part of earlier phases.						1,100	1,600	1,500	2,500	3,500																									
		G5 - Willesden Junction bridge. Pedestrian & cycle bridge across WCML (Link from EMR to Willesden Junction Station). The link will eventually provide part of a continuous link between Willesden Junction station, Old Oak Common station and Wormwood Scrubs. Costings assume 135m long by 20m wide pedestrian & cycle bridge. Costings include an allowance for temporary works and rail line possessions. Costs includes combination of ramps, steps and lifts at arrival and departure points considered sufficient to deal with complex levels.					5,000	10,000	15,000	10,000																											
		G27B - Concourse link to Wormwood Scrubs (CIL element). This is the element of the project outside the HS2 Petition process. This is effectively Phase 2 of the WSP/Farrells study. It completes the passive HS2 concourse link, reaching through site 17 and onto the green space of Wormwood Scrubs. This tranche of work is assumed funded through CIL.																				500	500	3,500	6,500											
	Roads & junctions	T11 - Internal junction within Car Giant E & W - three arm roundabout on internal link road.																																		
		T8 and T10 - Internal junctions within Car Giant North. T8 is a four arm roundabout assumed starting onsite in 2028. T10 is a three arm roundabout starting onsite in 2033. Costings include connecting routes from T8 to T9; T8 to G6; and short access road north of T8.																																		
		T18 - Old Oak Common Lane (TfL 'Access Road 4') is a new link road running east-west through Car Giant East and West site. Included in these costings is the length of connections from the eastern edge of T17 bridge approach to Scrubs Lane (source TfL SDG drawing 223676 201). Costings exclude T17 bridge and associated approach.																																		
		T12 Old Oak Lane improvement scheme. Scope to be confirmed. G11 junction dealt with separately.								2,000	3,000	5,000																									
		G11&12 - Access Roads to site 7 Willesden Junction homes and jobs.																																		
		T-STA - North Acton Station Capacity Improvements.		5,000	5,000	5,000	5,000																													
		T52, T22, T29 - Victoria Road widening to Old Oak Lane and low rail overbridge headroom increased. Essential road widening proposed as part of HS2 plans to improve access on the main access link from the south. This project includes stretch of road in an inverted U shape running from North Acton station, up Victoria Road, then south through T16 (costed separately), T22 junction, T29 junction, as far as junction with Wulfstan Street.																																		
		T24 - Junction between Old Oak Common Lane and new Link Road. The costings include the raised approach to the junction. Provides access to development site 17 IEP Depot.																																		
		T32 Access to sites 18 Mitre Bridge and site 19 North Pole East. Costed to include the junction and access road. This provision could extend as far as Ladbroke Grove for bus, cycle, peds only. However, this further access is not costed here.								900																											
		G102 pedestrian links under railway																																		
		T1 - A219 Scrubs Lane/Hythe Road Access Junction. This sees the junction improved onto the existing Hythe Road only. No costs have been allowed for in TfL numbers for any improvement of the underpass under the rail line immediately to the west, but we have allowed £5m for this on GLA advice. Strategic junction improving access to whole of eastern Old Oak area, together with T6 and T5. Therefore assumed to be CIL funded.		2,000	3,000	5,000																														
		T5/6 - A219 Scrubs Lane/ Access 2 & Scrubs Lane Re-alignment. This is principal Old Oak eastern gateway access. Improvements run from Great Western Mainline to Scrubs Lane junction with A404 Harrow Road. Improvements include T6 (new junction). SDG note that movement of T6 junction further north is not feasible due to highway capacity concerns. T6 location as shown provides adequate right turn provision for traffic from the north. SDG drawing number 226376 201. No works to the bridge of the West Coast mainline are included here. Strategic junction improving access to whole of eastern Old Oak area, together with T6 and T5. Therefore assumed to be CIL funded.					500	2,000	3,500	5,000																												
		G104 - Pedestrian Link under North London Line. Links to G107. Releases routes south out of Powerday site.																																		
		G105 - internal roads accessing Powerday. Also provides access to EMR Site 12 and Car Giant North 11.																				1,500	1,500														
		G106 - EMR tranche - internal roads for EMR Site 12 and Car Giant North Site 11. G105 and G106 were costed together. To breakdown, we have assumed that G106 takes 25% of total G105 and G106 costs. This is then split 50-50 between CG-North and EMR developers.																																		
		G106 - Car Giant North tranche internal roads for EMR Site 12 and Car Giant North Site 11. G105 and G106 were costed together. To breakdown, we have assumed that G106 takes 25% of total G105 and G106 costs. This is then split 50-50 between CG-North and EMR developers.																																		

		G107 pedestrian route associated with G104. This does not include crossing costs.																																			
		T16- Old Oak Common Lane junction to East-West Access link. Costings include both the junction and short link road to T17 Canal Bridge approach. Similar to T1 in that it has site access but also a strategic function.	500	1,500	2,500																																
		G26 - East / West Road. Access road runs right through the IEP Depot site 17. Runs from Scrubs Lane (including the easterly junction) to the start of the T24 raised junction approach in the west.																																			
