Palace of Westminster Restoration and Renewal Programme Independent Options Appraisal

Final Report
Volume 1

This final report (the "Final Report") has been prepared by Deloitte LLP ("Deloitte") for The Corporate Officer of the House of Lords and Corporate Officer of the House of Commons (Acting Jointly) in accordance with the contract with them dated 23rd December 2013 ("the Contract") and on the basis of the scope and limitations set out below.

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The Final Report has been prepared solely for the purposes of satisfying the 'Core Objective' of the Independent Options Appraisal as set out in the Contract i.e.: 'an independently produced costed options appraisal of the Scenarios, in order to enable Parliament to reach a well-founded decision in principle on the means of restoring and renewing the Palace of Westminster while maintaining business continuity.'

8 September 2014

Contents page

1. Executive summary

1.1 Introduction

The Strategic Case for the Programme reflects the need to address the current condition of the Palace, asset risks such as fire and flood, security threats, the need to improve accommodation and to protect image and reputation.

The Restoration and Renewal Programme – The strategic case

- The current PoW was re-built over a 30 year period following a fire in 1834, which destroyed most of the estate. Since the post war era, the PoW has not undergone any major restoration or renewal. The strategic case for change (as recorded in the Preliminary Strategic Business Case of Oct 2012) is as follows:
  - **Condition and risk** – 'The PoW is reaching the point where its condition is deteriorating, risks are growing and partial patching and mending interventions are no longer sufficient. Fundamental renovation can no longer be avoided.'
  - **Asset protection** – 'A fundamental requirement is for the PoW to remain safe from fire (which destroyed its predecessor), water damage, security threats, decay and dilapidation. This is the overwhelming driver for modernisation.'
  - **Decent standards of accommodation** – 'As a working institution, "Parliament in the PoW" has to provide decent standards of accommodation for all those who work within it, or visit as citizens, as school children on educational trips or as witnesses to Parliamentary business, and the building has to support the modern ways in which Parliaments work with informal as well as formal meetings, digital information and mobile devices.'
  - **UK brand and reputational image** – 'As a visitor attraction, whether for UK or international tourists, enthusiasts for democracy or specialists in the Victorian and medieval heritage, the PoW is part of the UK brand, instantly recognised and appreciated around the world.'
  - **Difficulty of combining renovation with ongoing occupation** – 'This (2012) study has reviewed the context in which the PoW was created and the way in which its use as the home of the UK Parliament has evolved. It has also reviewed the current condition of the PoW and the backlog of maintenance work that has built up over a long period of time, in part because of the way in which the PoW has been managed, but above all because of the great difficulty of carrying out fundamental renovation work on the inside of the PoW while Parliament remains in continuous occupation.'

The Programme Objectives

- In response to the Strategic Case, the Programme Board endorsed (February 2014) five Programme Objectives for the Programme, which are summarised in the table below.

Table E1: Programme Objectives

Programme Objectives
1) Allow the business of Parliament to continue uninterrupted, mitigate any adverse operational impact, and reduce risk over the longer term
2) Accommodate the needs of a 21st Century Parliament
3) Address existing building structure, fabric and service issues
4) Preserve and protect the PoW's status as a Grade I listed building and a UNESCO World Heritage Site (for the foreseeable future)
5) Deliver value for money for the taxpayer, generating a range of economic benefits

Source: IOA Team analysis

Independent Options Appraisal

- The core objective of the Independent Options Appraisal is for the Consultant to deliver to the Client an independently produced, costed, options appraisal of the Scenarios, in order to enable Parliament to reach a well founded decision in principle on the means of restoring and renewing the PoW, whilst maintaining business continuity; and to pave the way for an outline business case (OBC) that conforms to public sector good practice as set out in the HM Treasury Green Book.

Important assumptions

- Full details of the assumptions used for the IOA can be found within Volume 2 Appendix E.7 of this Final Report. Four of the most important assumptions are summarised below:
  - The strategic case for change, as set out in the 'Pre feasibility study and Preliminary Strategic Business Case' dated October 2012 is based upon a potential scope of work defined by the Client Programme Team and not by the Independent Options Appraisal team;
  - The scope associated with each Outcome Level of the programme works has been derived from Client consultation and documentation. The IOA team supported the reconfiguration of Outcome Levels A-C, which have been agreed by the Programme Board;
  - The assumed start date of the construction works is Q2 2020. Our financial, and schedule metrics are based on this date, however if this commencement date is not realised (i.e. delays occur), our analysis and outputs will need rebasing; and
  - All Scenarios have been financially analysed and compared over a 60 year period as per HMT Green Book Guidance, with a fixed commencement date of Q2 2014

1.1 Introduction

The Strategic Case for the Programme reflects the need to address the current condition of the Palace, asset risks such as fire and flood, security threats, the need to improve accommodation and to protect image and reputation.

Comparative scale

- The PoW is an intensely used ornate Victorian heritage, UNESCO World Heritage, Grade I listed building located in central London. There are no other single built assets offering direct comparisons. However, in order to obtain a sense of comparable scale, elemental comparisons can be extracted from the British Museum and the Ministry of Defence Main Building as both are of similar size and listed building status to the PoW. The British Museum includes a mixture of public and private areas and is a focal point for UK. It also provides visitor tours and educational outreach similar to that of the PoW. Other facilities with a comparable internal floor area to the PoW include the HSBC tower in Canary Wharf (i.e. 100,000 sq. m, albeit on 46 levels). A more detailed comparison matrix can be found within section three (Volume one) of the main body of the report.

IOA Scenarios

- The IOA adopts a Scenario based approach to analysis. The Scenarios are a product of (a) a potential Programme Outcome Level (driven by delivered scope and specification) and (b) the potential delivery Option needed to meet the prescribed Outcome Level
- Outcome Levels can be summarised as follows (Outcome Levels are cumulative):
  - Outcome Level A: Ensures compliance with legislation; maintain World Heritage and Grade 1 listing status; Repair or replace systems on a like for like basis to contemporary standards of design and quality, optimising costs and benefits over full system lifecycles. This outcome will meet built environment standards expected for public building;
  - Outcome Level B: As for A but additionally; Meets any additional built environment policy objectives stated by the Houses; Provide facilities to meet the stated objectives of both Houses (such as inclusion, outreach and education); Defined improvements to amenities within the constraints of the present design; Future proofing of infrastructure and provision for change to the current occupation where the requirement can be only loosely anticipated, over an indefinite period; and
  - Outcome Level C: As for A and B but additionally Significant defined improvements e.g. high performance and long life cycles appropriate to each system; Defined improvements to the amenities within the constraints of the present design.
- Delivery Options can be summarised as follows:
  - Option 1 (enabled): A rolling programme of phased works over a significantly prolonged period of years but still working around the continued use of the PoW. Option 1 as originally defined could not meet the Programme Objectives. Key operational constraints were removed or reduced to generate an Enabled Option 1 (E1) for comparison purposes. This would include the adoption of longer Parliamentary recesses, over many years. Emergency recalls could not be accommodated within the Chambers during these recesses.
  - Option 2: A programme incorporating a partial decant of each House in turn to temporary accommodation and closure to Members and the public of broadly half the PoW in turn for a prolonged period; and
  - Option 3: A programme incorporating a full decant of the PoW and associated programme of works necessary to deliver the restoration and renewal of the PoW.
- Of the long list of nine potential Scenarios (i.e. a matrix made up of three Outcome Levels and three delivery Options) five Scenarios were shortlisted for detailed evaluation as part of the Independent Options Appraisal. The shortlisted Scenarios are highlighted below in green.

Figure E1: Shortlisted Scenarios:

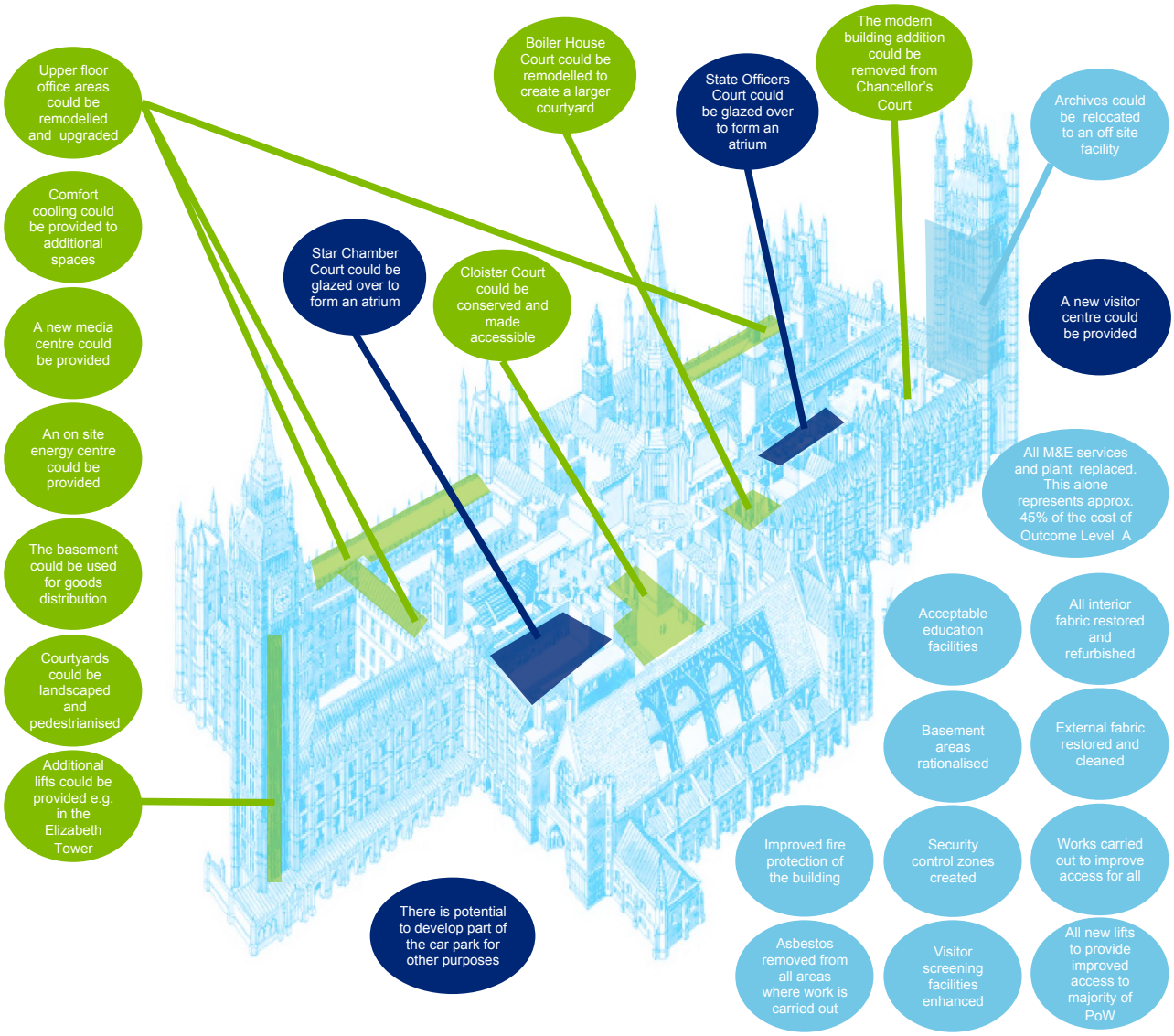
	Option 1 Decant (Rolling)	Option 2 Decant (Partial)	Option 3 Decant (Full)
Outcome Level A	E1A	2A	3A
Outcome Level B	1B	2B	3B
Outcome Level C	1C	2C	3C

Source: IOA Team analysis

1.2 Outcome Levels

The image below illustrates potential examples of the scope of work that could be completed within the Restoration and Renewal Programme. Outcome level A scope represents over 75% by capital cost of the Outcome C scope (outcomes are cumulative).

Figure E2: Potential scope



Source: IOA Team analysis.

Outcome A – Do minimum scope: light blue
Additional Outcome Level B scope: green
Additional Outcome Level C scope: dark blue

1.3 Delivery Options

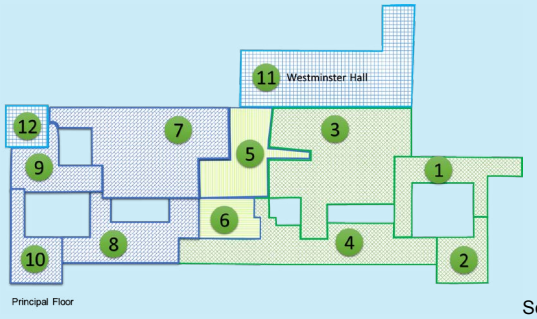
Delivery Options range from a rolling programme of works, with extensive sequencing of construction zones over an extended period, a partial decant enabling works to be undertaken on each House in turn, or a fully decanted Palace, enabling works to progress on both Houses in parallel.

Overview and summary implications of each Delivery Option

Table E2.1: Delivery Options

	Overview	Decant / reoccupation	Risks
Delivery Option E1	• The PoW would be notionally split into 12 construction zones above ground, plus the basement. The construction zone sequencing is notional and not fixed at this stage. • Both Chambers will need to be vacated for a significant amount of time • The delivery approach is to replace the basement mechanical and electrical infrastructure first (to minimise the risk of failure) and then to progress work on the upper floors, using a rolling programme of works over what is most likely to be a 32 year period (on average each construction zone could take 2-4 years to complete). • Occupants and users of the PoW will face significantly more Disruption and Nuisance (almost four-fold, when compared to existing levels) under this delivery Option when compared to Options 2 and 3. Fire and security measures will also need to be put in place. • Examples of day to day Nuisance include noise disturbance, loss of direct access routes to destinations within the PoW, loss of car parking spaces, and increased quantities of scaffolding and temporary buildings in courtyards for extended periods of time resulting in a loss of natural light. • Sufficient temporary accommodation will need to be made available especially in relation to core business function being provided for within the red line boundary.	• During this time both Chambers would alternately have to close for between two and four years, but sittings could be relocated to a temporary structure possibly in one of the courtyards. • Limited temporary relocation (i.e. moving users from their existing locations to temporary accommodation or vacant space) of users within the boundary of the PoW will provide the free space to form a construction zone when required (i.e. multiple times). • It is expected that the space required will, subject to Planning and Security reviews, be provided using temporary accommodation located in the courtyards.	• Nuisance to occupants over a very long period of time will inevitably lead to constant interruption to the works, resulting in delays and further extending the overall programme for E1. • The replacement of existing services, whilst in use will almost certainly result in significant Disruption. • Greatest risk of damage caused to artefacts during the works and churn. • Failure to maintain effective security and segregation, whilst providing sufficient means of escape. • Works not completed prior to lifecycle replacement of the new M&E plant starting. • Risk that insufficient churn space is available at appropriate standard.

Zoning



Source: IOA Team analysis

1.3 Delivery Options

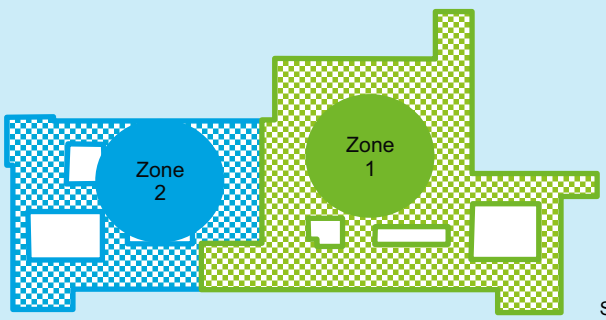
Delivery Options range from a rolling programme of works, with extensive sequencing of construction zones over an extended period, a partial decant enabling works to be undertaken on each House in turn, or a fully decanted Palace, enabling works to progress on both Houses in parallel.

Overview and summary implications of each Delivery Option

Table E2.1: Delivery Options

	Overview	Decant / reoccupation	Risks
Delivery Option 2	• A substantial area of the PoW would be closed to users for a significant period while major work is carried out. • Major aspects of core Parliamentary business (effectively on a House by House basis) would relocate to a temporary building, but the PoW would not be closed. • A partial decant delivery method results in a delivery programme that is approximately twice the duration of a full decant delivery timeline. In addition to the periods of construction activity there are significant periods of decant and reoccupation activity in the interim periods. • The fire wardens will continue to operate as normal and the route for the fire engine through the arches will need to be maintained within the active construction zone, or an alternative solution that is acceptable to the Fire Officer, will need to be identified. • The building will retain and need to protect aspects of heritage items and equipment requiring restoration, forming part of the Programme scope of works. These include works of art, furniture, and fixed items including elements of the building fabric. • Security will need to be maintained to a high level as a significant proportion of the building will remain occupied during construction. • Additionally, when zone 1 is being worked on, the clock maintenance team will require access to Elizabeth Tower to keep the clock fully functional during implementation of the Programme. There may be other regular maintenance access requirements that need to be satisfied during the delivery of the works. These access arrangements will need to be closely managed between the client and contractor(s).	• One House would be vacated to a temporary decant building while the other House remains in its current location. • Construction work would then beundertaken in the vacated part of the building while business activities continue in the occupied part. • Upon completion of Phase 1: • the vacated House would re-occupy their space; • the Decant Building will be reconfigured, to suit the needs of the other House; • the other House would move to the decant space; and • Phase 2 of the PoW construction works would proceed.	• Disruption and Nuisance to occupiers – noise, access restrictions, ceremonial restrictions, could impact the business of Parliament. • Inability to secure adequate decant accommodation. • Major temporary services may be required to keep occupied spaces fully functional. • Remaining building operation, use, security and functionality are potentially compromised due to site logistics. • Loss and damage could be caused to artefacts during the works and decanting. • Maintenance of safety systems/ environment during the works. • Materials may require greater security screening due to the split occupancy site. • There is a risk that there may not be enough specialist skilled labour in the market to service the Programme.

Zoning



Source: IOA Team analysis

1.3 Delivery Options

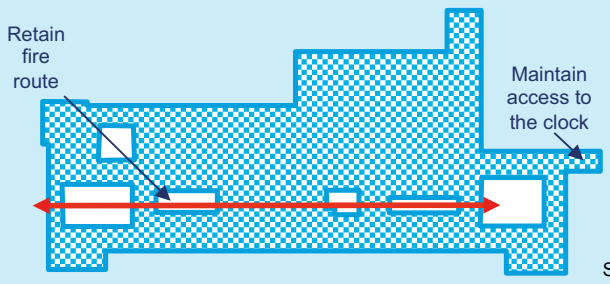
Delivery Options range from a rolling programme of works, with extensive sequencing of construction zones over an extended period, a partial decant enabling works to be undertaken on each House in turn, or a fully decanted Palace, enabling works to progress on both Houses in parallel.

Overview and summary implications of each Delivery Option

Table E2.3: Delivery Options

	Overview	Decant / reoccupation	Risks
Delivery Option 3	• All occupants will be decanted for the construction phase of the works. • The schedule for completing the works is the shortest of the three Options. • The fire wardens will continue to operate as normal and the route for the fire engine through the arches within the existing courtyards will need to be maintained, or an alternative solution that is acceptable to the Fire Officer, will need to be identified. • The building will retain and need to protect aspects of heritage items and equipment requiring restoration, forming part of the Programme scope of works. These include works of art, furniture, and fixed items including elements of the building fabric. • Security would need to be maintained as the construction zone still creates a threat to fabric and heritage items. • Additionally, the clock maintenance team will require access to Elizabeth Tower to keep the clock fully functional during implementation of the Programme. There may be other regular maintenance access requirements that need to be satisfied during the delivery of the works. These access arrangements will need to be closely managed between the Client and contractor(s).	• All occupants and functions within the PoW will be relocated to available space outside the Palace leaving behind a vacant building.	• Inability to secure adequate decant accommodation. • Loss and damage could be caused to artefacts during the works and decanting. • The large site establishment could be visibly obtrusive. • There could be logistical challenges in dealing with high levels of deliveries requiring security screening • There is a risk that there may not be enough specialist labour in the market to service the Programme.

Zoning



Source: IOA Team analysis

1.4 Shortlisted Scenarios: Overview and key metrics

A rolling programme of works with the Houses remaining in the PoW (Scenario E1A) is most likely to take 32 years and cost £5.67bn (P50), whilst delivery of the Programme by means of a full decant (for example Scenario 3B) is most likely to take six years and cost £3.52bn (P50).

Table E3.1: Shortlisted Scenarios: Overview and key metrics

	Scenario E1A An ongoing rolling programme of works with no additional amenity and functionality and achieves the built environment standards expected for public buildings.	**Scenario 2A** A partial decant that addresses statutory requirements and achieves the built environment standards expected for public buildings.	**Scenario 2B** A partial decant that delivers enhanced amenity and functionality	**Scenario 3B** A full decant that delivers enhanced amenity and functionality	**Scenario 3C** A full decant that delivers significantly enhanced amenity and functionality
Capital expenditure	Overall capital expenditure of: • £5.67 bn (based on P50) Of which construction and construction delivery costs: • £1.26 bn (based on P50)	Overall capital expenditure of: • £3.94 bn (based on P50) Of which construction and construction delivery costs: • £1.05 bn (based on P50)	Overall capital expenditure of: • £4.42 bn (based on P50) Of which construction and construction delivery costs: • £1.21 bn (based on P50)	Overall capital expenditure of: • £3.52 bn (based on P50) Of which construction and construction delivery costs: • £0.96 bn (based on P50)	Overall capital expenditure of: • £3.87 bn (based on P50) Of which construction and construction delivery costs: • £1.08 bn (based on P50)
Capital expenditure profile	Anticipated total expenditure profile of: • £43m (Years 1-5) Highest expenditure in period: • £1.05 bn (Years 31-35) Due to five zones being completed at once and the removal of temporary services from the PoW.	Anticipated total expenditure profile of: • £454m (Years 1-5) Highest expenditure in period: • £1.48 bn (Years 11-15)	Anticipated total expenditure profile of: • £454m (Years 1-5) Highest expenditure in period: • £1.67 bn (Years 11-15)	Anticipated total expenditure profile of: • £757m (Years 1-5) Highest expenditure in period: • £1.87 bn (Years 6-10)	Anticipated total expenditure profile of: • £756m (Years 1-5) Highest expenditure in period: • £2.05 bn (Years 6-10)
Operational expenditure and revenue income (based over 60 years)	Anticipated operational expenditure of: • £15.75bn (based P50) • Impact following Programme completion: No impact on revenue income streams as amenities and functionality remain unchanged.	Anticipated operational expenditure of: • £15.59bn (based P50) • Impact following Programme completion: No impact on revenue income streams as amenities and functionality remain unchanged.	Anticipated operational expenditure of: • £16.70bn (based P50) • Impact following Programme completion: Limited positive impact on revenue income streams given modest improvements in amenities and functionality.	Anticipated operational expenditure of: • £14.95bn (based P50) • Impact following Programme completion: Limited positive impact on revenue income streams given modest improvements in amenities and functionality.	Anticipated operational expenditure of: • £16.41bn (based P50) • Impact following Programme completion: Significant positive impact on revenue income streams given material improvements in amenities and functionality.

Source: IOA Team analysis

1.4 Shortlisted Scenarios: Overview and key metrics

A rolling programme of works with the Houses remaining in the PoW (Scenario E1A) is most likely to take 32 years and cost £5.67bn (P50), whilst delivery of the Programme by means of a full decant (for example Scenario 3B) is most likely to take six years and cost £3.52bn (P50).

Table E3.2: Shortlisted Scenarios: Overview and key metrics

	Scenario E1A An ongoing rolling programme of works with no additional amenity and functionality and achieves the built environment standards expected for public buildings.	**Scenario 2A** A partial decant that addresses statutory requirements and achieves the built environment standards expected for public buildings.	**Scenario 2B** A partial decant that delivers enhanced amenity and functionality	**Scenario 3B** A full decant that delivers enhanced amenity and functionality	**Scenario 3C** A full decant that delivers significantly enhanced amenity and functionality
Whole life cost (based over 60 years)	Anticipated whole life cost of: • £21.42 bn (inflated, based on P50) • £7.89 bn (Net present cost) (based on P50)	Anticipated whole life cost of: • £19.53 bn (inflated, based on P50) • £8.39 bn (Net present cost) (based on P50)	Anticipated whole life cost of: • £21.12 bn (inflated, based on P50) • £9.09 bn (Net present cost) (based on P50)	Anticipated whole life cost of: • £18.47 bn (inflated, based on P50) • £8.31 bn (Net present cost) (based on P50)	Anticipated whole life cost of: • £20.28 bn (inflated, based on P50) • £9.11 bn (Net present cost) (based on P50)
Schedule	Construction schedule range of: • 25 - 40 years • 32 years (most likely)	Construction schedule range of: • 9 - 14 years • 11 years (most likely)	Construction schedule range of: • 9 - 14 years • 11 years (most likely)	Construction schedule range of: • 5 - 8 years • 6 years (most likely)	Construction schedule range of: • 5 - 8 years • 6 years (most likely)
Operational risks and impacts	• **Excessive Nuisance -** noise, dust and general contractor presence are all likely to directly impact the core business of Parliament over several decades. • **Churn Disruption -** Members, Peers, staff and functions (including both Chambers) will have to relocate within the PoW and neighbouring estate (likely to be repeated more than once) • **Security issues -** a separate Security Report has been produced.	• **Nuisance -** despite only half the PoW being occupied, noise, dust and general contractor presence are all likely to directly impact the core business of Parliament for several Parliamentary terms. • **Decant / reoccupation Disruption -** Members of both Houses will have to vacate the PoW at the appropriate times, causing Disruption to individuals during both stages	• **Nuisance -** despite only half the PoW being occupied, noise, dust and general contractor presence are all likely to directly impact the core business of Parliament for several Parliamentary terms. • **Decant / reoccupation Disruption -** Members of both Houses will have to vacate the PoW at the appropriate times, causing Disruption to individuals during both stages	• **Decant / reoccupation Disruption -** Members of both Houses will have to vacate the PoW (likely to be on a phased basis) at the appropriate time, causing relatively short term Disruption to individuals during both stages. • **Security issues -** a separate Security Report has been produced.	• **Decant / reoccupation Disruption -** Members of both Houses will have to vacate the PoW (likely to be on a phased basis) at the appropriate time, causing relatively short term Disruption to individuals during both stages. • **Security issues -** a separate Security Report has been produced.

Source: IOA Team analysis

1.4 Shortlisted Scenarios: Overview and key metrics

Outcome Level A will deliver no additional amenity and functionality, whereas Outcome Levels B and C are likely to deliver incremental improvements. This is directly linked to the ability to future proof the Palace, delivery of enhanced amenities and wider Programme benefits

Table E3.3: Shortlisted Scenarios: Overview and key metrics

	Scenario E1A An ongoing rolling programme of works with no additional amenity and functionality and achieves the built environment standards expected for public buildings.	**Scenario 2A** A partial decant that addresses statutory requirements and achieves the built environment standards expected for public buildings.	**Scenario 2B** A partial decant that delivers enhanced amenity and functionality	**Scenario 3B** A full decant that delivers enhanced amenity and functionality	**Scenario 3C** A full decant that delivers significantly enhanced amenity and functionality
Operational risks and impacts (cont.)	• It will be essential for the HoC (and likely to be desirable but not essential for the HoL) to relocate to the temporary chamber to facilitate the completion of the Restoration and Renewal scope of works.	• **Security issues** - a separate Security Report has been produced.	• **Security issues** - a separate Security Report has been produced.		
Potential scope	• **Mechanical and electrical –** replacement of all plant, services infrastructure and systems, asbestos removed from services. • **Interior architecture / heritage** – all internal spaces refurbished, minor alterations to address room use changes, adaptations for access/security needs, asbestos removed. • **External fabric** – all external fabric repaired, cleaned and refurbished.	• **Mechanical and electrical** – replacement of all plant, services infrastructure and systems, asbestos removed from services. • **Interior architecture / heritage** – all internal spaces refurbished, minor alterations to address room use changes, adaptations for access/security needs, asbestos removed. • **External fabric** – all external fabric repaired, cleaned and refurbished.	• **Mechanical and electrical** – as Outcome Level A • **Interior architecture / heritage** – as Outcome Level A. • **External fabric** – as Outcome Level A.	• **Mechanical and electrical** – as Outcome Level A. • **Interior architecture / heritage** – as Outcome Level A. • **External fabric** – as Outcome Level A.	• **Mechanical and electrical** – as Outcome Level A. Comfort cooling, new energy centre and lifts • **Interior architecture / heritage** – as Outcome A. • **External fabric** as Outcome Level A.

Source: IOA Team analysis

1.4 Shortlisted Scenarios: Overview and key metrics

Outcome Level A will deliver no additional amenity and functionality, whereas Outcome Levels B and C are likely to deliver incremental improvements. This is directly linked to the ability to future proof the Palace, delivery of enhanced amenities and wider Programme benefits

Table E3.4: Shortlisted Scenarios: Overview and key metrics

	Scenario E1A An ongoing rolling programme of works with no additional amenity and functionality and achieves the built environment standards expected for public buildings.	**Scenario 2A** A partial decant that addresses statutory requirements and achieves the built environment standards expected for public buildings.	**Scenario 2B** A partial decant that delivers enhanced amenity and functionality	**Scenario 3B** A full decant that delivers enhanced amenity and functionality	**Scenario 3C** A full decant that delivers significantly enhanced amenity and functionality
Potential scope (cont.)	• **Interventions and enhancements –** which could include security, catering, business and support driven interventions, creating a permanent education centre, replacement of river terrace marquees, replacement and updates to lifts, improved screening facilities at entrances and improved access within PoW.	• **Interventions and enhancements –** which could include security, catering, business and support driven interventions, creating a permanent education centre, replacement of river terrace marquees, replacement and updates to lifts, improved screening facilities at entrances and improved access within PoW.	• **Interventions and enhancements –** as Outcome Level A plus further interventions / enhancements, which could include installation of additional lifts, basement use for goods distribution route, courtyards landscaped and traffic reduced, create new media centre, alter parts of upper floor areas to provide upgraded office accommodation, demolish modern buildings in Chancellor's Court, create a site energy centre to serve PoW and extend comfort cooling.	• **Interventions and enhancements –** As Outcome Level A plus further interventions / enhancements, which could include installation of additional lifts; basement use for goods distribution route; courtyards landscaped and traffic reduced; create new media centre; alter parts of upper floor areas to provide upgraded office accommodation; demolish modern buildings in Chancellor's Court; create a site energy centre to serve PoW and extend comfort cooling.	• **Interventions and enhancements –** as Outcome A plus B plus further interventions / enhancements, which could include glazing over Star Chamber Court to create an atrium at the entrance for the House of Commons; glazing over State Officer's Court to create an atrium at the entrance for the House ofLords; construct a visitor centre to include education, exhibition, conference, screening and visitor facilities; develop part of the New Palace area and car park.
Accommo-dating change (if desired)	• There is little or no ability to materially incorporate future proofing due to the overall programme schedule.	• Potentially some opportunity to incorporate future proofing.	• Potentially some opportunity to incorporate future proofing.	• Greater opportunities to incorporate future proofing initiatives and secure long term operating benefits within the PoW, principally due to the rate of progress and much shorter overall programme schedule.	• Much greater opportunity to incorporate future proofing initiatives and secure long term operating benefits and costs savings within the PoW, principally due to the rate of progress and much shorter overall programme schedule.

Source: IOA Team analysis

1.4 Shortlisted Scenarios: Overview and key metrics

Outcome Level A will deliver no additional amenity and functionality, whereas Outcome Levels B and C are likely to deliver incremental improvements. This is directly linked to the ability to future proof the Palace, delivery of enhanced amenities and wider Programme benefits

Table E3.5: Shortlisted Scenarios: Overview and key metrics

	Scenario E1A An ongoing rolling programme of works with no additional amenity and functionality and achieves the built environment standards expected for public buildings.	**Scenario 2A** A partial decant that addresses statutory requirements and achieves the built environment standards expected for public buildings.	**Scenario 2B** A partial decant that delivers enhanced amenity and functionality	**Scenario 3B** A full decant that delivers enhanced amenity and functionality	**Scenario 3C** A full decant that delivers significantly enhanced amenity and functionality
Accommo-dating change (if desired) (cont.)	• Multiple technological and legislative changes over time coupled with the slow rate of progress makes achieving any future proofing extremely challenging.	• However, lifecycle replacement will start to encroach on the programme i.e. services plant life expectancy may expire ahead of programme completion in some areas of the PoW.	• However, lifecycle replacement will start to encroach on the programme i.e. services plant life expectancy may expire ahead of programme completion in some areas of the PoW.		
Wider impacts	• Relatively modest rate of progress will limit the extent to which employment opportunities may cascade out regionally and nationally, beyond that currently experienced from the PoW.	• Greater opportunities to generate employment initiatives at regional and potentially at a national level, including specialist roofing, masonry and other heritage manufacturers	• Greater opportunities to generate employment initiatives at regional and potentially at a national level, including specialist roofing, masonry and other heritage manufacturers	• Presents the greatest opportunity to secure regional and national employment opportunities for individuals and businesses across the UK.	• Presents the greatest opportunity to secure regional and national employment opportunities for individuals and businesses across the UK.
Why deliver this Scenario?	• The core business of Parliament will remain within the PoW and the Houses will remain co-located. • There is no need to secure any decant accommodation therefore mitigating a Programme risk. • It is the lowest in Net Present Whole Life cost terms.	• Delivers the Programme far quicker than E1A and therefore reduces operational risk quicker. • A phased decant and reoccupation could be adopted, thereby potentially reducing the period when one or both Houses might be temporarily relocated from the PoW.	• Delivers the Programme far quicker than E1A and therefore reduces operational risk quicker. Delivers improved amenity and functionality compared to the existing PoW. • A phased decant and reoccupation could be adopted, thereby potentially reducing the period when one or both Houses might be temporarily relocated from the PoW.	• Delivers the Programme far quicker than delivery Options E1 and 2. It therefore reduces operational risk the quickest along with Scenario 3C. Delivers improved amenity and functionality when compared to the existing PoW. • There is a greater opportunity to future proof the PoW infrastructure.	• Delivers the Programme works far quicker than the other delivery Option Scenarios, ie. E1A, 2A and 2B, and it therefore reduces operational risk at the fastest rate. Delivers significantly improved amenity and functionality compared to the existing PoW. • There is a greater opportunity to future proof the PoW infrastructure.

Source: IOA Team analysis

1.4 Shortlisted Scenarios: Overview and key metrics

Outcome Level A will deliver no additional amenity and functionality, whereas Outcome Levels B and C are likely to deliver incremental improvements. This is directly linked to the ability to future proof the Palace, delivery of enhanced amenities and wider Programme benefits

Table E3.6: Shortlisted Scenarios: Overview and key metrics

	Scenario E1A An ongoing rolling programme of works with no additional amenity and functionality and achieves the built environment standards expected for public buildings.	**Scenario 2A** A partial decant that addresses statutory requirements and achieves the built environment standards expected for public buildings.	**Scenario 2B** A partial decant that delivers enhanced amenity and functionality	**Scenario 3B** A full decant that delivers enhanced amenity and functionality	**Scenario 3C** A full decant that delivers significantly enhanced amenity and functionality
Why deliver this Scenario? (cont.)	• It has the lowest in year capital funding requirement, albeit over a much longer period for the overall Programme.	• Enhanced business processes and ways or working could be adopted when moving out and then back into the PoW. • The public may have an opportunity to access the PoW during the Programme works as a large zone of the PoW will not be in use by Parliament. These public visits could raise awareness of the Programme.	• Moving out of and back into the PoW could provide an opportunity to facilitate new and enhanced business processes and ways of working could be adopted. • The public may have an opportunity to access the PoW during the works as a large zone of the PoW will not be in use by Parliament. Public visits could be used to help raise Programme awareness and the profile of the works.	• A phased decant and reoccupation of the PoW could be adopted, thereby potentially reducing the period when both Houses might be temporarily relocated from the PoW. • Moving out of and back into the PoW could provide an opportunity to facilitate new and enhanced business processes and ways of working could be adopted. • 3B should be noted as offering lowest overall capital, revenue and whole life cost (P50) at todays prices.	• A phased decant and reoccupation of the PoW could be adopted, thereby potentially reducing the period when both Houses might be temporarily relocated from the PoW. • Moving out of and back into the PoW could provide an opportunity to facilitate new and enhanced business processes and ways of working could be adopted. • The running costs and carbon footprint would reduce as a result of the investment in sustainable technologies.

1.5 Shortlisted Scenarios: Focus on schedule

The most likely schedule durations range from six years (Scenarios 3B and 3C), to 32 years (Scenario E1A). The ability to forecast Schedule duration with certainty is linked to the extent of proposed decanting from the PoW i.e. decanting potentially creates schedule certainty.

Background

- We have outlined below our initial findings and working assumptions on the Scenario schedules, and our assumed approach to delivering the Restoration and Renewal Programme. Our initial approach was to establish clear and logical delivery schedules that reflect the scope and cost of work in each Scenario.
- Our approach for assessing schedules for delivery of the Restoration and Renewal programme for the different Scenarios was to examine the Workstrand Reports for scope and identify gaps that exist. This led to the development of a scoping document (refer to the Outcome Level scope summary document included in Volume 2, Appendix D.1). Separately, we have assessed industry standard durations for typical works and also consulted with contractors currently on site to determine existing working practices and constraints.
- The PoW accommodates approximately 650 MPs, 780 Peers, Members' staff, staff of both Houses, visitors to the PoW and those attending debates and committee meetings and the media.
- Even now, there are several contractors undertaking works at the PoW at any given time, resulting in a large number of associated daily vehicular movements. The timeline necessary to deliver the assumed scope will need to take account of all of these factors if Option 1 is selected.
- The initial timeline analysis has been undertaken to reflect the unique nature of the PoW as a heritage asset, and its home of the UK Parliament.

Key assumptions – partial decant approach

- The ability to relocate key business systems and functions to new areas, for Options 1 and 2. Furthermore, the creation of a buffer zone is needed in order to help mitigate noise, dust, security and other potentially disruptive issues generated from construction activities in the PoW.
- New ground rules would need to be established with occupiers for Options 1 and 2 to remove constraints in relation to matters such as noise and access.
- Strip out and works in the basement areas will take place simultaneously with the standard work sequence progressing on upper floors. It will be necessary to create resilience in the new systems before completion of the renovated Chamber, following which testing and commissioning can start. A security sweep is also needed to allow the completed area to be occupied.

Key assumption – full decant approach

- Our approach to the full decant option has been to assume a fully vacated PoW, providing contractors unconstrained access to undertake the works on all floors of the PoW simultaneously.

Key observation

- The summarised timeline for each Scenario (based on illustrative lower range to upper range durations) is shown below. Our current working assumption is that delivery of Options 2 and 3 will be undertaken with a phased decant and reoccupation, thereby reducing the period when one or both Houses might be temporarily relocated from the PoW.
- It should be noted that the delivery method has a more significant impact on time and cost for each Scenario than the differing Outcome Levels.

Table E4: lower range, most likely and upper range construction schedule periods for each Delivery Option

Scenario	Lower range (years)	Most likely (years)	Upper range (years)
E1A	25	32	40
2A and 2B	9	11	14
3B and 3C	5	6	8

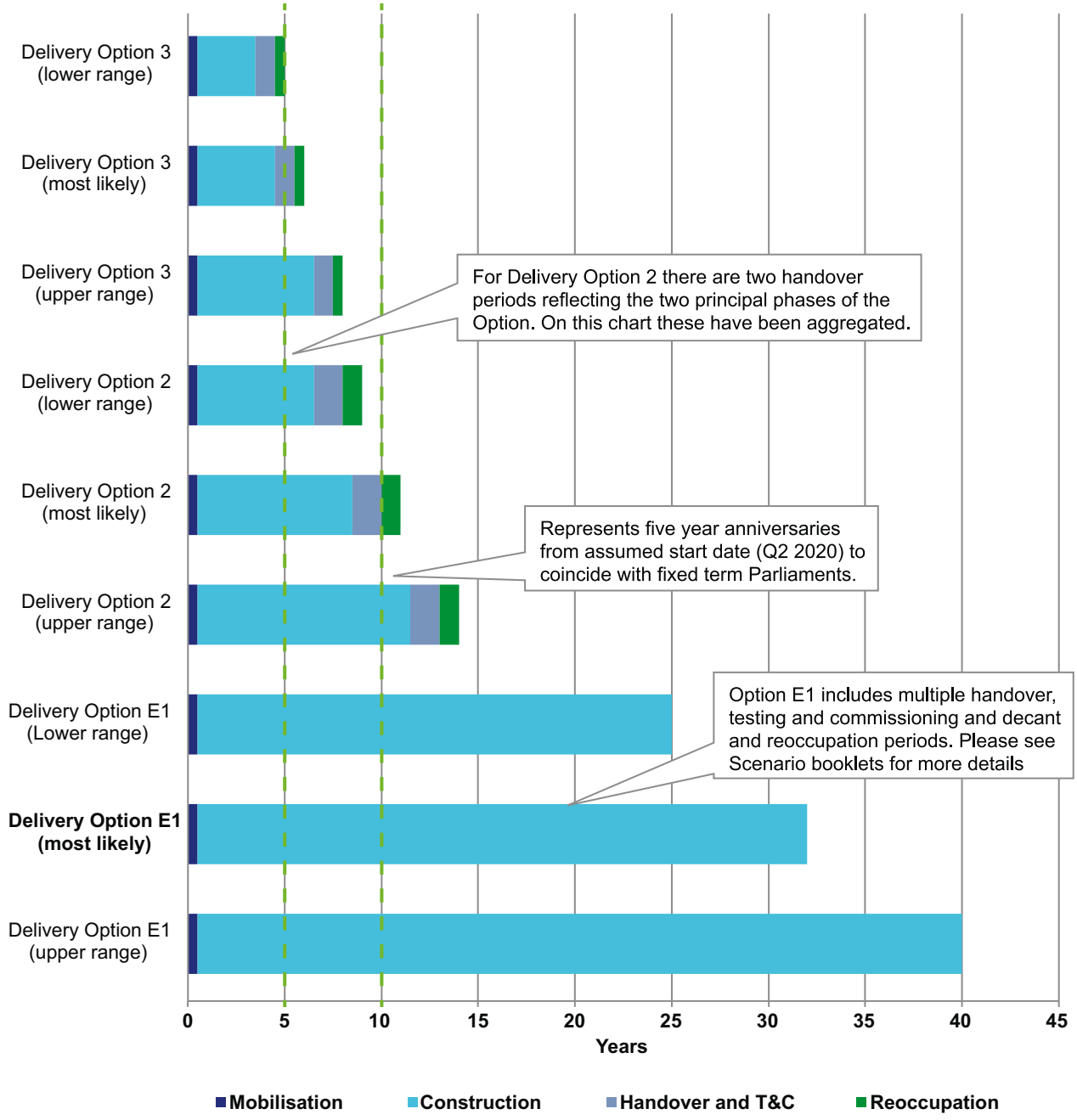
Source: IOA Team analysis

- The most likely duration analysis indicates that Scenarios 3B and 3C could be delivered in 6 years through a Full Decant Solution. There is also reasonable certainty to the range, which has a narrow spread.
- Scenarios 2A and 2B have a most likely duration of 11 years and a slightly wider spread.
- Scenario E1A has a 32 year most likely duration and is highly uncertain.
- Based on the current scope contained within the Programme, it is unlikely that the Programme can be delivered within a single Parliamentary Term, which is assumed to be five years, albeit we understand that it may be unduly disruptive to carry out a major move just prior to or just after an election.

1.5 Shortlisted Scenarios: Focus on schedule

The most likely schedule durations range from six years (Scenarios 3B and 3C), to 32 years (Scenario E1A). The ability to forecast Schedule duration with certainty is linked to the extent of proposed decanting from the PoW i.e. decanting potentially creates schedule certainty.

Figure E3: Scenario construction Schedules



Source: IOA Team analysis

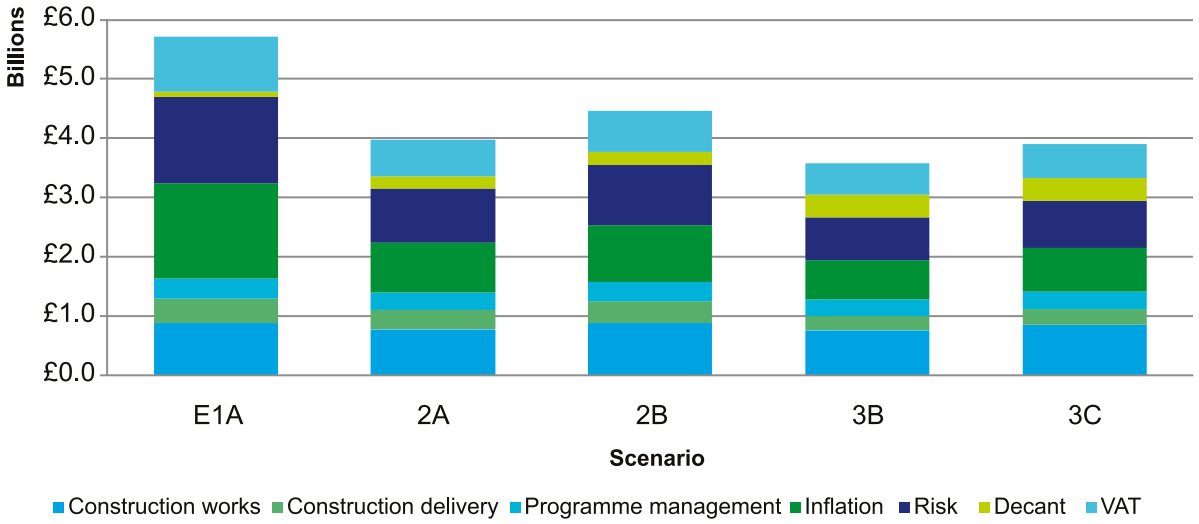
1.6 Shortlisted Scenarios: Focus on cost

Based on the Shortlisted Scenarios, the Programme is assessed to require capital investment of between £3.67bn (Scenario 3B) and £5.67bn (Scenario E1A). The greatest driver of capital expenditure is the delivery method.

Summary of capital expenditure

- The following bar chart illustrates the capital cost comparison between the shortlisted Scenarios based on the P50 and the most likely programme duration.