		A4 junction improvements. Costs will be refined following further TfL study.		500	1,000	1,000	500		500	1,000	1,000	500				500	1,000	1,000	500					500	1,000	1,000	500										
		Wider area junction improvements (excluding A4 junction improvements)		500	2,000	2,000	500		500	2,000	2,000	500				500	2,000	2,000	1,000					500	2,000	2,000	1,000										
	⊟ PT, cycle & pedestrian	T-STA - Two new stations on London Overground - assumed to be one new station on each of the North London Line (which is the westerly station) and West London Line (which is the easterly station).																																			
		G20 Pedestrian/Cycle link between HS2 and North London Line station. Provides improved links between NLL station and OOC rail hub. Development of link needs to fit in with site development as they come forward to ensure delivery.																																			
		G101 - Pedestrian/Cycle link between Victoria Road A4000 and North London Line new station. With G20 pedestrian link, this project provides improved links between North Acton tube station and OOC rail hub. Runs across Shield site which has been reserved for HS2 construction.																																			
		Mini-Holland standards adopted across the OOC core area. We assume that half of costs are sought through s106, and half through CIL. We assume a rolling programme of implementation, pro-rata with build out, although the actual build process is likely to proceed in shorter, more programmed, blocks of activity.	62	93	310	310	310	320	320	320	320	320	218	218	244	244	244	246	213	213	161	161	151	151	151	151	151	228	228	228	228	228	153	153	153	153	153
		T-STA - Willesden Junction Station Capacity Improvements. Redevelopment of station buildings and concourse plus gateline improvements. Essential improvements required to meet increased additional demand from new rail users associatted with OOC development. Costings do not include Willesden Junction bridge.						20,000	20,000	20,000																											
		G103 Second pedestrian Crossing Link to Wormwood Scrubs. Valuable for the access it provides from Car Giant East and West to Wormwood Scrubs.																					1,000	1,000	1,000	1,750	4,000	5,000	5,000								
		Bus operating revenue support for new services and compensation during construction. Assumed pooled as a CIL cost. S106 is not suitable because of pooling restrictions.						2,900	2,900	2,900	2,900	3,400	2,475	2,475	2,475	2,475	2,475	2,475	2,475	2,475	2,475	2,475	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900
		Spur connect Xrail to West Coast Mainline. The cost presented includes spur enabling works. Further WCML upgrades are not included.																																			
		High level assumptions for cycle hire; Legible London wayfinding and signage; nominal allowance for additional bus infrastructure at Overground stations.						500	1,000				1,000	1,000									500	500					2,500								
		T30/59 & G100. G100 is the pedestrian and vehicle link from HS2 to West London Line overground station. T30/59 is Eastern Canal Bridge, including a link from Hythe Road to HS2 hub. TfL will be undertaking a study in early 2015 which will look to amalgamate the eastern bridge link and Overground connections (WLL option C connection) into one piece of infrastructure. This may be a single structure. The link provides direct PT and cycle walking access from the north west side of the development to the HS2 hub. The link will need to cross the Crossrail sidings to the Crossrail Depot (highly complex to construct).																																			
⊞ Utilities																																					
⊟ Social	⊟ Ambulance	Extension to an exisitng ambulance station, comprising 625m2 of offices, stabling for vehicles, equipment storage, rest rooms and so on.																									2,231										
	⊟ Education	2 FE expansion to secondary school - 300 pupils. Officers would need to make further assessments to be sure how and where this takes place.								9,800																											
		2FE Primary School - comprising 450 pupils each. This might be best located in or around IEP depot site.																																			7,800
		2FE Primary School - comprising 450 pupils each. This might be best located in or around North Acton Shield site.																											7,800								
		New two form entry primary school - 480 pupils. Could be located around North Acton. A specific site is to be confirmed.									8,300																										
		All through school - 4FE Primary, 4FE Secondary, Early Years and Sixth Form provision. Located to allow use of open space, and with a view to the provision of shared services from the school site. Location to be confirmed.															44,015																				
		1FE expansion of existing primary school will be required - 210 pupils. If required, we have made the conservative assumption that some expansion capacity of existing schools to the north of the area will be required. Schools affected unknown.				4,500																															
	⊟ Fire	New fire station comprising 1500m2 GIA building, 3 storey with 2 storey void over appliance bay (three of, within the building and an additional three bays in front of the opening doors). Externally a six storey drill tower is provided together with wash-down area, additional vehicle bays, storage bays and parking for staff and visitors.																				4,290															
	⊟ Healthcare facilities	Primary health care facilities, generic GP surgery - project 1. The funding line assumes that provision would be built by a developer, but leased back to the NHS to at least cover the developer's costs. Detailed work would be needed to investigate this assumption further.						2,514																													
		Primary health care facilities, generic GP surgery - project 2. The funding line assumes that provision would be built by a developer, but leased back to the NHS to at least cover the developer's costs. Detailed work would be needed to investigate this assumption further.										2,514																									
		Primary health care facilities, generic GP surgery - project 3. The funding line assumes that provision would be built by a developer, but leased back to the NHS to at least cover the developer's costs. Detailed work would be needed to investigate this assumption further.																2,514																			
		Primary health care facilities, generic GP surgery - project 4. The funding line assumes that provision would be built by a developer, but leased back to the NHS to at least cover the developer's costs. Detailed work would be needed to investigate this assumption further.																									2,514										
		Primary health care facilities, generic GP surgery - project 5. The funding line assumes that provision would be built by a developer, but leased back to the NHS to at least cover the developer's costs. Detailed work would be needed to investigate this assumption further.																															2,514				
	⊞ Integrated											9,600															9,600										
	⊟ Open space & leisure	Improvements to existing Nature Reserve. May involve costly ground level changes. Shepherds Bush nature reserve upgrades used as very broad indicator of cost. Site is likley to form part of a sales offer at Car Giant W&W site. Assumed that these costs fall within the Car Giant masterplan.																																			
		Towpath upgrade project. We assume this runs alongside the Canal from Scrubs Lane to Old Oak Common Lane, around 1.1 km in length. Includes verges, kerbs, signage, lighting, tree planting etc.		790	790																																

		Green Cross Public Realm (excluding towpath) assumed in Car Giant North site. Seen across all sites, this project delivers additional planting and environmental improvements alongside e/west and n/south routes. Routes and lengths tbd - assumed 1.8km in total length excluding tow path. Represents extra over costs above the standard cost of setting out roads/ ped/ cycleways. Funding assumed absorbed in masterplans at CG E&W, CG N, EMR, Depots, station																																		
		Green Cross Public Realm (excluding towpath) assumed in Car Giant East & West site. Seen across all sites, this project delivers additional planting and environmental improvements alongside e/west and n/south routes. Routes and lengths tbd - assumed 1.8km in total length excluding tow path. Represents extra over costs above the standard cost of setting out roads/ ped/ cycleways. Funding assumed absorbed in masterplans at CG E&W, CG N, EMR, Depots, station																																		
		Green Cross Public Realm (excluding towpath) assumed in Depots site. Seen across all sites, this project delivers additional planting and environmental improvements alongside e/west and n/south routes. Routes and lengths tbd - assumed 1.8km in total length excluding tow path. Represents extra over costs above the standard cost of setting out roads/ ped/ cycleways. Funding assumed absorbed in masterplans at CG E&W, CG N, EMR, Depots, station																																		
		Green Cross Public Realm (excluding towpath) assumed in EMR site. Seen across all sites, this project delivers additional planting and environmental improvements alongside e/west and n/south routes. Routes and lengths tbd - assumed 1.8km in total length excluding tow path. Represents extra over costs above the standard cost of setting out roads/ ped/ cycleways. Funding assumed absorbed in masterplans at CG E&W, CG N, EMR, Depots, station																																		
		Green Cross Public Realm (excluding towpath) assumed in station site. Seen across all sites, this project delivers additional planting and environmental improvements alongside e/west and n/south routes. Routes and lengths tbd - assumed 1.8km in total length excluding tow path. Represents extra over costs above the standard cost of setting out roads/ ped/ cycleways. Funding assumed absorbed in masterplans at CG E&W, CG N, EMR, Depots, station																																		
		Access along canal northern towpath. Quality landscaping and hard surfacing treatment. Delivery with Car Giant E&W.																																		
		Sensitive upgrades to public space at Wormwood Scrubs. Both improvements are assumed quite early in the development period in order to demonstrate benefits of growth, and to help values at the new build. No specific projects have been costed, but costs included here benchmarked against local comparables at Bishops Park (£7m), Ravenscourt Park (£6m) and Shepherds Bush (£5m).						5,000						5,000										5,000													
		Car Giant North tranche - Provision of a public open space north of the Grand Union Canal to serve the public open space needs of development. Provision funded by developer.																																		
		EMR tranche - Provision of a public open space north of the Grand Union Canal to serve the public open space needs of development. Provision funded by developer.																																		
		Play space (offsite). Facilities for under 5s (onsite): assumed included in typical external budgets, so not included as a separate cost. Facilities for ages 5 to 11 (onsite and offsite). Some of these facilities are likley to be provided onsite, whilst others will be offsite. We have assumed a 50-50 split between onsite and offsite provision, and assume that offsite playspace costs are sought from CIL, whilst onsite costs form part of typical externals budget. Facilities for over 12s (offsite): we assume that all provision for over 12s is offsite, and is thus seeking funding from CIL as a strategic cross-site cost. We assume that provision is delivered in line with build out.			539	616	693	794	794	794	794	795	542	542	605	605	605	611	530	530	400	400	375	375	375	375	375	566	566	566	566	566	379	379	379	379	379
	⊟Policing	CCTV monitoring suite, housed in civic building plus infrastructure to operate monitoring service.					138																													
		425 sq m extension/intensification of existing police station incorporating custody centres, offices, public reception areas, evidence storage, police vehicle storage and so on. Total funding sought via CIL.														2,000																				
		425 sq m extension/intensification of existing police station incorporating custody centres, offices, public reception areas, evidence storage, police vehicle storage and so on.																														2,000					