Figure E4: Summary of capital expenditure



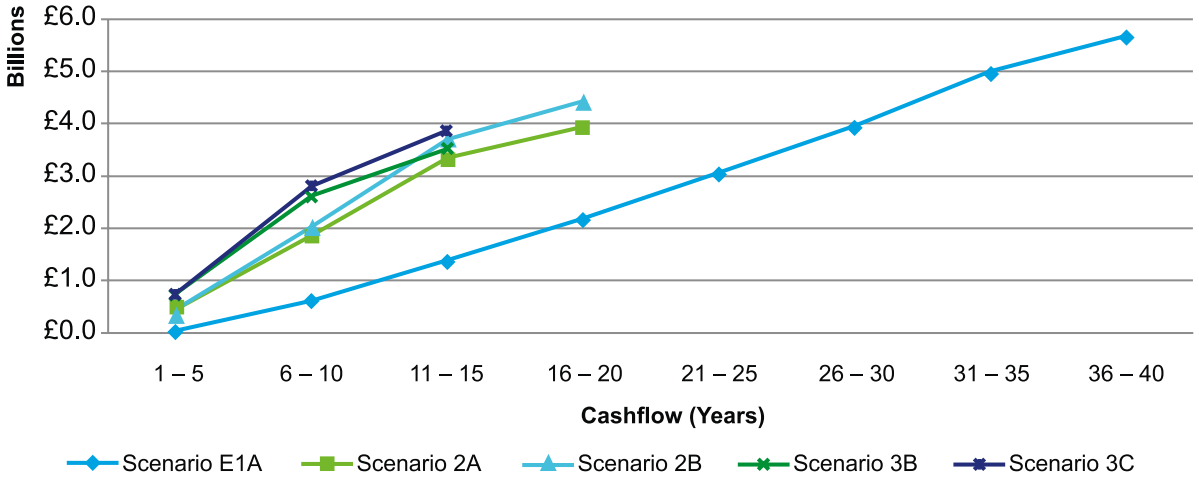
Source: IOA Team analysis

- Scenario E1A requires the most significant capital investment and Scenario 3B the least.
- Capital cost differentials between Scenarios are principally influenced by the delivery method (i.e. Option 1, 2 or 3) and not by Outcome Level (i.e. Outcome Levels A, B or C).

Summary of capital expenditure profiling over time

- The following expenditure profile illustrates the capital cost expenditure profile over the most likely programme schedule for the shortlisted Scenarios.

Figure E5: Summary of capital expenditure profiling over time



Source: IOA Team analysis

- Scenarios 3B and 3C have a large capital outlay profiled in the first five years in respect of the purchase and fit out of two decant buildings.
- Scenarios 2A and 2B have a similar early outlay but in respect of only one decant building.
- Scenario E1A shows a more straightforward profile as there is no separate decant building within the scope. The capital expenditure profile in the first five years is relatively small at only £43m (£8.6m per annum).

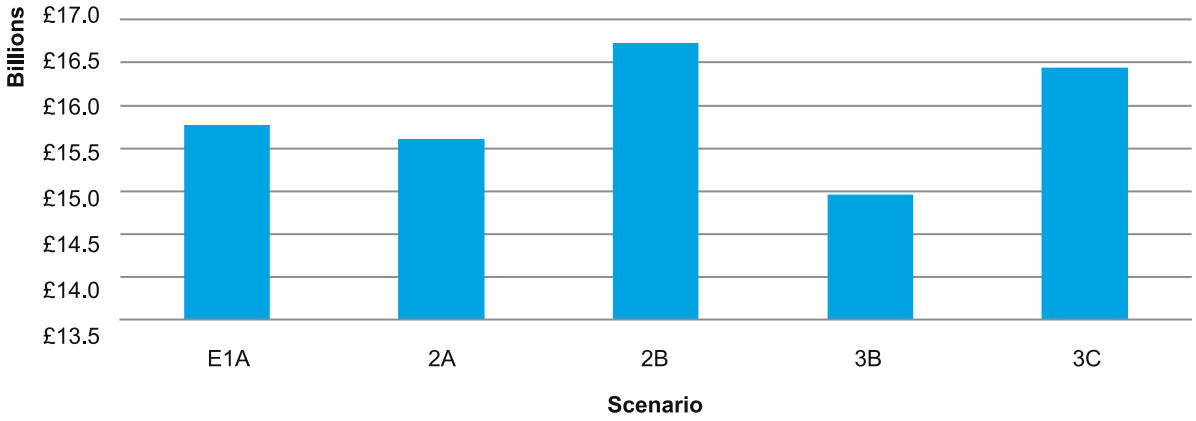
1.6 Shortlisted Scenarios: Focus on cost

Based on the Shortlisted Scenarios, the Programme is assessed to require capital investment of between £3.67bn (Scenario 3B) and £5.67bn (Scenario E1A). The greatest driver of capital expenditure is the delivery method.

Summary of operational cost comparisons

- The following bar chart illustrates the differences in operational expenditure based on P50 (including facilities management and lifecycle replacement expenditure) for the PoW during between the Scenarios over a 60 year period.

Figure E6: Operational cost comparisons



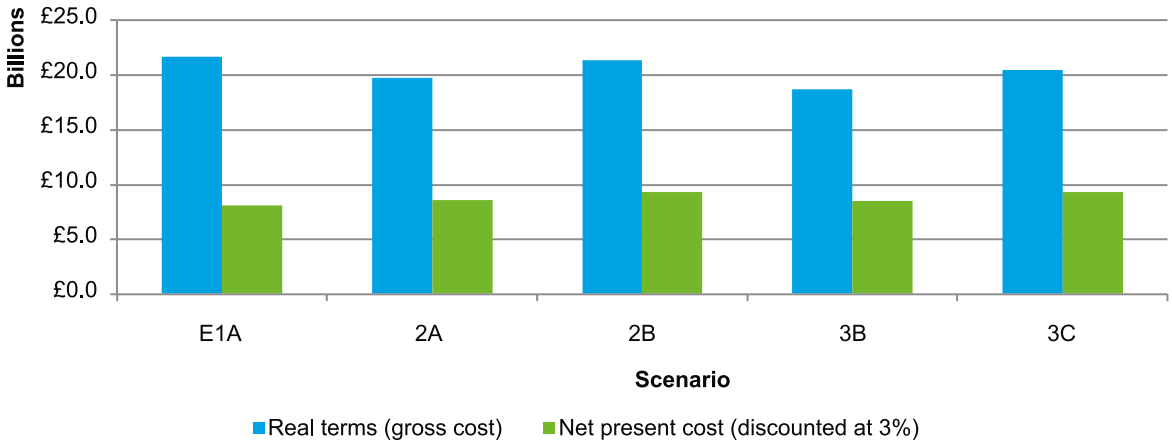
Source: IOA Team analysis

- The additional area and the installation of modern plant and services create the additional operational expenditure in Scenarios 2B and 3C. The additional costs amount to c.10% of Scenarios 2A and 3B. As FM costs are directly related to size of the building, the FM costs are likely to be marginally less for Option 3B compared to 3C due to the reduced floor area of the PoW.
- The FM costs for Scenarios 3B and 3C are likely to be lower as the service requirements are significantly reduced at the PoW during the Programme compared to Scenarios E1A, 2A and 2B. Most of the operational cost data was provided by PED.
- Once a detailed strategy for the FM operational costs has been established (including suitable decant buildings), further due diligence should be undertaken to address how the costs will be impacted.

Summary of whole life costs

- The whole life model profiles have been constructed to provide a view at varying risk levels of the likely outturn cost for each Scenario.

Figure E7: Summary of whole life costs at a P50 risk level



Source: IOA Team analysis

- The combined expenditure profile for capital works, lifecycle replacement and operational facilities management costs have been added together and compared for each of the Scenarios to assess the impact of risk allocation, inflation assumptions and comparative calculated programme costs. As a result of the assessment period (i.e. 60 years as per HMT Green Book guidance) the net present discounting effect has the greatest impact on Scenario E1A and draws all Scenarios within a £1.2bn range as a whole life cost.
- The capital expenditure associated with decant and reoccupation of the PoW are quoted on a net basis i.e. include for the sales receipt of the temporary accommodation at the conclusion of the required decant period.

1.7 Scenario evaluation: Evaluation Criteria

The Evaluation Criteria used during Phase 1 have been used again to form the basis of the evaluation stage during Phase 2. The Evaluation Criteria are divided between those which are qualitative or quantitative, all of which are aligned to the Programme Objectives

Introduction and approach to Selection Criteria

- During the initial stages of Phase 2, the shortlisted Scenarios were assessed against a number of Evaluation Criteria (together with sub-criteria) which are set out below. These cover both quantitative and qualitative criteria, and have been confirmed with the Client Programme Team.

Table E5: Evaluation Criteria and sub-criteria

Qualitative Tier 1 criteria	Operational risk/ impact	Schedule	Potential scope	Accommodate change (if desired)
Qualitative Tier 2 Criteria	• Risk to business continuity • Security • Health and safety • Disruption • Nuisance • Internal capacity and governance	• Schedule certainty • Pace and overall duration • Flexibility • Monitor and control • Speed of (business) risk reduction	• Scope certainty • Extent of scope being delivered • Build ability • Asset protection including heritage matters • Supply chain and market	• Environment • Technology • Business processes • Supporting changes in culture • Future proofing
Wider impact	**Financial Tier 1 criteria**	**Capital expenditure**	**Revenue income and expenditure**	
• Exemplar programme • Programme awareness • Engage with citizens • Cultural and skills opportunities • UK wide impact	Financial Tier 2 Criteria	• Total capital expenditure • Cost certainty • Cash flow (annual run rate)	• Long term view • Spend to save initiative	

Source: IOA Team analysis

Introduction and approach to Scenario evaluation

- We have advised the Programme Board and they have acknowledged that to establish with certainty which Scenarios are more likely to meet the Programme Objectives, all Scenarios will in due course need to be evaluated using a balanced scorecard approach. This will require the client to establish weightings indicating the relative importance they place against each of the evaluation criteria. This exercise will need to be completed before the Decision in Principle is made and will form an integral part of the OBC.

1.7 Scenario evaluation: Evaluation Criteria

The Evaluation Criteria used during Phase 1 have been used again to form the basis of the evaluation stage during Phase 2. The Evaluation Criteria are divided between those which are qualitative or quantitative, all of which are aligned to the Programme Objectives

Evaluation approach

- The Evaluation Criteria which were used for the detailed assessment of the shortlisted Scenarios during Phase 2 of the IOA were consistent with those used during Phase 1 (i.e. for the shortlisting of the Scenarios). This was essential to provide the necessary consistency and continuity throughout the IOA process and to pave the way for any downstream OBC.
- The Evaluation Criteria continued to reflect the confirmed Programme Objectives as agreed by the Client Programme Team and the Programme Board.
- During Phase 2, the IOA team did not establish any hurdles that would have immediately discounted Scenarios. Instead, their relative position was determined and summarised.
- At this stage, the IOA team also relied upon its experience and examples drawn from other comparable major public sector capital programmes, to identify any significant differences in the Evaluation Criteria. Further details of the comparators can be found in Volume 2, Appendix A.4 and B.1.

Illustrative analysis: Qualitative criteria

- The illustrative analysis of Scenarios against the qualitative Evaluation Criteria are summarised in the tables below and overleaf.

Table E6: Illustrative analysis : Qualitative criteria

Evaluation Criteria	Sub-criteria	Scenario E1A	Scenario 2A	Scenario 2B	Scenario 3B	Scenario 3C
Operational risk/impact	Mitigates business continuity risk	◔	◕	◕	●	●
	Security	◔	◑	◑	●	●
	Health and safety	◔	◑	◑	●	●
	Disruption	◔	◑	◑	●	●
	Nuisance	◔	◑	◑	●	●
	Internal capacity and governance	●	◑	◑	◔	◔
Schedule	Certainty	◔	◑	◑	◕	◕
	Pace and overall duration	◔	◑	◑	●	●
	Flexibility	◔	◑	◑	●	●
	Monitor and control	◔	◑	◑	◕	◕
	Speed of (business) risk reduction	◔	◕	◕	●	●

Source: IOA Team analysis

● Most likely to meet Evaluation Criteria
◕ More likely to meet Evaluation Criteria
◑ May meet Evaluation Criteria
◔ Less likely to meet Evaluation Criteria

1.8 Scenario evaluation: Illustrative analysis

The illustrative analysis has been undertaken on the basis of assessing Scenarios criterion by criterion to determine their relative position. No scoring or weighting has been included within this Final Report, but will be required for the Outline Business Case.

Illustrative analysis: Qualitative criteria (continued)

- Evaluation Criteria covering scope, accommodating change (if desired) and wider impacts are summarised in the table below.

Table E6: Illustrative analysis : Qualitative criteria (continued)

Evaluation Criteria	Sub-criteria	Scenario E1A	Scenario 2A	Scenario 2B	Scenario 3B	Scenario 3C
Potential scope	Certainty					
	Extent delivered					
	Buildability					
	Supply chain					
	Asset protection					
Accommodate change (if required)	Environment					
	Technology					
	Business processes					
	Culture					
	Future-proofing					
Wider impact	Exemplar programme					
	Programme awareness					
	Engage citizens					
	Cultural and skills opportunities					
	UK wide impact					

Source: IOA Team analysis

Most likely to meet Evaluation Criteria

More likely to meet Evaluation Criteria

May meet Evaluation Criteria

Less likely to meet Evaluation Criteria

1.8 Scenario evaluation: Illustrative analysis

The illustrative analysis has been undertaken on the basis of assessing Scenarios criterion by criterion to determine their relative position. No scoring or weighting has been included within this Final Report, but will be required for the Outline Business Case.

Quantitative and financial criteria

- Evaluation Criteria covering capital expenditure and revenue expenditure and income are summarised in the table below.

Table E7: Quantitative and financial analysis

Evaluation Criteria	Sub-criteria	Scenario E1A	Scenario 2A	Scenario 2B	Scenario 3B	Scenario 3C
Capital expenditure	Total CapEx (P50 undiscounted)					
	Cashflow					
	Cost certainty					
Revenue expenditure and income	Annual running costs					
	Long term view					
	Spend to save initiatives					

 Most likely to meet Evaluation Criteria

 More likely to meet Evaluation Criteria

 May meet Evaluation Criteria

 Less likely to meet Evaluation Criteria

Source: IOA Team analysis

Key observations and commentary

- Whilst this analysis is illustrative, it does show how the Scenarios compare with one another against each individual Tier 2 evaluation criterion.
- The illustrative analysis has been based, where possible, on the evidence that the IOA has assembled in relation to matters such as schedule, scope and cost for each Scenario, as outlined elsewhere within this Final Report.
- For other Evaluation Criteria, such as the Tier 1 criterion covering wider impacts, and associated sub-criteria, the IOA has drawn on its experience of other major capital programmes such as London 2012, to form a view on how well each Scenario meets the criterion or otherwise.
- It is recommended that further work is undertaken as next steps, to re-visit the Programme Objectives, the Evaluation Criteria and their relative importance through consultation. It is envisaged that this may be undertaken with a Joint Committee, should such a group be formed.

1.9 Conclusions drawn from the IOA

The decision in principle made by the two Houses may be influenced more by the selection of a preferred delivery Option, as opposed to a preferred Outcome Level. The former has a significantly greater impact on time, cost and operational matters including risk to the business of Parliament

Conclusions

- The selection of a preferred Scenario following the decision in principle is likely to be influenced in the first instance by the selection of a preferred Delivery Option, rather than the selection of a preferred Outcome Level. This is because Delivery Options have significant impacts on time, cost and operational risk and impact, whereas the various Outcome Levels have a much lesser impact.
- If a preferred Delivery option is identified, the selection of the appropriate Outcome Level could be determined through a structured process to more fully define and assess the potential benefits that could arise from increased Outcome Levels. This would be an integral part of establishing options for the downstream OBC.
- Whilst value for money (VFM) has not been tested during the IOA, early indications from the evaluation of Scenarios suggest that greater opportunities to deliver VFM might exist within Delivery Options 2 and 3. Testing of this would form a core element of the downstream OBC together with establishing the relative affordability of each OBC option. These actions should be a high priority for the next phase.
- Our more detailed conclusions are summarised and categorised below.

Schedule

- Schedule is impacted principally by delivery Option, not by Outcome level as most of the scope is delivered through Outcome Level A and any additions to this have a minor impact on time.
- Option 3 has the shortest overall duration but even then, it is likely to take slightly more than the lifetime of a single Parliament.
- Scenario E1A may be superficially attractive, given the ability for occupiers and functions to remain within the PoW, however there would still need to be a relocation to a temporary Chamber within the PoW boundary. Furthermore, it brings with it the longest overall schedule duration with high levels of delivery risk in areas such as market fluctuations, continuity of resources, together with policy and technological change (e.g. obsolesce) over a protracted period stretching into decades.
- Should the scope of Outcome Level C increase, then this might not have a proportional impact on schedule as there are likely to be opportunities to deliver the additional works concurrently.

Capital expenditure

- The capital cost of the programme is most significantly impacted by the adopted delivery approach and the overall duration. For example, the increase between Outcome 3B and 3C is +10% whereas the increase between Option 3B and 2B is 25%.
- The capital cost is impacted in the early years of the Programme by the decision whether to decant (Options 2 and 3) and to make investment in enabling works (Options E1 and 2). This together with the delivery approach has a much more significant bearing on the overall cost than by varying Outcome levels.
- Early capital investment in decant accommodation must be set against the much greater rate of asset risk reduction that is potentially achievable in delivery Options 2 and 3. The capital investment in enabling works for Delivery Option E1 needs to be considered carefully given the potentially slow rate of asset risk reduction.
- Furthermore, the potential capital cost of decant accommodation needs to be fully considered as part of an Estate wide opportunity to rationalise the portfolio over the longer term to derive the greatest benefit from this investment decision, rather than purely for the Restoration and Renewal Programme.
- The complexity of delivering the Restoration and Renewal Programme and the intensity of mechanical and electrical services at the PoW, bring with them, significant additional cost. Capital cost is also influenced by the cumulative impact of working on a unique heritage asset with Grade 1 Listing and UNESCO World Heritage status, which has significant legacy issues such as asbestos.
- The overall capital cost is also driven by the scale of the Palace, which is comparable in floor area to MoD Main Building or the Victoria and Albert Museum.
- Delays to the decision in principle may add between £60m and £85m per year (at today's real term prices at P50) to the capital cost in additional tender price inflation, based on current forecasts.

Revenue expenditure and income

- The ability to potentially secure reductions in revenue expenditure as a cash releasing benefit is influenced by the delivery Option as this impacts the timing of such benefits being realised. For example, the completion of the Restoration and Renewal works is likely to deliver opportunities to reduce reactive expenditure, although this is relatively modest, based on current levels of expenditure. In addition, there may be wider opportunities to reduce revenue expenditure through initiatives such as strategic FM procurement and greater risk transfer, against a newly renovated asset. Source: IOA Team analysis
- Opportunities to increase revenue income will potentially arise from a combination of newly renovated facilities and more extensive amenities that would be created through Outcome Levels B and C.

Operational risk and impact

- The rate of operational risk reduction varies dramatically depending on the selected delivery Option. The risk profile for Delivery Option 3 reduces at the quickest rate given the pace of the work capable of being delivered at an unfettered construction site.

1.9 Conclusions drawn from the IOA

The decision in principle made by the two Houses may be influenced more by the selection of a preferred delivery Option, as opposed to a preferred Outcome Level. The former has a significantly greater impact on time, cost and operational matters including risk to the business of Parliament

- Delivery Option E1 provides the slowest rate of operational risk reduction given the piecemeal nature of the delivery of the Programme, with the greatest potential residual risk of a catastrophic event such as fire or flood as a result of life expired services, fabric and structure.
- Delivery Options E1 and 2, both have the potential to impact the business of Parliament, given that works are being undertaken in an occupied building. Whilst mitigation measures such as buffer zones can reduce the risk, they cannot completely eliminate it, particularly given the extent of the Restoration and Renewal works. Delivery Option E1 has the potential for a whole generation of Parliamentarians and the Members of the public to experience sub-optimal conditions i.e. ongoing Disruption together with persistent Nuisance arising from noise, vibration and dust, as well as multiple relocations over the life of the programme.
- Decanting occupiers provides the best opportunity to mitigate Disruption and Nuisance over the long term, although it is understood that this brings about different challenges with those impacted by relocation.

Scope

- The minimum scope to be delivered through Scenarios E1A and 2A will deliver no improvement in amenity or perceived change to the PoW on completion. Stakeholders may question this, given the significant level of investment being made and the potential impact on occupiers over a considerable period.
- Additional scope, as currently defined, to deliver Outcome Levels B and C, does not have a material impact on cost or schedule, when compared with the impact of delivery method. However, it does potentially provide the ability to secure greater environmental benefits.
- Given the above, further in depth examination of the potential benefits that could arise from a C+ Outcome Level and the additional value that this could deliver should be investigated.

Accommodating change (if desired)

- Scenarios E1A and 2A are unlikely to provide an opportunity to deliver any change, if desired by Parliament, because the Outcome Level reflects the existing configuration, functionality and amenity. This, coupled with the limited decanting of occupants, (since decanting would create an event that might stimulate change) will limit any ability to proactively bring about improvements in business processes, technology or culture.
- Scenario 3C may provide the greatest opportunity for any wider desired change, as the complete decanting of the PoW to temporary locations may allow new practices to become embedded prior to reoccupation of the PoW together with the most significant improvements in the working environment.
- Future proofing is most likely to be achieved through Scenarios that deliver an Outcome Level of C.

Wider impacts

- Delivery Option 3, and to a lesser extent, Option 2, provide greater opportunities to deliver wider impacts during the Programme, e.g. employment and skills opportunities. This is because of the greater intensity and throughput of work over a shorter period.
- Delivery Option 3 would also generate the most rapid and thus visible rate of change to PoW. This may enhance the opportunity to engage with and educate citizens. With a significant decant and an intensive programme, perception may be that a strategically important heritage asset is being protected for generations to come. For example, a more predictable and intensive programme may generate significant interest in the re-opening of the Palace as a major national event.
- It is conceivable that Option E1 may not be perceptible to the wider public as a major investment programme given the relatively slow rate of delivery. The implications of this during times of austerity need to be carefully weighed up against the potential benefits that might arise from a more overt delivery programme.

Delivery model

- The success of all Scenarios is founded on the need to establish an effective delivery model with strategic governance and sponsor and client roles all clearly defined.
- There is a clear need to establish a single client body, necessitating legislation and this will be essential for all Options.
- The extent of the sponsor role, client body and nature of the delivery vehicle is materially different for Options 2 and 3, given the rate at which the programme will be delivered and resultant scale of capital investment being made year on year.

Pre-2020 strategic plan

- The assumed start date of May 2020 is deliverable, but extremely challenging, and is predicated on a number of activities to be undertaken at risk, most notably progressing the acquisition of decant accommodation. This investment needs to balanced against the cost of delaying the programme. It should be noted that the ability to secure appropriate decant accommodation is significantly more challenging for Delivery Option 3, given the need to potentially secure at least some of this space from a third party landlord.
- To meet this date, other activities would also need to be progressed at risk including establishment of BIM and survey work to understand the asset more fully, establishing a long term strategic vision for the Palace, potentially undertaking some initial conceptual design, and commence the activities necessary to establish and resource a client body, underpinned by legislation that could function with authority after a decision in principle is made, as part of the overall establishment of the delivery model.
- The need for cross-party support and leadership that will be necessary to drive the Programme forward is becoming increasingly important, and this should be progressed as a priority ahead of the next Parliament.

1.10 Next steps

The Decision in Principle will primarily be a decision regarding the preferred Delivery approach and less a decision about preferred Outcome Levels. This is because the Outcome Levels are not significantly differentiated whereas Delivery Options are highly differentiated.

Next Steps

- If the 2020 preferred construction start date for the Programme is to be achieved, a number of near term activities are required to be undertaken ahead of the Decision in Principle in Q1 2016. The key next steps are:
  - **Establish joint governance at a political level:** it has been assumed that there could be a need for legislative change to address governance and management arrangements that would be essential for delivery Options 2 and 3, and desirable for delivery Option 1. Prior to legislation being enacted a formally constituted joint political body is needed to act in a client governance role including consideration of the IOA.
  - **Develop PoW Strategic Vision and Master Plan:** this priority activity will create the likely framework against which the options and subsequent business case activity to test these and support the Decision in Principle will align. The vision will be subject to later validation.
  - **Interrogate future Parliament and Outcome Level C+ Scope:** Whilst change will only be implemented if desired by Members of both Houses, potential options for future Parliament must be developed to inform the Decision in Principle. It is envisaged that some pilot activity may be appropriate to inform decision making and highlight any benefits that could arise.
  - **Develop strategy for and complete survey work:** A significant amount of further technical survey work, including intrusive surveys and documenting assets during periods when Parliament is not sitting, will be necessary to inform the potential technical feasibility study work. This must be informed by a clear strategy for the format, scope and currency of gathered data, including the likely use of BIM.
  - **Design work required to support the Decision in Principle and OBC:** Some elements of conceptual design work will be required to support the decision in principle and definition of OBC options, with outline and detailed design required for the procurement and implementation of both the enabling works and main Restoration and Renewal programme. Inevitably this will take the form of a number of differing options and scope, some of which will be nugatory. This would also include early value engineering exercises to determine the most realistic do minimum Scenario.
  - **Preparation of the OBC:** The approach to this is based on work being progressed ahead of the decision in principle, where this is possible to do, with the OBC being finalised immediately after a decision in principle.
  - **Decant and estates strategy:** A principal enabler for delivery Options 2 and 3, it is envisaged that significant work will need to be undertaken to secure potential options for decant accommodation, and depending on availability and Parliament's requirement to rationalise the whole Estate, together with its appetite for risk and funding availability, this may need to be progressed in the period from late 2014 onwards.
  - **Procurement, at Risk, of Decant Buildings:** a Q2 2020 start date is predicated on the availability of decant buildings. The likely duration of design, procurement and fit out activity informs a key deadline in advance of the decision in principle.
  - **Decision in Principle:** This is predicated on a decision being made in the early part of the next Parliament. This will determine the desired approach.

Palace of Westminster Restoration and Renewal Programme Independent Options Appraisal

Final Report
Volume 1

Chapter 2 – Glossary

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No party other than The Corporate Officer of the House of Lords and Corporate Officer of the House of Commons (Acting Jointly) is entitled to rely on the Final Report for any purpose whatsoever and Deloitte LLP accepts no responsibility or liability or duty of care to any third party.

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8 September 2014

2. Glossary

2. Glossary

Term	Definition
Affordability	A key aspect of the Financial Case within the Business Case. Affordability tests whether proposed annual expenditure can be funded year to year i.e. a scenario may cost more in whole life cost terms, but may be more affordable in annual funding terms.
Assumed Restoration and Renewal Programme Start date: Q2 2020	The assumed start date for the Programme works (i.e. start works on site) is Q2 2020 as agreed with the SRO. This date represents the baseline for the Independent Options Appraisal against which all Scenario durations and costs are assessed.
Building Information Modelling (BIM)	A digital multi-dimensional computer aided design model linked to a database of programme information used to support integrated project delivery.
Business Continuity	Maintaining the core business functions of Parliament (including administrative and supportive roles) on a day-to-day basis.
CAGR	Compound Annual Growth Rate - The year on year growth rate over a specified period of time.
Capital expenditure	Capital Expenditure that creates assets which yield benefits over time, unlike operational expenditure which has an immediate pay-off, but leaves no lasting benefit. Constituent elements considered in this exercise include construction costs, construction delivery costs, programme management costs, risk, inflation, VAT and decant costs.
Challenge Panel	An independent challenge panel of Senior Partners and Directors from within the IOA Team's respective organisations and from Skanska UK Plc. Independent Members on this panel bring specific areas of subject matter expertise and their role is to challenge the thinking, assumptions, logic and emerging findings of the IOA team.
Client (for the IOA)	The Client for the Palace of Westminster Restoration and Renewal Programme Independent Options Appraisal, i.e. The Corporate Officer of the House of Commons and the Corporate Officer of the House of Lords acting jointly.
Client Function	A body of full-time professional people working for and on behalf of Parliament, under the leadership and direction of the Sponsor Body, as its agent. This is an integral element of the Delivery Model.
Client's Programme Management Team (Client Programme Team or CPT)	The Client's team having responsibility for the management of the Independent Options Appraisal
Confidence	A measure of certainty around a chosen course of action, used to describe results from a statistical analysis shown at levels of P10, P50 and P90 (10% probability, 50% probability and 90% probability respectively).
Consultant	The organisation that has entered into Contract with the Client to deliver the Services. For the avoidance of doubt and for the purposes of the Contract, the use of the term Consultant includes all sub-consultants and other organisations that are engaged by the Consultant to assist with the delivery of the Services.
Consultant's Services	The scope of services that the Consultant provides to the Client, as described in Appendix G.1: The Scope of The Services.
Contract	The agreement between the Consultant and the Client in respect of the delivery of the Services.
Contract Change Note	A document setting out any necessary amendments to the main scope of services contract. All contract change notes are contained within Volume 3 of this report.
Critical Success Factors	The critical factors necessary for the Programme to achieve its objectives. These have not yet been defined by either Members or the Programme Board.
Decant	The process of relocating to and from accommodation or a temporary location. Under Options 2 and 3 significant accommodation is required to accommodate those functions within the PoW that would be moved to a new and temporary location for the duration of the works.
Decant Costs	Decant costs refers to the costs associated with the relocation process including acquisition of lease or freehold, rent and rates, fit out, soft and hard FM. These costs have been provided to the IOA Team by the Client Programme Team.
Decision in Principle	A decision made by Parliament in principle on the means of restoring and renewing the Palace of Westminster whilst maintaining the ongoing business of Parliament.
Delivery Options	The three potential approaches to deliver the Restoration and Renewal programme whilst maintaining the Business of Parliament (as prescribed in Volume 3, Appendix G.1: The Scope of The Services): • Delivery Option 1: A rolling programme of phased works over a significantly prolonged period of years but still working around the continued use of the PoW. • Delivery Option 2: A programme incorporating a partial decant of each House in turn to temporary accommodation and closure to Members and the public of broadly half the PoW in turn for a prolonged period. • Delivery Option 3: A programme incorporating a full decant of the PoW to temporary accommodation and closure to Members and the public of the entire PoW for a shorter period.

2. Glossary

Term	Definition
Design Champion	The Design Champion should lead the development of the Programme Vision. The individual or firm carrying out this role will need to work closely alongside the Client team, the Programme Management office and the Design Team Lead to establish a design strategy. This strategy will inform the approach to managing design risk on the Programme, and the resultant briefs that are developed for each of the design disciplines.
Disruption	The potential detrimental impact on the business operations of Parliament as a direct result from decanting occupiers and functions from the PoW.
Do Minimum Scenario	A Scenario representing the minimum scope of work required to deliver the Restoration and Renewal Programme objectives. This Scenario informs the decision in principle and may also represent the Do Minimum Scenario in a downstream Outline Business Case.
Evaluation Criteria	Evaluation Criteria (consisting of Principal and sub-criteria) reflect the confirmed Programme objectives and are used as the basis of Scenario comparison.
Final Report	The report delivered to the Client on completion of delivering the Services (and by not later than eight months after the commencement of the Services), which complies with the requirements of the Services Information.
Facilities Management (FM) costs	Facilities management costs associated with running the Palace of Westminster
Full Business Case (FBC)	A detailed stage of HM Treasury Green Book Business Case process, which evaluates the costs, benefits and risks ahead of an investment decision. The FBC is completed before implementation of the works.
House of Commons (HoC)	House of Commons; where MPs represent the UK public.
House of Lords (HoL)	House of Lords; the second Chamber of UK Parliament.
Independence	Independence is the core Client objective for the IOA. For the purposes of the delivery of the Services, the term 'independence' is considered by the IOA team to mean: • Providing an objective evaluation of the evidence and information provided; • Using professional judgement in the interpretation of evidence and information provided; • Maintaining a willingness to stake the Consultant's professional reputation on the quality of deliverables; • Continually challenging stakeholder opinions; and • Ensuring and maintaining independence throughout sustained engagement with the stakeholders, the Client Programme Team and others within the Client organisation.
Independent Options Appraisal (IOA)	An independently produced, costed options appraisal of the Scenarios, to enable Parliament to reach a well-founded decision in principle on the means of restoring and renewing the Palace of Westminster whilst maintaining the ongoing business of Parliament; and to pave the way for an Outline Business Case that conforms to public sector good practice as set out in the HM Treasury Green Book.
Independent Options Appraisal Team (IOA Team)	The consortium of consultants employed to undertake the Independent Options Appraisal. The consortium consists of Deloitte LLP, AECOM and HOK.
Interim Report	The report delivered to the Client by the IOA Team in February 2014 with the principal purpose of informing shortlisting from a long list of nine potential Scenarios to a shortlist of five Scenarios.
Lower Range	A term used in the schedule section of this report to describe the shortest construction period that could be reasonably expected for a given Scenario. This has been established by statistical analysis of rate of expenditure, resource and delivery rate, as well as analysis of task durations using a typical sequence of works.
Master Data Assumptions List (MDAL)	A list of assumptions, exclusions and dependencies upon which the advice contained within this report is based. A number of these assumptions could have a significant impact and may be subject to change. Readers should familiarise themselves with these assumptions during the reading of this report. The MDAL can be found in Volume 2 Appendix E.7.
Medium Term Works Programme (MTWP)	An existing works programme established to address urgent issues at the PoW. The MTWP includes the medium term M&E services programme and also medium term works to the structure and fabric It is due for completion prior to the commencement of the Restoration and Renewal programme in 2020. Works delivered within this programme are excluded from the PoW Programme.
Monte Carlo Simulation	An industry accepted statistical technique that has been applied to each Scenario to assess the likelihood of certain outcomes taking account of multiple risks of varying probability.
Most Likely	A term used in the schedule section of this report to describe the most likely construction period that could be reasonably expected for a given Scenario. This has been established by statistical analysis of rate of expenditure, resource and delivery rate, as well as analysis of task durations using a typical sequence of works.

2. Glossary

Term	Definition
Net Present Whole Life Cost (NPC)	Whole life cost (including VAT) discounted by 3% per annum. This reflects the difference between the current and future value of money and is in accordance with HM Treasury Green Book guidance. This allows a like for like comparison between different scenarios having different whole life cost profile and is modelled over 60 years period for major infrastructure programmes. NPC excludes any cash value benefits (NB: the IOA team has not undertaken any analysis as part of this Final Report), where as a Net Present Value (NPV) does make allowances for cash value benefits/employment savings.
Nuisance	Nuisance arising from construction activity including noise, dust and vibration. In some cases Nuisance could lead to Disruption.
Operational Expenditure	The cost of operating and maintaining the building. Constituent elements include hard and soft facilities management costs, lifecycle replacement costs and general maintenance and utilities.
Operational risk and impact	The risk that the day to day business of Parliament may be disrupted through the realisation of a risk and the resultant impact that would be experienced.
Outcome Level	The required outcomes that could be realised by delivering the Programme. These are described at three different levels, A, B and C and are influenced by the scope and specification of physical works to be undertaken.
Outcome Level A	• Ensures compliance with legislation. • Maintains World Heritage and Grade 1 Listing status. • Repairs or replaces systems to contemporary standards of design and quality, optimising costs and benefits over full system lifecycles. • Meets built environment standards expected for public buildings.
Outcome Level B	As Outcome Level A plus: • Meets any additional built environment policy objectives stated by the Houses. • Provides facilities to meet the stated objectives of both Houses (such as inclusion, outreach and education). • Defined improvements to amenities within the constraints of the present design. • Future proofing of infrastructure and provision for change to the current occupation where the requirement can be only loosely anticipated, over an indefinite period.
Outcome Level C	As Outcome Level A and B plus: • Significant defined improvements e.g. high performance and long life cycles appropriate to each system. • Defined improvements to the amenities within the constraints of the present design and outside of the PoW site boundary.
Outcome Level C+	Outcomes that represent potential significant enhancements to amenity that are not currently included within the scope of the IOA. These were identified during a stakeholder workshop held in February 2014 and could not be included within the IOA Report due to time constraints, their potentially significant nature and the need to consult stakeholders. Consideration should be given to C+ Outcomes following completion of the IOA Report.
Outline Business Case (OBC)	An interim stage of HM Treasury Green Book Business Case process, which evaluates costs, benefits and risks ahead of an investment decision. The OBC is completed before engaging with the market to deliver a solution.
Outline Procurement Strategy	Potential approaches to the sourcing of goods and services for the delivery of the works.
P10 – P90 Confidence Levels	The range from 10% probability to 90% probability of realising specific outcomes.
Packaging Strategy	The approach to the packaging of elements of the Work Breakdown Structure for the purposes of procuring the work from and within a suitable market.
Palace of Westminster (PoW)	The premises subject to the Restoration and Renewal Programme. Buildings outside of the PoW are not considered within the IOA, other than where they are required to facilitate a delivery option.
Parliamentary Estates Directorate (PED)	The sub-division of the Parliamentary administration that is responsible for the maintenance and upkeep of the Client's Premises.
Phase 1 of the Independent Options Appraisal	The first phase of the Independent Options Appraisal, the principal purpose of which was to inform and facilitate the shortlisting of five Scenarios from a long list of nine.
Phase 2 of the Independent Options Appraisal	The second phase of the Independent Options Appraisal leading to the completion of the Final Report.
Pre Feasibility Study and Business Case (Oct 2012)	The report upon which the Strategic Case for the Restoration and Renewal programme is principally based.
Programme	The Palace of Westminster Restoration and Renewal Programme.
Programme Board	The executive body responsible for direction and oversight of the Programme.
Programme Objectives	A list of five strategic objectives that set the context for the delivery of the Restoration and Renewal programme.

2. Glossary

Term	Definition
Quantitative Risk Analysis	The use of Monte Carlo Risk Simulation Modelling technique that utilises computational algorithms to generate multiple iterations of the cost model to factor risks. This technique has been used to establish the confidence levels applied to the cost of each Scenario.
Revenue income	Income received for example from the catering, film and TV rights and merchandising. Projected changes in revenue income associated with a particular scenario are modelled as a benefit and offset expenditure.
Risk	Risk is defined as known and quantifiable factors that might impact the achievement of the Programme objectives and is measured by likelihood and impact against cost and time variables.
Scenario E1A	Enabled (E) 1A - A rolling programme of repair and replacement works of total duration most likely to be 32 years but still working around the continued use of the Palace of Westminster. At completion Outcome Level A will have been achieved. Enabled refers to the need to remove three significant constraints that to date prevent the Programme being completed. The enabling assumptions are: (1) accepting that all activities within the Palace will need to be moved on a phased basis (12 phases) to temporary locations elsewhere within the Palace boundary (this includes at least one Chamber), (2) clearing the entire basement of all existing staff and providing contractor's access throughout. (3) Accepting a very prolonged period of significant Disruption and Nuisance whilst the works are completed.
Scenarios (Long List)	A product of the three Potential Delivery Outcome Levels and three Potential Delivery Options. The long list of Scenarios comprises nine potential Scenarios.
Scenarios (shortlist)	A shortlist of five Scenarios that are considered more likely to meet the Programme Objectives also having regard to the retention of (a) a Do Minimum Scenario E1A and (b) retaining only those Scenarios that are materially different from one another. This is to inform a decision in principle and an Outline Business Case.
Soft Landings	Soft Landings means designers and constructors stay involved with buildings beyond practical completion. The idea behind this is that this continued involvement will assist the client during the first months of operation and beyond, to help fine-tune and de-bug systems, and ensure the occupiers understand how to control and best use their building. The introduction of Soft Landings on Government projects will become a requirement in 2016.
Schedule	The result of planning a sequence of time based tasks and activities in a logical manner to describe when the activity will be undertaken. It also defines the overall period needed to complete the work.
SMART	Specific Measurable Appropriate Realistic and Timely measures.
Sponsor Body	The group responsible for leadership and direction of the R&R programme which may include politicians representing the ownership of Parliament.
Stakeholders	Those persons or organisations having an interest (direct or indirect) in the Programme and the outcomes of the Programme.
Strategic 2020 Schedule	A plan of the activities required leading up to the preferred start date of Q2 2020, used to illustrate a number of significant activities that would need to be progressed before a decision in principle is made by Members. The Plan also illustrates a number of significant risks and uncertainties associated with meeting a Q2 2020 start date.
Temporary Accommodation	The accommodation required to House those functions currently located within the PoW that would be displaced during the Programme. The temporary accommodation would be located outside the footprint of the PoW except in respect of Scenario E1A where temporary churn space will be within the PoW footprint.
The Palace of Westminster Restoration and Renewal Programme	The Programme has been established to address the significant work required to preserve the Palace of Westminster and ensure it can continue to serve as home for the UK Parliament in the 21st century.
Timeline	A period of time expressed in years that defines how long each scenario could take to be delivered.
Treasury Green Book	HM Treasury guidance for public sector bodies on how to appraise proposals before committing funds to a policy, programme or project.
Upper Range	A term used in the schedule section of this report to describe the longest construction period that could be reasonably expected for a given Scenario. This has been established by statistical analysis of spend rate, resource and delivery rate, as well as analysis of task durations using a typical sequence of works.
Value for money	Value for money is articulated through the application of the agreed Evaluation Criteria (and relative weightings of these) to each of the Scenarios. As the Evaluation Criteria are a direct product of the Programme Objectives, those scenarios scoring more highly against this balanced scorecard are more likely to meet the programme objectives and therefore more likely to represent greater value for money. As the weightings have yet to be agreed, no VFM conclusions can be finalised at this stage.
Whole Life Cost	The sum of Capital Expenditure (CAPEX) and Operational Expenditure (OPEX) modelled over a consistent 60 year period, allowing a like for like comparison to be made.
Workstrand Reports	Studies produced by each of the Workstrand leads identifying the policies, strategies and or preferences for each of the subject areas. Where relevant they also described the future end state conditions mapped to Outcome Levels. These were used to identify the potential works required for each Scenario.

Palace of Westminster Restoration and Renewal Programme Independent Options Appraisal

Final Report
Volume 1

Chapter 3 – Introduction and approach

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8 September 2014

3. Introduction and approach

3.1 The Programme: Background and context

The Programme was established to address the cumulative effect of decades of significant backlog maintenance and disrepair, which now represents a significant risk to the business of Parliament and the integrity of this heritage asset

The strategic case for the Programme

- The Strategic Case for the Programme is set out in the Pre-Feasibility Study and Preliminary Strategic Business Case dated October 2012, which represents the output of a study group (including Members of PED) appointed by the Management Boards of both Houses in January 2012 to:
- Review previous documentation (including technical reports driving the Strategic Case) relating to the restoration and renewal of the building services of the PoW; and
  - Outline the Preliminary Strategic Business Case for the restoration and renewal of the PoW.
  - The core objective of this Independent Options Appraisal (IOA) is not to challenge the validity of the Restoration and Renewal Programme's Strategic Objectives, but to independently challenge and appraise the means by which the Programme

Objectives might be achieved. During this process, the IOA team has gained a thorough understanding of the proposed scope of works and challenged some areas of scope, where appropriate. However, the required scope of works that drives the Strategic Business Case is derived from technical reports that were not produced by the IOA team. A key example is the detailed Mechanical and Electrical Services Report produced by Chapman Bathurst Bathhurst (November 2013), which informs very significant elements of the Programme scope.

Background and condition

- The PoW was re-built over a 30 year period in 1834 following a fire which destroyed most of the previous PoW. The sole purpose of the newly designed PoW was to be the home of the UK Parliament. However as the practice of democracy in the UK has evolved, the PoW has been constantly adapted over the years. Serious war-time damage was repaired as a national priority after 1945 and the opportunity was taken to create new facilities, consistent with the original design. Since the post war era, the PoW has only disparate internal restoration or renewal works have been undertaken.
- As a result, the existing mechanical and electrical plant within the PoW is no longer fit for purpose, and requires a comprehensive programme to address the ageing equipment and to enhance the services supplied to the PoW.
- The current maintenance cost (including lifecycle replacement) for running the PoW is relatively high. Carrying out any degree of works is expensive and takes a considerable amount of time, especially when compared to other buildings across central London. The current annual expenditure offers limited value for money and can only deliver short term temporary solutions.
- Therefore, business continuity risk has continued to steadily rise and whilst the Members and users do not always see the full effects, building services issues are ever present and the risk of a catastrophic failure is increasing. Examples include a burst water pipe flooding the Committee Room corridor and a component of the ceiling in the Lords Chamber falling onto the benches below. It has been previously concluded that without urgent and significant intervention, a major failure of the existing service infrastructure is inevitable, which will disrupt the function of the PoW and likely require extended periods to recover the service. Source: Pre-feasibility and preliminary strategic business case (October 2012).

The strategic case for change

- The Pre-feasibility and Preliminary Strategic Business Case (October 2012) forms the basis of the strategic case for change and informs this IOA Final Report. The Strategic Case promoted within these can be divided into five key areas as represented below.
  - Condition and Risk – 'The PoW is reaching the point where its condition is deteriorating, risks are growing and partial patching and mending interventions are no longer sufficient. Fundamental renovation can no longer be avoided.'
  - Asset Protection - 'A fundamental requirement is for the PoW to remain safe from fire (which destroyed its predecessor), water damage, security threats, decay and dilapidation. This is the overwhelming driver for modernisation.'
  - Decent Standards of Accommodation - 'As a working institution, "Parliament in the PoW" has to provide decent standards of accommodation for all those who work within it, or visit as citizens, as school children on educational trips or as witnesses to Parliamentary business, and the building has to support the modern ways in which Parliaments work with informal as well as formal meetings, digital information and mobile devices.'
  - UK Brand and Reputational Image - 'As a visitor attraction, whether for UK or international tourists, enthusiasts for democracy or specialists in the Victorian and medieval heritage, the PoW is part of the UK brand, instantly recognised and appreciated around the world.'
  - Difficulty of Combining Renovation with Ongoing Occupation - 'This (2012) study has reviewed the context in which the PoW was created and the way in which its use as the home of the UK Parliament has evolved. It has also reviewed the current condition of the PoW and the backlog of maintenance work that has built up over a long period of time, in part because of the way in which the PoW has been managed, but above all because of the great difficulty of carrying out fundamental renovation work on the inside of the PoW while Parliament remains in continuous occupation.'

3.1 The Programme: Background and context

The Programme was established to address the cumulative effect of decades of significant backlog maintenance and disrepair, which now represents a significant risk to the business of Parliament and the integrity of this heritage asset

Opportunity for long term change (if desired) within the PoW

- The Programme could offer opportunities to effect long term change within the PoW, although the scale of the opportunity is dependent on the adopted Scenario e.g. Scenario 3C will offer a more significant opportunity to effect long term change as opposed to Scenario E1A.
- The following extracts have been taken from the Pre-feasibility and Preliminary Strategic Business Case (October 2012):
  - 'Other iconic Victorian buildings have been successfully modernised, serving their old purposes in new ways. There could be an opportunity to re-think the part that the Palace plays in the whole ensemble of the Westminster World Heritage Site;" and
  - 'Because of the backlog of essential work and the severity of some of the risks of inaction it will inevitably be a highly-invasive and disruptive intervention, the first such since 1950. Once completed, a similar intervention should not be necessary again for up to 40 years. Consequently, the opportunity to achieve other desired improvements may not arise again until, perhaps, the 2060s.'

Comparative scale

- The PoW is an intensely used ornate Victorian heritage building located in central London. There is no other single asset offering direct comparisons. However, in order to obtain a sense of comparable scale, the table below summarises details of other major assets across central London comparing purpose, building status, age, use and most importantly the comparable size (sq m).

Table 1: Comparative scale

	Palace of Westminster	Royal Courts of Justice	British Museum	Ministry of Defence Main Building
Purpose	Focal point of UK Parliament	Focal point of UK Justice	Focal point for UK and world history collections and knowledge	Focal point for Government department
Building status	Grade I listed	Grade I listed	Grade I listed	Grade I listed
Date of completion	1871	1882	1857	1957
Size (sq m)	100,000 sqm (approx)	19,600 sqm in main building (approx)	92,000 sqm (approx)	100,000 sqm (approx)
Use	• Mixture of public and private areas • Combination of large public and ceremonial spaces and cellular offices	• Mixture of public and private areas • Combination of large public spaces and cellular offices	• Mixture of public and private areas • Combination of large public spaces and cellular offices / laboratories	• Mostly private but with some public areas by invitation only, such as press briefing room
Wider amenities	• Public and ceremonial spaces contain murals and other art works • Contains Libraries and Dining facilities • Contains state apartments • Provides visitor tours and educational outreach	• Public spaces contain art works and costume gallery • Provides visitor tours and educational outreach	• Public spaces contain art works and archaeological artefacts • Provides visitor tours and educational outreach	• Combination of large communal areas on the ground floor, open plan offices on all floors, and a small number of cellular offices • Communal areas have high quality finishes • Six historic rooms from other buildings preserved in the building
Source	• Parliament website	• RCJ website	• British museum website	• MoD website

Source: IOA Team analysis

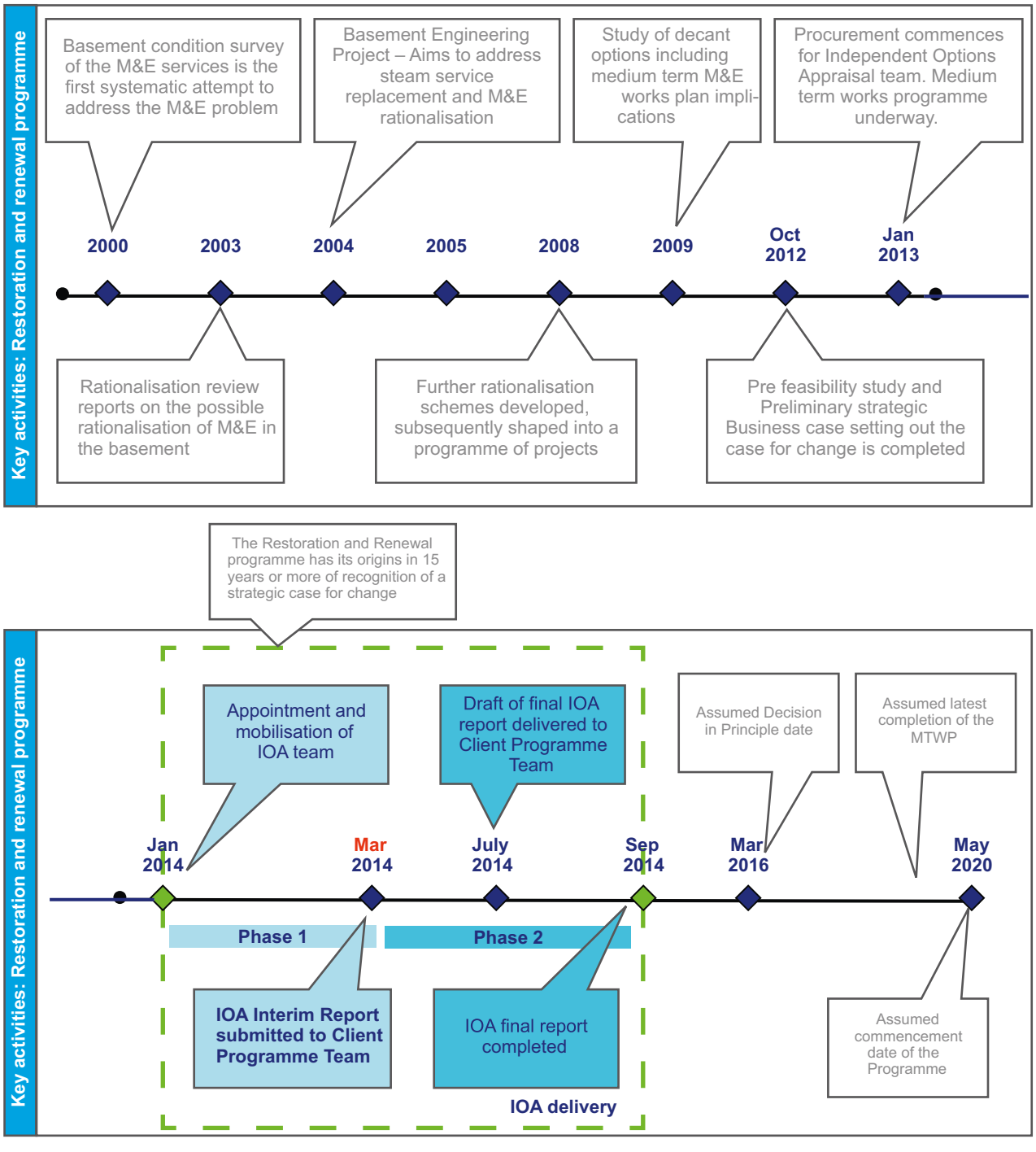
3.1 The Programme: Background and context

The Programme has evolved from an initial need to urgently address significant obsolescence and disrepair in the mechanical and electrical plant and services within the PoW. A decision in principle is required by March 2016, if the assumed start date of May 2020 is to be met

Timeline and key events

- The timeline below illustrates how the Programme has evolved over nearly 15 years and highlights the key activities undertaken by the IOA team during the delivery of the IOA Final Report.
- The initial phase of work focused around the mechanical and electrical plant of the PoW. This developed into a programme of work in recognition of a longer term, fundamental and technical approach.
- The IOA is seeking to pave the way for a downstream OBC, subsequent investment decisions, implementation of enabling works and an assured potential construction start date of Q2 2020.
- The construction start date is predicated on meeting a series of key programme milestones especially over the next 12-24 months.

Figure 1.1: Pre-2020 timeline and key events



Source: IOA Team analysis

3.1 The Programme: Background and context

The Programme Objectives define the structure and strategic direction of the Programme. A series of Evaluation Criteria were used to evaluate and compare each of the Scenarios. The Programme Objectives and Evaluation Criteria are endorsed by the CPT and Programme Board

Approach to establishing the Programme Objectives

- A series of SMART Programme Objectives are essential to provide a structured set of achievable targets against which performance of a programme can be measured.
- The approach the IOA team took in developing and refining the Programme Objectives and Evaluation Criteria is outlined below.
- The Programme Objectives needed to address the most significant Programme issues facing the PoW, namely:
  - The current underperforming building services;
  - Deteriorating structure and fabric;
  - Building plant beyond its normal life expectancy;
  - Significant health and safety concerns; and
  - A general principle that the needs of a modern working Parliament may be incompatible in part with a building of this age and which is in significant disrepair.
- During the early stages of the IOA, the IOA team discussed potential Programme Objectives with the Client Programme Team and supported the development and refinement of them. Establishing clear objectives for the Programme was agreed to be essential in determining whether the future programme is successful and if it has delivered the range of benefits being sought.
- The completion of the endorsed Programme Objectives also provided the basis for determining the Evaluation Criteria for shortlisting Scenarios during Phase 1 (tier 1 criteria) and for additional in depth evaluation of the shortlisted Scenarios during Phase 2 (using both tier 1 and tier 2 criteria).
- The table below illustrates the current issues being faced within the PoW which the Programme Objectives seek to address.

Table 2: Current issues within the PoW

Current issues within the PoW
1) Business continuity is difficult to predict and manage and the risk of catastrophic breakdown is uncomfortably high.
2) Designed and constructed for the needs of a 19th Century Parliament, with no major changes in design during the 20th Century
3) Defective building structures and services. Deleterious materials are present throughout the PoW.
4) Grade 1 listing obligation and UNESCO world heritage site status are both at risk due to state of current disrepair
5) The existing maintenance approach is uneconomic and therefore the ability to secure value for money is compromised

Source: IOA Team analysis

3.1 The Programme: Background and context

The Programme Objectives define the structure and strategic direction of the Programme. A series of Evaluation Criteria were used to evaluate and compare each of the Scenarios. The Programme Objectives and Evaluation Criteria are endorsed by the CPT and Programme Board

Programme Objectives agreed by the Programme Board

- In order to address the current issues within PoW, five Programme Objectives were endorsed by the Programme Board in February 2014.
- Whilst the Programme Objectives have been agreed, it would be prudent to ensure that these are regularly monitored and challenged and if necessary, adapted as the Programme moves forward. This principle should help ensure the objectives continue to reflect the key priorities of the HoC and HoL ahead of the commencement of the Programme.

Table 3: Endorsed Programme Objectives

Endorsed Programme Objectives
1) Allow the business of Parliament to continue uninterrupted, mitigate any adverse operational impact, and reduce risk over the longer term.
2) Accommodate the needs of a 21st Century Parliament.
3) Address existing building structure, fabric and services issues.
4) Preserve and protect the PoW's status as a Grade I listed building and a UNESCO World Heritage Site (for the foreseeable future).
5) Deliver value for money for the taxpayer, generating a range of economic benefits.

Source: IOA Team analysis

Approach to establishing Evaluation Criteria

- Once the Programme Objectives were agreed, the Evaluation Criteria were then developed to ensure direct alignment was maintained.
- The IOA team used the agreed Programme Objectives to establish a series of tier 1 and tier 2 Evaluation Criteria, for use in assessing how likely each of the Scenarios would meet the Programme Objectives. The tier 1 criteria were divided into two categories: quantitative and qualitative criteria. A summary for both categories is set out below.

Table 4: Quantitative Evaluation Criteria

Capital expenditure	Revenue income and expenditure	Wider impacts
• The capital expenditure of the programme and rate of expenditure must be determined, along with a provision for risk and uncertainty	• Revenue expenditure and income associated with the operation of the PoW over a defined period, including and beyond the Programme (assumed to be 60 years)	• This programme is large, complex and a unique capital programme of strategic and national importance and is likely to have a UK wide economic impact. Such impacts could include the creation of new employment during and beyond the Programme

Source: IOA Team analysis

Table 5: Qualitative Evaluation Criteria

Operational risk/impact	Schedule	Potential scope	Accommodating change (if desired)
• Captures a range of programme related issues which may adversely impact the operations at the PoW	• Establishing a schedule with a clear start and finish date, interim milestones at an appropriate pace of delivery with the necessary flexibility and final milestone certainty	• The scope needs to be clearly defined and aligned to the overarching strategic objectives of the programme at the outset	• Enables physical operational and therefore the potential for cultural change, if desired

Source: IOA Team analysis

3.2 The IOA: Background and report structure

The IOA will assist Parliament in reaching a balanced decision in principle on the approach to restoring and renewing the PoW. Volume one of this report is divided into six key sections with all technical information contained within volume two and contractual information in volume three.

Independent Options Appraisal (IOA) – The core objectives

- The core objective of the IOA is for:
  - *'the Consultant to deliver to the Client an independently produced, costed, options appraisal of the Scenarios, in order to enable Parliament to reach a well founded decision in principle on the means of restoring and renewing the PoW, whilst maintaining business continuity; and to pave the way for an outline business case (OBC) that conforms to public sector good practice as set out in the HM Treasury Green Book'.*
- The IOA team understands that independence is essential in the delivery of the IOA. For the purposes of the delivery of the Services, the term independent is considered by the IOA team to mean:
  - Providing an objective evaluation of all submitted evidence and information;
  - Using robust and professional judgement in the analysis and interpretation of evidence and information provided;
  - Maintaining a willingness to stake the Consultant's professional reputation on the quality of deliverables;
  - Continually challenging stakeholder opinions; and
  - Ensures and maintains their independence throughout.

The IOA report (this report)

- This report captures the work undertaken by the IOA team during both Phases of the IOA. Phase 1, completed between January and March 2014, resulted in the submission of an Interim Report to the Client Programme Team. The Interim

Report including a recommended shortlist of Scenarios and provided the platform on which Phase 2 was based. Phase 2, completed between April and July 2014 had a focus on further detailed analysis of the shortlisted Scenarios, building upon the knowledge gained during Phase 1.

- This Final Report seeks to provide a detailed comparative analysis of the shortlisted Scenarios and describes the various differences and similarities between each Scenario. It also identifies those Scenarios more likely to meet the Programme Objectives.
- A booklet for each shortlisted Scenario can be found in Section 6 (Volume 1) of this Final Report.
- Furthermore, this report provides outline details on how the Programme could be delivered; the potential key programme risks; and the primary benefits to both users and the wider public, once the identified building works are complete.
- It is possible that a selection of the shortlisted Scenarios may also form the basis of the options for inclusion in a future Outline Business Case (OBC), prepared in accordance with HM Treasury Green Book guidance. With this in mind, the Final Report has been developed to efficiently and effectively support development of future business cases.
- In the preparation of this report, the IOA team made extensive use of Challenge Panels in which senior Members of the IOA team (who were not involved in the day to day deliver of the IOA) challenged emerging findings.

Important assumptions

- During both Phase 1 and 2, the IOA team based the analysis on a series of assumptions.
- These assumptions have been agreed with the Programme Team. Full details of the assumptions used for the IOA can be found in Volume 2, Appendix E.7: Master Data Assumption List of this Final Report.
- The principle assumptions are summarised below:
  - The Strategic Case for Change, as set out in the 'Pre feasibility study and Preliminary Strategic Business Case' dated October 2012 is based upon a scope of work defined by the Client and not by the IOA team;
  - The Outcome Level of the Programme works has been derived from the Workstrand reports. The IOA team supported the reconfiguration of Outcome Levels A-C;
  - The assumed Programme start date is Q2 2014. The assumed start of works on site date is Q2 2020. Our financial, and schedule metrics are based as this date. If this date is not realised, then the analysis and outputs will need rebasing; and
  - All Scenarios have been financially analysed and compared over 60 year period (as per HMT Green Book Guidance) with a fixed commencement date of Q2 2014.

Source: IOA Team analysis

3.2 The IOA: Background and report structure

The IOA will assist Parliament in reaching a balanced decision in principle on the approach to restoring and renewing the PoW. Volume one of this report is divided into six key sections with all technical information contained within volume two and contractual information in volume three.

Report structure

- **Volume 1 of the Final Report comprises six key sections, as illustrated below:**

1. Executive summary – summarises the key findings and conclusions of the IOA Final Report and suggests the next steps necessary to meet the assumed construction start date of Q2 2020;

2. Glossary – An explanation of defined terms and abbreviations used within the report;

3. The Restoration and Renewal Programme and the Independent Options Appraisal: background, context and approach – provides the background to the strategic case for change, the core Programme Objectives and Evaluation Criteria, timeframes, how Scenarios are derived,the shortlisting process and the creation of a variant Scenario (E1A);

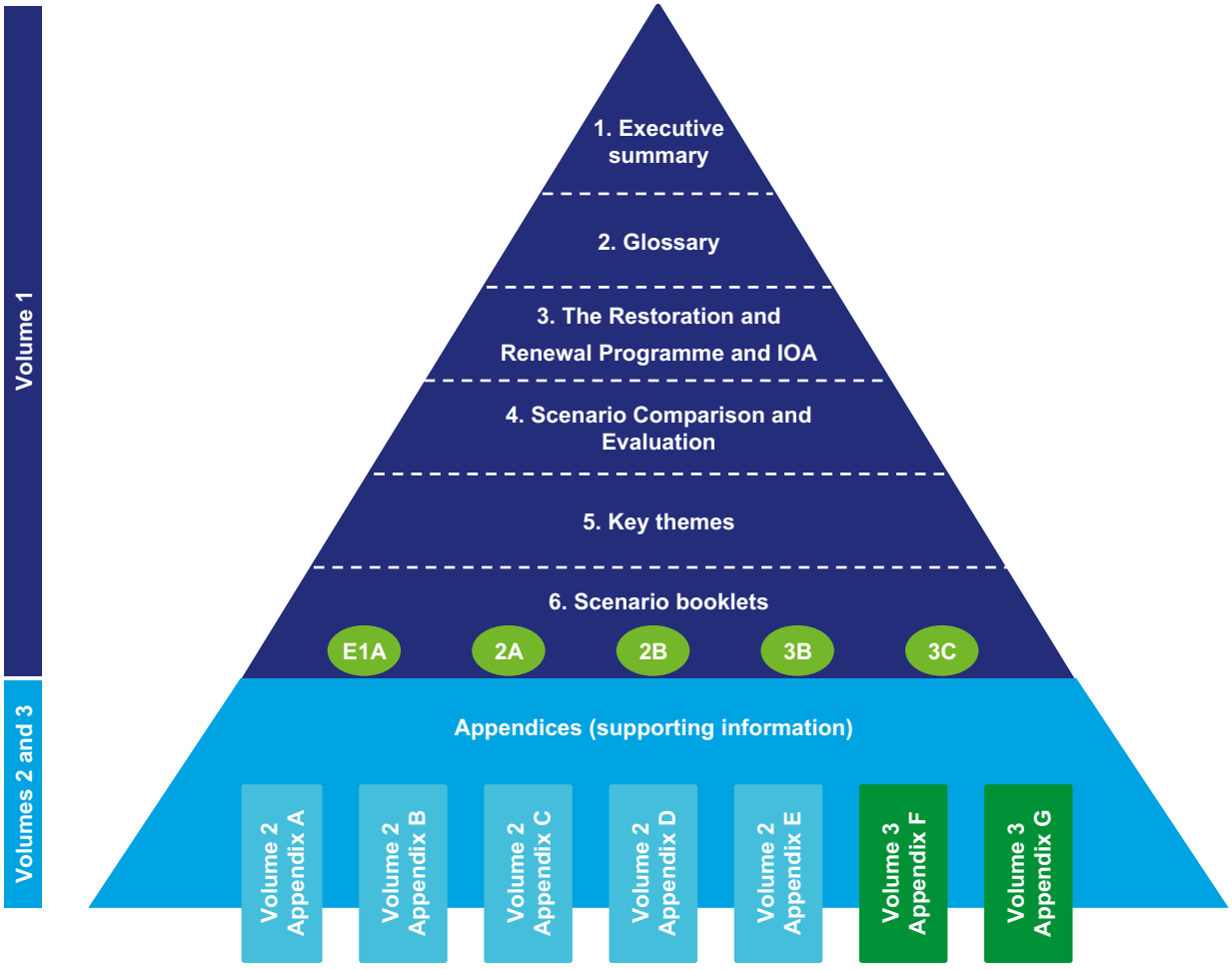
4. Scenario comparison and evaluation - a detailed comparison of the five shortlisted Scenarios, undertaken on a consistent basis using the Evaluation Criteria to evaluate all Scenarios on a like for like basis;

5. Key themes - a supplement to Section 4, addressing broad themes impacting all of the shortlisted Scenarios including the delivery models; delivery approach; planning and statutory considerations; sustainability and accessibility; and

6.Shortlisted scenario booklets – Summarises the relevant technical information for each of the five shortlisted Scenarios based on the agreed Evaluation Criteria.

- Additionally, the final report includes two further volumes:
  - Volume 2 includes all detailed technical supporting evidence for the report, developed during the IOA
  - Volume 3 includes all contractual documentation (including Change Control Notes).

Figure 2: Report structure



Source: IOA Team analysis

3.3 The IOA: Our approach

The IOA team, consisting of Deloitte, AECOM and HOK was appointed in December 2013 and mobilised in January 2014. The IOA team submitted its interim IOA findings to the Client Programme Team on 2 April 2014, and its Final Report in September 2014.

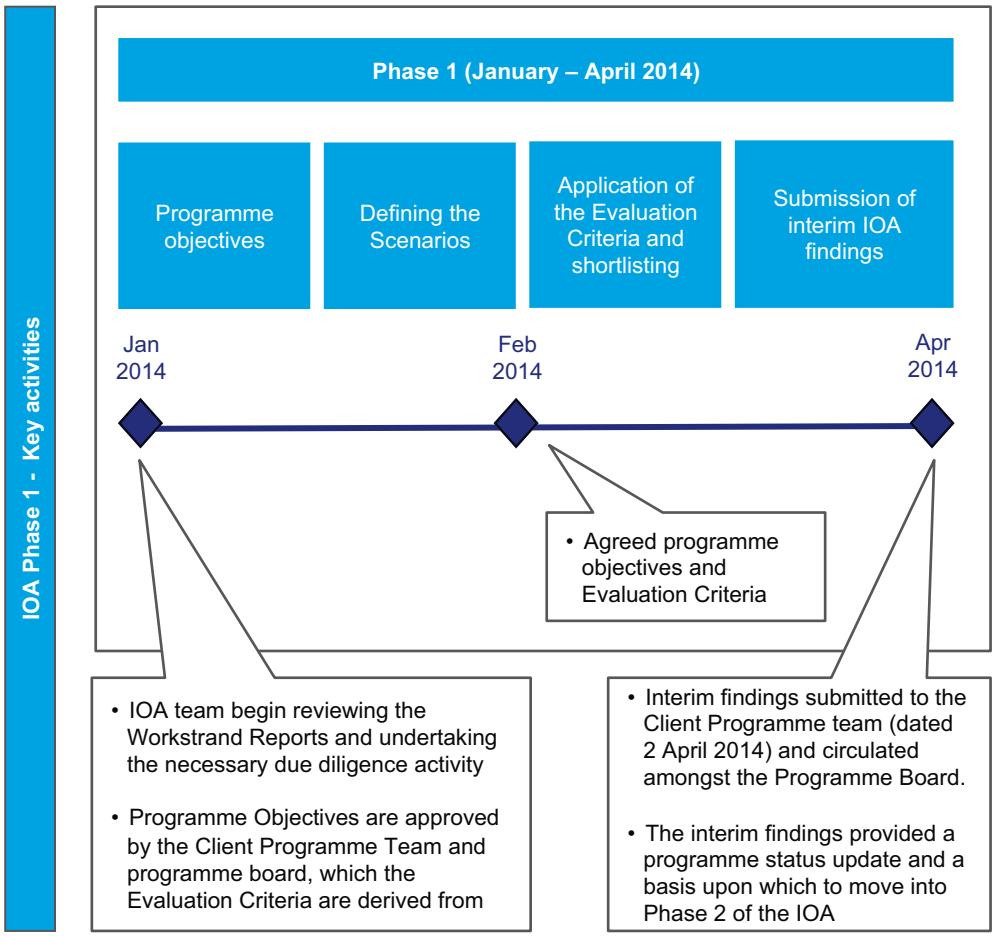
Phase 1

- The IOA team undertook its work in two phases and over a six month period from January 2014. During both phases, contributions were made by the core IOA team (consisting of Deloitte, AECOM and HOK) and specifically during Phase 2 a number of sub-consultants provided bespoke subject matter expert input to help develop the findings captured within the Draft Final Report.

Independent Options Appraisal approach

- Phase 1 (January – April 2014) included an IOA team programme mobilisation period to agree the Programme Objectives with the Client Programme Team, define the Scenarios (including re-categorising the Outcome Levels A-C), and confirming the three delivery Options. Based on this work, the IOA team arrived at an agreed shortlist of Scenarios for further evaluation during Phase 2.

Figure 3: Phase 1 overview



Source: IOA Team analysis

3.3 The IOA: Our approach

The IOA team, consisting of Deloitte, AECOM and HOK was appointed in December 2013 and mobilised in January 2014. The IOA team submitted its interim IOA findings to the Client Programme Team on 2 April 2014, and its Final Report in September 2014.

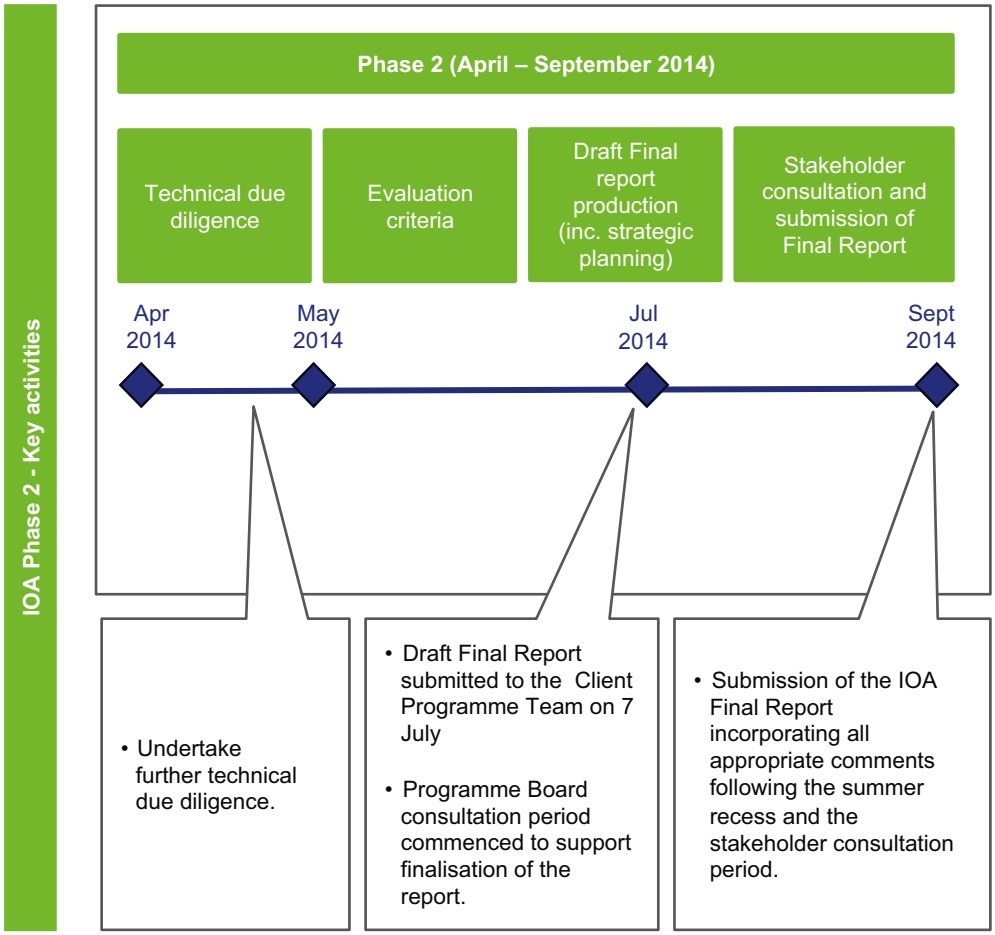
Phase 2

- Drawing upon the information obtained during Phase 1, further technical due diligence and investigations were undertaken. The Evaluation Criteria enabled illustrative evaluation and comparison to be completed.

Independent Options Appraisal approach

- In both phases, contributions were made by the core IOA team and specifically during Phase 2, a number of sub-consultants provided bespoke subject matter expert inputs to further develop the evidence contained within the Final Report.
- A timeline covering Phase 2 is shown below and summaries the key activities. This summary timeline should be read in conjunction with the notional near term plan covering the following 12-24 months from the completion of the IOA. If site activity at the PoW is to commence in Q2 2020, all of the key interim milestones in the near term schedule will need to have been successfully met.
- Full details of the near term plan can be found in the executive summary and Section 4 (within the Schedule).

Figure 4: Phase 2 overview



Source: IOA Team analysis

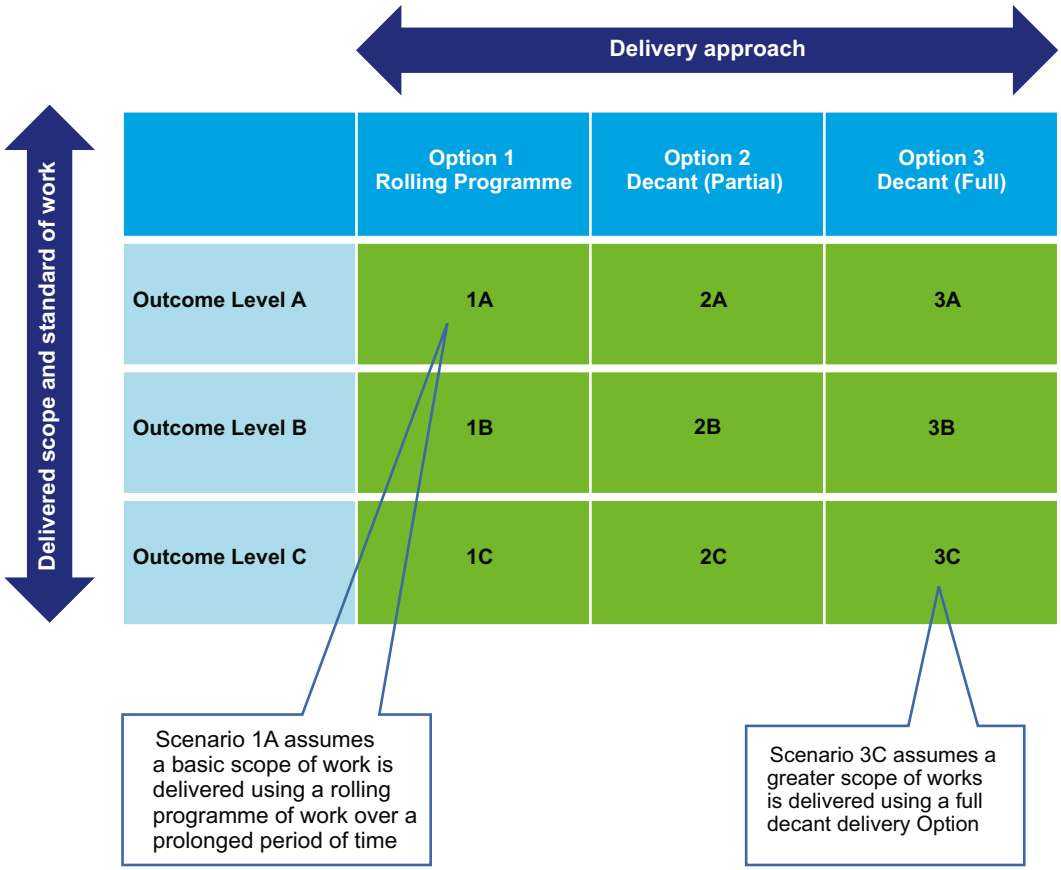
3.3 The IOA: Our approach

Nine Scenarios were the product of three Outcome Levels and three delivery Options. The Scenarios were appraised at a high level and shortlisted to five during Phase 1 of the IOA. The consideration of the scenarios provides a robust basis for a Decision in Principle to address the Programme.

What is a Scenario and how is it derived?

- A Scenario is a product of a defined Outcome Level and a delivery Option. The Outcome Level determines what the scope will need to include and the delivery Option defines how the programme of works will be delivered.

Figure 5: Scenario matrix



Source: IOA Team analysis

3.3 The IOA: Our approach

Nine Scenarios were the product of three Outcome Levels and three delivery Options. The Scenarios were appraised at a high level and shortlisted to five during Phase 1 of the IOA. The consideration of the scenarios provides a robust basis for a Decision in Principle to address the Programme.

Why are Scenarios significant?

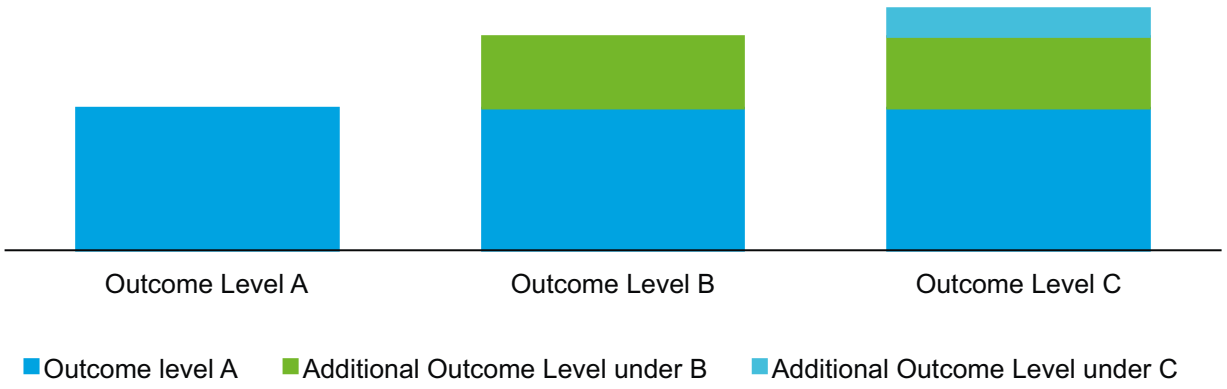
- The long list of nine and the short list of five Scenarios each represent the basis upon which Parliament could ultimately make an informed Decision in Principle on the means of restoring and renewing the PoW.
- In doing so, Parliament is likely to make its decision based on the respective advantages and disadvantages of each Scenario. Therefore, understanding how all Scenarios are derived is extremely important.

Why are Scenarios illustrative?

- It is accepted that the Scenarios defined within this Final Report are unlikely to remain fixed or absolute. In reality, the scope of work will be refined or amended as will the delivery Option. However, they do form an entirely valid basis on which a well founded decision in principle could be made.

Overall breakdown of the Outcome Levels

- The image below outlines the overall breakdown of the Outcome Levels, but more importantly illustrates the incremental improvement in amenity and functionality within the PoW as the scale is moved from Outcome Level A to C.
- An Outcome Level C+ is introduced within Section four and covers other potential opportunities both inside and outside the site boundary of the PoW.



Source: IOA Team analysis

3.4 Outcome Level definition

The differences between the Outcome Levels are relatively modest and there is little difference in the overall cost and schedule for delivering each. The scope of work to be delivered under Outcome Level A represents the majority of all work to be completed within the Programme.

Overview of Outcome Levels

- Following an early review of the Outcome Level definitions, and having regard to the standards currently being achieved as part of the ongoing rolling programme of works at the PoW (including the Medium Term Works Programme), the IOA team proposed and agreed with the Programme Board, a refined set of Outcome Levels. These reflect the minimum standards the Client is seeking to achieve, as well supporting both a well-founded decision in principle and the downstream creation of an OBC that follows HM Treasury Green Book Guidance.
- The Outcome Level definitions were developed by the Client Programme Team and were approved on the 7 March 2014.
- The Outcome Levels have been developed as an incremental series of standards and scope. The agreed Outcome Levels are expressed in three ascending steps: A, B and C, which are designed to allow for flexibility and expansion. Whilst, Outcome Level A accounts for the vast majority of the potential scope, Outcome Levels B and C could be added to Outcome Level A to represent incremental enhancements.

Approved Outcome Levels

- The approved Outcome Levels used to define the Scenarios are set out below, together with the supporting rationale for their adaption and illustrative examples within the PoW.

Aggregate outcomes

Outcome level A Outcome level B Outcome level C

Table 6.1: Agreed Outcome Levels (continued on next page)

	Agreed Outcome Level definition	Rationale	Illustrative examples of Outcome Level within PoW
Outcome Level A: Meets all legislation and building policy	• Ensure compliance with legislation • Maintain World Heritage and Grade 1 Listing status • Repair or replace systems on a like for like basis to contemporary standards of design and quality, optimising costs and benefits over full system lifecycles • Meet built environment standards expected for public buildings	• The proposed definition broadly reflects the current approach to keeping the building operational, albeit through a series of ongoing interventions. • This Outcome Level forms a credible do minimum option for the downstream outline business case.	• All mechanical and electrical services and plant replaced. • External fabric restored and cleaned • Basement areas rationalised • All interior fabric restored and refurbished • Asbestos removed from all areas where work is carried out • New lifts to provide improved access to majority of the PoW
Outcome Level B: Delivers enhanced amenity and functionality over and above meeting legislation and building policy (i.e Outcome Level A)	• As Outcome Level A plus: • Meet any additional built environment policy objectives stated by the Houses • Provide facilities to meet the stated objectives of both Houses (such as inclusion, outreach and education) • Defined improvements to amenities within the constraints of the present design • Future proofing of infrastructure and provision for change to the current occupation where the requirement can be only loosely anticipated, over an indefinite period	• Policy objectives beyond the built environment constitute increased amenity. Examples include inclusion and outreach enhancements. • Future Proofing covers what is reasonably foreseeable over an indefinite period.	As per Outcome Level A plus: • Upper floor offices areas remodelled and upgraded • Comfort cooling providing in some areas • New media centre • Courtyards landscaped and pedestrianized • Additional lifts in the Elizabeth Tower • Cloister Court conserved and made accessible

3.4 Outcome Level definition

The differences between the Outcome Levels are relatively modest and there is little difference in the overall cost and schedule for delivering each. The scope of work to be delivered under Outcome Level A represents the majority of all work to be completed within the Programme.

Table 6.2: Agreed Outcome Levels *(continued from previous page)*

	Agreed Outcome Level definition	Rationale	Illustrative examples of Outcome Level within PoW
Outcome Level C: Delivers significantly enhanced amenity and functionality over and above meeting legislation and building policy (i.e. Outcome Level A)	• As Outcome Level B but also: • Significant defined improvements e.g. high performance and long life cycles appropriate to each system • Defined improvements to the amenities within the constraints of the present design and outside of the PoW site boundary.	• Incorporating many more amenities and functions throughout the PoW • Improve business and energy efficiencies • Enhanced visitor experience	As per Outcome Level B plus: • New visitor centre • Star Chamber Court and StateOfficers' Courts glazed over

Source: IOA Team analysis

Key findings

- It has become apparent through completing the analysis of the Scenarios that the Outcome Levels (i.e. the scope of works), defined in increasing levels from A to C, currently contain relatively modest differences between them therefore have relatively little impact on overall cost and schedule. This is because the scope of work to be delivered under Outcome Level A represents the vast majority of all work to be completed within the Programme.
- The scope of works included within Outcome Level A delivers new or refurbished work in all areas of the PoW. The replacement of all the mechanical and electrical services is proposed to be completed as part of Outcome Level A. Comparatively, the works currently proposed in Outcome Levels B and C are generally more localised and consist of specific architectural interventions

3.5 Delivery Option definition

The delivery Options have been agreed by the Programme Board. Option 1 involves a rolling programme using temporary accommodation within the PoW. Option 2 incorporates a partial decant (e.g. one House at a time) and Option 3 will require the PoW to be vacated in its entirety

Delivery Option overview

- Three delivery Options were outlined and agreed by the Client Programme Team, and these have been adopted to support the definition of the Scenarios being assessed as part of the IOA. These Options represent potential ways of delivering the Programme and should be re-evaluated during the next stage of the Programme.
- To clarify the extent of each delivery Option, and to highlight the underlying assumptions that have been made in defining the Scenarios, the three Options are described in more detail below.

Table 7.1: Delivery Options (continued on next page)

Delivery Option 1:	• A defined rolling programme of more substantial repairs and replacement over a long period but still working around the continued use of the PoW • This Option was amended and is now: • Enabled delivery Option E1

Summary attributes	**Potential implications for Parliament**
• In its original form, this delivery Option reflected the existing traditional approach to maintenance and the lifecycle replacement, where particular access routes and or offices might be closed off, usually during recess periods, but never in such a way as to disrupt the core business of Parliament. • The findings contained within slide (3.8 shortlisted Scenario E1A), demonstrates that the Programme works cannot be delivered under the traditional approach due to the delivery constraints. As a result the IOA team examined how releasing key constraints could potentially deliver a viable Option: an enabled option (Option E1). E1 has the following summary attributes: • The PoW would be divided into 12 construction zones with the occupants of each zone being removed to temporary accommodation (still within the site boundary of the PoW) and the zone placed into the possession of a contractor. In addition, the entire basement would be cleared of occupants (some core services would remain) and possession would again be passed onto a contractor(s). • During this time both Chambers would alternately have to close for between two and four years, but sittings could be relocated to a temporary structure possibly in one of the courtyards. The approach is dependent on the installation of temporary services in the early years, enabling the renovation of the Palace basement infrastructure, followed by vacated vertical zones being progressed on upper floors. Users of the building would have to tolerate extremely high levels of disruption and nuisance and there would be risks to business continuity over a long period. This option is the least predictable in terms of duration and cost. • Acceptance by Members and occupants of the substantial increase in Nuisance and Disruption over a very prolonged period of approximately 32 years. • The temporary accommodation is likely to be located within the PoW courtyards.	• Parliament remains in occupation. • Houses remain co-located. • Potentially very prolonged Disruption and Nuisance over 32 years or more. • Members must accept substantial disturbance over a similar period. • Greatest uncertainty and risk impacting the overall schedule and costs. • Highest risk to the business continuity of Parliament due to extended works programme required to address and negate current risks as well as the potential for other currently unforeseen risks materialising and needing to be addressed.

Source: IOA Team analysis

3.5 Delivery Option definition

The delivery Options have been agreed by the Programme Board. Option 1 involves a rolling programme using temporary accommodation within the PoW. Option 2 incorporates a partial decant (e.g. one House at a time) and Option 3 will require the PoW to be vacated in its entirety

Table 7.2: Delivery Options *(continued from previous page)*

Delivery Option 2:	• A substantial area of the PoW being closed for users for a significant period whilst major work is carried out. A partial decant will disrupt some aspects of the work of Parliament requiring relocation to temporary accommodation, but at no time is the PoW closed.

Summary attributes	**Potential implications for Parliament**
• One House would be vacated to temporary decant accommodation (outside the PoW) while the other House remains in its current location within the PoW. • Construction work would be undertaken in the vacated part of the PoW, while business activities continue in the remaining occupied part(s). • Once the Programme works are completed, the vacated House would re-occupy its space, followed by the other House vacating its space allowing the construction works to proceed.	• Both Houses (one House at a time) will at some point during the Programme be required to decant from the PoW • The core business of Parliament will operate from separated premises. • Houses will not be co-located. • Reduced Disruption and Nuisance compared to E1, but still significant and prolonged. • Members must accept potential albeit reduced disturbance. • A low level of uncertainty and risk than delivery Option 1. • A lower level risk to the business continuity of Parliament than delivery Option 1.

Delivery Option 3:	• A programme incorporating a full decant of the PoW and associated programme of works necessary to deliver the full scope. The business of Parliament would need to function from the decant premises.

Summary attributes	**Potential implications for Parliament**
• All occupants and functions within the PoW will be relocated to temporary decant accommodation leaving the PoW clear for the delivery of the Programme works.	• All of Parliament to function from alternative accommodation. • Houses unlikely to be co-located. • Nuisance significantly reduced or absent. • Disruption will be at its highest levels during the decant and reoccupation periods. • Opportunity to enhance ways of working and benefit from efficiencies. • Greater programme and IOA certainty • Delivers the fastest reduction rate in business continuity risk to Parliament and the earliest realisation of Programme benefits.

Source: IOA Team analysis

Key messages

- The delivery Option needs to allow suitable flexibility to adapt to future stakeholder requirements. The difference in delivery Option is significant and depending on which is adopted, there are significant differences in schedule, cost and risk. Once a delivery Option is adopted it could be difficult to change the approach bearing in mind the complexity of the programme, the governance implications and the commitments that will have been made e.g. decant accommodation and contracting arrangements.

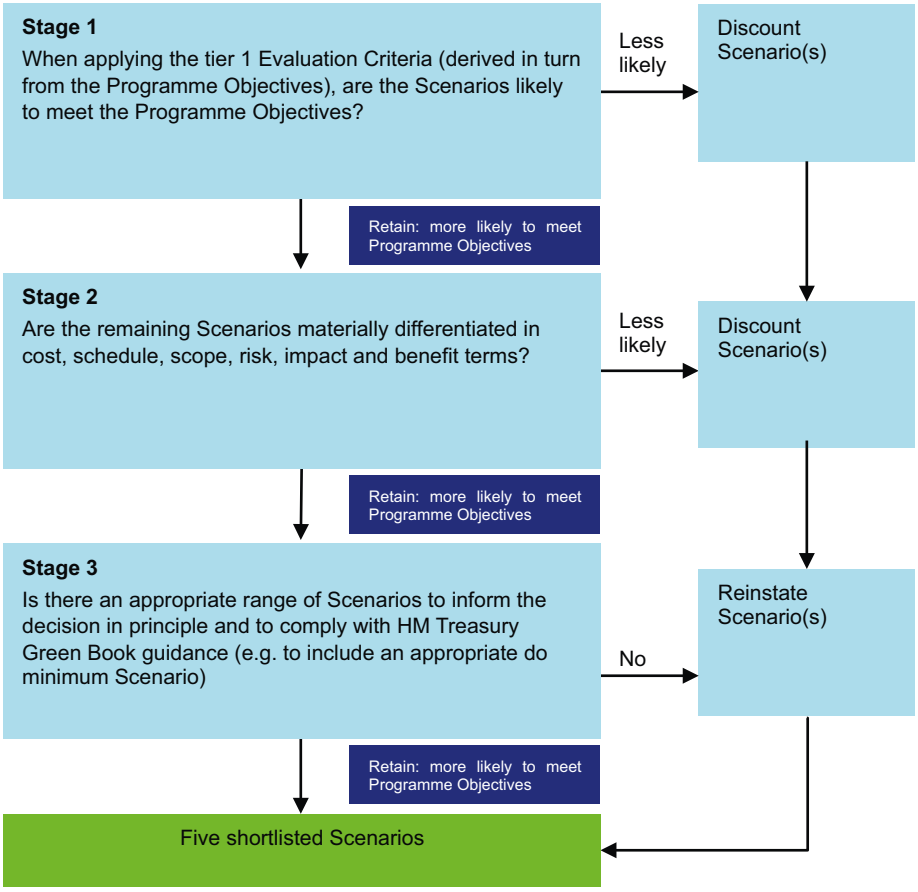
3.6 Scenario shortlisting

Once the Scenarios had been defined and assessed during Phase 1, the IOA team applied a three stage selection process to shortlist Scenarios to five. The shortlisted Scenarios formed the key interim findings of the IOA and the basis of Phase 2 evaluation.

Introduction

- In order to undertake the initial shortlisting process during phase 1, three sequential stages were undertaken and are illustrated in more detail below.

Figure 7: Initial shortlisting



Source: IOA Team analysis

Stage 1: Initial shortlisting process

- As a result of the initial short listing process the following Scenarios were deemed to be more likely to meet the Programme Objectives.

Figure 8: Result of shortlisting process

	Option 1 Decant (Rolling)	Option 2 Decant (Partial)	Option 3 Decant (Full)
Outcome Level A	**1A**	**2A**	**3A**
Outcome Level B	**1B**	**2B**	**3B**
Outcome Level C	**1C**	**2C**	**3C**

Using the tier 1 Evaluation Criteria; the highlighted Scenarios are more likely meet the Programme Objectives.

Source: IOA Team analysis

3.6 Scenario shortlisting

Once the Scenarios had been defined and assessed during Phase 1, the IOA team applied a three stage selection process to shortlist Scenarios to five. The shortlisted Scenarios formed the key interim findings of the IOA and the basis of Phase 2 evaluation.

Stage 2: secondary shortlisting process

- The IOA team applied a second process to confirm the remaining Scenarios were materially differentiated by the Evaluation Criteria.

Figure 9: Secondary shortlisting process

	Option 1 Decant (Rolling)	Option 2 Decant (Partial)	Option 3 Decant (Full)
Outcome Level A	1A	2A	3A
Outcome Level B	1B	2B	3B
Outcome Level C	1C	2C	3C

Scenarios 2B and 2C are not materially differentiated by cost and schedule. As a result, Scenario 2C was discounted.

Source: IOA Team analysis

Stage 3: Reinstatement of the do minimum Scenario

- The IOA team confirmed there was not a sufficient range of Scenarios in order to comply with HMT Green Book guidance.

Figure 10: Reinstatement of the do minimum Scenario

	Option 1 Decant (Rolling)	Option 2 Decant (Partial)	Option 3 Decant (Full)
Outcome Level A	E1A	2A	3A
Outcome Level B	1B	2B	3B
Outcome Level C	1C	2C	3C

To follow HM Treasury Green Book guidance the variant E1A was reinstated as a Do Minimum Scenario for the downstream OBC.

Source: IOA Team analysis

Presentation of the final shortlisted Scenarios

- At the end of phase one, the IOA team confirmed the five final shortlisted Scenarios that were materially differentiated and, which followed complied with HMT Green Book guidance.

Figure 11: Presentation of the final shortlisted Scenarios

	Option 1 Decant (Rolling)	Option 2 Decant (Partial)	Option 3 Decant (Full)
Outcome Level A	E1A	2A	3A
Outcome Level B	1B	2B	3B
Outcome Level C	1C	2C	3C

The final Shortlisted Scenarios in which to carry out further due diligence and analysis during Phase 2 of the IOA.

Source: IOA Team analysis

3.6 Scenario shortlisting

Five Scenarios were shortlisted following the initial shortlisting process carried out during phase one. The five Scenarios are highlighted together with a summary of the Scenario and supporting rationale for shortlisting.

Overview

- The table below summaries the initial down selection process during Phase 1 and identifies the five shortlisted Scenarios. The shortlisted Scenarios have been scrutinised and analysed further during phase two.

Table 8.1: Shortlisting Scenarios (continued on next page)

	Delivery Option 1	Delivery Option 2	Delivery Option 3
	Rolling programme of works • A defined rolling programme of restoration and replacement over a long period but still working around the continued use of the PoW.	**Partial Decant** • A substantial area of the Palace of Westminster being closed for users for a significant period whilst major work is carried out. A partial decant may disrupt some aspects of the work of Parliament requiring relocation to a temporary place, but at no time is the PoW closed.	**Full Decant** • A programme incorporating a full decant of the PoW to temporary accommodation and associated programme of works to create the temporary accommodation and to undertake works to PoW.
Outcome Level A • Ensure compliance with legislation • Maintain World Heritage and Grade 1 Listing status • Replace systems on a like for like or improvement basis where appropriate, to current standards of design and quality with a view to optimising costs and benefits over the lifecycle considered normal for each specific system • Meet declared reasonable built environment policy objectives of the Houses.	**Scenario E1A: Shortlisted** • An ongoing rolling programme of works that repairs or replaces systems and components on a like for like basis, with no additional amenity, but meeting statutory requirements and achievable built environment standards expected for public buildings. Rationale for shortlisting: • Originally discounted as it didn't meet the Programme Objectives • Reinstated as enabled Option E1A to form the do minimum Scenario, with both Houses remaining within the Palace.	**Scenario 2A: Shortlisted** • A partial decant that replaces systems and components on a like for like basis, with no additional amenity, but meeting statutory requirements and achievable built environment standards expected for public buildings. Rationale for shortlisting: • Meets the Programme Objectives. • Whilst not materially different to 2B, this scenario is retained to provide a potential do minimum Scenario in the event that E1A is not taken forward or proves undeliverable.	**Scenario 3A: Discounted** • A full decant that repairs or replaces systems and components on a like for like basis, with no additional amenity, but meeting statutory requirements and achievable built environment standards expected for public buildings. Rationale for discounting: • Not materially differentiated from 3B
Outcome Level B As for proposed Outcome Level A plus: • Meet any stated additional built environment policy objectives, and where appropriate exceed, declared policy objectives beyond for the built environment of the Houses: for instance inclusion and outreach • Defined improvements to the amenities within the constraints of the present design • Achieve future proofing of infrastructure and provision for change to the current occupation where the requirement can be only loosely anticipated, over an indefinite period.	**Scenario 1B: Discounted** • A rolling programme of works that in addition to Outcome Level A delivers enhanced amenity and functionality. Rationale for discounting: • Does not meet the Programme Objectives as the scope of works cannot be delivered. Not reinstated following enabling of the delivery option, as option E1A will represent the do minimum Scenario.	**Scenario 2B: Shortlisted** • A partial decant that in addition to Outcome Level A delivers enhanced amenity and functionality Rationale for shortlisting: • Meets the Programme Objectives. • A partial decant that appears capable of being delivered over a reasonable timeline and only requiring a single decant building	**Scenario 3B: Shortlisted** • A full decant that in addition to Outcome Level A delivers enhanced amenity and functionality. Rationale for shortlisting: • Meets the programme Objectives. • A full decant Scenario that appears capable of being delivered over the shortest timeline whilst delivering additional amenities and functionality.

Source: IOA Team analysis

3.6 Scenario shortlisting

Five Scenarios were shortlisted following the initial shortlisting process carried out during phase one. The five Scenarios are highlighted together with a summary of the Scenario and supporting rationale for shortlisting.

Overview

- The table below summaries the initial down selection process during Phase 1 and identifies the five shortlisted Scenarios. The shortlisted Scenarios have been scrutinised and analysed further during phase two.

Table 8.2: Shortlisting Scenarios ***(continued on next page)***

	Delivery Option 1	Delivery Option 2	Delivery Option 3
	Rolling programme of works • A defined rolling programme of restoration and replacement over a long period but still working around the continued use of the PoW.	**Partial Decant** • A substantial area of the Palace of Westminster being closed for users for a significant period whilst major work is carried out. A partial decant may disrupt some aspects of the work of Parliament requiring relocation to a temporary place, but at no time is the PoW closed.	**Full Decant** • A programme incorporating a full decant of the PoW to temporary accommodation and associated programme of works to create the temporary accommodation and to undertake works to PoW.
Outcome Level C As for Outcome Level B plus: • Significant defined improvements e.g. high performance and long life cycles appropriate to each system • Defined improvements to the amenities within the constraints of the present design and outside of the PoW site boundary.	**Scenario 1C: Discounted** • A rolling programme of works that in addition to Outcome Level A and B delivers significantly enhanced amenity and functionality. Rationale for discounting: • Does not meet the Programme Objectives as the scope of works cannot be delivered. Not reinstated following enabling of the delivery option, as option E1A will represent the do minimum Scenario for the purpose of a downstream OBC.	**Scenario 2C: Discounted** • A partial decant that in addition to Outcome Level A and B delivers significantly enhanced amenity and functionality. Rationale for discounting: • Whilst it meets the Programme Objectives it is not materially different to Scenario 2B.	**Scenario 3C: Shortlisted** • A full decant that in addition to Outcome Level A and B delivers significantly enhanced amenity and functionality. Rationale for shortlisting: • Meets the Programme Objectives • Whilst it is not materially differentiated from 3B, it will form a more comprehensive Scenario for the OBC • The scope may be increased further, creating material differentiation.

Source: IOA Team analysis

3.7 Shortlisted Scenario overview

The key characteristics of the five shortlisted Scenarios have been summarised in the table below.

Table 9.1: Shortlisted Scenario overview (continued on next page)

E1A	
Operational risk/ impact	**Advantages:** No decant. Both Houses remain in the PoW. **Disadvantages:** Ongoing high risk of services failure. Long term residual business risk that is only mitigated slowly. Ongoing Disruption and Nuisance e.g. structure borne noise and vibration, at significantly higher levels than currently being experienced. Need for repeated moves.
Schedule	**Advantages:** No substantive advantages **Disadvantages:** Much longer (32 years) delivery period which potentially merges with life cycle replacement of major plant and equipment.
Scope	**Advantages:** Delivery of scope can be prioritised over the construction period. **Disadvantages:** Only minimum scope delivered. Significant technical challenges to facilitate replacement of central mechanical and electrical infrastructure without area being vacated.
Accommodating change (if desired)	**Advantages:** Maintains tradition and existing working practices at the Palace, subject to localised delivery of programme works **Disadvantages:** Does not provide the opportunity for changes to working practices and culture.
Capital expenditure	**Advantages:** Provides a basis for a longer term, more manageable level of capital investment. **Disadvantages:** Much longer delivery period which potentially merges with life cycle replacement of major plant and equipment. Limited degree of cost certainty, Most expensive Scenario in whole life cost terms.
Operational expenditure and revenue income	**Advantages:** No substantive advantages **Disadvantages:** Limited ability to reduce long term revenue expenditure to maintain the Palace given the rate of progress. Does not support the creation of revenue generative opportunities e.g. additional catering open to the public.
Wider impacts	**Advantages:** No substantive advantages **Disadvantages:** Limited opportunity to demonstrate the wider impact that the restoration and renewal programme can generate in the short term, given scale of annual investment. Palace being perceived as a construction site for 30 years or more will impact Palace / UK brand.
2A	
Operational risk/ impact	**Advantages:** Speed of business risk mitigation much improved. Risk of Disruption or Nuisance reduced as compared to E1A as works more contained within larger zones. **Disadvantages:** Co-located with construction operations. Disruption due to decant and reoccupation back into the PoW.
Schedule	**Advantages:** greater schedule certainty and significantly reduced duration when compared to E1A. **Disadvantages:** Significant schedule dependencies and constraints to allow for phased delivery and staggered decant and reoccupation back into the PoW.
Scope	**Advantages:** Significantly reduces the technical challenges associated with delivering the required works **Disadvantages:** Only minimum scope delivered. Would not take full advantage of the opportunity created by significant decanting to deliver enhancements to amenity.
Accommodating change (if desired)	**Advantages:** Partial decant provides the opportunity to support change on a progressive basis. **Disadvantages:** Potential conflicts in working practices given potential for two (or more) site decant facilities.
Capital expenditure	**Advantage:** Greater cost certainty than E1A. **Disadvantages:** Anticipated as greater overall cost than Scenario 3B but for no additional amenity. Significant increase in year on year capital expenditure during programme.
Operational expenditure and revenue income	**Advantages:** Some ability to reduce anticipated long term revenue expenditure following completion of the restoration and renewal programme. **Disadvantages:** Does not support the creation of revenue generative opportunities e.g. additional catering open to the public.
Wider impacts	**Advantages:** Ability to establish a programme with a foreseeable skills and training legacy element (e.g. Crossrail TUCA Tunnelling and Underground Construction Academy). Programme can be set up and run as an exemplar of a scheme with a client in occupation. **Disadvantages:**Programme is longer than Option 3 and therefore impact to Palace / UK brand would be prolonged.

Source: IOA Team analysis

3.7 Shortlisted Scenario overview

The key characteristics of the five shortlisted Scenarios have been summarised in the table below.

Table 9.2: Shortlisted Scenario overview (continued from previous page)

2B	
Operational risk/ impact	**Advantages:** Speed of business risk mitigation much improved. Risk of Disruption or Nuisance reduced when compared to E1A as works more contained within larger zones. **Disadvantages:** Co-located with construction operations. Disruption due to decant and reoccupation back into the PoW.
Schedule	**Advantages:** greater schedule certainty and significantly reduced duration when compared to E1A. **Disadvantages:** Significant schedule dependencies and constraints to allow for phased delivery and staggered decant and reoccupation back into the PoW.
Scope	**Advantages:** Greater scope delivered. Significantly reduces the technical challenges associated with delivering the required works. **Disadvantages:** Would not take full advantage of the opportunity created by significant decanting to deliver significant enhancements to amenity.
Accommodating change (if desired)	**Advantages:** Partial decant provides the opportunity to support change on a progressive basis. **Disadvantages:** Potential conflicts in working practices given two (or more) site decant facilities.
Capital expenditure	**Advantages:** Greater cost certainty than E1A. **Disadvantages:** Anticipated as greater overall cost than Scenario 3B but for the same additional amenity. Significant increase in year on year capital expenditure during programme (affordability).
Operational expenditure and revenue income	**Advantages:** Some ability to reduce anticipated long term revenue expenditure. Some potential creation of revenue generative opportunities e.g. additional catering open to the public. **Disadvantages:** Some limitation to the opportunities for revenue generation.
Wider impacts	**Advantages:** Ability to establish a programme with a foreseeable skills and training legacy element. Programme can be set up and run as an exemplar of a scheme with a client in occupation. **Disadvantages:** Programme is longer than Option 3 and therefore impact to Palace / UK brand would be prolonged.
3B	
Operational risk/ impact	**Advantages:** Almost immediate reduction in business risk following decant. Disruption only due to decant in short term and upon reoccupation. Nuisance reduced given co-location at purpose built decant facilities. **Disadvantages:** Houses not co-located. Parliament entirely absent from PoW for prolonged period.
Schedule	**Advantages:** Greatest schedule certainty and very significantly reduced duration when compared to E1A, 2A and 2B. **Disadvantages:** No substantive disadvantages.
Scope	**Advantages:** Greater scope delivered. Significantly reduces the technical challenges associated with delivering the required Programme works. **Disadvantages:** Would not take full advantage of the opportunity created by full decanting to deliver significant enhancements to amenity as efficiently as possible.
Accommodating change (if desired)	**Advantages:** Full decant provides a good opportunity to support a step change if required. **Disadvantages:** Users may be more resistant to a sudden change that is not graduated. Note potential risk to tradition and heritage.
Capital expenditure	**Advantages:** Greatest cost and schedule certainty. **Disadvantages:** Very significant increase in year on year capital expenditure during programme (affordability).
Operational expenditure and revenue income	**Advantages:** Ability to reduce anticipated long term operational expenditure. Supports the creation of some revenue generative opportunities. **Disadvantages:** Opportunity for revenue income will not have been maximised.
Wider impacts	**Advantages:**Greatest ability to establish a programme with a foreseeable skills and training legacy element. Potential for wider UK benefit given scale of investment over limited period. Shortest impact on Palace / UK brand. **Disadvantages:** No substantive disadvantages.

Source: IOA Team analysis

3.7 Shortlisted Scenario overview

The key characteristics of the five shortlisted Scenarios have been summarised in the table below.

Table 9.3: Shortlisted Scenario overview (continued from previous page)

3C	
Operational risk/ impact	**Advantages:** Almost immediate reduction in business risk following decant. Short term Disruption only due to decant in and upon reoccupation. Nuisance reduced given co-location at purpose built decant facilities. **Disadvantages:** Houses not co-located. Parliament entirely absent from Palace of Westminster for prolonged period.
Schedule	**Advantages:** greatest schedule certainty and very significantly reduce duration as compared to E1A, 2A and 2B. **Disadvantages:** No substantive disadvantages
Scope	**Advantages:** Delivers the full scope of the restoration and renewal Programme including all defined additional amenities. Significantly reduces the technical challenges associated with delivering the required Programme works. **Disadvantages:** Few.
Accommodating change (if desired)	**Advantages:** Full decant provides a good opportunity to support a step change if required. **Disadvantages:** Users may be more resistant to a sudden change that is not graduated. Note potential risk to tradition and heritage.
Capital expenditure	**Advantages:** Greatest cost certainty. Little additional cost compared to 3B. **Disadvantages:** Very significant increase in year on year capital expenditure during programme (affordability).
Operational expenditure and revenue income	**Advantages:** Ability to reduce anticipated long term operational expenditure. Supports the creation of a broad range of revenue generative opportunities. **Disadvantages:** No substantive disadvantages.
Wider impacts	**Advantages:** Greatest ability to establish a programme with a foreseeable skills and training legacy element. Potential for wider UK benefit given scale of investment over limited period. Shortest impact on Palace / UK brand. **Disadvantages:** No substantive disadvantages

Source: IOA Team analysis

3.8 Shortlisted Scenario E1A

Delivery Option 1 could not meet the Programme Objectives. As a result, a variant (E1) to delivery Option 1 was developed, which allowed the Programme scope to be delivered, and forms the basis of the do minimum Scenario for the purpose of the downstream OBC.

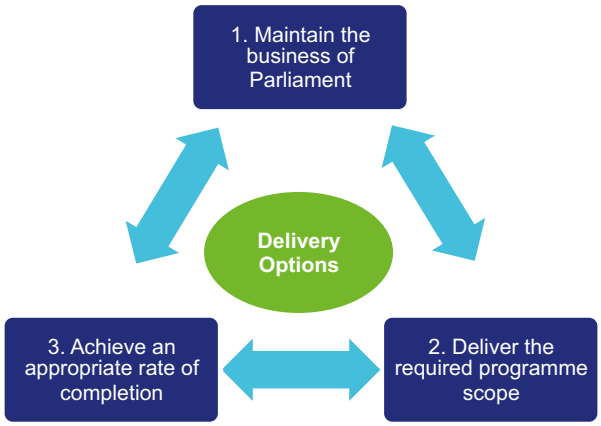
Introduction

- During phase one of the IOA, the appraisal of delivery Option 1 was based on the following definition set out by the Client Programme Team:
- A defined rolling programme of more substantial repairs and replacement over a long period but still working around the continued use of the PoW. This delivery Option reflected the traditional approach to maintenance (that remains unchanged since 1950), where particular access routes or offices might be closed off usually during a recess, but never in such a way as to interfere with the business of Parliament.
- The IOA team has assumed the summer recess would be a minimum of a continuous 10 week period per annum. However, if during the 10 week period Parliament were to be recalled in an emergency, then the assumption was to be that Parliament would be able to operate during the 10 week recess by occupying or jointly occupying alternative locations, but not within the PoW.

Programme requirements

- All of the delivery Options need to satisfy three absolute Programme requirements, which have been illustrated below.

Figure 12: Programme requirements



Source: IOA Team analysis

1. The delivery Option must ensure that the business of Parliament is never compromised or placed at unnecessary risk;
2. The required Programme scope of works is completed, i.e. that the Programme scope is delivered; and
3. The rate of completion is sufficient to complete the Programme in an appropriate timescale and therefore mitigates the risk of system or building fabric failure and irreversible damage to the building structure.

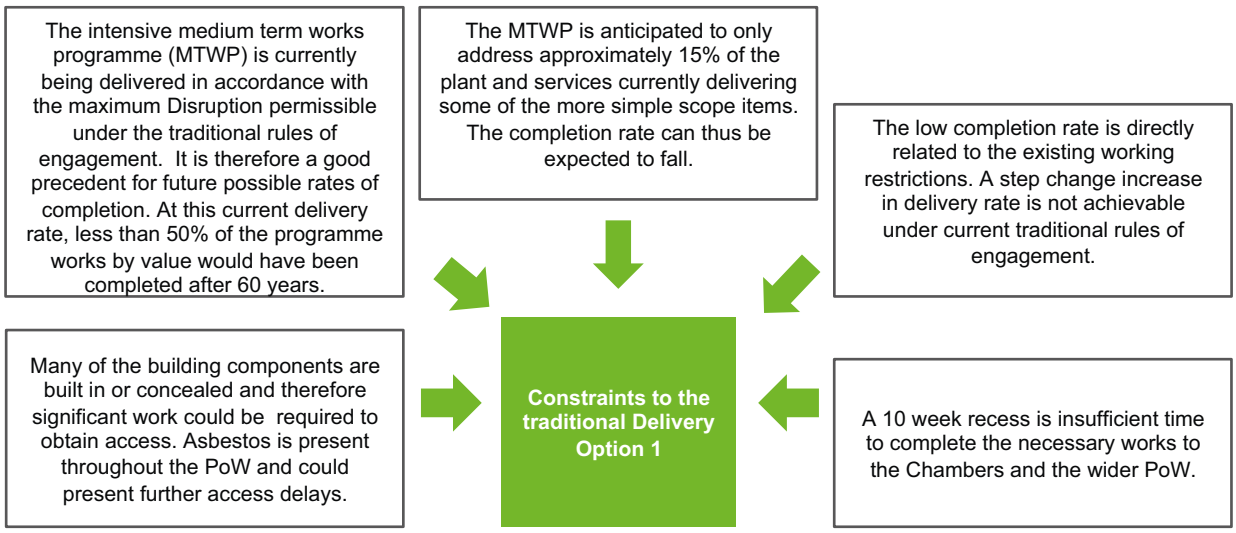
Why delivery Option 1, based on a traditional approach to maintenance does not satisfy these three key Programme requirements.

- The traditional approach to maintenance via delivery Option 1 cannot deliver the required Programme scope of work nor at the required rate of completion without disrupting the core business of Parliament.
- The reasons why this delivery Option is not suitable to address the Programme are outlined on the following page.

3.8 Shortlisted Scenario E1A

Delivery Option 1 could not meet the Programme Objectives. As a result, a variant (E1) to delivery Option 1 was developed, which allowed the Programme scope to be delivered, and forms the basis of the do minimum Scenario for the purpose of the downstream OBC.

Figure 13: Constraints of delivery Option 1

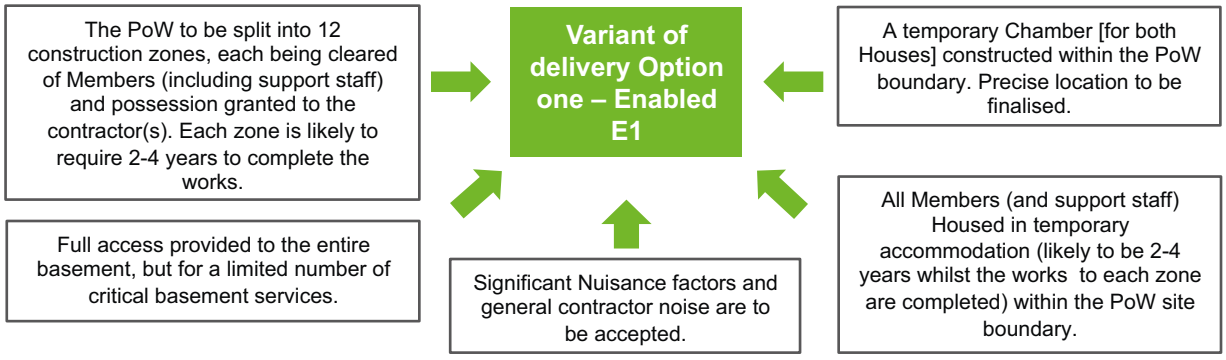


Source: IOA Team analysis

Delivery Option E1

- To create the variant of delivery Option 1, the IOA team focused on how the required rate of delivery of the Programme works could be achieved within a 60 year period to reflect HM Treasury Green Book guidance for analysing major infrastructure programmes by reducing or removing some of the current working constraints.
- To facilitate this process during Phase 1, the IOA team removed or amended the three key constraints to delivery that exist under the existing rules of engagement that prohibit the Programme works being delivered.
- The IOA team then remodelled delivery Option one to create delivery Option E1 based on the release of the following key constraints:
  - **Basement access:** The basement will need to be cleared of all non mechanical and electrical services and functions such as storage, workshops and offices. Furthermore, the majority of the existing services can be by-passed by the introduction of a significant (and potentially substantial) temporary services route, which are likely to be installed at ground level (ie through courtyards and passageways within the site boundary) of the PoW. A small number of critical basement services serving above ground facilities (such as catering) might need to stay in the basement, although this will be very much by exception only. It requires unrestricted access to the basement for a significant period (a number of years).
  - **Limited decant, but relocation to temporary accommodation:** The floors above ground will be subject to a series of limited temporary relocations (potentially on a zone by zone basis), using where possible, available parts (not including the basement) of the existing estate. As a general principle, the relocations will be kept to a minimum.
  - **Disruption:** the Members and users of the PoW will need to accept some form of additional Disruption, such as longer recesses or acceptance of contractor noise and Nuisance. Should the HoL choose to remain in their current Chamber during the R&R works programme (rather than make use of the temporary chamber required by the HoC) and they are recalled during a recess, they would have to relocate to an alternative site outside of the Palace.
- The image below highlights some of the key aspects of delivery Option E1.

Figure 14: Enabled 1A (E1A)



Palace of Westminster Restoration and Renewal Programme Independent Options Appraisal

Final Report
Volume 1

Chapter 4 – Evaluation and comparison

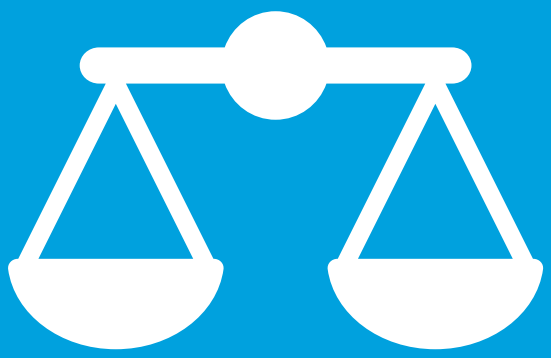
This final report (the "Final Report") has been prepared by Deloitte LLP ("Deloitte") for The Corporate Officer of the House of Lords and Corporate Officer of the House of Commons (Acting Jointly) in accordance with the contract with them dated 23rd December 2013 ("the Contract") and on the basis of the scope and limitations set out below.

No party other than The Corporate Officer of the House of Lords and Corporate Officer of the House of Commons (Acting Jointly) is entitled to rely on the Final Report for any purpose whatsoever and Deloitte LLP accepts no responsibility or liability or duty of care to any third party.

The Final Report has been prepared solely for the purposes of satisfying the 'Core Objective' of the Independent Options Appraisal as set out in the Contract i.e.: 'an independently produced costed options appraisal of the Scenarios, in order to enable Parliament to reach a well-founded decision in principle on the means of restoring and renewing the Palace of Westminster while maintaining business continuity.'

8 September 2014

4. Evaluation and comparison



4.1 Introduction and approach to evaluation

The seven Evaluation Criteria described in this section have been used as a framework for evaluation and comparison. They are derived from the Programme Objectives to provide consistency and alignment.

Introduction and approach to Scenario comparison and evaluation

- The Evaluation Criteria are derived from the Programme Objectives and they are used as a framework for comparison and evaluation.
- By comparing and evaluating in this way, it is possible to understand how each Scenario measures up against an appropriate set of cr`iteria, each of which are directly linked to the Programme Objectives. This section firstly compares the five Scenarios using each of the seven Evaluation Criteria in turn, before evaluating the Scenarios using a hypothetical balanced scorecard.
- The Evaluation Criteria are split into quantitative and qualitative criteria. A summary of the tier 1 (seven) and tier 2 (32) Evaluation Criteria are illustrated in the tables below.

Quantitative criteria –Tier 1 and tier 2

Table 10: Evaluation Criteria overview (quantitative)

Capital expenditure	Operational expenditure and revenue income	Wider impacts
• Total capital expenditure • Cash flow • Cost certainty	• Annual running cost and income • Long term view • Spend to save initiatives	• Exemplar programme • Programme awareness • Engage with citizens • Cultural and skills opportunities • UK wide impact

Source: IOA Team analysis

Qualitative criteria – Tier 1 and tier 2

Table 11: Evaluation Criteria overview (qualitative)

Operational risk/ impact	Schedule	Potential scope	Accommodating change (if desired)
• Risk to business continuity • Security • Health and safety • Disruption • Nuisance • Internal capacity and capability	• Schedule certainty • Pace and overall duration • Flexibility • Monitor and control • Speed of risk reduction	• Scope certainty • Extent of scope to be delivered • Build ability • Supply chain and market • Asset protection including heritage	• Environment • Technology • Business processes • Supporting changes in culture • Future proofing

Source: IOA Team analysis

The purpose of this section of the report is to:

- Compare each of the shortlisted Scenarios against the tier 1 and tier 2 Evaluation Criteria in turn noting that the IOA does not currently provide for a full and detailed analysis of each of the criteria in the same level of detail (as some of the information will be generated after completion of the IOA).

4.1 Introduction and approach to evaluation

The seven Evaluation Criteria described in this section have been used as a framework for evaluation and comparison. They are derived from the Programme Objectives to provide consistency and alignment.

Breakdown of section

- The table below outlines the structure of this section.

Table 12: Section overview

Scenario comparison based on the endorsed Evaluation Criteria	Sub section
• Capital expenditure	
• Capital expenditure comparison	4.2
• Capital expenditure profiling	4.3
• Inflationary impact of a deferred construction start date	4.4
• Impact on inflation of economic cycle extremes	4.5
• Capital expenditure risk provision	4.6
• Operational expenditure and revenue income	4.7
• Estimated whole life costs (not an Evaluation Criteria, but the summation of capital expenditure, operational expenditure and revenue income	4.8
• Wider impacts	4.9
• Operational risk/impact	
• Core operational considerations	4.10
• Core operational risks	4.11
• Schedule	
• Schedule overview	4.12
• Schedule: Construction schedule comparison	4.13
• Schedule: Pre-2020 activities	4.14
• Schedule risk	4.15
• Potential scope	
• Illustration of potential scope	4.16
• Potential scope: Outcome Level C+	4.17
• Accommodating change (if desired)	4.18

Source: IOA Team analysis

Table 13: Evaluation and benefits overview

Scenario evaluation and identified benefits	Sub section
• Scenario evaluation	
• Scenario evaluation: Evaluation Criteria	4.19
• Scenario evaluation: Illustrative analysis	4.20
• Identified benefits	
• Identified benefits: Cash releasing	4.21
• Identified benefits: Non cash releasing	4.22

Source: IOA Team analysis

4.2 Capital expenditure comparison

Scenario E1A requires the greatest capital investment in the works, with Scenario 3B requiring the least. The most significant cost differentials between these two Scenarios are inflation and risk, both of which are driven by the method of delivery (including duration), not by Outcome Level.

Introduction

- The total capital expenditure for each of the shortlisted Scenarios have been broken down into the sub categories set out below. This enables the reader to understand the component elements of the capital expenditure and also to assess where and how differences in capital expenditure are derived. All are based on P50 confidence levels.

Basis of preparation

- The baseline commencement date for all cost plan summaries is Q2 2014.
- The cost models are driven from a scope of works that has been set by the Client Programme Team and not by the IOA team. This scope of works assumes that the Medium Term Works Programme will have been completed by Q2 2020, and therefore the completion of any of these works is not included in the cost models within this report.
- To inform the capital expenditure data the IOA team has undertaken significant cost analyses including detailed and comprehensive comparisons with a wide range of other major construction and restoration programmes. Further details of these comparable programmes can be found in Volume 2, Appendix A.4: Details of Comparable Programmes/Projects.
- A full breakdown of each cost plan summary can be found in Volume 2, Appendix A.1: Supporting Capital Expenditure Information.

Scenario Comparison – Key findings

- Scenario E1A requires the most significant capital investment in the works and Scenario 3B the least.
- Differences in Capital cost between scenarios are substantially driven by the method of delivery (i.e. Option 1, 2 or 3) and not by Outcome Level (i.e. Outcome Levels A, B or C).
- Delivery Option 1 takes considerably longer than other delivery Options and is substantially more complex and risky. Scenario E1A could take 26 years longer than 3C and would be delivered within a fully operational building. Therefore the schedule and risk associated with the method of delivery increases the level of capital expenditure.
- Delivery Options 2 and 3 require decant buildings to be made available. The figures below indicate the net capital expenditure to the Programme of decant accommodation after buildings have been secured, occupied and then sold, with a capital receipt offsetting the cost of purchase and the proceeds of sale returning to the balance sheet at completion. Therefore the actual cash required to deliver the Programme under delivery Option 2 and 3 would be greater than indicated below. The value of the receipt would also be dependent on property values at the time of the disposal.
- The greatest cost driver is the increasing delivery complexity and duration across the delivery Options, from 3 through to E1 (associated with the accompanying increased levels of occupancy and access restrictions), as opposed to the increased scope and enhancement of the Outcome Levels. A breakdown of the capital expenditure (based on P50 confidence levels and in £bn) is shown in the table below.

Table 14: Total capital expenditure (at 2Q 2014 prices)

Category	Scenario E1A	Scenario 2A	Scenario 2B	Scenario 3B	Scenario 3C
Construction works	£0.83	£0.73	£0.84	£0.72	£0.81
Construction delivery	£0.42	£0.32	£0.37	£0.24	£0.27
Programme management	£0.34	£0.30	£0.33	£0.27	£0.29
Inflation	£1.60	£0.84	£0.95	£0.67	£0.74
Risk	£1.46	£0.91	£1.02	£0.72	£0.80
Sub total (excl Decant)	£4.65	£3.10	£3.51	£2.62	£2.91
VAT	£0.93	£0.62	£0.70	£0.52	£0.58
Sub total (incl VAT)	£5.58	£3.72	£4.21	£3.14	£3.49
Decant /reoccupation	£0.09	£0.22	£0.22	£0.38	£0.38
Total (£bn) (Incl decant)	£5.67	£3.94	£4.42	£3.52	£3.87

Source: IOA Team analysis

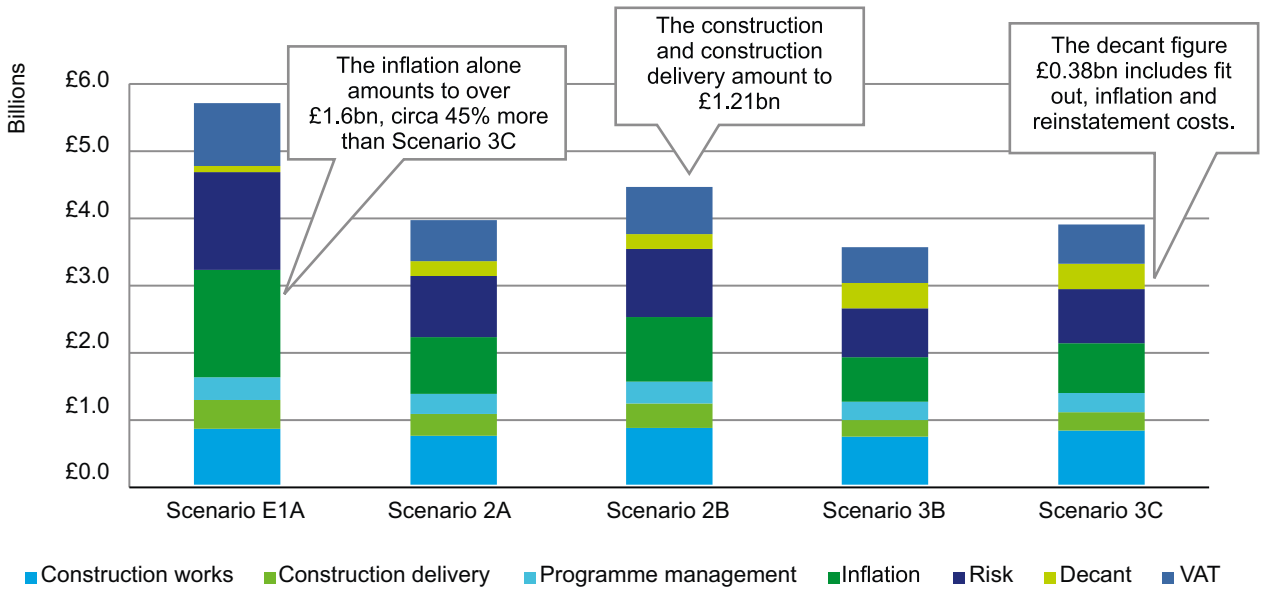
4.2 Capital expenditure comparison

Scenario E1A requires the greatest capital investment in the works, with Scenario 3B requiring the least. The most significant cost differentials between these two Scenarios are inflation and risk, both of which are driven by the method of delivery (including duration), not by Outcome Level.

Summary of capital cost comparisons – based on P50 confidence

- The following bar chart illustrates the capital cost comparison between the shortlisted Scenarios.

Figure 15: Summary of capital expenditure



Source: IOA Team analysis

Observations – based on P50 confidence

- Construction Works: There is a relatively narrow spread between the cost of construction works between all Scenarios. This is principally because there is little differentiation between Outcome Levels A, B or C. For example Outcome Level A (included in all Scenarios) includes all of the internal fabric refurbishment and the complete replacement and renewal of all of the mechanical, electrical and plant (MEP) services.
- Construction Delivery: Although in absolute terms, this element is a relatively small proportion of the total costs, Construction Delivery costs vary significantly as a direct product of the delivery approach. Cost drivers include extended schedule, access to the construction zones (constrained in delivery Options 1 and 2 as a result of the continued occupancy), more complex logistics (as occupancy management becomes more significant), and the phasing of works.
- Programme Management (Professional Fees): There is limited differentiation between the Scenarios. This will in due course be driven by the preferred Delivery Option. Thus these fees have not been finalised as part of the IOA.
- Inflation: The significant differences in inflation are substantially driven by the extended Schedules associated with different delivery approach. E1A may take 32 years to deliver compared with six years for Scenario 3C. The impact of inflation is much greater on Scenario E1.
- Risk: This is a significant differentiator and could be 100% higher for capital expenditure under delivery Option 1 than for delivery Option 3. This is principally a product of the impact of the continued occupancy at the PoW during the delivery of Options 1 and 2.
- Decant: Decant costs are greatest under Delivery Option 3, which assumes two decant buildings are available, whilst delivery Option two assumes that only one building is available. Scenario E1A does not require the acquisition of decant buildings, but it does assume the creation of a significant volume of temporary buildings on the PoW site including the creation of a temporary Chamber.
- VAT: VAT has a simple multiplier (20%) affecting all Scenarios.

4.3 Capital expenditure profiling

The five shortlisted Scenarios have differing programmes and capital expenditure profiles. Given the unique nature of the Palace, the capital expenditure has been assessed against relevant reference projects on an elemental basis to provide appropriate comparisons

Capital expenditure profiles

- The capital expenditure financial profiles for each Scenario (based on the P50 confidence levels and the most likely Programme) are compared below over the duration of the relevant schedule periods (in groups of five years). The costs illustrated below are actuals for each period (in £bns) and include decant, reoccupation and VAT.
- The cashflow start date (i.e. year zero) is Q3 2014. Years 1 – 5 for delivery Options 2 and 3, require a substantial element of the expenditure, which would be necessary to secure available decant buildings.

Table 15: Capital expenditure cashflow (£bn)

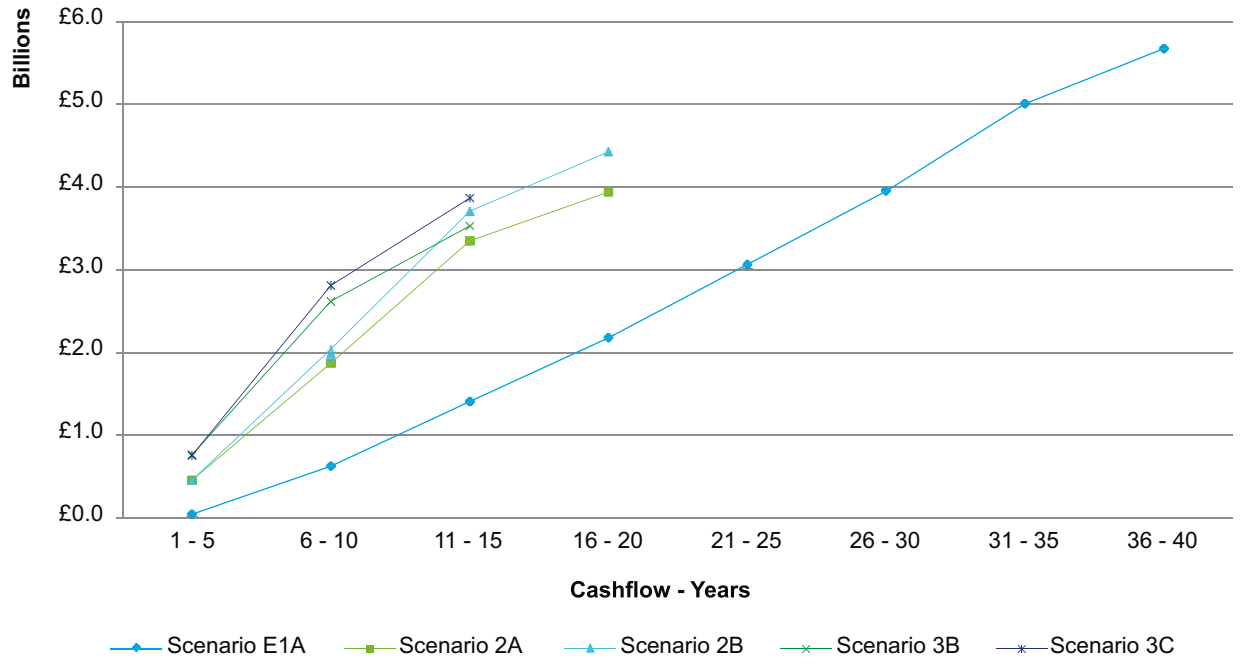
Scenario	Years 1 - 5	Years 6 – 10	Years 11 – 15	Years 16 – 20	Years 21 – 25	Years 26 – 30	Years 31 – 35	Years 36 – 40	Total
E1A	£0.04	£0.59	£0.77	£0.78	£0.8	£0.89	£1.05	£0.67	**£5.67**
2A	£0.45	£1.42	£1.47	£0.60	-	-	-	-	**£3.94**
2B	£0.45	£1.59	£1.67	£0.71	-	-	-	-	**£4.42**
3B	£0.76	£1.86	£0.90	-	-	-	-	-	**£3.52**
3C	£0.76	£2.04	£1.07	-	-	-	-	-	**£3.87**

Source: IOA Team analysis

Summary of capital cost expenditure profile (cumulative)

- The following expenditure profile illustrates the capital cost spend profile over the appropriate P50 programme durations for the shortlisted Scenarios.

Figure 16: Capital expenditure cashflow



Source: IOA Team analysis

4.3 Capital expenditure profiling

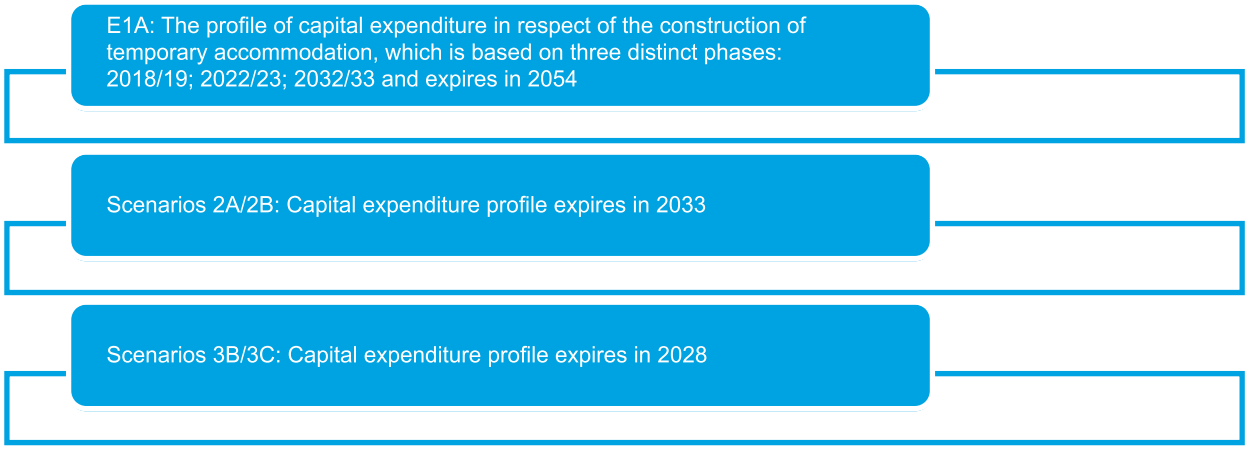
The five shortlisted Scenarios have differing programmes and capital expenditure profiles. Given the unique nature of the Palace, the capital expenditure has been assessed against relevant reference projects on an elemental basis to provide appropriate comparisons

Key findings

- The specific key findings in respect of the capital expenditure profiles are summarised below:
  - The costs shown include decant and reoccupation expenditure;
  - The sales receipts (received from the sale of the decant buildings, assuming the accommodation is surplus to PoW requirements) are reflected;
  - Scenarios 3B and 3C have a large capital outlay profiled in the first five years in respect of the purchase and fit out of two decant buildings;
  - Scenarios 2A and 2B have a similar early outlay but in respect of only one decant building; and
  - Scenario E1A shows a more linear profile as there is no separate decant building within the scope. The capital expenditure profile in the first five years is relatively small at only £43m (£8.6m per annum);

- A summary of the capital expenditure profile expiry dates for each delivery Option is outlined below.

Figure 17: Capital cost cashflow expiry dates



Source: IOA Team analysis

4.4 Inflationary impact of a deferred construction start date

The IOA report is based upon an assumed start date for the construction works of Q2 2020. If that date were deferred by five years, there would potentially be a significant additional inflationary impact ranging from £311m (E1A) to £444m (3C). The latter would equate to c.£22m per quarter.

Introduction

- The IOA team assessed the potential inflationary impact of a deferred construction start date i.e. Q2 2020 not being achieved. One Parliamentary term (currently a period of 5 years) was adopted as the assumed deferred period and to determine what effect such a delay could have on the potential outturn costs of the Programme.
- In calculating the deferred inflationary impact, the IOA team used industry standards and guidance from HMT Green Book. The basis of inflation preparation and the potential impact of a delayed Programme (construction start date) are set out below.

Basis of inflation preparation

- Throughout the IOA report, inflation has been calculated by reference to industry data published by the RICS Building Cost Information Service (BCIS), using its all in tender price inflation (TPI) index. Tender prices represents the cost to the Client, or the equivalent price paid for building and construction work.
- A key feature of the BCIS TPI is the consistent basis of calculation. The use of a consistent assessment approach began 40 years ago which measured the trend and level of contractor pricing contained within accepted tenders for construction work. The IOA team has analysed the same 40 year period of data, including three distinct economic cycles to help forecast the applicable inflation for the Programme (i.e. at P10, P50 and P90 confidence levels).
- Inflation for all calculations has been expressed as a compound annual growth rate (CAGR) over a defined period of time.
- The uncertainty in inflation forecasting has been approached by using the same confidence levels as applied to the risk calculations.

Table 16: Inflation confidence levels

P10 – 2.72%	P50 – 3.64%	P90 – 5.79%

Source: IOA Team analysis

- Further inflationary information can be found in Volume 2, Appendix A.2: Supporting Inflation Information.

Inflationary impact of a five year delay

- If the assumed Programme construction period start date is not achieved, the impact on the capital expenditure and in turn the whole life costs could be significant. The table below outlines the effects on the capital expenditure for each of the Scenarios (using the P10 –P90 range) if the Programme construction period is delayed by one Parliamentary term i.e. a period of five years and the construction works would not commence until Q2 2025.

Table 17: Summary of real term cost inflation

Actual cost (capital expenditure)	P10 (£m)	P50 (£m)	P90 (£m)
E1A	£515	£737	£1,097
2A	£433	£578	£920
2B	£491	£656	£1,043
3B	£392	£526	£835
3C	£433	£578	£922

Source: IOA Team analysis

- The table below presents the inflationary impact on each of the Scenarios albeit on a net present cost basis i.e. discounted at a rate of 3% per annum.

Table 18: Summary of NPC inflation

Net present cost (capital expenditure)	P10 (£m)	P50 (£m)	P90 (£m)
E1A	£232	£311	£493
2A	£286	£382	£608
2B	£324	£433	£689
3B	£306	£407	£646
3C	£332	£444	£706

Source: IOA Team analysis

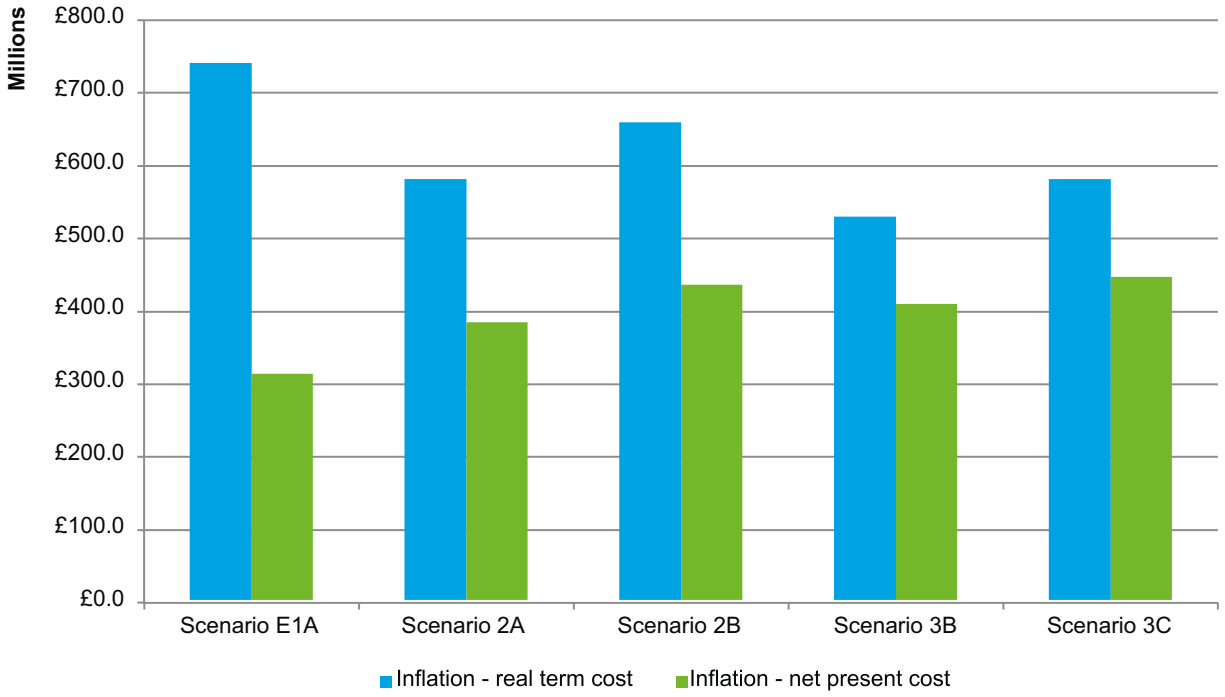
4.4 Inflationary impact of a deferred construction start date

The IOA report is based upon an assumed start date for the construction works of Q2 2020. If that date were deferred by five years, there would potentially be a significant additional inflationary impact ranging from £311m (E1A) to £444m (3C). The latter would equate to c.£22m per quarter.

Inflationary impact for each Scenario

- The inflationary figures have been analysed over a five year basis to understand the potential impact of future inflation on the Programme. The graph below presents the overall finding of the inflationary impacts based on the P50 capital and net present cost inflationary figures. The below figures include all decant and reoccupation costs and VAT.

Figure 18: Five year inflationary impact



Source: IOA Team analysis

- The equivalent quarterly and monthly costs on the assumed construction start date being delayed by five years (based on the P50 net present cost inflation figures over a five year period) for each of the Scenarios is summarised in the table below:

Table 19: Short term inflationary impact

Scenario	Per quarter	Per month
E1A	£15.55m	£5.18m
2B	£19.10m	£6.36m
2C	£21.65m	£7.21m
3B	£20.35m	£6.78m
3C	£22.20m	£7.40m

Source: IOA Team analysis

4.5 Impact on inflation of economic cycle extremes

CAGR is sensitive to the economic cycle. Delivery Options 2 or 3 could coincide with peaks or troughs in the economic cycle whereas Delivery Option 1 would span several cycles thereby offsetting the impact of any inflationary extremes.

Summary rationale

- Whilst a long term approach to calculating allowances for the effects of inflation has been adopted (as set out in Appendix 2 A. 2), it is acknowledged that the cost of the R&R Programme could be impacted by the uncertainty of the UK economic cycle.
- This page sets out the inflationary impact of delivering the R&R programme during a particularly significant upswing or downturn in the economic cycle. The impact of these theoretical extremes have not included with the IOA Report, but are presented here for completeness.

Approach to a varied compound annual growth rate

- The approach taken to inflation throughout the main body of this Final Report has been to calculate an allowance by reference to industry data, published by the RICS Building Cost Information Service. By examination of the Tender Price Inflation (TPI) it was possible to generate a long term CAGR view, which was used to calculate the inflation figures.
- The IOA team recognises and acknowledges the shorter schedules for delivery Options 2 and 3. In theory, much wider extremes of inflation could be felt if the Programme happened to coincide with the extremes of an inflationary cycle. Over the past 40 years there have been three distinct economic cycles.
- The alternative approach and the associated figures below, take into account the duration of each Scenario and the extremes of both low (P10) and high (P90) compound annual growth rates over a matching period of time. Whilst using the long term CAGR is a sound basis for calculations, the tables below indicates possible inflation outcomes using this revised approach.
- Scenario E1A has not been reassessed as the anticipated schedule (i.e. 32 years) is much longer meaning that the short term extremes of inflationary cycles would not impact the Scenario.
- The varied compound annual growth rates (CAGR) for delivery Options 2 and 3 are as follows.

Table 20: Varied Compound Annual Growth Rates

	P10	P90
Delivery Option 2: Analysed time period 17 years	2.17%	8.22%
Delivery Option 3: Analysed time period 12 years	1.16%	8.77%

Source: IOA Team analysis

- Further inflationary information can be found in Volume 2, Appendix A.2: Supporting Inflation Information.
- The table below presents the capital cost figures based on the revised approach of calculating the CAGR for each of the delivery Option 2 and 3 Scenarios. The P10 figures represent a potential saving in inflation (based on the adopted approach), however the P90 represents potential additional costs arsing from inflation.

Table 21: Potential real term inflation

Capital expenditure	P10 (£m)	P90 (£m)
2A	(£151)	£675
2B	(£173)	£764
3B	(£342)	£653
3C	(£381)	£728

Source: IOA Team analysis

- The following table presents the findings from the revised approach based on the net present cost outcome.

Table 22: Potential Net Present Cost of Inflation

	P10 (£m)	P90 (£m)
2A	(£100)	£446
2B	(£114)	£505
3B	(£262)	£500
3C	(£292)	£558

Source: IOA Team analysis

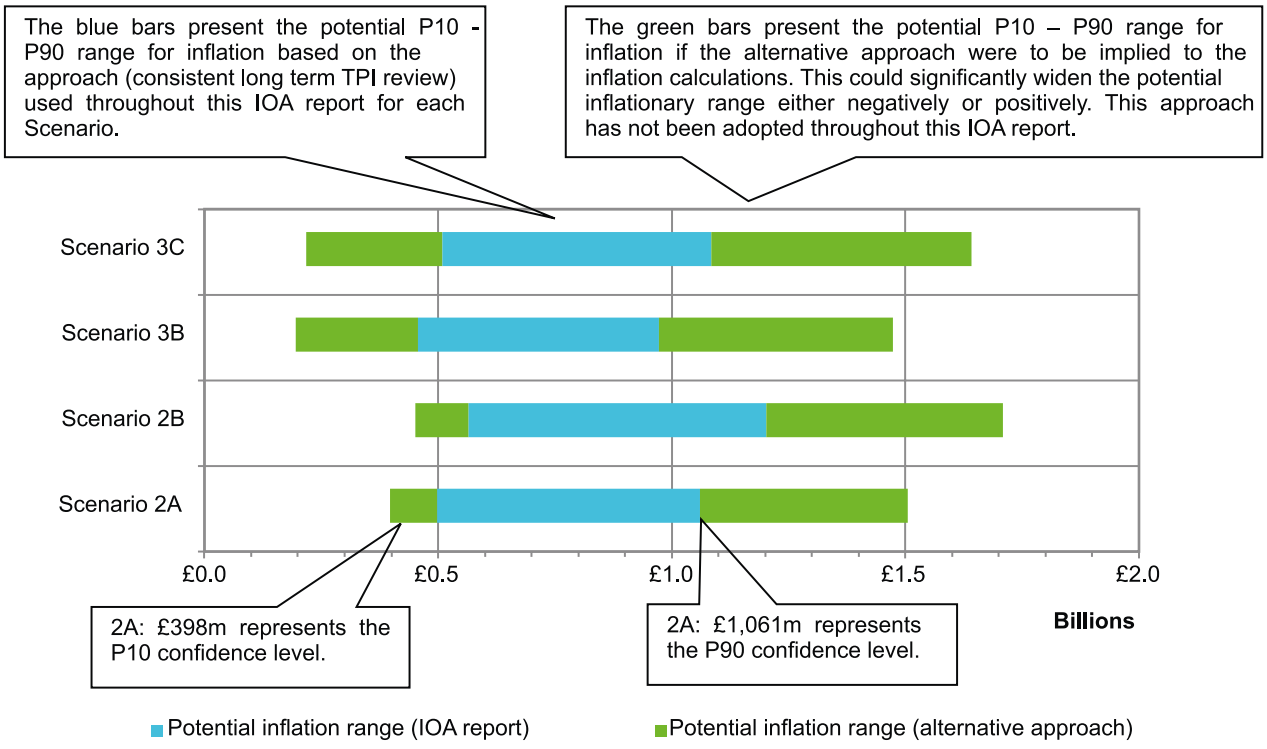
4.5 Impact on inflation of economic cycle extremes

CAGR is sensitive to the economic cycle. Delivery Options 2 or 3 could coincide with peaks or troughs in the economic cycle whereas Delivery Option 1 would span several cycles thereby offsetting the impact of any inflationary extremes.

Inflationary impact on delivery Options 2 and 3

- The inflationary figures have been calculated using the shortened analysed time periods, reflecting the overall schedule for delivery Options 2 and 3 to understand the potential impact of future inflation on the Programme. The graph below presents the inflationary impacts of the alternative approach, using discounted net present costs and based on P50 confidence levels figures. The below figures include all decant and reoccupation costs and VAT.

Figure 19: Alternative inflation range



Source: IOA Team analysis

- The table below outlines the range of net present cost inflationary figures for the two delivery Options based on the alternative inflationary approach other than the approach based throughout this report.

Table 23: Alternative inflation summary

Scenario	Adopted inflationary approach throughout the IOA (blue bars shown above) (Base Case) (£m)		Alternative inflationary approach not adopted for the purposes of the IOA (green bars shown above) (Alternative Case) (£m)	
	P10	P90	P10	P90
2A	498	1,061	398	1,506
2B	565	1,203	451	1,708
3B	457	973	195	1,473
3C	510	1,084	217	1,642

Source: IOA Team analysis

- The IOA team has not adopted this alternative approach. We have reported on the basis of Section 4.4, in order to provide a clear, simple consistent approach to the assessment of Scenarios. It may be appropriate to consider the alternative approach as part of the next stage of work necessary to inform the OBC.

4.6 Capital expenditure risk provision

Risk provisions have been calculated for each Scenario to support the assessment of total costs. Nine key construction risks apply across all of the delivery Options. The risk provision has been prepared using HM Treasury Green Book guidance

Introduction

- Risk management is an integral element of the IOA and has been considered from an early stage. The objective was to determine a risk premium at different levels of confidence for each of the Scenarios using a consistent and structured approach. This was obtained by holding a series of risk workshops, risk reviews and qualitative analysis that helped to inform the quantitative analysis which led to the results summarised below.
- A risk provision produces an allowance for the Programme as a whole and supports contingency planning. By including the risk provision in the capital expenditure, the outturn budget is made more realistic. The risk provision is assessed by running a Quantitative Risk Assessment (QRA) which allows the preparation of HM Treasury recognised three point estimates using different confidence levels.

Risk approach

- In order to provide tangible risk cost outputs at the earliest opportunity, a pro-active approach to risk management was adopted, focusing initially on identifying the quantum of risks through a number of risk workshops. The risks were scored qualitatively using cost and time impacts and the information was captured in the form of high-level risk assessment registers. A separate risk register for each Scenario can be found in Volume 2, Appendix A.5: Supporting Cost Risk Information.

Risk quantification

- The QRA was based on the qualitative risk analysis carried out in the workshops. Probability assessments were converted into percentages according to the agreed scales and cost assessments were converted into three point estimates based on the agreed scales.
- A Monte Carlo Simulation of risks was performed based on 10,000 iterations of the cost and risk model. The individual risk outputs were then collected and expressed as a graph illustrating the P10, P50 and P90 confidence levels. The QRA produces a risk provision for the Programme as a whole, not simply for each risk. The Monte Carlo Simulation findings are presented within Volume 2, Appendix A.5: Supporting Cost Risk Information.

Key risks

- The key construction risks for each of the delivery Options are as follows.

Table 24: Key construction risks

	Key construction risks (sample - refer to Risk Register)
Delivery Option E1A	1. Stakeholders accept a 'terms of engagement' agreement to put up with more Disruption from construction work than is currently experienced, but consider day to day changes unacceptable and seek changes to planned construction activities. 2. Increased risk of failure of old mechanical and electrical services as they are required to operate for a greater length of time. 3. Insufficient, inadequate or unacceptable swing space to facilitate the required temporary accommodation within the PoW boundary
Delivery Option 2: both Scenarios	1. Decant and temporary accommodation strategy and process is more demanding than originally anticipated: • Decant / temporary accommodation space unavailable; • Relocation site is unsuitable; • Relocation site is not adjacent with other parts of the same function; and • Relocation site is outside the time / travel distance. 2. Failure to manage major stakeholder engagement (e.g. Westminster City Council, pressure groups, users) 3. Cannot define / finalise scope, e.g. failure to agree level of repairs to heritage work (e.g. standard to be adopted, stabilisation, cleaning or renovation)
Delivery Option 3: both Scenarios	1. The decant and temporary accommodation strategy is more demanding than originally anticipated • Decant and temporary accommodation space is unavailable or unsuitable; and • Relocation site has unsuitable adjacencies or outside the required travel distance time. 2. Late changes by the Client or unclear Client brief at pre-construction stage due to large number of potential briefing individuals and potentially multiple client bodies. 3. Unable to obtain specialist skills, for e.g. stonework, fibrous plaster, joinery.

Source: IOA Team analysis

4.6 Capital expenditure risk provision

Risk provisions have been calculated for each Scenario to support the assessment of total costs. Nine key construction risks apply across all of the delivery Options. The risk provision has been prepared using HM Treasury Green Book guidance

Risk provisions

- The table below summaries the risk provisions for each Scenario at the various confidence levels, and should be read in conjunction with Volume 2, Appendix E.7: Master Data Assumption List and Volume 2, Appendix A.5: Supporting Cost Risk Information.
- The costs outlined in the table below exclude VAT, decant and reoccupation costs.

Table 25: Risk provisions

Scenario	Confidence level	Construction (inc. construction delivery)	Programme	Total	Percentage of capital expenditure
		£m	£m	£m	
E1A	P10	1,098	116	1,214	38%
	P50	1,319	139	1,458	46%
	P90	1,542	162	1,704	53%
2A	P10	640	88	728	33%
	P50	795	110	905	41%
	P90	945	130	1,075	49%
2B	P10	724	95	819	33%
	P50	900	118	1,018	41%
	P90	1,070	140	1,210	49%
3B	P10	487	70	557	29%
	P50	632	91	723	38%
	P90	768	111	879	46%
3C	P10	541	75	616	29%
	P50	702	97	799	38%
	P90	853	118	971	46%

Source: IOA Team analysis

Risk findings

- Risk allowances were applied to the construction, construction delivery and programme management elements of the capital expenditure and based on the inputted risk data, the confidence ranges were calculated. A summary of the ranges are set out below to generate a clearer understanding of the specific risk profile for each Scenario:
  - Scenario E1A: P10 £1,214m / 38% to P90 £1,704m / 53%
  - Delivery Option 2 (both Scenarios): P10 £728m / 33% to P90 £1,210 / 49%
  - Delivery Option 3 (both Scenarios): P10 £557m / 29% to P90 £971m / 46%
- As a comparison, a high level review has been undertaken of the risk allowances for other major programmes at a similarly early stages in their planning process. This confirmed that for two of the London 2012 Olympic venues, the risk allowances ranged between 23% and 36% at this level of programme maturity. For both phases of a major rail infrastructure programme at a similar level of maturity, the risk allowance was 34% to 66%.
- The delivery Option 3 risk provision has been checked using HM Treasury Green Book guidance for Optimum Bias. The Contributory Factors for a Non Standard Building were firstly checked for alignment with the Risk Register and then adjusted to reflect the anticipated PoW Restoration and Renewal Programme. The resulting percentage was 38% which correlates with the QRA results at P50. A statutory single client is assumed.
- Outcome Level C and to some extent Outcome Level B are still relatively undeveloped and require further analysis beyond the IOA. An element of design uncertainty risk therefore exists until such time as the scope becomes clearer. The allowance at this stage in the life of the programme might exceed normal expectations of contingency because some management actions have yet to be identified or completed.

4.7 Operational expenditure and revenue income

Facilities management operational costs are divided between hard and soft services. The current annual running costs at the PoW are significant and exceed £44m. Greater and earlier opportunities to reduce the operational costs at the PoW arise in delivery Options 2 and 3.

Introduction

- The existing FM costs have been provided by the relevant teams within PED for the PoW.
- For the purpose of this IOA report, the FM costs have been split into hard services and soft services. The tables below summarise the categories of each service.

Table 26: Overview of FM provision

Hard services (asset related services)	Soft services (personnel services)
Mechanical and electrical	Security, helpdesk and porters
	Cleaning, catering and pest control
Building fabric maintenance (including carpenters, plumbers, painters, glaziers, curtain makers and clock specialists)	General grounds maintenance and waste collection
	Post room and printing facilities

Source: IOA Team analysis

- The FM operational costs (including the hard and soft services) were analysed to establish the specific impacts and key differences in each of the Scenarios during the Programme. The total annual FM operational costs are shown in the table below together with a breakdown on a per square metre basis.

Table 27: Breakdown of Annual FM costs at the PoW (excluding FM cost associated with temporary and decant space)

Category	Scenario E1A	Scenario 2A	Scenario 2B	Scenario 3B	Scenario 3C
Hard Services	£18.40m £153.69 psm	£12.20m £101.94 psm	£12.22m £101.94 psm	£3.01m £25.14 psm	£3.22m £25.14 psm
Soft Services	£52.01m £434.27 psm	£34.11m £284.83 psm	£34.16m £284.83 psm	£16.03m £133.68 psm	£17.16m £133.68 psm
Total	**£70.42m £587.96 psm**	**£46.32m £386.77 psm**	**£46.39m £386.77 psm**	**£19.05m £158.83 psm**	**£20.39m £158.83 psm**

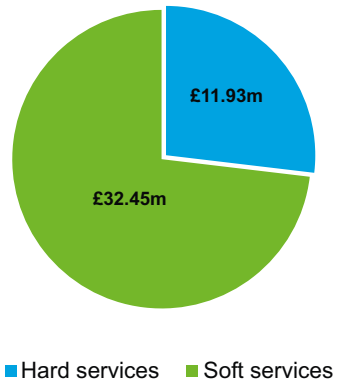
Source: PED and IOA Team analysis

- All of FM operational costs are inflated from Q2 2014 to Q2 2020 using the RPI inflation rate of 2.5% from current costs.
- There are a number of operational services than have not been included in the FM costs as these are not considered by PED as facilities management costs and should be accounted for elsewhere. These include Hansard, broadcasting, hairdresser, flower shop, gift shop, visitor services and furniture maintenance and storage.
- Under Scenarios 2A, 2B, 3B, and 3C, a proportion of the annual FM costs are displaced to the decant and temporary accommodation and are not reflected in the above table.

Summary

- The specific key findings have been summarised below.
- Total current costs for the FM service per annum at the PoW are:
  - Hard Services: £11.93m;
  - Soft Services: £32.45m;
  - Total: £44.38m
- Scenario E1A: There is a potential adverse impact on the current cost of FM.
- Scenarios 2A and 2B: FM costs at the PoW could reduce by approximately 40% during the construction period; and
- Scenario 3B and 3C: Many of the FM services will not be required during the Programme, thus creating immediate cost savings. However, a minimum level of services will need to be retained, including the necessary levels of security, full pest control and general grounds maintenance services.
- Following the completion of the Programme, some of the FM costs at the PoW will return to the current costs if the service level is retained. A full review will need to be completed during the latter stages of the Programme.
- All FM costs are based on a set of assumptions that are described in detail in Volume 2, Appendix E.7.

Figure 20: Current Annual FM costs at the POW



Source: IOA Team analysis

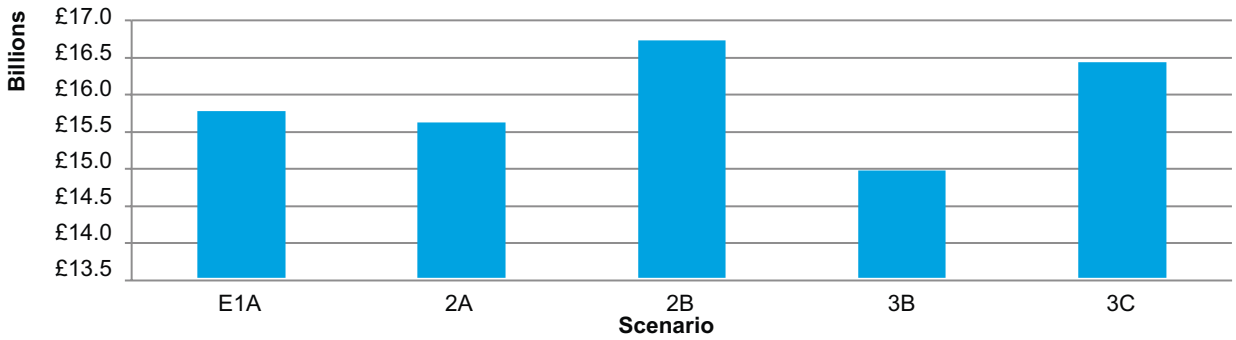
4.7 Operational expenditure and revenue income

Facilities management operational costs are divided between hard and soft services. The current annual running costs at the PoW are significant and exceed £44m. Greater and earlier opportunities to reduce the operational costs at the PoW arise in delivery Options 2 and 3.

Summary of operational expenditure comparisons

- The following bar chart illustrates the differences in operational expenditure based on P50 (including facilities management and lifecycle replacement expenditure) at the PoW during the Programme (based over a 60 year period) between the Scenarios.

Figure 21: Summary of total operational expenditure.



Source: IOA Team analysis

Key findings

The specific key findings have been summarised below:

- The additional area (c. 15,000 sq m) and the installation of modern plant and services create the additional operational expenditure in Scenarios 2B and 3C. The additional costs amount to c.10% of Scenarios 2A and 3B. As FM costs are directly related to size of the building, the FM costs are likely to be marginally less for Option 3B compared to 3C due to the reduced floor area of the PoW.
- The FM costs for Scenarios 3B and 3C are likely to be lower as the service requirements are significantly reduced at the PoW during the Programme compared to Scenarios E1A, 2A and 2B.
- Most of the operational cost data was provided by PED.
- Once a detailed strategy for the FM operational costs has been established (including suitable decant buildings), further due diligence should be undertaken to address how the costs will be impacted.

Revenue income – key findings

- Most of the Houses' revenue income (c.£13m per annum as at FY13) is derived from either food and beverage related activity at the various outlets across the PoW or from visitor related activities i.e. tours, souvenir sales and guidebooks. Other revenue income streams directly related to the PoW include filming rights.
- All figures have been provided by HoC Finance.
- The impact of the various Scenarios on these revenue income streams has been considered at a high level and is summarised below.

Table 28: Overview of revenue income.

Scenario	Potential impact whilst Programme underway	Potential impact following completion of programme
E1A	Limited impact on revenue income streams as PoW remains mostly occupied.	No impact on revenue income streams as amenities remain unchanged.
2A	Potential reduction in visitor related revenue income streams. No impact on food and beverage related income, as this would be displaced.	No impact on revenue income streams as amenities remain unchanged.
2B	Potential reduction in visitor related revenue income streams. No impact on food and beverage related income, as this would be displaced.	Limited positive impact on revenue income streams given modest improvements in amenities.
3B	Potential material reduction in visitor related revenue income streams as the PoW is closed for a period of time. No impact on food and beverage related income, as this would be displaced.	Limited positive impact on revenue income streams given modest improvements in amenities.
3C	Potential material reduction in visitor related revenue income streams as the PoW is closed for a period of time. No impact on food and beverage related income, as this would be displaced.	Significant positive impact on revenue income streams given material improvements in amenities.

Source: IOA Team analysis

4.8 Estimated whole life cost

The highest inflated whole life cost is for Scenario E1A at £21.42bn (P50). However, the impact of discounting over a 60 year period reduces this figure to £7.89bn (P50) on a NPC basis, which is lower than all the other Scenarios. Scenarios 2B and 3C carry the highest NPC at c.£9.10bn (P50)

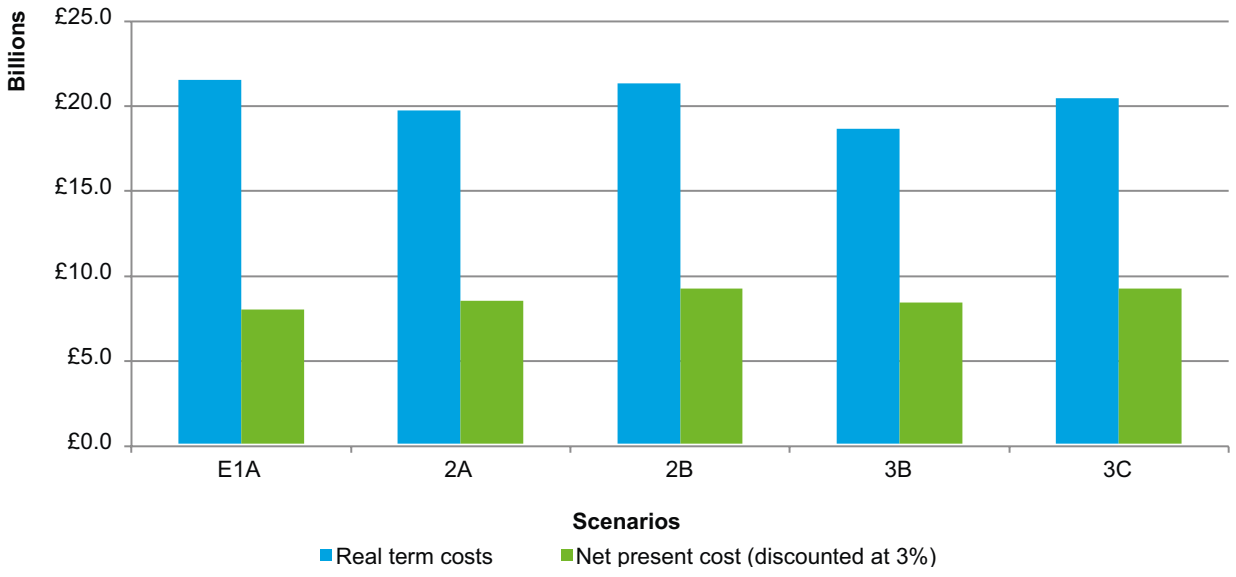
Components of whole life cost assessment

- The whole life model profiles have been constructed to provide a view at varying risk levels of the likely outturn cost for each Scenario. The capital cost plans have been developed into a lifecycle profile over an agreed 60 year period taking into consideration the capital replacement of the PoW fabric and services components; ongoing requirement for hard facilities management services (maintenance) and operational soft facilities management services delivery both during the Programme and in subsequent steady state once the Programme has completed.
- The IOA team has given consideration to the varying levels of programme risk for both capital works and the ongoing lifecycle replacement works programme beyond the Programme.
- In all cases, the projected costs include an allowance for inflation over the assessment period of 60 years and then discounted to provide a net present cost comparison over the period.
- After completion of the R&R programme it has been assumed that an ongoing lifecycle replacement regime will be consistently applied across all Scenarios.

Programme expenditure comparison

- For each of the Scenarios, the combined capital and operational expenditure (including lifecycle replacement and facilities management costs) have been added together and the P50 confidence level.
- These results have been presented graphically over the assessment period (60 years) to compare the real term cost of the Programme and the net present costs (discounted at 3%) to understand a potential budgetary figure for the entire Programme. It also allows like for like comparison between Scenarios which have significantly different profiles and durations.

Figure 22: Overview of Whole Life Costs



Source: IOA Team analysis

Summary

The specific key findings have been summarised below:

- The long term application of inflation and risk factoring has considerable impact on the outturn costs both in the cumulative inflated expenditure and within the net present costs calculated spend profiles.
- Scenario E1A has the greatest sensitivity to risk.
- The marginal difference between the real term cost and the net present costs is at its greatest level in Scenario E1A (amounting to approx. £13bn). This is principally due to the prolonged amount of time over which Scenario E1A is being delivered and therefore the capital expenditure requirements being spread over the 32 year schedule.
- As elements of the capital works will not be implemented for many years (if Scenario E1A is adopted), at face value today, the cost of such works today will be less as the capital expenditure is not immediately required. However, in deferring the capital expenditure the inherent business continuity risks are likely to remain in place and could increase over time (i.e. the chances of catastrophic failure (of a core building service) is likely to continue to increase over time. The opportunity to realise early Programme benefits (cash and non cash releasing) is also lost.

4.8 Estimated whole life cost

The highest inflated whole life cost is for Scenario E1A at £21.42bn (P50). However, the impact of discounting over a 60 year period reduces this figure to £7.89bn (P50) on a NPC basis, which is lower than all the other Scenarios. Scenarios 2B and 3C carry the highest NPC at c.£9.10bn (P50)

Inflated and net present (including decant) from 2020

- The cost profile and elemental build up for each of the Scenarios have been developed into a lifecycle expenditure profile for 60 years from the Programme commencement date (assumed to be Q2 2020). The resulting 60 year profiles have been discounted back to a net present cost to offer a present day comparison on the outturn costs of the Programme works.
- All of the outturn costs have been outlined in the table below.

Table 29: Whole Life Cost summary

	P10			P50			P90		
Scenario	Base (inc risk) £bn	Inflated (variable) £bn	NPC (3%) (£bn)	Base (inc risk) £bn	Inflated (variable) £bn	NPC (3%) (£bn)	Base (inc risk) £bn	Inflated (variable) £bn	NPC (3%) (£bn)
E1A	£8.67 bn	£18.22 bn	£6.87 bn	£9.08 bn	£21.42 bn	£7.89 bn	£9.48 bn	£34.33 bn	£11.43 bn
2A	£8.54 bn	£17.12 bn	£7.43 bn	£8.77 bn	£19.53 bn	£8.39 bn	£9.11 bn	£29.16 bn	£11.37 bn
2B	£9.14 bn	£18.32 bn	£8.03 bn	£9.47 bn	£21.12 bn	£9.09 bn	£9.81 bn	£32.16 bn	£12.40 bn
3B	£8.26 bn	£16.46 bn	£7.46 bn	£8.50 bn	£18.47 bn	£8.31 bn	£8.84 bn	£26.28 bn	£10.80 bn
3C	£8.96 bn	£17.96 bn	£8.15 bn	£9.30 bn	£20.28 bn	£9.11 bn	£9.54 bn	£29.38 bn	£12.04 bn

Source: IOA Team analysis

- The risk applied to the lifecycle costs was at a rate of 29% (P10), 36% (P50) and 43% (P90) respectively. No risk allowance was applied to the facility management costs as the level of FM risk can be managed with a greater level of control.
- The inflation applied is at a rate of 2.72% (P10), 3.64% (P50) and 5.79% (P90) to the lifecycle costs and 2.5% to the facilities management costs.
- In respect of the architectural and fabric interventions during the Programme, and in all Scenarios, the standard of the fabric will be improved over time. However, delivery Option 3 allows for a coordinated and comprehensive reinstatement at an early stage of the assessment period, which will provide an early steady state improvement for maintenance over the remaining service life of the assessment. By comparison, Scenario E1A does not enable a comprehensive plan until much later due to a slower rate of improvement.
- This early investment increases the relative contribution to the net present cost of this Scenario, but it does ensure the early retention of the fabric elements and the quality standards for this historic and Grade 1 listed building. It also delivers earlier mitigation to the risks of catastrophic system failure.

Key findings

- The specific key findings have been summarised below:
  - Scenario E1A: Whilst the impact of discounting expenditure further out in time for this Scenario brings with it the most favourable net present cost, it also pushes out the delivery of benefits far into the future. In addition, the implications for operational management and interface between the working PoW and multiple construction activities will be an ongoing management and security challenge throughout the entire Schedule duration. This should also be considered against the implications for the core business of the PoW being subject to multiple relocations to temporary accommodation over a lengthened programme delivery period. At the higher levels of risk the outturn net present compares with that of the Scenario 3B variant which delivers the results many years earlier.
  - Delivery Option 2: Scenario 2 allows some ongoing occupation of the PoW function for an extended period and offers the same end result as delivery Option 3 over a duration approximately twice as long as delivery Option 3. Management of interfaces between the construction site and the ongoing business of the PoW is a key operational matter and one that will need to be resolved ahead of the commencement date. The extended schedule presents a cost premium when compared to the shorter delivery Option 3.
  - Delivery Option 3: Presents the greatest opportunity for early delivery of the Programme objectives. It provides for the shortest period of intervention within the PoW and offers the restoration of the PoW in both visual and performance terms in one intensive period. However, this Option does require a wholesale decant of the PoW functions and the associated administrative implications. These considerations need to be fully tested and in place prior to commencement of the Programme. This delivery Option presents the lowest risk of catastrophic failure and delivers the benefits at the earliest opportunity.
  - Scenario 3B consistently shows the lowest base expenditure, however as noted above, the early capital expenditure and the acquisition of the decant buildings impacts on the net present cost evaluation, which then places this delivery Option equivalent or above that of the E1A variant under the differing risk levels. The business benefits for associated tourism and brand for an early delivery could be a further consideration which is currently outside the scope of this assessment.

4.9 Wider impacts

Scenario 3C is likely to provide the greatest opportunity for wider impact given the extensive works and improvements to amenity and functionality. Scenario E1A will have little or no wider impact as a result of the relatively slow rate of progress and Outcome Level being delivered.

Introduction

- The scale and nature of this programme has the potential to deliver a significant and lasting impact across a broad range of stakeholders including occupiers, visitors, delivery partners as well as wider groups through engagement and outreach. Where the rate of progress is sufficient, there may also be opportunities for employment and skills initiatives both during and beyond the restoration and renewal programme. If secured, these impacts can support positive stakeholder engagement and wider public communications.
- Our analysis of the Scenarios indicates that there are likely to be limited differences to wider impacts as a consequence of Outcome Levels. The potential to deliver wider impact from the programme is influenced much more significantly by the Delivery Option as this determines the rate at which the programme can be delivered and overall timescale. An overview of the potential wider impacts have been summarised below to illustrate the principal differences between the Delivery Options.

Table 30.1: Wider impacts

Evaluation Criteria – Tier 2	Delivery Option 1	Delivery Option 2	Delivery Option 3
UK wide impact	• Wide impact: Relatively modest rate of progress will limit the extent to which opportunities e.g. within the supply chain may cascade out regionally and nationally, beyond that currently experienced from the PoW.	• Wide impact: Greater opportunities to generate initiatives at regional and potentially at a national level, including specialist roofing, masonry and other heritage manufacturers.	• Wide impact: Present the greatest opportunity to secure regional and national opportunities for individuals and businesses across the UK. The demand for goods and services is likely to necessitate that it cannot be satisfied by local markets, therefore providing openings to a much wider UK audience.
Cultural and skills opportunities	• Culture: Limited opportunity to preserve existing capabilities e.g. some limited succession planning for specific heritage trades, and potentially build some capacity, the demand for this will be relatively limited given the overall schedule duration. • Skills: Relatively modest throughput of work and potential lack of continuity over a pro-longed schedule, could discourage the existing supply chain to invest in its workforce.	• Culture: Presents some opportunity to both preserve the existing skills base and corporate knowledge, but also to invest in development of capability and capacity to maintain the PoW in the period beyond the programme completion date. • Skills: Some opportunities will also exist with the PoW's supply chain, given the improved throughput of work, when compared with delivery option one.	• Culture: Presents significant opportunities of both internal capability and capacity from the PoW's workforce as well as the supply chain. Investment in skills and knowledge transfer e.g. through a trade school could be a key success factor. Creation of a sustainable pool of skills e.g. within heritage trades, to secure a lasting legacy for the PoW. • Skills: Presents sufficient scale and pace to potentially necessitate wider apprenticeships and job brokerage which could support positive communications and media opportunities for the programme.
Exemplar programme	• Technical: Limited opportunity to embrace the full extent of good industry programme delivery practice, given the difficulty in establishing a clear end date with supporting interim milestones.	• Technical: Improved opportunity to adopt good industry programme delivery practice. Ability to adopt tools such as Building Information Management (BIM) is improved and this will support the delivery of positive outputs and outcomes.	• Technical: Highest opportunity to establish an effective programme delivery framework and adoption of good industry practice.

Source: IOA Team analysis

4.9 Wider impacts

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- Our analysis of the Scenarios indicates that there are likely to be limited differences to wider impacts as a consequence of Outcome Levels. The potential to deliver wider impact from the programme is influenced much more significantly by the Delivery Option as this determines the rate at which the programme can be delivered and overall timescale. An overview of the potential wider impacts have been summarised below to illustrate the principal differences between the Delivery Options.

Table 30.2: Wider impacts

Evaluation Criteria – Tier 2	Delivery Option 1	Delivery Option 2	Delivery Option 3
Exemplar programme (cont.)	• Schedule: The prolonged nature and complexity of working in and around existing occupiers could prove challenging to ensure effectively planning and execution of the programme schedule. Benefits will be delivered over a protracted time period. • Cost (budget certainty): The prolonged nature of the programme and increased risk of change and delay makes it more difficult to provide a high level of budget certainty that would expected of an exemplar programme. • Assurance (programme execution): It is likely to be more difficult to assure a programme with less certainty over schedule, cost and scope. Assurance will be offset by a reduced rate of activity. • Setting a precedent for UK programmes: The nature of this as a long term programme with relatively uncertain outcomes, makes it more challenging to position as an exemplar.	• Schedule: The ability to define a clear and more certain overall schedule with well defined milestones will be facilitated by the shorter overall programme duration. • Cost (budget certainty): Greater cost certainty is part of an exemplar programme and is closely associated with the ability to determine a clearly defined schedule. • Assurance (programme execution): Ability to establish and maintain a clear assurance framework, against which delivery can be tested. Personnel continuity challenges could become problematic given length of programme schedule. • Setting a precedent for UK programmes: Partial ability to establish and deliver the programme as an exemplar due to significant increase in the rate of progress and improved cost and schedule certainty from delivery Option one.	• Schedule: This option provides the greatest ability to establish a clear and most certain schedule, with well defined milestones and end date. However, it should be noted that there could be pressure from decanted occupiers to reoccupy the PoW, which impact the schedule. • Cost (budget certainty): The greatest degree of certainty could be delivered through to reinforce its position as an exemplar. • Assurance (programme execution): Whilst there is an ability to establish and maintain a clear assurance framework, against which delivery can be tested, the overall programme duration will still bring some challenges over personnel continuity. • Setting a precedent for UK programmes: This option provides the best opportunity to establish and deliver the programme as an exemplar.

Source: IOA Team analysis

4.9 Wider impacts

Scenario 3C is likely to provide the greatest opportunity for wider impact given the extensive works and improvements to amenity and functionality. Scenario E1A will have little or no wider impact as a result of the relatively slow rate of progress and Outcome Level being delivered.

Introduction

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- Our analysis of the Scenarios indicates that there are likely to be limited differences to wider impacts as a consequence of Outcome Levels. The potential to deliver wider impact from the programme is influenced much more significantly by the Delivery Option as this determines the rate at which the programme can be delivered and overall timescale. An overview of the potential wider impacts have been summarised below to illustrate the principal differences between the Delivery Options.

Table 30.3: Wider impacts

Evaluation Criteria – Tier 2	Delivery Option 1	Delivery Option 2	Delivery Option 3
Programme awareness	• Internally: Ability to raise awareness of the programme, but for potentially negative reasons i.e. the risk of continued Nuisance to Members, support staff and visitors). • Externally: Raising awareness is likely to be challenging especially over the programme schedule. The ability to convey positive messages about the programme will be impeded by prolonged period over which the programme is being delivered.	• Internally: Delivery will fully support awareness of the programme, particularly if one of the Houses needs to be relocated outside the PoW. internal stakeholder communications will need to be carefully managed to maintain full support. • Externally: Delivery will support raising awareness of the programme, particularly if one of the Houses needs to be relocated outside the PoW. May provide the opportunity to demonstrate how material progress is being made against interim key programme milestones.	• Internally: Delivery could offer effective programme awareness, given fundamental impact on all occupiers. Internal communications will need to be managed carefully to maintain support for the approach. • Externally: Delivery offers the best opportunity to raise awareness to external stakeholders given the full decant, rate of delivery, the overall duration and the ability to communicate a number of key programme milestones to be delivered in each year of the Programme. Organised tours or exhibitions could also be arranged.
Engage with citizens	• Outreach: Provides very limited opportunity for outreach to citizens given the rate of progress and the nature of the work that will be undertaken at the outset and during the Programme.	• Outreach: Provides an improved opportunity for outreach given the rate of progress and the material changes that will take place to relocate one of the Houses. Opportunities for outreach could potentially include organised tours or exhibitions given the need to relocate artefacts and the more demonstrable changes that will take place over a shorter period within the PoW.	• Outreach: Provides a significant opportunity to engage with the wider UK citizens given the nature of the programme and the available initiatives that could be made available and promoted by the PoW. The ability to showcase the heritage asset and potentially gain involvement from a range of citizens exists e.g. specialist heritage skill sets and conservations specialists.

Source: IOA Team analysis

4.10 Operational considerations

The success of the Programme is based on maintaining the core business of Parliament, whilst delivering the necessary works. However the extent of the work is substantial, potentially for a long period of time and a broad range of operational considerations will need to be addressed

Overview

- The key operational considerations for each delivery Option have been summarised with an illustration of the scale of their impact and some potential actions that may be taken.

Table 31.1: Operational considerations

	Delivery Option 1 – Operational considerations	Illustrative scale	Potential actions to adopt
1	**Operational impact - Excessive Nuisance:** The completion of the works could cause excessive Nuisance within the PoW. Noise, dust and general contractor presence all have the potential to directly impact the core business of Parliament. During the programme there are likely to be approx. 170 trades people on site at any one time, which compares to only approx. 30-40 today. Any conflict could also have an adverse impact on the rate of delivery of the works e.g. if ongoing works are stopped.	○	• Contractors are to be limited to the amount of noise and dust creation during normal business hours. • Contractors are to be given clear operating procedures which must be integrated to minimise Nuisance factors.
2	**Temporary relocation of PoW occupants:** Despite remaining within the PoW, Members, Peers, staff and functions (e.g. libraries) will have to relocate within the PoW and neighbouring estate to enable the programme of works to be undertaken. Such multiple relocations are likely to be repeated many times during the programme and will potentially affect all Members, Peers and staff of the PoW at some point during the Programme. Each construction zone is likely to be needed for a period of approximately two to four years (including those covering the Chambers).	◑	• A robust logistical process will need to be finalised identifying all of the necessary steps in order to complete all churn events.
3	**Fire safety management:** The fire strategy may have to be closely managed and regularly amended to suit the day to day activities on site. This process will need to be carried out at the point when each phase is completed, but also during each phase to ensure a safe means of escape and clear fire routes are constantly maintained.	○	• Fire strategy to be periodically refreshed and updated. • London fire brigade to be consulted on a regular basis during the programme.
4	**Security:** A separate Security Report has been prepared to cover this.		• See separate security report
5	**Ceremonial impacts:** The programme works and temporary accommodation may impact the existing ceremonial processes. Depending on the final sequencing of zones, alternative arrangements would need to be agreed prior to the commencement of the programme works. If the ceremony occurs near or through a construction zone, close management and potential unplanned adjustments may be required to successfully meet the ceremony demands.	◔	• Alternative arrangements will need to be planned and agreed prior to the commencement of the works. • Ceremonial events to take place away from construction sites, where at all possible.
6	**Site logistics:** The coordination of existing site deliveries with additional construction traffic will be a key issue requiring management attention. The number of new deliveries to be accommodated because of the programme works will be far greater than in the current arrangements at the PoW.	◔	• A new site delivery plan will need to be agreed. • Materials associated for the programme works may need to be delivered to a separate site for screening and security

Source: IOA Team analysis

Key:

Unlikely to meet Parliamentary requirements ○

Likely to meet Parliamentary requirements ●

4.10 Operational considerations

The success of the Programme is based on maintaining the core business of Parliament, whilst delivering the necessary works. However the extent of the work is substantial, potentially for a long period of time and a broad range of operational considerations will need to be addressed

Overview

- The key operational considerations for each delivery Option have been summarised with an illustration of the scale of their impact and some potential actions that may be taken.

Table 31.2: Operational considerations

	Delivery Option 2 – Operational considerations	Illustrative scale	Potential actions to adopt
1	**Operational impact – Nuisance:** There could be significant Nuisance during the programme works, despite only half the PoW being occupied. Noise, dust and general contractor presence are all likely to directly impact the core business of Parliament. These Nuisance factors could manifest itself in minor delays to programme.	○	• Greater control over the contractors may need to be adopted given the PoW is still partially occupied. • Nuisance levels are to be actively monitored and recorded.
2	**Decant / reoccupation Disruption:** Members of both Houses will have to vacate the PoW at the appropriate times. This process will cause Disruption to individuals during both the decant and the reoccupation. This will be more disruptive than Delivery Option 3 as the Houses will not be collocated.	◑	• A decant plan will need to be developed setting out which Members will decant / reoccupation and when.
3	**Fire safety management:** The fire strategy may have to be closely managed and regularly amended to suit the day to day activities on site. This process will need to be carried out at the point when each phase is completed, but also during each phase to ensure a safe means of escape and clear fire routes are constantly maintained.	○	• Fire strategy to be periodically refreshed and updated. • London fire brigade to be consulted on a regular basis during the programme.
4	**Security management:** A separate Security Report has been prepared to cover this.		• See separate security report
5	**Ceremonial impacts:** Issues with only half the building. The considerations could potential be worse in this delivery Option rather than 1 and 3.	◕	• Bespoke ceremonial arrangements will need to be finalised, which take account of the varying circumstances of the PoW.
6	**Site Logistics:** With the PoW split in two, logistics will prove challenging. The way deliveries are managed will have to change from the existing process, which could result in some teething issues.	◕	• A new site delivery plan will need to be agreed addressing both the occupied and non occupied (contractor run) sides of the PoW. • Materials associated for the Programme works may need to be delivered to a separate site for screening and security.

Source: IOA Team analysis

Key:

Unlikely to meet Parliamentary requirements ○

Likely to meet Parliamentary requirements ●

4.10 Operational considerations

The success of the Programme is based on maintaining the core business of Parliament, whilst delivering the necessary works. However the extent of the work is substantial, potentially for a long period of time and a broad range of operational considerations will need to be addressed

Overview

- The key operational considerations for each delivery Option have been summarised with an illustration of the scale of their impact and some potential actions that may be taken.

Table 31.3: Operational considerations

	Delivery Option 3 – Operational considerations	Illustrative scale	Potential actions to adopt
1	**Operational impact** - Decant / reoccupation Disruption: Members of both Houses will have to vacate the PoW (likely to be on a phased basis) at the appropriate time. This process will cause relatively short term Disruption to individuals during both the decant and the reoccupation periods.		• On site support is to be provided within the decant buildings including technology and way finding. The same principle is to be adopted upon reoccupation into the PoW.
2	**Security management:** A separate Security Report has been prepared to cover this.		• See separate security report
3	**Ceremonial impacts:** The PoW will not be able to accommodate any ceremonies and therefore the ceremonial processes will have to be revised and agreed to suit the new logistical constraints. Opportunities could be made available in the decant spaces.		• Alternative measures will need to be agreed in order to host ceremonial events at another building.

Source: IOA Team analysis

Key:

Unlikely to meet Parliamentary requirements 

Likely to meet Parliamentary requirements 

4.11 Operational risks

A number of significant operational risks will need to be addressed to reduce or eliminate their potential impact on Members, Peers and other users of the PoW. These include both risks that exist at the PoW as well as the associated risks in delivering decant accommodation.

Overview

- The key operational risks for each delivery Option have been summarised within the tables below, e.g. systems failure or ability to secure decant accommodation. In addition, there may be other knock on impacts to wider stakeholders including those within Government who deal with Parliament e.g. to address Disruption and this would also need to mitigated.

Table 32.1: Operational risks

	Delivery Option 1 – Operational risks	Potential mitigating actions	Illustrative rating
1	**Catastrophic failure including security and fire risks:** The works will be completed on a zone by zone basis over 30 years and involve numerous churn events. This significant time period for delivery, means that the risk of a catastrophic failure occurring in the existing plant is high for longer in this Option, when compared to Options 2 and 3. Challenge to manage breach given that the site will be partially occupied. Close proximity of working business of Parliament and a construction site.	• Test and keep disaster recovery and business continuity accommodation on standby • Define clear access routes and establish, maintain and adapt fire detection • Implement security measures	
2	**Invasive works:** The required works to provide temporary infrastructure and to allow works in the basement to be completed, could seriously impact the core business of parliament. There are many interfaces, complicated connections and diversions required to deliver this enabling phase of works. Each interface, connection or diversions has the potential to take longer than expected, or could be completed incorrectly or fail during testing and use.	• Agree protocols with both Houses including any revised rules of engagement for invasive works • Establish and maintain delivery plan for all invasive works • Plan for contingent activity, should unforeseen matters be encountered	
3	**Temporary accommodation:** insufficient, inadequate, or unacceptable temporary accommodation to facilitate this delivery Option and temporary Chamber location. Locations for staff to churn within the PoW during the works and / or a temporary Chamber to be located, could be challenging to deliver. This could in turn directly and adversely impact the business of Parliament.	• Identify and test swing space opportunities • Establish and implement strategic moves plan	
4	**Ongoing terms of engagement:** Members and users (including support staff) change the planned construction activities and logistics of the programme of works. Such changes could take place on a recurring basis given the nature of the small scale works, but could impact the overall schedule.	• Confirm revised terms of engagement for works in occupied accommodation • Implement and monitor activity for compliance with the revised terms	

Source: IOA Team analysis

Key:
Low Risk  Medium Risk  High Risk 

4.11 Operational risks

A number of significant operational risks will need to be addressed to reduce or eliminate their potential impact on Members, Peers and other users of the PoW. These include both risks that exist at the PoW as well as the associated risks in delivering decant accommodation.

Overview

- The key operational risks for each delivery Option have been summarised within the tables below, e.g. systems failure or ability to secure decant accommodation. In addition, there may be other knock on impacts to wider stakeholders including those within Government who deal with Parliament e.g. to address Disruption and this would also need to mitigated.

Table 32.2: Operational risks

	Delivery Option 2 – Operational risk	Potential mitigating actions	Illustrative rating
1	**Invasive works:** A temporary infrastructure solution will be needed to allow half the PoW to be restored and renewed, however this could become a Nuisance to the business of parliament e.g. service diversions are likely to pass through the construction site and the partially occupied PoW and therefore could be subject to damage and or create more Nuisance during the programme schedule.	• Agree protocols with both Houses including any revised rules of engagement for invasive works • Establish and maintain delivery plan for all invasive works • Plan for contingent activity, should unforeseen matters be encountered	
2	**Availability of decant premises:** There is a significant risk that premises may not be available that are suitable to House one of the Chambers. This dependency could dictate which delivery Option is actually deliverable and feasible.	• Research market conditions • Identify suitable options • Understand market implications and availability challenges • Effect transaction	
3	**Delivery and completion of decant building fit out:** The remodelling required to the decant building to meet Parliamentary requirements, is likely to be significant. These fit out works will need to be completed and the facilities thoroughly tested ahead of the programme start date, to ensure any associated risk to Parliament are minimised. The timeframe for these works will be considerable and therefore requires decant premises to be secured in the near future.	• Set out space utilisation plans • Develop outline and detailed plans and specifications • Procurement and delivery of fit out • Test decant building thoroughly	
4	**Security and fire risks:** Given that the site will be partially occupied it will be a challenge to manage any breach of the site boundary. The site will be in close proximity to the working business of Parliament and a construction site.	• Define clear access routes • Implement security measures • Establish, maintain and adapt fire detection	
5	**Ongoing terms of engagement:** Approval of overarching decant solution. Occupiers may not agree to the Disruption of decanting during the programme of works.	• Confirm revised terms of engagement for works in occupied accommodation • Implement and monitor activity for compliance with the revised terms	

Source: IOA Team analysis

Key:
Low Risk  Medium Risk  High Risk 

4.11 Operational risks

A number of significant operational risks will need to be addressed to reduce or eliminate their potential impact on Members, Peers and other users of the PoW. These include both risks that exist at the PoW as well as the associated risks in delivering decant accommodation.

Overview

- The key operational risks for each delivery Option have been summarised within the tables below, e.g. systems failure or ability to secure decant accommodation. In addition, there may be other knock on impacts to wider stakeholders including those within Government who deal with Parliament e.g. to address Disruption and this would also need to mitigated.

Table 32.3: Operational Risks

	Delivery Option 3 – Operational risk	Potential actions to adopt	Illustrative scale
1	**Availability of decant premises:** There is a high risk that there may not be sufficient available space in the market to decant both Houses to. If enough space is not available, this delivery Option may not be feasible.	• Research market conditions • Identify suitable options • Understand market implications and availability challenges • Effect transactions (likely to be more than one)	
2	**Decant and completion of decant building fit out:** The remodelling required to the decant buildings to meet Parliamentary requirements, will be significant. These works will need to be completed and the facilities thoroughly tested pre 2020, to ensure there is no risk to the business of Parliament. The timeframe for these works will be considerable and therefore requires decant premises to be procured in the near future, potentially prior to a decision on which Scenario is favoured, to avoid delay to the 2020 start date.	• Set out space utilisation plans • Develop outline and detailed plans and specifications • Procurement and delivery of fit out • Test decant building thoroughly	
3	**Ongoing terms of engagement:** Approval of overarching decant solution. Occupiers may not agree to the Disruption of decanting during the programme of works.	• Confirm revised terms of engagement for works in occupied accommodation • Implement and monitor activity for compliance with the revised terms	

Source: IOA Team analysis

Key:
Low Risk  Medium Risk  High Risk 

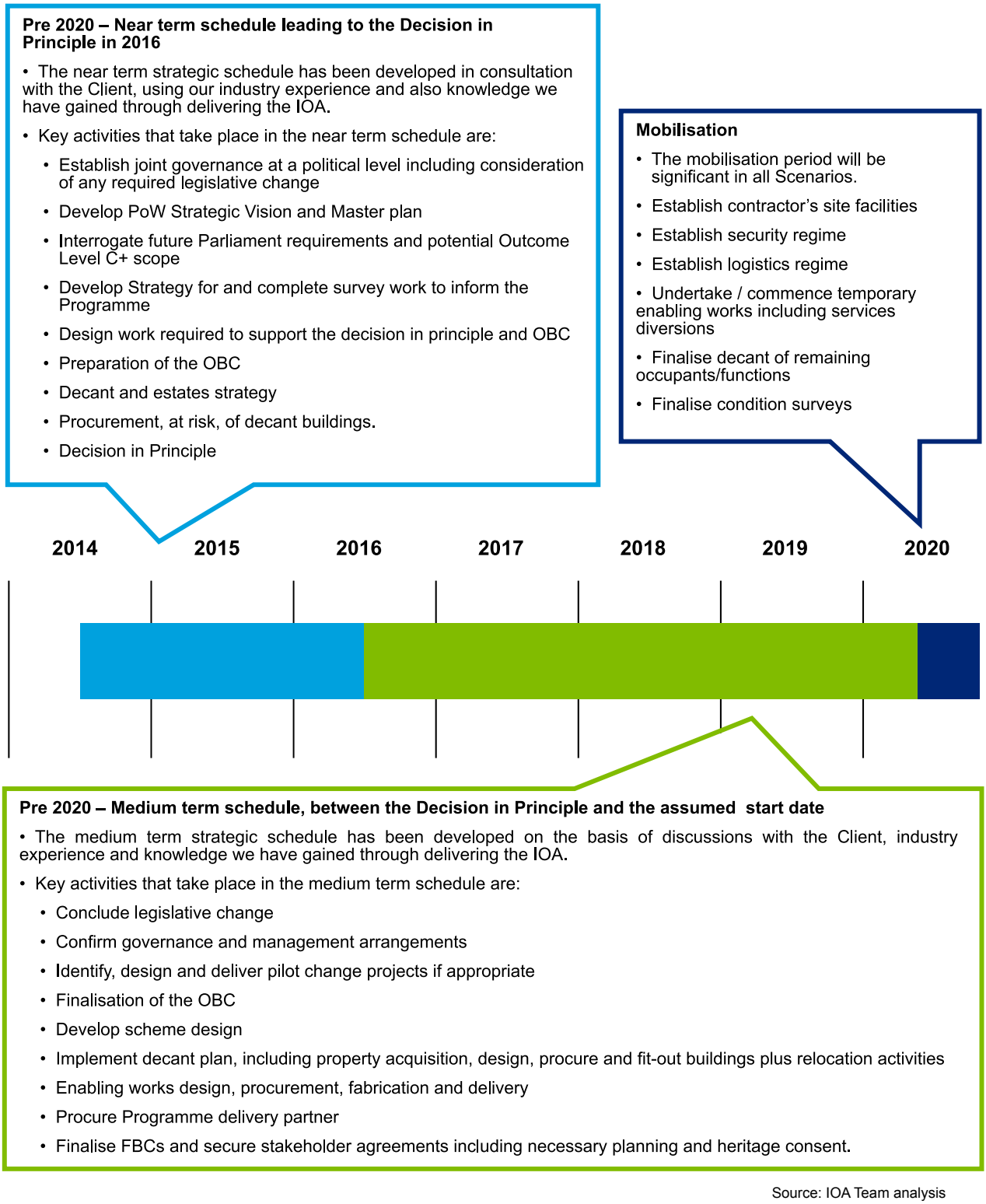
4.12 Schedule overview

The overall Schedule has been broken down into a number of key sections to provide clarity on the changing nature of the Programme over time and the breath of activities that will need to be undertaken to successfully deliver the Programme

Introduction

- The boxes below indicate the six distinct end-to-end elements of the Restoration and Renewal programme.
- Further, more detailed analysis on each of these elements will be required.
- Further details on the strategic schedule are included in Volume 2, Appendix B.2.

Figure 23.1: Schedule overview *(continued on next page)*



Source: IOA Team analysis

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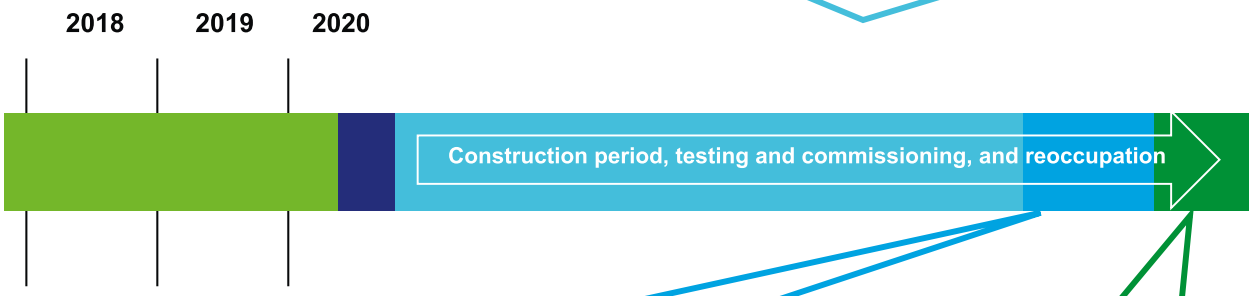
Figure 23.2: Schedule overview *(continued from previous page)*

Construction

- The PoW has been divided into workable areas, based on:
  - Building footprint (e.g.. basement, ground, principal level)
  - Floor levels – each floor has been split into 12 work areas / zones
  - Business function - South (HoL), North (HoC) and Central (Lobby)
- The notional durations have been determined using three key productivity metrics:
  - Construction expenditure
  - Manpower levels and
  - Resource output levels
- A notional construction programme has been developed by examining a generic sequence of activities to be undertaken in each work zone. This sequence is scalable and has therefore been applied to delivery Options E1, 2 and 3. The schedules are divided into site wide activities, preparation works, main-works and clean up of the zone on completion. Each schedule takes in to account PoW specific constraints applicable to the relevant working methods.
- The schedules have been tested against data from a number of major complex construction and engineering projects. The range of these comparators include:-
  - London Underground Upgrade Programme
  - Crossrail Programme
  - London 2012 Summer Games Programme
  - Various other infrastructure projects including airport terminals, hospitals, heritage redevelopment projects
  - PoW - Committee Rooms refurbishment (recent project of similar scope)
  - Other similar Parliamentary buildings (Vienna and Ottawa)
  - A notional construction schedule was created using a critical path technique. In addition, statistical analysis has been undertaken to identify a suitable range of schedule durations.



Handover, testing and commissioning

- Handover and testing and commissioning periods have been based on a soft landings approach for the Programme, in line with government requirements and industry best practice.
- The Programme assumes that a significant testing period will be required after completion and handover of the construction works given the critical nature of the systems and infrastructure on the business of Parliament.

Reoccupation

- The reoccupation will be a phased process that moves key functions, departments and users back to the PoW in a logical and agreed manner.

Source: IOA Team analysis

4.13 Schedule: Construction schedule comparison

The construction summary timeline below has considered mobilisation, construction, handover and reoccupation of the PoW, with all options commencing in Q2 2020.Options 3B and 3C have a 'most likely' duration of 6 years, 2A and 2B of 11 years and E1A of 32 years.

Introduction

- The assessed schedule ranges indicated above are indicative only and are used as a basis for comparing delivery options. The approach adopted was to:
  - Focus on the construction delivery period only, which is the varying element of the overall timeline; and
  - Assume that the pre-construction activities leading up to the assumed start date of Q2 2020 are common for all options.
- Delivery Options were assessed instead of Scenarios as there is little impact on schedule as a consequence of Outcome Levels, and therefore it is the Delivery Option rather than the scope that drives the construction durations.
- The IOA team used statistical techniques to establish an overall range of durations. This technique considered three key metrics of Spend rate, Labour force and Delivery rates to deliver a 'Most likely duration' together with a Lower Range and an Upper Range'.

Key Messages

- The 'most likely duration' analysis includes an element of 'known' risks and unique complexities of working at the Palace. The 'Upper' range reflects the outcome of risks while the 'Lower' range reflects the outcome of opportunities.
- The analysis indicates that Scenarios 3B and 3C could be delivered in a most likely duration of 6 years through a Full Decant Solution. Within this option, the range has a relatively narrow spread
- Scenarios 2A and 2B have a most likely duration of 11 years and a slightly wider spread.
- Scenario e1A has a 32 year most likely duration and is highly uncertain.
- Based on the current scope contained within the Programme, it is highly unlikely that the construction activity can be delivered within a single Parliamentary Term (assumed to be five years). The IOA team understand there is a preference (but not mandatory) to remain within the PoW for a period of one year either side of an election, which will impact upon and reduce the time available to complete the works within a Parliamentary Term.
- A shorter duration will not automatically result in lower costs as this could increase risks in areas such as management, off-site fabrication, and extended hours of working.

Construction timeline opportunities

- There are a number of key activities in each schedule that could be reviewed to try and reduce the overall schedule periods, towards the Lower Range:
  - Pre-planning in readiness for activity on site, such as procuring specialist long-lead items, setting up training academies to meet specialist skills demand, identifying gaps and enhanced processes to reduce constraints on key operational matters such as logistics;
  - Carrying out enabling works prior to a decant (such as creating new plant rooms) whilst the PoW is still in occupation;
  - Refining the scope and scale of the Restoration and Renewal Programme via a structured value engineering process;
  - Engaging with the supply chain to identify off-site fabrication facilities and ensuring as much as possible can be fabricated ahead of actual requirements on site; and
  - Consider operational trade-offs (including for example, reduced facilities and services, closure of certain corridors, higher tolerance of noise during the works, ongoing testing of mechanical and electrical systems post re-occupation).
- These areas should be reviewed at the next stage once a final scope of works and procurement strategy has been agreed.

Source: IOA Team analysis

4.13 Schedule: Construction schedule comparison

The construction summary timeline below has considered mobilisation, construction, handover and reoccupation of the PoW, with all options commencing in Q2 2020.Options 3B and 3C have a 'most likely' duration of 6 years, 2A and 2B of 11 years and E1A of 32 years.

Figure 24: Schedule overview

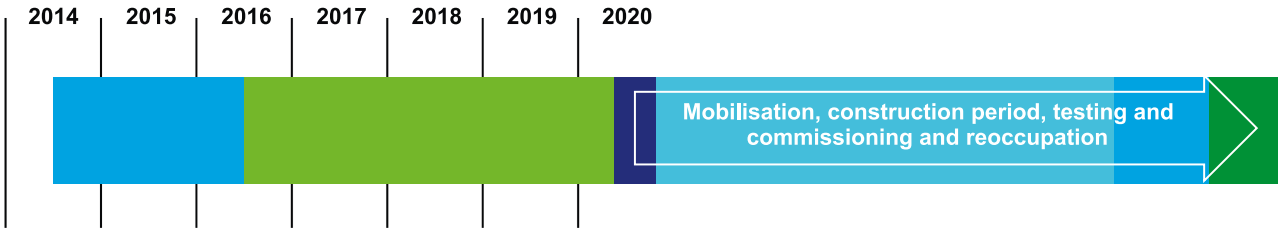
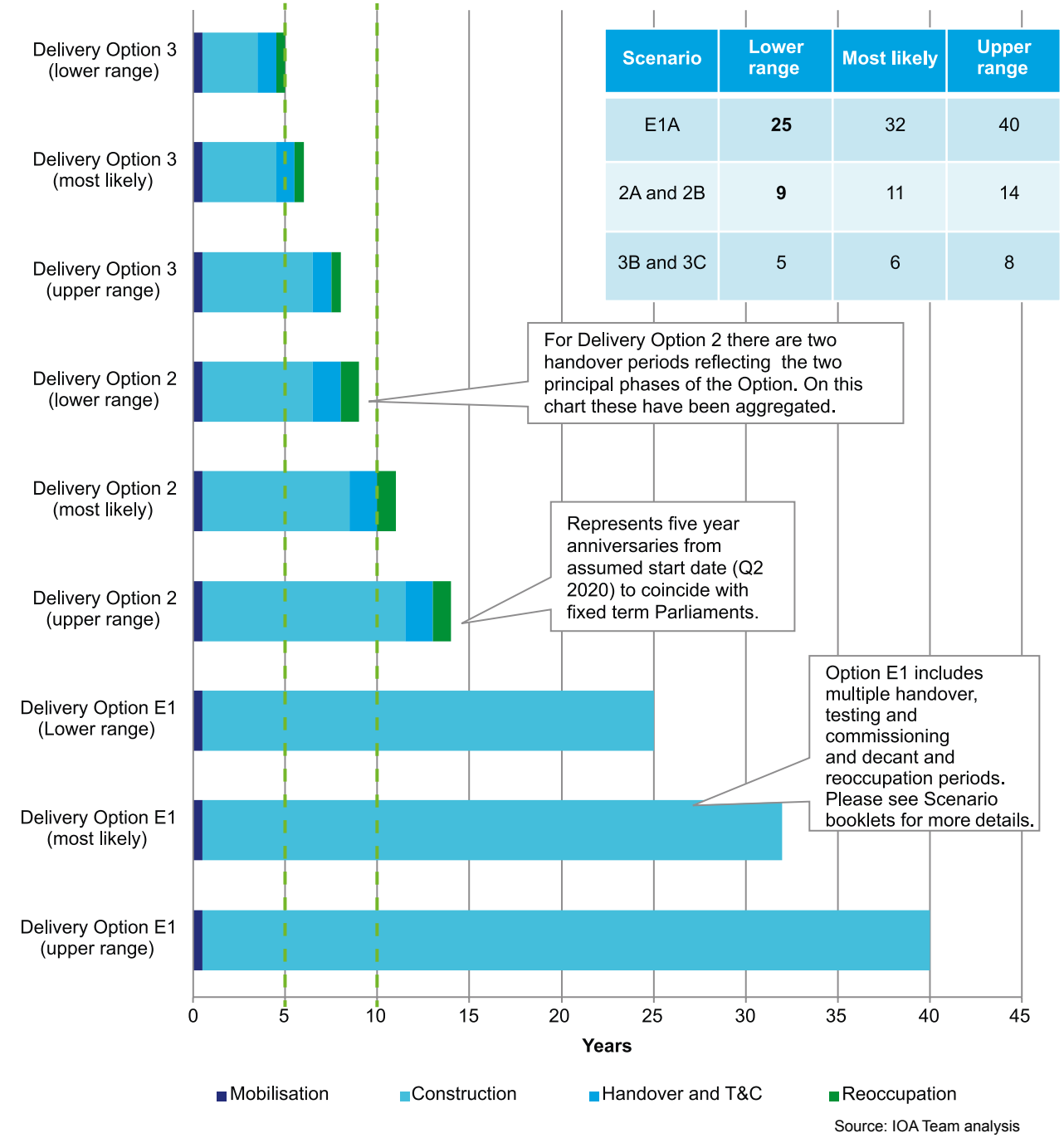


Figure 25: Construction schedule



Scenario	Lower range	Most likely	Upper range
E1A	**25**	32	40
2A and 2B	**9**	11	14
3B and 3C	5	6	8

Source: IOA Team analysis

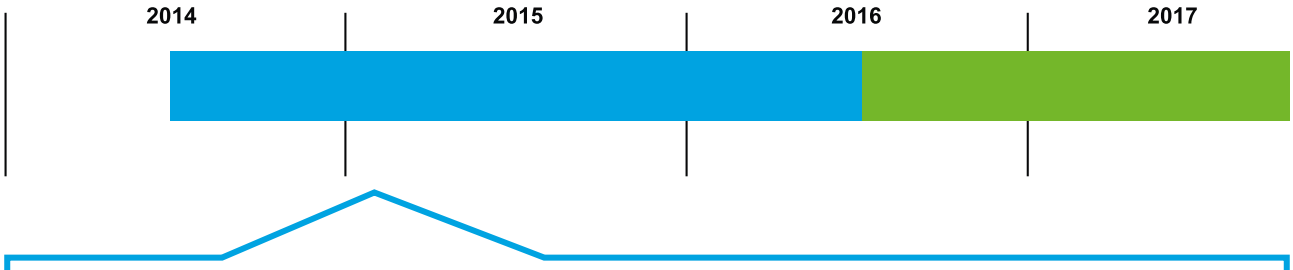
4.14 Schedule: Pre-2020 activities

The pre-2020 strategic plan sets out the key activities that need to be progressed to start the Programme on site by mid-2020. This schedule also highlights certain activities that need be progressed at risk ahead of a Decision in Principle having been made.

Introduction

- The following figure outlines the key activities and milestones for the near and medium term schedules in the run up to the Restoration and Renewal works commencing, notionally in May 2020. The sequence shown below is predicated upon the Client undertaking a number of activities at risk in order to make progress in the period leading up to and beyond a decision in principle to mitigate the adverse impact of the current construction sector inflation and overall programme prolongation. A detailed Pre 2020 schedule is included in Volume 2, Appendix B.3.

Figure 26.1: Schedule overview *(continued on next page)*



Near term schedule (to March 2016): Key activities undertaken ahead of the decision in principle – therefore some at risk.

1. **Establish joint governance at a political level:** it has been assumed that there could be a need for legislative change to address governance and management arrangements that would be essential for delivery Options 2 and 3, and desirable for delivery Option 1. Prior to legislation being enacted a formally constituted joint political body is needed to act in a client governance role including consideration of the IOA.
2. **Develop PoW Strategic Vision and Master plan:** this priority activity will create the likely framework against which they will align. The vision will be subject to later validation.
3. **Interrogate future Parliament and C+ Scope:** Whilst change will only be implemented if desired by Members of both Houses, potential options for future Parliament must be developed to inform the decision in principle. It is envisaged that some pilot activity may be appropriate to inform decision making and highlight any benefits that could arise.
4. **Develop strategy for and complete survey work to inform the Programme:** A significant amount of further technical survey work, including sound transmission and intrusive surveys during periods when Parliament is not sitting, will be necessary to inform the potential technical feasibility study work. This must be informed by a clear strategy for the format, scope and currency of gathered data, including the likely use of BIM.
5. **Design work required to support the decision in principle and OBC:** Some elements of conceptual design work will be required to support the definition of OBC options, with outline and detailed design required for the procurement and implementation of both the enabling works and main Programme. Inevitably this will take the form of a number of differing options, some of which will be nugatory.
6. **Preparation of the OBC:** The approach to this is based on work being progressed ahead of the decision in principle, where this is possible to do. This could include the determination of hybrid Scenarios if desirable, with the OBC being finalised immediately after a decision in principle.
7. **Decant and estates strategy:** A principal enabler for delivery Options 2 and 3, it is envisaged that significant work will need to be undertaken to secure potential options for decant accommodation, and depending on availability and Parliament's appetite for risk and funding availability, this may need to be progressed in the period from late 2014 onwards.
8. **Procurement, at risk, of decant accommodation (Options 2 and 3 only):** a Q2 2020 start date is dependent on the availability of decant accommodation, amongst other constraints. The likely duration of design, procurement and fit out activity informs the deadline to identify accommodation in advance of the Decision in Principle.
9. **Decision in Principle -** This is predicated on a decision being made in the early part of the next Parliament. This will determine the preferred scenario.

Source: IOA Team analysis

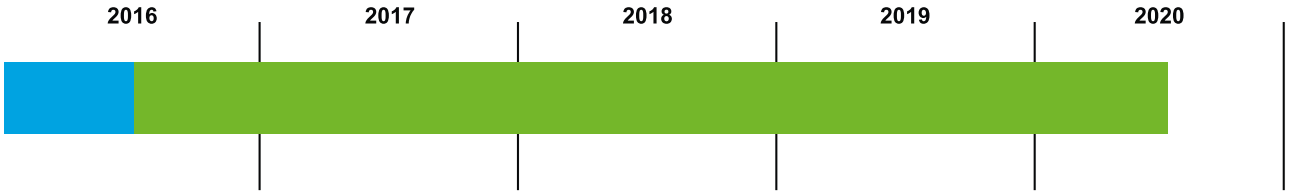
4.14 Schedule: Pre-2020 activities

The pre-2020 strategic plan sets out the key activities that need to be progressed to start the Programme on site by mid-2020. This schedule also highlights certain activities that need be progressed at risk ahead of a Decision in Principle having been made.

Introduction

- The following figure outlines the key activities and milestones for the near and medium term schedules in the run up to the Restoration and Renewal works commencing, notionally in May 2020. The sequence shown below is predicated upon the Client undertaking a number of activities at risk in order to make progress in the period leading up to and beyond a decision in principle to mitigate the adverse impact of the current construction sector inflation and overall programme prolongation. A detailed Pre 2020 schedule is included in Volume 2, Appendix B.3.

Figure 26.2: Schedule overview *(continued from previous page)*



Medium term schedule (March 2016 to May 2020)

10. **Conclude legislative change:** This is required to put in place the legal framework for the establishment of appropriate governance and management arrangements ahead of them being delegated formal authority.
11. **Confirm governance and management arrangements:** To put in place effective management, decision making and reporting structure, that is appropriately resourced for a programme of this importance, scale and complexity.
12. **Identify, design and deliver pilot projects:** To inform decision making by Members and other key stakeholders, so that any requirements, if desired, can be embedded within the overall design and construction of the scheme.
13. **Finalise and gain approval of the OBC:** To test the preferred option and prepare the way for full business cases to secure funding and approval for the appointment of a delivery partner, their supply chain, and decant accommodation delivery.
14. **Develop scheme design:** to support planning submission, procure delivery partners(s) and inform the FBC.
15. **Implement decant plan:** including design, procure and fit-out buildings plus relocation activities. This is needed to secure the appropriate accommodation, if required for Delivery Options 2 or 3, and the adaptation and fitting out of the accommodation to meet the needs of Parliament.
16. **Conclude enabling works design, procurement, fabrication and delivery:** To establish the overall technical scope, configuration and specification of the works necessary to enable the Programme to commence at the PoW, subject to delivery approach.
17. **Procure Programme delivery partner(s):** The OJEU procurement process to appoint potential delivery partners, leading to an appointment. It is currently envisaged that this may include roles to lead and co-ordinate the design, as well as management and delivery of the construction. The options for keeping these role separate or combining these will need to be made as part of the management and commercial cases for the OBC.
18. **Finalise and gain approvals for the FBCs:** To secure approval to the appointment of delivery partner(s) and the binding commitment(s) to acquire and fit out decant accommodation (which will be required for delivery Options 2 and 3).
19. **Secure Stakeholder agreements including necessary planning and heritage consent(s):** Early activity to engage key stakeholders and establish agreement to the Master Plan and Vision. Also, to undertake pre-consultation, the agreement of a planning framework and approach and implementation of this, and securing of the necessary consents (planning and heritage) to enable the works to be commenced on site. It is currently envisaged that this will also include enabling works, given their potentially extensive nature.
20. **Complete, test, commission and validate operational readiness of decant accommodation:** Upon completion of the fitting out of the decant accommodation, it is currently envisaged that significant testing of such facilities would need to be undertaken in the run up to relocation from the Palace.
21. **Undertake effective programme assurance:** The maintenance of an effective integrated assurance and approvals plan for the Restoration and Renewal programme that is aligned to wider activity across Parliament.

Source: IOA Team analysis

4.15 Schedule risks

The schedule for the Scenarios is insensitive to Outcome Level but is sensitive to the Delivery Option. We have therefore grouped the Scenarios by Delivery Option. General and scenario specific schedule risks are set out below.

Introduction

- The table below sets out the key features of the schedules for the five Scenarios. The Scenarios have been grouped together because the overall schedule has been proven to be insensitive to the impact of the various Outcome Levels but it is highly sensitive to the chosen delivery Option.

Table 33.1: Schedule risks *(continued on next page)*

Scenarios	Overview	Scenario specific risks
E1A	• Option E1 will have an assumed number of three work areas during the peak activity on site. The total delivery period (32 years based on the most likely Schedule) correlates to the availability of work areas (sub-zones or functional activities), which is dictated by the chosen delivery option. • It is possible that, the Programme definition, construction enabling works and initial churn stage will run in parallel in this option.	• If E1A is delayed, this would extend the period during which Parliament is required to function within or adjacent to a construction environment. This impact would not be felt with Delivery Options 2 or 3, because in those instances Houses will be functioning undisturbed from within their decant accommodation. In the event of delay they would simply stay their for longer. • Disruption to occupiers manifesting itself in a greater likelihood of works being stopped • Unable to replace existing services while they are in use • Damage to immoveable artefacts and finishes when carrying out the works • Increased need for security and need to control segregation • Unable to secure and maintain a competent workforce over a long term period • Erosion of the public image of the PoW • M&E Replacement works will not be completed prior to lifecycle replacement starting
2A and 2B	• Option 2 indicates the PoW will be vacated in two parts over a total period of 11 years - split between the two Houses. • Option 2 will be have an assumed number of 14 work areas during the peak activity on site. The total delivery period correlates to the availability of work areas, which is dictated by the chosen delivery option. • It is possible that, the Programme definition, construction enabling works and initial decant stage will run in parallel in this option. • All finishes trades would be delivered in a sequential manner at the end of the programme to avoid 'mothballing' of finishes work that will have initial activities completed early in some parts of the building.	• Unavailability of decant space • Use and functionality of the remaining building is compromised • Damage to immoveable artefacts and finishes when carrying out the works • Compromising safety systems, which are required for ongoing occupancy in parallel with the construction works • Disruption to occupiers – noise, access restrictions, ceremonial restrictions • Increase in required screening of materials • Severe reduction in visitor activity– loss of revenue • Unable to secure and maintain competent workforce / management over a long term period due to gap in construction programme • Inability to secure specialist labour
3B and 3C	• The Option 3 schedule requires the PoW to be vacant for up to 6 years. • Option 3 will have an assumed number of 25 work areas during the peak activity on site. The total delivery period correlates to the availability of areas, which is dictated by the chosen delivery option. • It is possible that the Programme Definition, construction enabling works and initial decant stage will run in parallel in this option. • All finishing trades would be delivered in a sequential manner at the end of the programme to avoid 'mothballing' of finishes work that will have initial activities completed early in some parts of the building.	• Unavailability of decant accommodation • Damage to immoveable artefacts and finishes when carrying out the works • Size and scale of the contractor's site establishment will have a unacceptable visual impact • Inability to secure specialist labour • Logistical challenges of dealing with high levels of deliveries requiring security screening • Greatest opportunity for standardisation of components

Source: IOA Team analysis

4.15 Schedule risks

The schedule for the Scenarios is insensitive to Outcome Level but is sensitive to the Delivery Option. We have therefore grouped the Scenarios by Delivery Option. General and scenario specific schedule risks are set out below.

Introduction

- The table below sets out the key features of the schedules for the five Scenarios. The Scenarios have been grouped together because the overall schedule has been proven to be insensitive to the impact of the various Outcome Levels but it is highly sensitive to the chosen delivery Option.

Table 33.2: Schedule risks *(continued from previous page)*

General schedule risks

• The list below identifies some of the key risks that can impact achievement of delivery schedule (based on knowledge and information available at the time of the IOA study)
• Assumed start on site date of Mid-2020 is not achievable due to pre-construction activities being delayed, such as:
  • programme delivery structure; decant fit-out and moves; design and procurement; planning and statutory legislation; completion of required enabling works and surveys
• Key decisions to maintain the programme dates are not made in time
• Lack of capacity and capability of key trades and skills to achieve required productivity rates
• Lack of suitable engagement with Stakeholders
• Extent of unknown known items such as:
  • asbestos; specific mechanical and electrical services; structural repairs; heritage and conservation; level of fabric restoration; level of external intervention e.g. English Heritage; level of stakeholder involvement
• Security demands in terms of:
  • contractor's site set-up; clearance of workforce; materials delivery and storage
• Unavailability of key materials and resources
• Impact of major international / external events
• Lack of market appetite throughout the supply chain due to competing national infrastructure programmes and projects.

Source: IOA Team analysis

Table 34: Key schedule assumptions

Key assumptions
• Programme start date assumed to be 2nd quarter of 2020. • All pre-planning, design and procurement is achieved prior to start of restoration and repair works on site. • Decant Building(s) will be ready by 2020, including pre-move testing, commissioning and operational readiness. • Both Houses will be restored and refurbished in parallel, in a full decant scenario rather than sequentially. • Assumed output levels are based on similar Grade1 listed buildings and other similarly complex programmes. • The notional schedule is primarily resource driven maintaining a constant level of resources throughout the construction period, providing continuity of work to key trades. • No additional scope is added from the PED medium and long term programmes – these works are completed ahead of the start of restoration and repair works on site. • The construction sequence is governed by the M&E design, the designated zones and riser locations. • The IOA Team understands that it could be unduly disruptive to carry out a major move just before of after an election. The effect of this on the schedule should be reviewed at the next stage.

Source: IOA Team analysis

4.16 Potential scope

The potential scope assessed within the IOA has been based on the Workstrand Reports. The scope is likely to change, depending on the future requirements of Parliament as well as the establishment of a clear vision for the Programme.

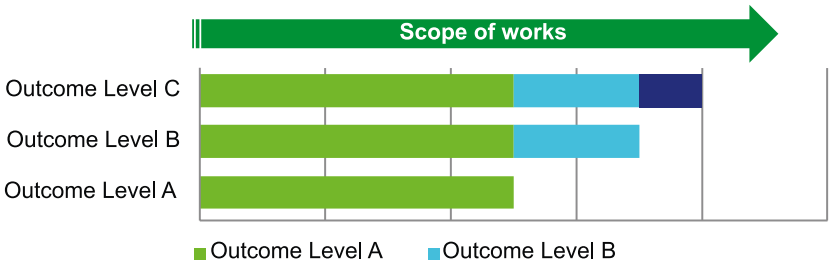
Introduction

- The initial approach included establishing a potential scope for each of the three agreed Outcome Levels. This was to enable cost and schedule to be evaluated including associated risks for each of the shortlisted Scenarios.
- This section of the report compares and evaluates the three Outcome Levels delivered by the potential scope ,to determine the differences and the potential benefits to the users and visitors of the PoW. This builds on the information gathered during Phase 1 and the additional meetings held with a range of stakeholders including Members of the PED team and contractors currently working at the PoW.
- An overview of the illustrative Outcome Levels can be found within section 3.4 of this Final Report, however a full breakdown of the potential scope, including a selection of illustrative drawings is detailed in Volume 2, Appendices D.1 and D.2.
- The Outcome Levels were refined by the IOA team, however the IOA team did not complete any feasibility design work, create a masterplan or have the Outcome Levels explicitly challenged as part of the IOA. All illustrative Outcome Level definitions were discussed with and agreed by the Client Programme Team and the Programme Board in February 2014.

Context

- It has been assumed that the main scope to deliver each Outcome Level will not be materially impacted by the delivery Options. Therefore whilst a consistent scope could be delivered, albeit delivered through differing delivery methods, each Scenario will have its own cost, schedule and business continuity risk implications. In addition, interventions and enhancements will increase the Outcome Levels incrementally, which could be delivered as illustrated below.

Figure 27: Scope of works



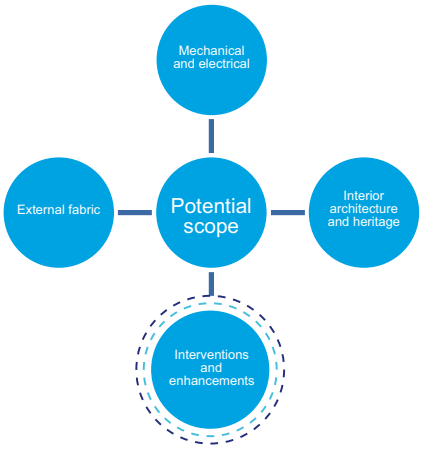
Outcome Level C combines all Outcome Levels together to provide significantly enhanced functionality and amenity within the PoW.

Source: IOA Team analysis

Outcome Level summary

- The vast majority of the potential scope currently falls within Outcome Level A, and following the completion of the Programme the PoW will benefit from completely renewed mechanical and electrical plant, be compliant with legislation, maintain the World Heritage and Grade I listing status, and achieve built environment standards expected for public buildings.
- The potential scope is currently made up of four key elements, which together deliver the Outcome Levels, namely mechanical and electrical, external fabric, interior architecture and heritage and wider interventions and enhancements. Only the interventions and enhancements vary between Outcome Levels.
- The potential scope has been developed based on the documentation supplied to the IOA team;
- To date the scope has been developed in relative isolation;
- The potential scope will require further stakeholder engagement;
- Subject to the agreed definition of a 21st Century Parliament the scope could evolve over time to meet the Programme Objective; and
- Outcome Level C is relatively undeveloped and should capture opportunities to improve the utilisation of the PoW and significantly enhance the amenity for users.
- A record of further ideas associated with Outcome Level C can be reviewed within section 4.17 of this Final Report.

Figure 28: Potential scope breakdown



Source: IOA Team analysis

Key assumptions

- That the MTWP will have been completed prior to the assumed commencement date of the Programme;
- That suitable decant accommodation will be available, secured (if a decant option is adopted) and fitted out; and
- All Outcome Level C+ ideas captured during a series of workshops are currently excluded for the purpose of the IOA.

4.16 Potential scope

The potential scope assessed within the IOA has been based on the Workstrand Reports. The scope is likely to change, depending on the future requirements of Parliament as well as the establishment of a clear vision for the Programme..

Comparison of the Outcome Levels

- The following tables summarise the Programme works within each of the shortlisted Scenarios.

Table 35: Outcome Level summaries

Outcome Level A

Key works	Outcome Level summary
Mechanical and electrical	• Replace all plant, services infrastructure and systems to all rooms, spaces and zones. Remove asbestos from services.
Interior architecture / heritage	• Refurbish all internal spaces, including conservation works to heritage items and fabric. Minor alterations to address room use changes, adaptions in response to access requirements and security needs, and remove asbestos.
External fabric	• Repair, clean and refurbish external fabric including Elizabeth Tower and clock.
Interventions and enhancements	• Security, catering, business and support driven interventions and enhancements, which could include: creating a permanent education centre, replacement of the river terrace marquees, replacement and upgrades to lifts to improve accessibility and formation of new improved screening facilities at entrances, and to improve access within the PoW.

Outcome Level B (in addition to Outcome Level A)

Key works	Outcome Level summary
Mechanical and electrical	• As Outcome Level A
Interior architecture / heritage	• As Outcome Level A
External fabric	• As Outcome Level A
Interventions and enhancements	• As Outcome A plus further interventions and enhancements which could include: installing additional lifts to provide improved access and business use (e.g. to Elizabeth Tower), use basement for goods distribution route with a new drop off facility in Black Rods Garden. • Courtyards landscaped and traffic reduced, create a new media centre, alter parts of the upper floor areas to provide upgraded office accommodation (e.g. third floor upper committee corridor north and south), demolish modern buildings in Chancellor's Court, demolish part of Boiler House Court and courtyard opened up. • Create an on site energy centre specifically for PoW and extend cooling to additional areas where possible.

Outcome Level C (in addition to Outcome Level A and B)

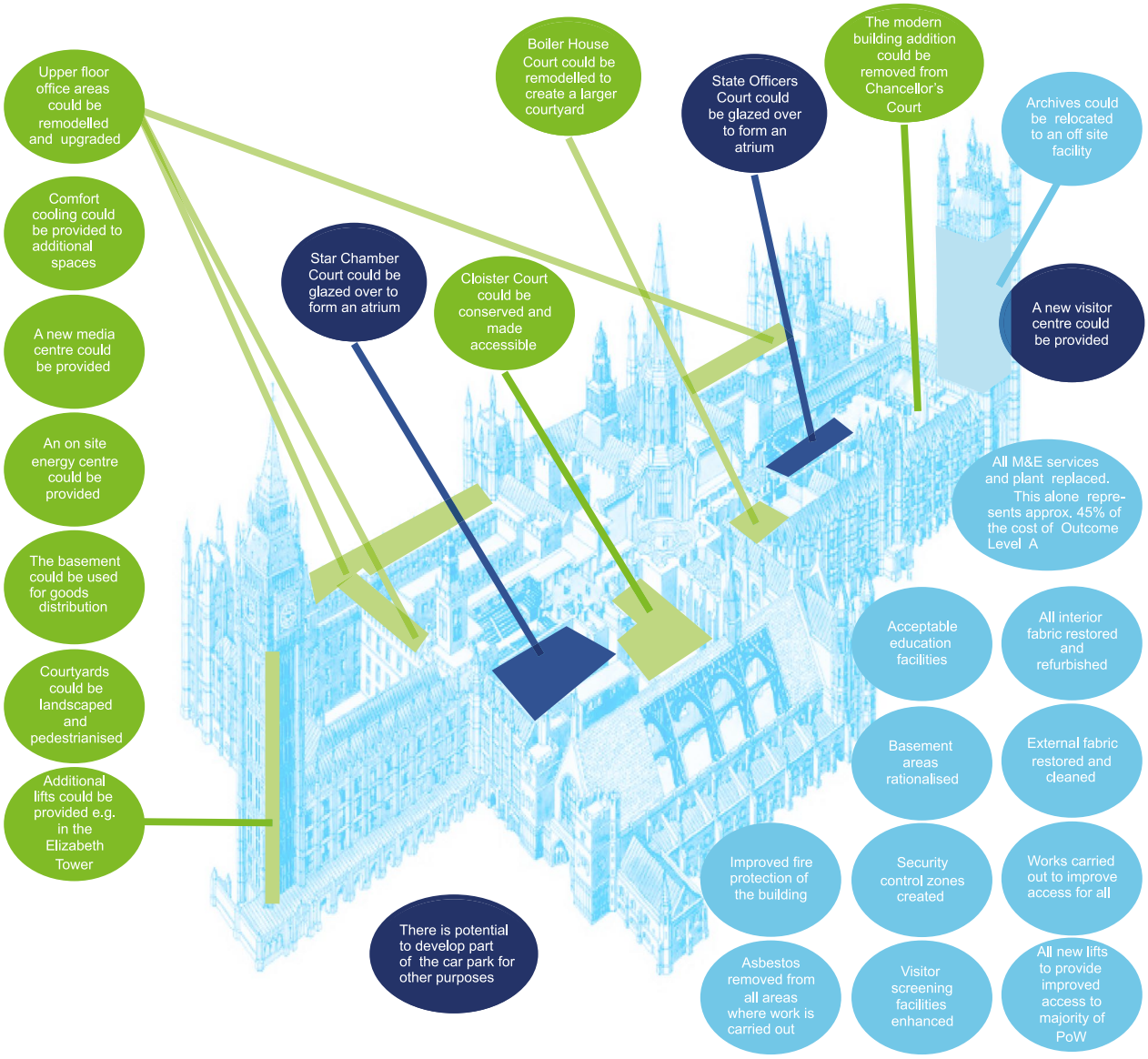
Key works	Outcome Level summary
Mechanical and electrical	• As Outcome Level A and B
Interior architecture / heritage	• As Outcome Level A and B
External fabric	• As Outcome Level A and B
Interventions and enhancements	• As Outcome A plus B plus further interventions / enhancements which could include: glaze over Star Chamber Court to create an Atrium at the entrance for the House of Commons (including taking down the 1970s infill block within the courtyard); glaze over State Officer's Court to create an atrium at the entrance for the House of Lords, construct a visitor centre for the entire site to include education, exhibition, conference, screening and visitor facilities, develop part of the New Palace Yard area and car park.

Source: IOA Team analysis

4.16 Potential scope

The image below illustrates potential examples of the scope of work that could be completed within the Restoration and Renewal Programme. Outcome level A scope represents over 75% by capital cost of the Outcome C scope (outcomes are cumulative).

Figure 29: Potential scope



Outcome A – Do minimum scope: light blue
Additional Outcome Level B scope: green
Additional Outcome Level C scope: dark blue

Source: IOA Team analysis

4.17 Potential Scope: Outcome Level C+

During Phase 1 of the IOA it became apparent that the scope of work associated with Outcome C could not be considered as definitive or exhaustive at this stage. There may be an opportunity to develop a fuller version of this Outcome Level after the completion of the IOA

Background

- The IOA team facilitated an ideas workshop at the offices of HOK on 18 February 2014. It was attended by officials from the administrations of both Houses.
- Attendees reviewed areas of Outcome Level C based on the Workstrand Reports and identified ideas for potential additional benefits. Many but not all of these arose from opportunities extending beyond the boundary of the Palace site as defined for the purposes of this study. In the table below they are categorised according to whether they could potentially be achieved within the Palace boundary or not.
- The scope items listed in the table have not been included in Outcome Level C for the purposes of this report and are not therefore included in the costings and analysis.

Strategic Planning

- Areas that could benefit from strategic planning to inform the development of the scope during the next stages were:
  - Circulation – pedestrian: Promote external distant viewing vistas of WHS, public / private delineation; clear intuitive access for all / segregation; capacity, footfall and timings; clearly defined journeys i.e. How do you lobby MPs; ceremonial requirements; and rationalisation of back of house accommodation;
  - Transport: Car 'free' environment except for accessibility; low carbon; encourage pedestrian access/ bikes/ public transport; controlled deliveries; fully accessible; VIP and ceremonial routes; and easy/free circulation;
  - Catering (+ events, exhibitions, entertainment): Rationalise offers; agile and flexible for events and meetings; catering support / back of house; offer to reflect audience – MPs/lords, tourists, school children, events ; quality – what is the offer?; other facilities – toilets, cloakrooms, multi-faith provision; Internal/ external customers; and accessibility – who uses what?;
  - Workplace: Define workplace requirements; consistent standards, provision, look + feel, light, IT; graduation of workplace; i.e. Offices, meeting space, 'dark corridors'; and flexibility, hot-desking; workplace across the estate – PoW; and
  - Technology: Define workplace requirements; media; BMS; tourist / educational requirements (virtual tours).

Table 36.1: Outcome Level C+ ideas *(continued on next page)*

	Ideas within the building footprint but not included	Ideas outside the current site boundary but not included
Improve linkages with the southern estate.		✓
Provision of more modern committee rooms, and improved facilities for witnesses.	✓	
Provision of prayer rooms and multi-faith facilities.	✓	
Open up more space for visitor and public access and facilities on the ground floor, including rest and seating areas for visitors	✓	
Improved retail outlets within the PoW.	✓	
Review relationship of the Jewel Tower, Old Palace Yard and Abingdon Street car park to Parliament and the PoW.		✓

Source: IOA Team analysis

4.17 Potential Scope: Outcome Level C+

During Phase 1 of the IOA it became apparent that the scope of work associated with Outcome C could not be considered as definitive or exhaustive at this stage. There may be an opportunity to develop a fuller version of this Outcome Level after the completion of the IOA

Table 36.2: Outcome Level C+ ideas *(continued from previous page)*

	Ideas within the building footprint but not included	Ideas outside the current site boundary but not included
Programme to be designed around wider estate strategy. PoW is only one of the estate buildings and how other estate buildings are used and what accommodation is provided needs to be co-ordinated.	✓	
Improve links to the northern estate.		✓
Improved access and vistas from Parliament Square (could be addressed by implementation of World Heritage Site proposals for greater pedestrianisation).		✓
Consider wider sense of place, e.g. including TFL super highway (which could be addressed by implementation of World Heritage Site Proposals		✓
Programme to improve wider infrastructure provision in Westminster e.g. tube access and address Bridge Street pavement pinch points.		✓
Improve public realm around building for visitors – implementation of World Heritage Site proposals for greater pedestrianisation.		✓
Develop facilities to improve catering efficiency within the PoW.	✓	

Source: IOA Team analysis

Next steps

- Potential items of enhanced scope deserve further consideration following the completion of the IOA. This should be based on wide consultation with stakeholders and should not be limited to the list above. It would be sensible to consider this in parallel with any changes to the working practice of Parliament that may be adopted or planned in the period while the IOA is under consideration.

4.18 Accommodating change (if desired)

The shortlisted Scenarios all provide differing opportunities to accommodate change if this is considered desirable by stakeholders. Scenario E1A provides little or no opportunity for change, with much more significant potential in Scenarios 3B and 3C

Introduction

- The Programme provides the potential to instigate a range of potential changes (if desired) to address the way that Parliament functions and the way in which the PoW is operated and maintained. These could support the delivery of a range of financial and non-financial benefits to occupiers, visitors and wider stakeholders.
- The relocation that is needed for all Scenarios, with the exception of E1A, provides the potential to pilot any changes, albeit the ability to embed these will be impacted by the end state of the PoW following the Programme.

Table 37.1: Accommodating change *(continued on next page)*

Evaluation Criteria (Tier 2) – Environment	
Scenario	**Commentary**
E1A	• The extended schedule incurs higher overall energy use, relying upon existing systems and the churn of existing accommodation. • Does not deliver any improvement in use of space or additional amenity for all users and visitors. Reconfigured space is not delivered.
2A	• Shorter duration reduces overall energy use, despite using relying upon existing systems. • Does not deliver any improvement in use of space or additional amenity for all users and visitors. Reconfigured space is not delivered.
2B	• Greater use of low and zero carbon solutions is likely to reduce the building carbon footprint. • Delivers more efficient and economic use of space with some additional amenity for all users and visitors. Some reconfigured space is delivered e.g. upper floor office areas could be remodelled and upgraded.
3B	• Greater use of low and zero carbon solutions is likely to reduces building carbon footprint. • Delivers more efficient and economic use of space with some additional amenity for all users and visitors. Some reconfigured space is delivered e.g. upper floor office areas could be remodelled and upgraded.
3C	• Maximises the use of low and zero carbon solutions and minimises the overall carbon footprint/ lifecycle carbon use within the PoW. • Delivers significantly more efficient and economic use of space with additional amenities and functionality for all users and visitors. New reconfigured space is also delivered e.g. potential enclosure of a number of courtyards

Evaluation Criteria (Tier 2) – Technology	
Scenario	**Commentary**
E1A	• Little or no opportunity to embed new technology that could be capable of supporting new working practices, if this was considered necessary.
2A	• Little or no opportunity to embed new technology that could be capable of supporting new working practices, if this was considered necessary.
2B	• Limited opportunities to embed new technology that could be capable of supporting new working practices, if this was considered necessary e.g. wider CCTV coverage and monitoring systems.
3B	• Limited opportunities to embed new technology that could be capable of supporting new working practices, if this was considered necessary e.g. wider CCTV coverage and monitoring systems.
3C	• Presents a wider opportunity to fully embed new technology that could be capable of supporting new working practices and management of the PoW, if this was considered necessary e.g. improved levels of environmental control in heritage areas.

Source: IOA Team analysis

4.18 Accommodating change (if desired)

The shortlisted Scenarios all provide differing opportunities to accommodate change if this is considered desirable by stakeholders. Scenario E1A provides little or no opportunity for change, with much more significant potential in Scenarios 3B and 3C

Table 37.2: Accommodating change *(continued from previous page)*

Evaluation Criteria (Tier 2) – Business processes	
Scenario	**Commentary**

E1A	• The configuration and functionality of the PoW remains unchanged at the end of the programme, therefore:
	  • there may be limited ability to make adaptations to core business processes; and
	  • there may be few opportunities to deliver efficiencies from core business processes and any supporting operating procedures.

2A	• The configuration and functionality of the PoW remains unchanged at the end of the programme, there may be some opportunities to make adaptations to core business processes for functions that are relocated to the decant building(s). However, these changes may be challenging to maintain following the reoccupation back into the PoW.
2B	• The potential for some reconfiguration of the PoW and additional functionality may provide an opportunity to adapt existing business processes, and use the decant facilities to embed such change e.g. blend of offices and administrative functions. • This may deliver some improvements to processes and therefore potentially extract some long term benefits and efficiencies.
3B	• The potential for some reconfiguration of the PoW and additional functionality may provide an opportunity to adapt existing business processes, and use the decant facilities to embed such change e.g. blend of offices and administrative functions. • This may deliver some improvements to processes and therefore potentially extract some long term benefits and efficiencies.
3C	• This provides the best opportunity for the introduction of more extensive improvements in functionality to support any desired improvements to business processes and to fully embed these as part of the relocation to the decant facilities. • This may deliver significant improvements to existing business processes and enable the capture of long term benefits and efficiencies.

Evaluation Criteria (Tier 2) – Supporting changes in culture	
Scenario	**Commentary**
E1A	• No opportunity to embed any desired cultural changes as there is no pivotal event e.g. a significant decant that would support changes to culture and the configuration and functionality of the PoW remains the same upon completion of the programme.
2A	• Some opportunities to instigate desired cultural changes could arise as a consequence of the relocation of some occupiers to the decant building(s). However, the ability to embed these will be challenging over the longer term given the lack of revised reconfiguration or any new amenity and functionality.
2B	• Some opportunities to instigate desired cultural changes could arise as a consequence of the relocation of some occupiers to the decant building(s). There may be a greater ability to embed these over the longer term as a result of any reconfiguration and additional functionality including changes to accommodation and infrastructure.
3B	• Some opportunities could arise to effect any desired changes in culture arising from a full decant and the additional amenities and functionality to improve accommodation and infrastructure.
3C	• This Scenario, with its additional amenities and functionality could provide extensive opportunities to effect any desired changes in culture arising from a full decant and the additional scope to improve accommodation and infrastructure.

Source: IOA Team analysis

4.18 Accommodating change (if desired)

The shortlisted Scenarios all provide differing opportunities to accommodate change if this is considered desirable by stakeholders. Scenario E1A provides little or no opportunity for change, with much more significant potential in Scenarios 3B and 3C

Table 37.3: Accommodating change *(continued from previous page)*

Evaluation Criteria (Tier 2) – Future proofing	
Scenario	**Commentary**
E1A	• There is little or no ability to materially deliver future proofing due to the overall programme schedule. Multiple technological and legislative changes over time coupled with the slow rate of progress makes achieving any future proofing extremely challenging.
2A	• Potentially some opportunity to deliver future proofing, however lifecycle replacement will start to encroach on the programme i.e. services plant life expectancy may expire ahead of programme completion in some areas of the PoW.
2B	• Potentially some opportunity to deliver future proofing, however lifecycle replacement will start to encroach on the programme i.e. services plant life expectancy may expire ahead of programme completion in some areas of the PoW.
3B	• Greater opportunities to seek future proofing initiatives and secure long term operating benefits within the PoW, principally due to the rate of progress and much shorter overall programme schedule.
3C	• Much greater opportunity to seek future proofing initiatives and secure long term operating benefits and costs savings within the PoW, principally due to the enhanced scope, rate of progress and much shorter overall programme schedule.

Source: IOA Team analysis

4.19 Scenario evaluation: Evaluation Criteria

The Evaluation Criteria used during Phase 1 have been used again to form the basis of the evaluation stage during Phase 2. The Evaluation Criteria are divided between those which are qualitative or quantitative, all of which are aligned to the Programme Objectives

Introduction and approach to Selection Criteria

- During the initial stages of Phase 2, the shortlisted Scenarios were assessed against a number of Evaluation Criteria (together with sub-criteria) which are set out below. These cover both quantitative and qualitative criteria, and have been confirmed with the Client Programme Team.

Table 38: Evaluation Criteria and sub-criteria

Qualitative Tier 1 criteria	Operational risk/ impact	Schedule	Potential scope	Accommodate change (if desired)
Qualitative Tier 2 Criteria	• Risk to business continuity • Security • Health and safety • Disruption • Nuisance • Internal capacity and governance	• Schedule certainty • Pace and overall duration • Flexibility • Monitor and control • Speed of (business) risk reduction	• Scope certainty • Extent of scope being delivered • Build ability • Asset protection including heritage matters • Supply chain and market	• Environment • Technology • Business processes • Supporting changes in culture • Future proofing
Wider impact	**Financial Tier 1 criteria**	**Capital expenditure**	**Revenue income and expenditure**	
• Exemplar programme • Programme awareness • Engage with citizens • Cultural and skills opportunities • UK wide impact	Financial Tier 2 Criteria	• Total capital expenditure • Cost certainty • Cash flow (annual run rate)	• Annual running cost and income • Long term view • Spend to save initiative	

Source: IOA Team analysis

Introduction and approach to Scenario evaluation

- We have advised the Programme Board and they have acknowledged that to establish with certainty which Scenarios are more likely to meet the Programme Objectives, all Scenarios will in due course need to be evaluated using a balanced scorecard approach. This will require the client to establish weightings indicating the relative importance they place against each of the evaluation criteria. This exercise will need to be completed before the Decision in Principle is made and will form an integral part of the OBC.

4.19 Scenario evaluation: Evaluation Criteria

The Evaluation Criteria used during Phase 1 have been used again to form the basis of the evaluation stage during Phase 2. The Evaluation Criteria are divided between those which are qualitative or quantitative, all of which are aligned to the Programme Objectives

Evaluation approach

- The Evaluation Criteria which were used for the detailed assessment of the shortlisted Scenarios during Phase 2 of the IOA were consistent with those used during Phase 1 (i.e. for the shortlisting of the Scenarios). This was essential to provide the necessary consistency and continuity throughout the IOA process and to pave the way for any downstream OBC.
- The Evaluation Criteria continued to reflect the confirmed Programme Objectives as agreed by the Client Programme Team and the Programme Board.
- During Phase 2, the IOA team did not establish any hurdles that would have immediately discounted Scenarios. Instead, their relative position was determined and summarised.
- At this stage, the IOA team also relied upon its experience and examples drawn from other comparable major public sector capital programmes, to identify any significant differences in the Evaluation Criteria. Further details of the comparators can be found in Volume 2, Appendix A.4 and B.1.

Illustrative analysis: Qualitative criteria

- The illustrative analysis of Scenarios against the qualitative Evaluation Criteria are summarised in the tables below and overleaf.

Table 39: Illustrative analysis : Qualitative criteria

Evaluation Criteria	Sub-criteria	Scenario E1A	Scenario 2A	Scenario 2B	Scenario 3B	Scenario 3C
Operational risk/ impact	Mitigates business continuity risk	◔	◕	◕	●	●
	Security	◔	◑	◑	●	●
	Health and safety	◔	◑	◑	●	●
	Disruption	◔	◑	◑	●	●
	Nuisance	◔	◑	◑	●	●
	Internal capacity and governance	●	◑	◑	◔	◔
Schedule	Certainty	◔	◑	◑	◕	◕
	Pace and overall duration	◔	◑	◑	●	●
	Flexibility	◔	◑	◑	●	●
	Monitor and control	◔	◑	◑	◕	◕
	Speed of (business) risk reduction	◔	◕	◕	●	●

Source: IOA Team analysis

● Most likely to meet Evaluation Criteria
◕ More likely to meet Evaluation Criteria
◑ May meet Evaluation Criteria
◔ Less likely to meet Evaluation Criteria

4.20 Scenario evaluation: Illustrative analysis

The illustrative analysis has been undertaken on the basis of assessing Scenarios criterion by criterion to determine their relative position. No scoring or weighting has been included within this Final Report, but will be required for the Outline Business Case.

Illustrative analysis: Qualitative criteria (continued)

- Evaluation Criteria covering scope, accommodating change (if desired) and wider impacts are summarised in the table below.

Table 39: Illustrative analysis : Qualitative criteria (continued)

Evaluation Criteria	Sub-criteria	Scenario E1A	Scenario 2A	Scenario 2B	Scenario 3B	Scenario 3C
Potential scope	Certainty	◔	◕	◑	◑	◑
	Extent delivered	◔	◔	◕	◕	●
	Buildability	◔	◕	◕	●	●
	Supply chain	●	◕	◕	◑	◑
	Asset protection	◔	◕	◕	●	●
Accommodate Change (if required)	Environment	◔	◔	◕	◕	●
	Technology	◔	◔	◕	◕	●
	Business processes	◔	◔	◕	◕	●
	Culture	◔	◔	◕	◕	●
	Future-proofing	◔	◕	◕	◕	●
Wider impact	Exemplar programme	◔	◕	◕	●	●
	Programme awareness	◔	◑	◑	◕	◕
	Engage citizens	◔	◑	◑	◕	●
	Cultural and skills opportunities	◔	◕	◕	●	●
	UK wide impact	◔	◑	◑	●	●

Source: IOA Team analysis

● Most likely to meet Evaluation Criteria

◕ More likely to meet Evaluation Criteria

◑ May meet Evaluation Criteria

◔ Less likely to meet Evaluation Criteria

4.20 Scenario evaluation: Illustrative analysis

The illustrative analysis has been undertaken on the basis of assessing Scenarios criterion by criterion to determine their relative position. No scoring or weighting has been included within this Final Report, but will be required for the Outline Business Case.

Quantitative and financial criteria

- Evaluation Criteria covering capital expenditure and revenue expenditure and income are summarised in the table below.

Table 40: Quantitative and financial analysis

Evaluation Criteria	Sub-criteria	Scenario E1A	Scenario 2A	Scenario 2B	Scenario 3B	Scenario 3C
Capital expenditure	Total CapEx (P50 undiscounted)					
	Cashflow					
	Cost certainty					
Revenue expenditure and income	Annual running costs					
	Long term view					
	Spend to save initiatives					

Source: IOA Team analysis

Most likely to meet Evaluation Criteria

More likely to meet Evaluation Criteria

May meet Evaluation Criteria

Less likely to meet Evaluation Criteria

Key observations and commentary

- Whilst this analysis is illustrative, it does show how the Scenarios compare with one another against each individual Tier 2 evaluation criterion.
- The illustrative analysis has been based, where possible, on the evidence that the IOA has assembled in relation to matters such as schedule, scope and cost for each Scenario, as outlined elsewhere within this Final Report.
- For other Evaluation Criteria, such as the Tier 1 criterion covering wider impacts, and associated sub-criteria, the IOA has drawn on its experience of other major capital programmes such as London 2012, to form a view on how well each Scenario meets the criterion or otherwise.
- It is recommended that further work is undertaken as next steps, to re-visit the Programme Objectives, the Evaluation Criteria and their relative importance through consultation. It is envisaged that this may be undertaken with a Joint Committee, should such a group be formed.

4.21 Identified benefits: Cash releasing

Scenario 3C is likely to deliver the greatest opportunity for cash releasing benefits given the nature of the extensive works and improvements to the amenities. Scenario E1A will potentially provide very limited potential to deliver savings or revenue generative opportunities

Introduction

- The delivery of the Restoration and Renewal programme will potentially secure a range of cash releasing benefits, although the quantum of these mean that they are unlikely to offset the capital costs of the Programme. These may come in the form of either reduced operating costs at the Palace, reductions that impact the running of the overall Parliamentary Estate or through revenue income generating opportunities that arise from enhancements in the attractiveness, the functionality and amenity at the Palace. The anticipated schedule durations for each of the Delivery Options potentially will have a material impact on the discounted value of these benefits.
- These cash releasing benefits have been categorised by stakeholders and beneficiaries, to provide a structured perspective on their respective impact.
- As part of the downstream OBC and subsequent FBCs, the proposed approach to benefits appraisal, and the resultant strategy, framework and plan will need to be developed in detail to determine the scale of cashable benefits and how these will be tracked and realised.
- Delivery of the Programme will also generate a number of benefits, however even for delivery Options 2 and 3, these will be delivered over a significant timeframe, but for Scenario E1A this will be over a very prolonged period.

Table 41.1: Cash releasing benefits *(continued on next page)*

Beneficiaries – The public interest in value for money	
Scenario	**Commentary**
E1A	It is difficult to envisage how this Scenario might be capable of delivering significantly lower running costs given the relatively slow rate of replacement of existing services and fabric. The existing relatively high maintenance costs will continue and only reduce very slowly over time. The existing service offers e.g. catering, would be re-provided as part of the Outcome Level , therefore this will also have little or no opportunity for revenue expenditure reduction or to improve revenue income e.g. through more covers or greater per capita income through catering outlets.
2A	Whilst this will potentially deliver the ability to secure lower running costs from hard and soft facilities management relative to E1A, this is still only achieved after a relatively long period of time. The ability to secure greater revenue income or reductions in expenditure will also be impacted in the same manner as E1A given Outcome Levels, and therefore has limited potential.
2B	Whilst this will potentially deliver the ability to secure lower running costs from hard and soft facilities management relative to E1A, this is still only achieved after a relatively long period of time. However, it does begin to open up the potential for spend to save initiatives being incorporated as part of the enhanced specification to meet Outcome Level B. The existing service offers could be reconfigured and enhanced as part of Outcome Level B, and therefore this does provide some potential to reduce revenue expenditure and increase income e.g. through catering consolidation and improvement in both access to the service and the quality and range of catering available.
3B	The speed of delivery of this Scenario coupled with the enhanced Outcome Level, provides a significant opportunity to reduce running costs as a consequence of introducing new technology that is more efficient to operate thereby reducing utility consumption. This Scenario also provides the earliest opportunity to benefit from reconfigured and enhanced services, thereby providing a greater potential for lower revenue expenditure and increasing revenue income e.g. enhanced catering provision. as a consequence of introducing new technology that is more efficient to operate thereby reducing utility.
3C	This Scenario provides the greatest opportunity for the Clerks and PED to secure long term cash releasing benefits. Whilst the programme is delivered in a comparable timescale to Scenario 3B, the ability to provide additional scope and enhancements, brings with it a greater opportunity to secure longer term cash releasing benefits through lower facilities management costs and reconfigured facilities. This could include the visitor centre and wider retail offerings.

Source: IOA Team analysis

4.21 Identified benefits: Cash releasing

Scenario 3C is likely to deliver the greatest opportunity for cash releasing benefits given the nature of the extensive works and improvements to the amenities. Scenario E1A will potentially provide very limited potential to deliver savings or revenue generative opportunities

Table 41.2: Cash releasing benefits *(continued from previous page)*

Beneficiaries – The Parliament including Members of both Houses	
Scenario	**Commentary**
E1A	Scenario provides little or no opportunity for (or more efficient use of existing resources) for Parliament including Members of both Houses. Furthermore, it is possible that the level of ongoing relocation (churn) and Disruption necessary to deliver E1A actually disbenefits Members of both Houses. It is not envisaged that cash releasing benefits e.g. from more effective technology will be possible to secure, given the Outcome Level and relatively slow rate of progress on the Restoration and Renewal programme through Scenario E1A. There is little or no potential to generate cash releasing benefits from external visitors given the condition and configuration of the Palace once the Restoration and Renewal is complete, and after such a long period. However, this Scenario does not potentially carry the same level of disbenefits associated with the Palace becoming a major construction site when compared with Delivery Options 2 and 3.
2A	Outcome Level for Scenario 2A dictates that there will be limited opportunity to deliver reduced running costs or more efficient use of existing resources. However, there is slightly less potential for disbenefits associated with numerous relocations than would be case for Scenario E1A. Similarly to E1A, it is unlikely that cash releasing benefits arising from new technology, given the proposed Outcome Level being delivered. For the same reasons as Scenario E1A, this provides little or no potential to generate cash releasing benefits from external visitors. The partial decanting of some accommodation from the Palace potentially creates a disbenefit in restricting the ability to conduct tours and associated impact on retail income.
2B	Scenario does provide some opportunity for better use of resources that may deliver cash releasing benefits. This would principally arise from the enhanced Outcome Level that might be delivered. However, the scale of these cash releasing benefits will be potentially offset by the time taken to deliver the Programme. Over the long term, this may provide some potential to generate cash releasing benefits from external visitors as a result of enhanced and reconfigured facilities. However, the partial decanting of some accommodation from the PoW potentially creates a disbenefit in restricting the ability to conduct tours as a heritage attraction and associated impact on retail income. This could be off set by alternative tours to witness the Programme works being delivered.
3B	A greater opportunity to deliver cash releasing benefits for Parliament including Members of both Houses exists for this Scenario, given the speed of delivery and enhanced Outcome Level. Cash releasing benefits will potentially come through at a much earlier point than in Scenario 2B, and across both Houses together. This Scenario will potentially deliver cash releasing benefits in the same way as 2B, albeit much sooner. This will be consequential short term disbenefits arising from the inability to conduct tours at the PoW as a heritage attraction. However, it may be possible to off set some of the effect by offering alternative tours to witness the Programme works being delivered.
3C	Scenario 3C provides the best opportunity to secure cash releasing benefits given this shares the shortest overall duration with Scenario 3B, but importantly provides a greater potential to lever new technology and efficiencies that may come through reconfiguration. Over the long term, the enhanced Outcome Level for Scenario 3C provides a good opportunity to secure cash releasing benefits, both from a spend to save perspective e.g. to reduce utility consumption as well as to secure new revenue income generative opportunities. The Outcome Level, coupled with the shortest overall programme duration for Option 3, provides the best opportunity to secure cash releasing benefits amongst all five shortlisted Scenarios

Source: IOA Team analysis

4.22 Identified benefits: Non cash releasing

Scenario 3C is likely to provide the best opportunity to generate non-cash releasing benefits given the nature of the extensive works and improvements to the amenities in the shortest timescale. In contrast, Scenario E1A potentially delivers very few non-cash releasing benefits

Introduction

- The Programme may deliver a broad range of benefits that do not generate cash, either through efficiencies leading to reduced revenue expenditure, or through additional revenue generative opportunities. However, these are still important to consider and would include qualitative improvements to the working environment that might lead to improved attraction and retention of talent, greater diversity of users at the PoW and the wider brand benefits for Parliament and the PoW. The consideration of what might be included in a C+ Scenario should take account of these non-cash releasing benefits in the next stage of work following the IOA.
- A high level summary of these has been set out below, and whilst benefits are usually measured on completion of the Programme, the significant delivery durations for some Scenarios bring into focus the need to potentially consider what the implications are whilst the Programme is underway.

Table 42.1: Non-cash releasing benefits *(continued on next page)*

Beneficiaries – Members of both Houses	
Scenario	**Commentary**
E1A	There is little evidence to suggest that this Scenario will deliver any meaningful non-cash releasing benefits to, given the absence of any improvements in outcome levels, coupled with the long term, delivery of this and associated potentially disruptive impact of construction activities taking place in an occupied building. This potential for Disruption and Nuisance may actually become a disbenefit of delivering the Restoration and Renewal programme in the manner.
2A	This Scenario is likely to have little positive impact on the Members and staff. Whilst there may be some advantages relative to Scenario E1A, give the ability to better segregate construction from operations at the Palace, the still relatively long term nature of this delivery Option coupled with the lack of any material improvements arising from the Outcome Level means that any positive impact is likely to be very modest.
2B	The enhanced outcome level may deliver some qualitative benefits upon completion such as a greater ability to attract and retain staff and lower absenteeism through improvements in the physical working environment. The delivery of these benefits is only likely to take place once all the Restoration and Renewal works are completed as construction operations may still have adverse impacts whilst they are underway.
3B	The enhanced outcome level may deliver some qualitative benefits upon completion such as a greater ability to attract and retain staff and lower absenteeism through modest improvements in the physical working environment. This Scenario provides the earliest opportunity to deliver such benefits.
3C	The enhanced outcome level may deliver some more significant qualitative benefits upon completion such as a greater ability to attract and retain staff and lower absenteeism through potentially more significant improvements in the physical working environment. This Scenario provides the earliest opportunity to deliver such benefits.

Source: IOA Team analysis

4.22 Identified benefits: Non cash releasing

Scenario 3C is likely to provide the best opportunity to generate non-cash releasing benefits given the nature of the extensive works and improvements to the amenities in the shortest timescale. In contrast, Scenario E1A potentially delivers very few non-cash releasing benefits

Table 42.2: Non-cash releasing benefits *(continued from previous page)*

Beneficiaries – Other passholders i.e. Parliamentary staff	
Scenario	**Commentary**
E1A	There is little evidence to suggest that this Scenario will deliver any meaningful non-cash releasing benefits to non-Passholders, given the absence of any improvements in outcome levels, coupled with the long term, delivery of this and associated potentially disruptive impact of construction activities taking place in an occupied building. The Scenario is unlikely to generate benefits such as improved attraction and retention of staff, given the lack of improvement in the working environment following completion. Furthermore, the ongoing and long term risk of Disruption and Nuisance may actually prejudice this during the lifetime of the Programme.
2A	This Scenario is likely to have little positive impact on other Pass holders. Whilst there may be some advantages relative to Scenario E1A, give the ability to better segregate construction from operations at the Palace to alleviate disbenefits during the duration of the Programme, the still relatively long term nature of this delivery Option coupled with the lack of any material improvements arising from the Outcome Level means that any positive impact is likely to be very modest.
2B	The enhanced outcome level may deliver some qualitative benefits upon completion such as a greater ability to attract and retain staff and lower absenteeism through improvements in the physical working environment. The delivery of these benefits is only likely to take place once all the Restoration and Renewal works are completed as construction operations may still have adverse impacts whilst they are underway.
3B	The enhanced outcome level may deliver some qualitative benefits upon completion such as a greater ability to attract and retain staff and lower absenteeism through improvements in the physical working environment. Whilst there may also be opportunities to secure early wins at the decant accommodation, those other Pass holders located at the PoW whilst the works are underway may be adversely impacted as a consequence of Disruption and Nuisance.
3C	The enhanced outcome level is much more likely to deliver some qualitative benefits upon completion such as a greater ability to attract and retain staff and lower absenteeism through improvements in the physical working environment. The wider improvement of amenities at the PoW may also encourage wider benefits such as diversity amongst other Pass holders. There may be significant opportunities to secure early wins at the decant accommodation to deliver the above benefits and embed them for the long term following reoccupation of the PoW.

Source: IOA Team analysis

4.22 Identified benefits: Non cash releasing

Scenario 3C is likely to provide the best opportunity to generate non-cash releasing benefits given the nature of the extensive works and improvements to the amenities in the shortest timescale. In contrast, Scenario E1A potentially delivers very few non-cash releasing benefits

Table 42.3: Non-cash releasing benefits *(continued from previous page)*

Beneficiaries – External visitors and users of the PoW	
Scenario	**Commentary**
E1A	There is little evidence to suggest that this Scenario will deliver any meaningful non-cash releasing benefits to external visitors and users of the PoW, given the absence of any improvements in outcome levels, coupled with the long term delivery of this Scenario and associated potentially disruptive impact of construction activities taking place in an occupied building.
2A	This Scenario is likely to have little positive impact on other external visitors and users of the Palace given the Outcome Level that is ultimately delivered. Furthermore, the need to undertake major construction activity within a part occupied PoW may actually bring about more significant disbenefits as a consequence of a long term construction activities which could damage the PoW brand, given the external impact on visitors.
2B	This Scenario is likely to have some positive impact on other external visitors and users of the Palace given the Outcome Level that is ultimately delivered to deliver benefits such as the brand of the PoW to external visitors. However, the need to undertake major construction activity within a part occupied PoW may actually bring about more significant disbenefits as a consequence of a long term construction activities which could damage the PoW brand, similar to Scenario 2B.
3B	This Scenario is likely to have some positive impact on other external visitors and users of the Palace given the Outcome Level that is ultimately delivered and in a much shorter timescale than Scenario 2B. However, the need to decant all users from the PoW for a period of time, may actually have a detrimental impact on brand over the short term whilst works are underway. Mitigating actions to address this will need to be taken e.g. public engagement on the Programme
3C	This Scenario provides the greatest opportunity to deliver significant non-cash releasing benefits. Additional amenities and facilities may attract a much more diverse range of visitors and users to the PoW to create a welcoming and inclusive environment. However, like Scenario 3B, the need to decant all users from the PoW for a period of time, may actually have a detrimental impact on brand over the short term whilst works are underway. Again, mitigating actions will need to be taken.

Source: IOA Team analysis

Palace of Westminster Restoration and Renewal Programme Independent Options Appraisal

Final Report
Volume 1

Chapter 5 – Key themes

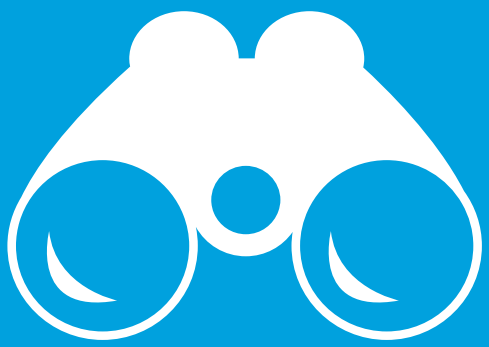
This final report (the "Final Report") has been prepared by Deloitte LLP ("Deloitte") for The Corporate Officer of the House of Lords and Corporate Officer of the House of Commons (Acting Jointly) in accordance with the contract with them dated 23rd December 2013 ("the Contract") and on the basis of the scope and limitations set out below.

No party other than The Corporate Officer of the House of Lords and Corporate Officer of the House of Commons (Acting Jointly) is entitled to rely on the Final Report for any purpose whatsoever and Deloitte LLP accepts no responsibility or liability or duty of care to any third party.

The Final Report has been prepared solely for the purposes of satisfying the 'Core Objective' of the Independent Options Appraisal as set out in the Contract i.e.: 'an independently produced costed options appraisal of the Scenarios, in order to enable Parliament to reach a well-founded decision in principle on the means of restoring and renewing the Palace of Westminster while maintaining business continuity.'

8 September 2014

5. Key themes



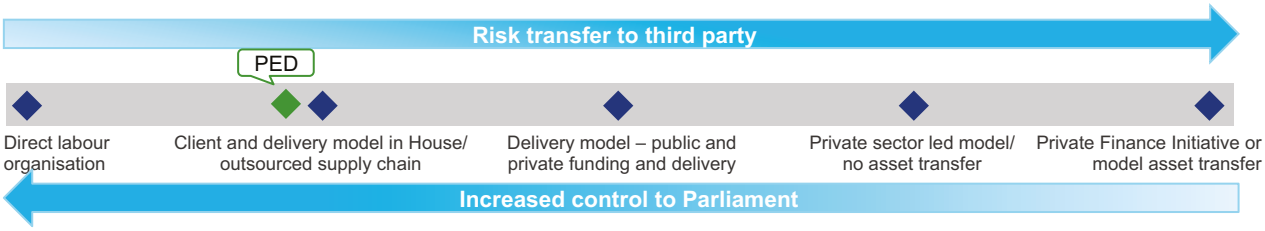
5.1 Overview of delivery models

A delivery model is required to enable and drive the Programme and to secure the anticipated benefits. The structure, scale and capability requirements of the delivery model will need to be tailored to reflect the selected delivery Option to realise a successful outcome

Background to delivery models

- This section outlines the structure of delivery models that could be required to deliver the Programme Objectives. Establishing and managing a programme of this scale and complexity requires a suitable delivery model that harnesses the necessary levels of authority, capability and capacity to achieve the anticipated benefits.
- There have been an increasing number of substantial infrastructure programmes in the UK in recent years that have successfully developed and deployed appropriate delivery models. Examples include the London 2012 Olympic Games and Crossrail. In both instances bespoke client bodies and delivery vehicles were tailored to meet the specific needs of the programme.
- The lessons from these programmes, and others, have been gathered by Infrastructure UK as part of the Government's Construction Strategy. The IOA team has had informal sessions with Members of the IUK team and drawn on our own IOA team's experience from these large programmes to gain provide a considered overview.
- The delivery model must address the following: the need for a dedicated client interface between stakeholders and the actual delivery function, what the model is trying to achieve, the governance arrangements that would need to be put in place to ensure it's effective, and finally how it interacts with the supply chain to deliver the Programme.
- Within this section there is reference to:
  - Strategic governance, which reflects Parliament's independence but significantly influenced by Government policy;
  - A sponsor body which might comprise Members to take significant programme related political decisions; and
  - A Client function, ostensibly the client programme team led by a Programme Board to make day to day decisions on the programme.
- The image below provides a high summary of the spectrum of generic delivery models that exist and where PED currently sits.

Figure 30: Generic delivery model spectrum



Source: IOA Team analysis

Key challenges

- For the Programme to be successful, each of the following challenges will need to be addressed and mitigated through an effective delivery model. These include:
  - A lack of capacity, and to some extent capability, in the existing PED organisation, to manage a programme of this scale and complexity;
  - A very complex stakeholder landscape;
  - The absence of a single Client function. i.e. at present the HoC and HoL act independently, potentially leading to competing requirements and Programme conflict;
  - The complexity and potentially protracted nature of decision making (which could have detrimental impacts on schedule and costs);
  - The limited access to the PoW to carry out day to day maintenance (i.e. essential building and services works); and
  - The need to capture the opportunity to manage PoW data in a single coordinated manner (including technical services information, building plans/drawings and asbestos register).

Key Client Functions

- In order to measure the success of the Programme, to continue to deliver ongoing added value, and meet objectives over the long term, it will be essential to have a strong Client function which:
  - Leads and directs the Programme effectively, through effective forward planning and timely, informed decision making;
  - Provides continuity to manage the delivery of the Programme to meet the stated objectives throughout a number of Parliamentary cycles to mitigate the impact of changes on timescales and delivery options;
  - Embeds strong necessary governance to represent both Houses, proactively manage, be credible and accountable to key stakeholders and influencers. This may involve the client function supporting the sponsor body taking difficult decisions early on in the Programme e.g. selecting the necessary decanting option(s) and potential fit out requirements;
  - Is established with sufficient scale and with appropriate capability and authority, noting that this will be determined in part by the selected delivery Option;
  - Manages risk allocation between the Client, delivery partners and their supply chain and maintains transparency at all levels, and with a thorough understanding of the impact of austerity and public expectation; and
  - Focuses on the end vision for a 21st Century Parliament that meets the needs of stakeholders for generations to come.

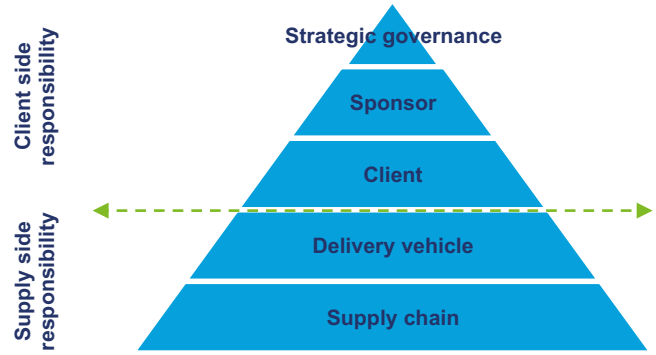
5.1 Overview of delivery models

A delivery model is required to enable and drive the Programme and to secure the anticipated benefits. The structure, scale and capability requirements of the delivery model will need to be tailored to reflect the selected delivery Option to realise a successful outcome

Purpose and context

- The Management Case of the downstream OBC will need to identify, to a reasonable level of detail, who will deliver the programme of works and how this will be achieved. As a minimum, this will need to include the following:
  - How the Client function/organisation is established and maintained;
  - How supply chain partners may be engaged to enhance the Client function/organisation, where appropriate; and
  - The outline procurement strategy, and thus, the structure and approach to supply chain construction partners (tier one and tier two contractors).
- The purpose of this section is to outline a number of relevant issues, to provide an illustrative and likely direction of travel, and thus to provide a realistic set of assumptions for the IOA, such that appropriate allowances can be made for the time to set up any new Client function and delivery vehicle (if required), mobilise these, and the period necessary to procure supply chain partners;
- It is envisaged that in the post IOA phase, this work will need to be progressed further, to help inform the Management Case in the OBC. The development of the Management Case is envisaged to be the process through which these proposals are finalised and agreed. These follow on activities are described in Section four (within the Schedule) of this report.
- The organisational structure covering both the client responsibilities for leadership, direction and governance, the supply side responsibilities for delivery, and crucially the divide between the two layers has been illustrated below.

Figure 31: Overview of delivery structure



Source: IOA Team analysis

- The table below provides a high level summary of each of the layers from the organisational structure.

Table 43: Summary of roles and responsibilities

Roles	Summary
Strategic governance	The Government / Houses of Parliament will be accountable, setting strategic policy, providing funding, and the overall decision framework for the management of risk on the Programme.
Sponsor	A single entity to enable leadership, direction (including challenge) and strategic decision making. To be held accountable for achieving and realising the programme benefits, but not managing operational issues.
Client	Ownership for delivery of the vision of the Programme, distinct from the acquisition or procurement of that vision. It is envisaged that this function would: • Own the vision and is committed to delivering the strategic objectives; • Provide strong leadership and direction, oversight and manage the delivery of the Programme; • Manage the Programme proactively and be credible with key stakeholders and influencers; • Secure and maintain resources with relevant skills and information to be able to make timely and informed decisions; • Provide an appropriate and intelligent interface with the delivery vehicle and its supply chain; • Manage Programme funding with appropriate delegated authority in place to make decisions e.g. decant; and • Oversee expenditure and performance against plans and budgets, and physical and non-physical outcomes.
Delivery vehicle	Primarily responsible for managing and procuring the design, works trades and supply chain including procurement of the works and services; and manage the delivery of the programme.
Supply chain	Delivery of the works and services required to realise the benefits of the programme. There will be a requirement to engage with the supply chain, which will exist across multiple markets.

Source: IOA Team analysis

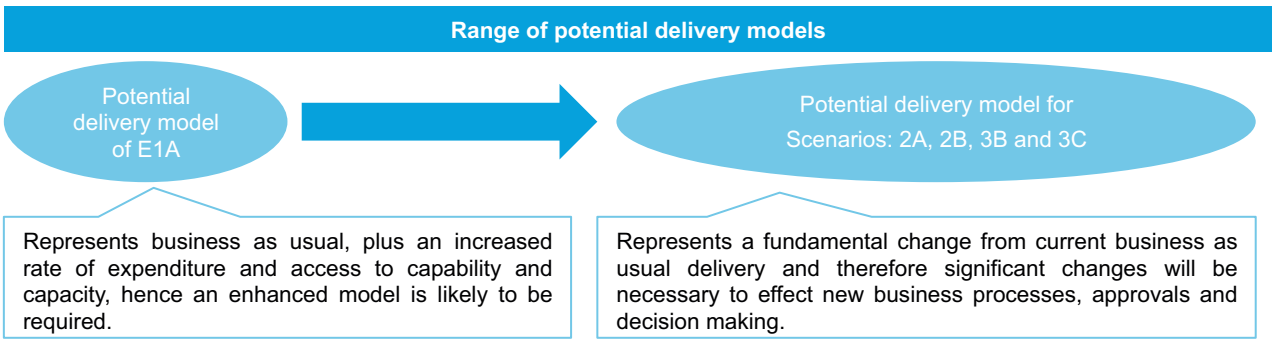
5.1 Overview of delivery models

A delivery model is required to enable the effective delivery of the Programme and to maximise the benefits. The size and capability of the delivery model is likely to change depending on the selected delivery Option.

Approach

- The IOA team's approach has been based on a small number of standardised roles for the Programme. The delivery model should clearly identify how these roles and responsibilities will be sourced and organised.
- The image below outlines the potential and significant changes in the delivery model depending on the option selected.

Figure 32: Range of potential delivery models



Source: IOA Team analysis

Roles and responsibilities

- The core roles for each of the organisational layers are illustrated below, however these roles and responsibilities may change over time depending on which Scenario is adopted.

Table 44: Scenario specific delivery model roles.

	Scenario: E1A	Scenario 2A	Scenario 2B	Scenario 3B	Scenario 3C
Strategic governance	Complete commitment from the Government (including HM Treasury) is required regardless of the adopted Scenario				
Sponsor	Status quo, plus some enhancement	Single sponsor requiredm given scale and complexity of Programme			
Client	Status quo, plus enhanced due to rate of expenditure	Significantly enhanced Client function team			
Delivery model	Light-touch model	Potential dedicated programme delivery vehicle (potentially with private sector leadership and involvement) i.e. including a delivery partner/construction manager			
Supply chain	Enhancement of existing supply chain	Programme specific and sustainable supply chain to be established and maintained. NB: indicative packaging and contracting strategy is included in volume two. At this stage of the programme with the scope yet to be finalised, only a notional approach can be currently illustrated.			

Source: IOA Team analysis

Asset stewardship

- The Programme Objectives principally aim to address long term asset stewardship, which is the management and maintenance of the condition and utilisation of the PoW and the Parliamentary Estate on a day-to-day basis. Furthermore, the Programme is not a one off capital investment. The long term asset stewardship of the PoW for generations to come, is an integral driver in the establishment of an effective client delivery model.
- HM Treasury and IUK guidance is principally targeted at one-off capital expenditure organisations. In the case of other major publicly funded programmes such as the London 2012 Summer Games and Crossrail, other Government bodies continue to be responsible for ongoing asset stewardship.
- The PoW is materially different to the likes of London 2012, as not only does it require an initial capital investment, but consideration and operational expenditure also needs to be given to the on-going asset stewardship (i.e. maintaining the asset, and managing its occupation). PED may need to evolve and potentially restructure in order to reflect this long term need.

5.1 Overview of delivery models

A delivery model is required to enable the effective delivery of the Programme and to maximise the benefits. The size and capability of the delivery model is likely to change depending on the selected delivery Option.

Key issues affecting asset stewardship

- Gaining and maintaining a comprehensive understanding of the PoW to effectively and efficiently deliver the Programme. To do this, the Client function must have a clear understanding of the PoW and its various elements, systems and components. This is critical for the effective management and transfer of risk through the delivery process.
- The ability to maintain the reputation of Parliament as an effective steward (i.e. one of a world class Parliamentary estate) to all stakeholders, and in particular Members of both Houses and associated administrations, and avoidance of continued and unchecked dilapidation.
- The need to maintain project momentum during the cyclical nature of Parliament and its impact on timescales, the impact of delivery Options and the level and duration of potentially disruptive construction works.
- The requirement for transparency at all levels and a thorough understanding of the impact of austerity and public expectation and how this position relates directly to stakeholders' reputations.
- The clear need for a single sponsor body that represents and is accountable to both Houses and wider stakeholders.
- Given the strategic and national importance of the PoW, the working assumption is that asset transfer is not currently being considered and therefore the PoW will remain in public ownership both during and after the Programme.

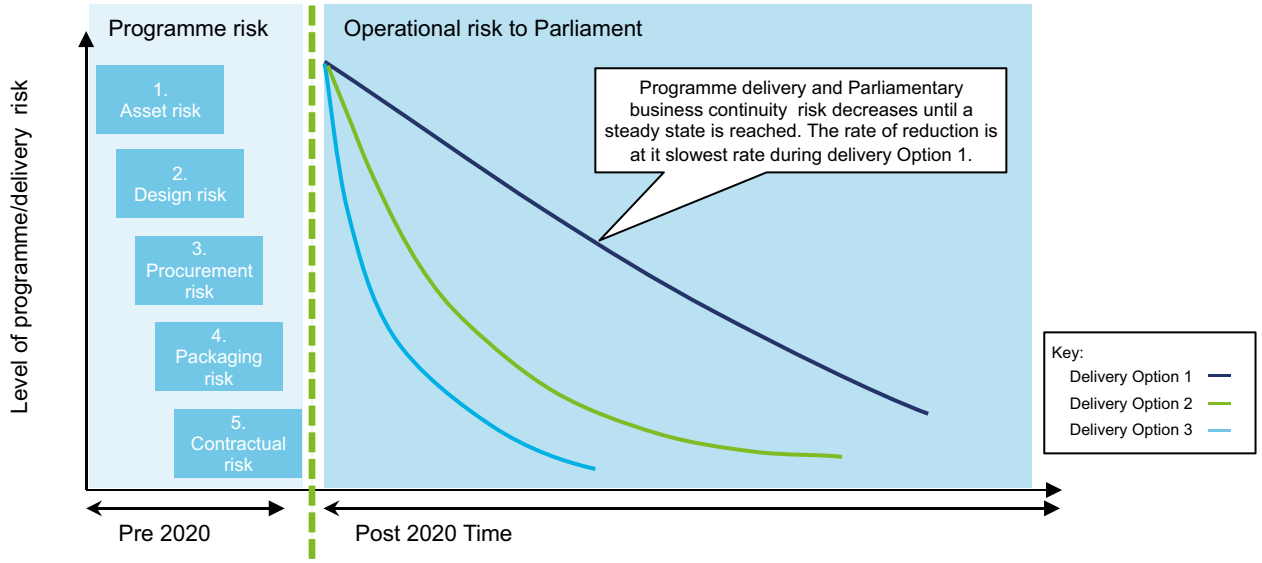
Strategic governance

- The vision - should be established to reflect the desired end state for the PoW that will meet the needs of a 21st Century Parliament and which will continue to do so for generations to come.
- Asset Condition - without improved knowledge of the PoW (and related systems and sub systems) tangible benefits may be more difficult to identify and track. The stewardship of the PoW should be linked to Parliament's responsibility and accountability for the PoW's fitness for purpose, and ultimately maintaining the world class status of the Estate. The measures could be user quality and experience, estate availability, and the visitor experience. (A = Attention to detail / C = Consistency / E = Energy in Service Delivery). Where appropriate, Parliament should draw on good industry practice elsewhere.
- Asset Steward – Potentially needs vesting through primary legislation such that they can discharge an ultimate role of protecting the PoW and the wider estate as an asset into perpetuity. The long-term objective for a new entity should be to preserve the asset for future generations and maintaining the Estate's reputation.

Programme and delivery risk

- The Programme will encounter various levels of risk ahead of the assumed start date (Q2 2020) during the planning stages. The five key areas of risk are highlighted within the visual below. Asset risk and contractual risk will remain the most prolonged, however as the design, procurement, packaging and contracting stages are completed, the associated risks will reduce.
- The risk to Parliamentary business will remain at high levels until the Programme has materially delivered early improvements in areas such as infrastructure and services, however depending on the adopted Scenario will reduce at different rates over time (noting that delivery Option 3 will reduce business risk far quicker than delivery Option E1).

Figure 33: Programme and delivery risk



Source: IOA Team analysis

5.2 Governance and sponsor body

A joint sponsor covering both Houses is required and therefore new legislation is likely to be required. The sponsor will act as a single point of contact, which should simplify decision making, delegation of authority and reduce the risk of overlapping requirements.

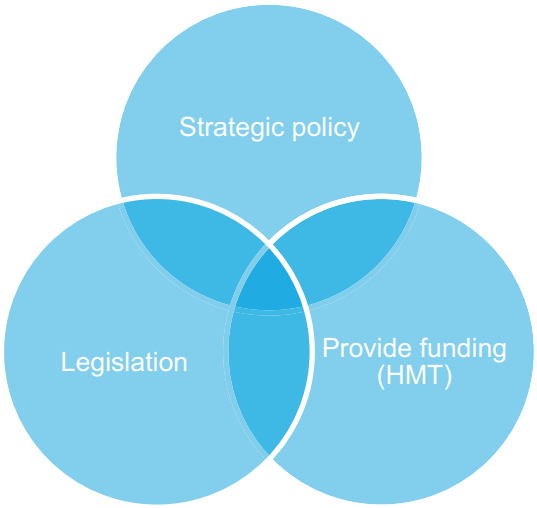
Introduction

- This section outlines the need to establish a single sponsor body that is responsible for bringing the condition of the PoW to an acceptable level to meet the programme objectives, its business requirements and to maintain the PoW in perpetuity.

Strategic governance

- There is a complex symbiotic relationship between Parliament and Government. Parliament is an independent organisation but which is impacted by Government policy. In turn, Government is dependent on Parliament for budget and legislation.
- This mutually dependent relationship is outlined in the diagram below.

Figure 34: Strategic governance



Source: IOA Team analysis

- This complex relationship must be enduring, therefore it is essential that cross party support is established and maintained for the duration of the Programme and beyond.
- In addition to the above, Parliament and Government have specific obligations for protecting and preserving the PoW as a heritage asset i.e. DCMS responsibility for World Heritage Sites. Therefore, Government may have a role to facilitate the delivery of the Programme.

The sponsor body

- It is envisaged that the sponsor body may be created formally through legislation and should place asset stewardship of the PoW at its core. The key objectives of the sponsor body could include:
  - Maintaining the PoW as a heritage asset of strategic national importance in perpetuity;
  - The requirement to raise the current condition of the PoW to a level where on-going maintenance and management is future proofed, and where operational effectiveness and period-on-period efficiency improvements are secured; and
  - Managing strategic objectives and performance of the Programme over a repeated, pre-determined period e.g. every 5 years
- The significance of the above points is magnified further when considering:
  - The iconic nature of the asset; and
  - The impact of the condition of the asset on the UK tourist industry;
  - The reputational damage to the UK, should the asset significantly degrade or fail.
- The core purpose of this body would be to deliver the restoration and renewal of the PoW to the necessary cost, time and quality requirements, and the establishment and delivery of an effective maintenance and life cycle regime as part of its asset stewardship role.

5.2 Governance and sponsor body

A joint sponsor covering both Houses is required and therefore new legislation is likely to be required. The sponsor will act as a single point of contact, which should simplify decision making, delegation of authority and reduce the risk of overlapping requirements.

- Furthermore the sponsor body must be in a position to minimise strategic Programme risks such as:
  - Poor brief definition of the works to be carried out and resulting scope creep or unplanned change;
  - Lack of timely and informed decision making leading to delays and increased cost; and
  - Changes in the political context with the UK over the long term i.e. between Parliamentary cycles.
- Therefore, it is advisable that a sustainable mechanism (in the form of an enduring single body or authority) is created to combine the authority of both Houses to act as a single sponsor.
- This statutory body to be created will include all the function required of the sponsor role, although it may also include some of the functions of the Client role. However, the precise remit of the body will be dependent on the delivery Option going forward.

Principles of the sponsor body

- Due to the high profile nature of the Programme, there is an essential requirement for the sponsor to be a single body or authority to act as a single entity, representing both Houses. In doing so, the sponsor body must include the following within their roles and responsibilities:
  - Provide a single point of responsibility with clear communicating and reporting channels;
  - Provide a focused and well informed client or user function; and
  - Allow the programme works, and hence the asset stewardship, to become separate from the core business of Parliament and the normal management of the PoW.

Roles and responsibility of the sponsor body

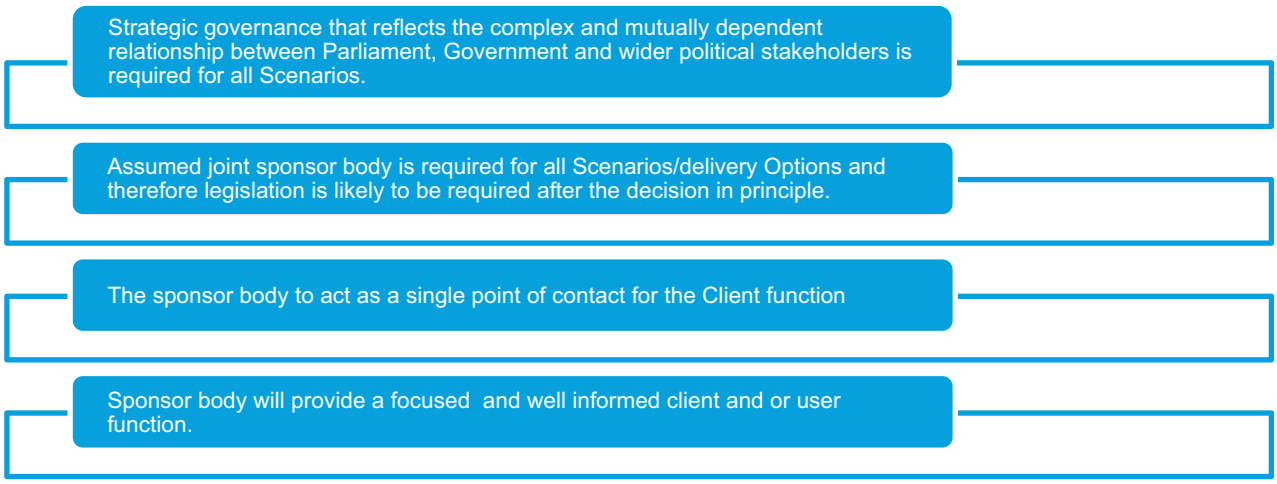
- The joint sponsor body will need to have the following key attributes, which are summarised below.

Figure 35: Sponsor Body Attributes

Structure	Statutory	Accountable
• To be a formally constituted body • Legislation required • Is representative of both Houses	• Statutory powers are to be granted • To be set up without time limitations that would impede the Programme	• Act in the best interest and to be held accountable to both Houses • Clear lines of accountability to body and in turn, from the body to the Houses

Source: IOA Team analysis

Figure 36: Governance and sponsor body key messages



Source: IOA Team analysis

5.3 Client function

Regardless of delivery Option, the programme will not be delivered (principally due to capacity and capability constraints) without the implementation of an enhanced Client function

Introduction

- This section outlines the attributes necessary for the potential client model that will be necessary to deliver the Programme and uses a high level evaluation framework to assess a series of strategic challenges. The relationship between the key stakeholders within the Client function and day to day delivery model (subject to adopted Scenario) is separately assessed.

Primary role of the Client function

- The Client function must manage upwards and outwards, dealing with the communications required by sponsors, internal stakeholders, and wider issues such as Freedom of Information requests, media events and enquiries from other UK citizens.
  - The role of the Client function should be to:
  - Oversee and manage the delivery of the programme to meet the required objectives, and deliver the confirmed benefits;
  - Provide strong leadership and direction;
  - Establish and maintain an appropriate and intelligent interface with the secondary delivery functions; and
  - Ensure ongoing stakeholder alignment.
- The Client function will need to:
  - Have appropriate delegated authority in place to meet Programme needs e.g. decant decisions;
  - Have strong governance arrangements in place;
  - Be resourced with relevant skills and have relevant management information to hand to make timely and informed decisions; and
  - Have a complete understanding of the PoW, and the location, condition and operational implications of all elements, systems and components.
- With these attributes in place, the Client function will be able to:
  - Ensure issues and risks are effectively managed and mitigated and take account of any adverse impacts on Programme delivery with the potential operational implications on the business of Parliament;
  - Keep the sponsor appraised of progress, and act as a common point of contact and control;
  - Provide leadership to the delivery vehicle and its supply chain and maintain the necessary focus on benefits delivery; and
  - Be accountable for delivery of the programme objectives and Critical Success Factors and be responsible for Programme support functions such as Finance, HR, and programme assurance.

Source: IOA Team analysis

Table 45: Client function contributions

Programme objectives	How the Client function can contribute
Allows the business of Parliament to continue uninterrupted, mitigates any adverse operational impact, and reduces risk over the longer term	Establish a Client function which is: • Capable of assessing the implications of Programme delivery on the business of Parliament • Able to readily access information and effectively manage stakeholders across the Programme to prevent delays in decision making • Appropriately authorised to make decisions (for example, decanting/ reoccupying
Accommodates the needs of a 21st Century Parliament	Creating a Client function which is: • Capable and has the capacity to manage the Programme to meet this objective e.g. through the definition of scope and specification for delivery within the required timescale, to the agreed budget and to quality standards
Addresses existing building structure, fabric and services issues	Maintaining a Client function which: • Thoroughly understands the PoW as an asset, together with its systems and components • Provides a suitable interface between the client and the delivery vehicle to ensure appropriate and effective management of the supply chain to meet this objective • Effectively manages delivery risk to prioritise and address these issues during the Programme
Preserves and protects the PoW's status as a Grade I listed building and a UNESCO World Heritage Site for the foreseeable future	Equipping the Client function that has the: • Specialist expertise to oversee this aspect of the Programme • Ability to proactively, cohesively and collaboratively manage all engagement with English Heritage, Westminster City Council and other interested parties
Delivers value for money for the taxpayer, generating a range of economic benefits	Mandating the Client function so that it: • Monitors and manages the delivery of value for money through the Programme • Delivers wider benefits e.g. employment, skills and public engagement

5.3 Client function

Regardless of delivery Option, the programme will not be delivered (principally due to capacity and capability constraints) without the implementation of an enhanced Client function

Client function – illustrative delivery options

- A number of illustrative delivery options are outlined below to demonstrate some of the principal differences, advantages and disadvantages, and how these might be considered against the short listed Scenarios.

Table 46: Outline evaluation summary

	Status quo	Enhanced status quo	Arms length body	Arms length body: Private sector partner (PSP)	Joint venture/ Private sector partner (PSP)	Privatisation/ outsourcing
Summary description	Client continues to deliver in-House, however concerns over the existing Client function having the capability and capacity to deliver the Programme.	Client recruits into team and supplements with external support, where appropriate	Form depends on precise requirements. Separate entity with delegated powers to take forward vision e.g. Crossrail, Olympic Delivery Authority, and utility companies	Invited into arrangement in return for skills/ resource/ capital. Structure depends on objectives and extent of risk transfer. Need to establish payment mechanism e.g. DIO	JV structure, where PSP takes more of a decision making and funding role than under the arms length body: PSP option	Transfer of risk/ possible ownership to private sector on the basis of a service provision e.g. MOD main building
Advantages	Flex team as and when required.	Augments existing team Preserves in- House skills and knowledge. Brings in wider external experience.	Introduces commercial disciplines. Separates out management and governance – may assist in stakeholder management. Allows the administration to concentrate on business as usual	Private sector expertise and capacity Potential source of capital - albeit likely to be limited.	Private sector expertise and capacity Sharing of risk.Potentially more capital deployed than under arms length body. Couldbe classified as private sector entity	Access to private sector expertise and capital. Encourages cost reduction and efficiencies
Dis-advantages	Team have skills/ capacity to deliver over log term?	Time consuming to recruit piecemeal Internal governance model be able to challenge users.	Political reluctance to recommend new non departmental public body.	Needs strong governance to manage relationship. Difficulty in specifying upfront requirements. No real risk transfer given length of time	Needs strong governance to manage relationship. Difficulty in specifying upfront requirements.	Lack of future flexibility. Need to define upfront requirements with certainty. May be difficult to transfer risk. Asset transfer politically sensitive
Outline evaluation summary						
Delivery Option 1	○	●	●	◑	◑	○
Delivery Option 2	○	◔	●	◑	◑	○
Delivery Option 3	○	◔	●	◑	◑	○
Rationale	• Capacity and capability of team.	• Ability to augment existing team to overcome weaknesses in status quo but not for complex & scale project.	• Separated entity with clear focus and commercial disciplines could drive programme forward.	• Unlikely to be able to transfer real risk. • Difficult to align interests over the long term but could work over a shorter period.	• Unlikely to be able to transfer real risk • Difficult to align interests over the long term but could work over a shorter period.	• Unable to define requirements upfront - leading to potentially costly change. • No appetite to transfer asset .

Key: ○ Low alignment ● High alignment

Source: IOA Team analysis

5.4 Delivery vehicle

The delivery vehicle should share the directional responsibility of the Programme with the Client function. A delivery vehicle will be most applicable to delivery Option 2 and 3 given the scale and complexity of the Programme. E1A may not require a bespoke delivery vehicle

Introduction

- This section looks at the principle of creating a suitable delivery vehicle. The vehicle will bridge the gap between the Client function and the required design, procurement and construction delivery requirements.
- The primary functions of the delivery vehicle are direction (of the delivery of the design, procurement and construction), navigation and implementation and these are described below.

Table 47: Primary function of the delivery model

Primary functions	Summary
Direction	• Responsibility for direction will be shared between the Client function and the delivery vehicle. The dividing line between accountability for direction will depend on the delivery Option and the structure needed for each of these approaches. In all Scenarios, the delivery vehicle will direct the day to day delivery of design, procurement and construction activities.
Navigation	• The Programme Management Office: Provides both forecasting and predictive capability to leadership team and implementation • Programme controls and reporting
Implementation	• Procurement and acquisition of works and services • Project management and trade supervision • Design management

Source: IOA Team analysis

Principles

- The core principles of the delivery vehicle include:
  - Providing an appropriate and intelligent interface with the Client function;
  - Overseeing and managing the delivery of the Programme with the professional team, contractors and the supply chain; and
  - Having the necessary capability and capacity to make timely and informed decisions for the professional team, contractors and supply chain.

Key benefits of a delivery vehicle

- The proposed delivery vehicle should be to provide both flexibility and longevity to:
  - Procure and acquire goods and services to meet a potentially volatile demand over a long period of time;
  - Maintain delivery of the Programme, whilst remaining capable of responding quickly and efficiently to changes in the use of the asset; and
  - Establish and maintain a sustainable and flexible supply chain and workforce with the necessary experience and capability to working on this iconic heritage asset.

Key risks of a delivery vehicle

- There are a number of risks associated with the establishment and maintenance of the delivery vehicle. The table below outlines the potential risk/cause, the implication and the mitigation action.

Table 48: Key risks of a delivery vehicle

Risk/cause	Implication	Mitigation
• Overlap between the delivery vehicle and Client function body	• Clear programme direction could be lost, which could cause delays and unforeseen costs	• Roles and responsibilities (including delegations) are to be agreed at the outset
• Size of the delivery vehicle is not applicable to the chosen Scenario	• The Programme is unlikely to be delivered	• The delivery vehicle size must align to the adopted Scenario.
• The delivery vehicle does not have the opportunity to drive efficiency and improvement	• The Programme is likely to suffer and value for money will not be achieved. Benefits not extracted.	• Delivery vehicle (subject to approvals) to continuously drive efficiencies and improvements
• Inadequate knowledge of the PoW prior to embarking on the works element.	• Delivery vehicle fails to be properly equipped with the necessary management and technical information at the assumed commencement date.	• Knowledge transfer to commence at the earliest opportunity/ lessons learnt to be exchanged. BIM to be fully utilised.

Source: IOA Team analysis

5.4 Delivery vehicle

The delivery vehicle should share the directional responsibility of the Programme with the Client function. A delivery vehicle will be most applicable to delivery Option 2 and 3 given the scale and complexity of the Programme. E1A may not require a bespoke delivery vehicle

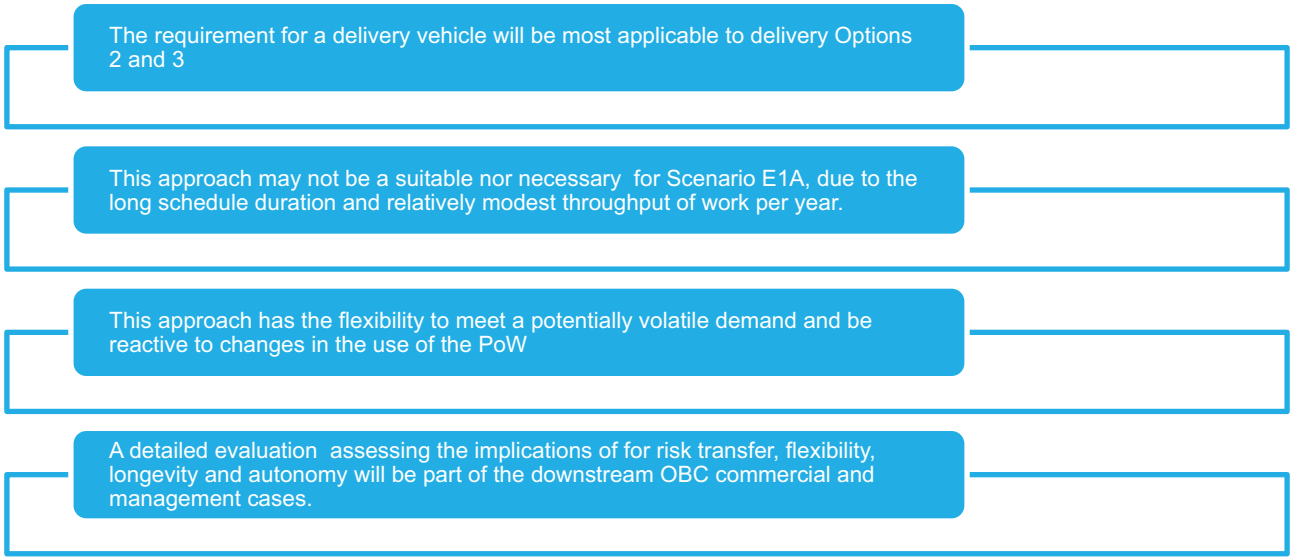
Delivery vehicle attributes

- The success of the delivery vehicle will be predicated upon its ability to effectively, efficiently and economically design, procure and deliver the works necessary for the Programme to reflect the selected Scenario in due course.
- Regardless of the adopted delivery Option or Outcome Level, the structure and make up of the delivery vehicle will need to be flexible to accommodate a broad range of requirements, which are likely to change over time.

Table 49: Delivery vehicle requirements

Delivery vehicle attributes	Summary
Design Services	The design elements of this programme can be procured under a number of different type of contracts. The key issue here being how much control of the design and subsequent output needs to remain under the direct control of the Sponsor and Client. Standard elements of work can easily be transferred through a design and build arrangement to the market. However, specialist conservation and heritage works, subjectively monitored by bodies such as English Heritage, may require a much more direct and controlling arrangement to be put in place.
Procurement	The degree of risk transfer will need to be agreed between the Client function and delivery vehicle before any procurement exercise can commence. Once the allocation of risk is agreed the delivery vehicle will need to set out a robust approach to procure all relevant contracts with the market.
Direct delivery (Labour / Plant / Materials)	Specialist trades and skills made need to be part of a direct labour force. This approach may be required to fulfill a market capacity or capability deficiency. In particular, heritage and conservation skills made need to be 'grown from within' to meet quality and availability needs.
Packages (Trade / Services)	A traditional approach to procuring any form of works or services, using either a main contractor or management contractor to deliver this work using standard industry contracts. A notional view of how these packages or contracts may be divided up is shown in Volume 2, Appendix E.1.
Common Components and Commodities	Asset stewardship for a considerable period of time (i.e. greater than the expected life span of certain components) allows the opportunity to adopt a strategic and efficient approach to the acquisition and supply of common components and commodities. This could include standardisation of components and commodities to delivery economies of scale and efficient upkeep of the estate including PoW. Again, due to market conditions, the acquisition of these (mainly) materials may require close control by the delivery vehicle.

Figure 37: Delivery vehicle key messages



Source: IOA Team analysis

5.5 Packaging and contracting strategy

The packaging strategy should effectively divide the Programme works to reflect the balance of risk transfer and supply side structure, capability and appetite. Early market engagement is essential to inform this and the downstream contracting strategy.

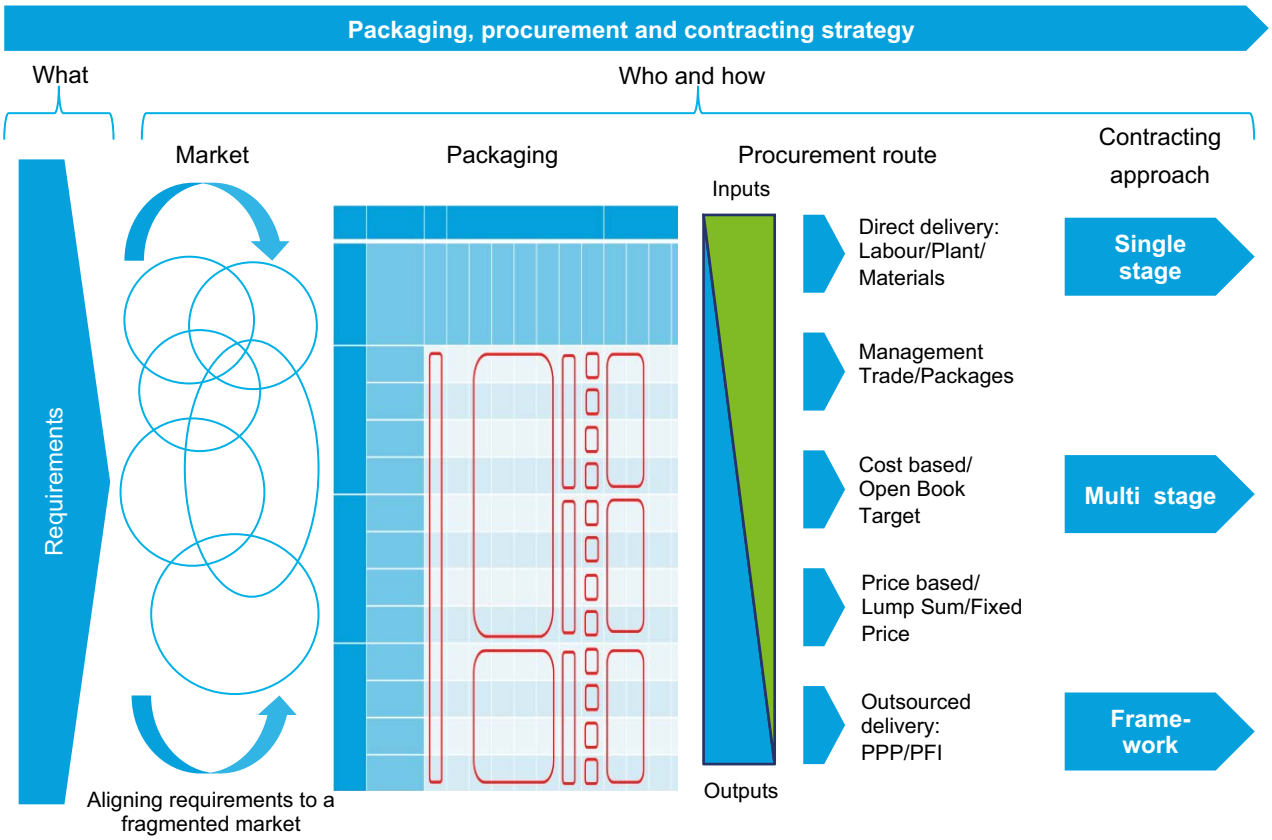
Introduction - Packaging

- The principal function of the packaging strategy is to ensure the Programme works are fully deliverable through an efficient route to market, and therefore reducing the number of interfaces to meet technical requirements and manage risk, whilst delivering value for money. There is also an opportunity to generate appetite and stimulate an appropriate level of market competition.
- Further information on both packaging and contracting strategies can be found in Volume 2, Appendix E1: Procurement Strategy.

Overview

- Efficient, effective and economic packaging is at the heart of the IUK model and is fundamental to the success of a major programme. The purpose of having a packaging strategy is to plan and co-ordinate the scope into delivery by different organisations to meet the requirements of the outline business case. Careful planning is required at an early stage to put in place a robust framework from which the PoW service or goods can be successfully procured and delivered. It lays the foundations for the downstream approach for active management of Programme delivery.
- The Client will need to establish its appetite for risk on the Programme at an early stage, taking account the strategic policy direction from Government, as this will have a significant influence on the packaging approach. It must determine what risks it considers it will be best placed to manage and which risks are best managed by the supply chain and are therefore outsourced to it. This may include the delivery vehicle, the professional team, the tier one and tier contractors and the supply chain.
- There will also be a requirement to understand the risks associated with both interfaces and the appetite for collaborative arrangements with the supply chain. There are many drivers to consider when packaging scope but the key areas will include the following:
  - Potential physical and contractual interfaces that are created;
  - Market in which the Client and its potential supply side partners operate;
  - Technical characteristics of the Programme including delivery approach, scope and specification;
  - Time constraints; and
  - Market structure and funding routes and availability e.g. PFI/PPP/concessions and initiatives.

Figure 38: Packaging, procurement and contracting strategy



Source: IOA Team analysis

5.5 Packaging and contracting strategy

The packaging strategy should effectively divide the Programme works to reflect the balance of risk transfer and supply side structure, capability and appetite. Early market engagement is essential to inform this and the downstream contracting strategy.

Packaging strategy

- The packaging strategy for the Programme must separate and cluster certain aspects of the works. The objective is to engage with the market and identify the optimum packaging strategy through market analysis covering capability, capacity, appetite, sentiment, and management of risk between packages. An approach to finalising the packaging strategy for the Programme might include the following:
  - Articulating the risks the Client prefers to manage e.g. through the definition of the interface between the design and construction of building works and services packages;
  - Testing the market appetite for packages as set out and examine the advantages and disadvantages;
  - Describing clearly the interfaces and their management;
  - Considering the entire scope when formulating the package strategy so that the most appropriate choices are made;
  - Formulating the packaging strategy before the contracting strategy and the risk profile needs to be identified first: test appetite;
  - Assessing attitude and ability to manage risk;
  - Evaluating what risks are appropriate to transfer to supply side organisations;
  - Considering market intelligence when forming strategy use feedback and re-test where necessary, given the Programme's duration; and
  - Establishing the organisation structure needed to support the packaging strategy.
- As there are many ways to package the Programme works, ranging from multiple packages to a single large package, it is essential that the marketplace is properly consulted and engaged, to gauge the strategy's appropriateness. This should inform the Client of market appetite, capacity and capability available to them for the intended packages of scope. On-going feedback and engagement will enable the packaging strategy to be continually refined and refreshed, providing the Client's organisation with confidence that its approach is robust, and that the marketplace is able to deliver the programme works in an effective, efficient and economic manner.

Contracting strategy

- The contracting strategy must establish the most appropriate means of entering into a formal arrangements for each of the work packages to meet the Client's requirements and market appetite for risk, reward and where appropriate, incentivisation. The principal inputs to the contracting strategy are outlined below:
  - Articulating a clear allocation of risk to the party best placed to manage them – Client or supply chain;
  - Understanding both the client organisation and market's appetite for risk – re-testing the contracting strategy if necessary;
  - Confirming the organisational structure, capability and capacity that can support the proposed contracting approach;
  - Deciding on the appropriate contracting approach for each package and promoting a coherent suite of contracts to deliver the Client's requirements, both from policy and delivery perspectives and which sets out risk, reward and any incentivisation;
  - Taking account of balanced scorecard and wider soft requirements e.g. collaboration tools and behavioural expectations; and
  - Testing collaboration between sub-contractors to help manage behaviour . Greater collaboration can help to soften the interfaces between packages.

Figure 39: Packaging and contracting strategy key messages

Source: IOA Team analysis

5.6 Supply chain

Gather market intelligence at the outset of the Programme and maintain dialogue throughout its duration, to promote competition, reflect changing market structure, and the capability and appetite of potential supply side partners.

Overview

- A high level understanding of the market is critical to the successful delivery of the Programme.
- The supply chain will ultimately deliver the Programme works and it is important that the Client gathers intelligence about the environment in which they wish to transact, to become informed on capability, capacity, and appetite. Only then can the extent of the delivery risks be fully assessed with confidence. At that point the degree of risk to be transferred to the supply chain can be determined.
- Only once the Client requirements have been determined and documented, can market interaction commence to help support delivery of the Programme and realisation of the benefits.

Approach to market engagement

- A number of key principles need to be considered to deliver effective engagement with the market that gathers and maintains an effective body of relevant, contemporary and coherent intelligence. These principles include the following:
  - Establishing and identifying the market or markets from which the works will be procured;
  - Determining the market capability to deliver the identified requirements;
  - Understanding the capacity that is available within those markets;
  - Ascertaining the market appetite for the Programme opportunity;
  - Approaching the market engagement in a structured manner, so that a number of markets may be engaged simultaneously, as well as exploring alternative markets at different stages of the lifecycle of the Programme works;
  - Operating effectively within the market environment i.e. on a transparent and two way basis;
  - Accepting that market engagement is an iterative process and a tool to maintain up to date intelligence, in relation to packaging, contracting and the intended route to market. Furthermore, it allows supply to inform demand thereby avoiding future surprises; and
  - Warming up the market prior to packaging and tendering the proposed scope of works. Bidders welcome this as it allows them to plan pipelines of activity for resource allocation over time. This can generate efficiencies in bidding and therefore potentially more competitive proposals.

Generating and maintaining market appetite

- Once the Client has identified the market it needs to procure from, it is then important to engage with market participants at the earliest opportunity, and prior to formally publishing those opportunities e.g. through OJEU. This will allow the Client's organisation to test the market on the various options open to it and gauge its reaction to risk transfer, technical solutions, funding, interfaces, approach and schedule. Market appetite can then be assessed and incorporated into the packaging and contracting strategy.
- Engagement with the market has a dual benefit. A benefit to the Client in understanding what the market can and cannot do (capability) and what they will or will not bear (capacity) in pursuit of an opportunity. A benefit to the participating suppliers is that they will be given an insight into the Programme related opportunities that will potentially arise, as well as the risks and rewards associated with securing those opportunities.
- Following the engagement process, potential bidders can begin planning their tender resources in anticipation of the opportunity on the Programme i.e. get themselves ready and fit to supply. Ongoing dialogue will support the maintaining an appropriate level of market appetite over time. This will be critical on the Programme given the overall schedule duration for all the shortlisted Scenarios.

5.6 Supply chain

Gather market intelligence at the outset of the Programme and maintain dialogue throughout its duration, to promote competition, reflect changing market structure, and the capability and appetite of potential supply side partners.

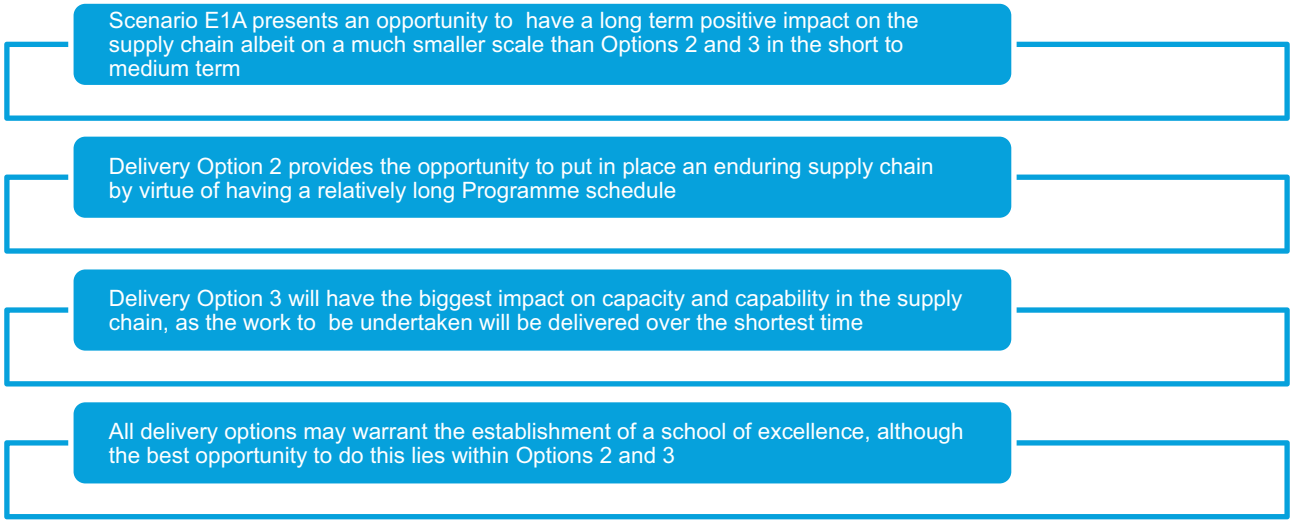
Building and sustaining relationships with the supply chain

- The Client's relationship with its potential and live suppliers is symbiotic. Both are dependent on one other, one wanting to realise the benefits from the Programme, the other to improve their trading position and business prospects.
- Market behaviour is influenced by the Client preparedness to effectively engage, and this includes selling the Programme to the market by engaging in early dialogue, adopting a consistent approach, communicating the proposed opportunity clearly and equitably to the intended market. This will strengthen the Client's organisation understanding of the capability, capacity and appetite of the supply chain.
- The approach to creating and managing the supply chain should reflect:
  - The longevity and sustainability of working and professional relationships;
  - Relationships based on mutual respect and trust;
  - Long term retention of resources to harness and lever knowledge, and provide progression opportunities for individual's career paths;
  - The ability to address some of the unique considerations of the Programme to reflect specific trades e.g. there is a limited market for encaustic tiles and stonework;
  - An environment where all supply side organisations including the professional team, contractors and their supply chains are supportive and aligned to the Programme; and
  - The ability to generate benefits from wider Government initiatives that may be in place whilst the Programme is being delivered.

Schools of Excellence

- In adopting the proposed asset stewardship approach to the Programme, there is a potential opportunity to create schools of excellence based around the core skills and trades required to perform the specialist day-to-day refurbishment, restoration and maintenance works. These works will be carried out not only during the Programme but in perpetuity and this highlights the need to adopt an approach that is sustainable over the long term.
- The approach of using a major public funded (infrastructure) programme to facilitate the creation of not only jobs, but also training academies and apprenticeships has proven very successful on the London 2012 Games and Crossrail, e.g. .Tunnelling and Underground Construction Academy, where a specific facility for the development of tunnelling and underground construction skills has been created.
- This approach could be adopted for specialist restoration and conservation skills at the PoW, as well as for the establishment of a quality standard for the more common skills such as mechanical and electrical trades.

Figure 40: Supply chain key messages



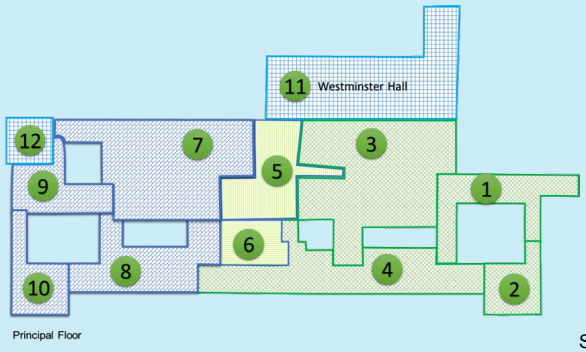
Source: IOA Team analysis

5.7 Delivery overview

Delivery of Option E1 will require work in 12 sequential work zones over 32 years without closure of PoW, Option 2 works in two sequential work zones over an 11 year period with substantial closure of the PoW and Option 3 one work zone over 6 year period with full decant of PoW.

Key features and implications of each delivery Option

Table 50.1: Delivery options key features *(continued on next page)*

	Overview	Decant / reoccupation	Risks
Delivery Option E1	• The PoW would be notionally split into 12 construction zones above ground, plus the basement. The construction zone sequencing is notional and not fixed at this stage. • Both Chambers will need to be vacated for a significant amount of time • The delivery approach is to replace the basement mechanical and electrical infrastructure first (to minimise the risk of failure) and then to progress work on the upper floors, using a rolling programme of works over what is most likely to be a 32 year period (on average each construction zone could take 2-4 years to complete). • Occupants and users of the PoW will face significantly more Disruption and Nuisance (almost four-fold, when compared to existing levels) under this delivery Option when compared to Options 2 and 3. Fire and security measures will also need to be put in place. • Examples of day to day Nuisance include noise disturbance, loss of direct access routes to destinations within the PoW, loss of car parking spaces, and increased quantities of scaffolding and temporary buildings in courtyards for extended periods of time resulting in a loss of natural light. • Sufficient temporary accommodation will need to be made available especially in relation to core business function being provided for within the red line boundary.	• During this time both Chambers would alternately have to close for between two and four years, but sittings could be relocated to a temporary structure possibly in one of the courtyards. • Limited temporary relocation (i.e. moving users from their existing locations to temporary accommodation or vacant space) of users within the boundary of the PoW will provide the free space to form a construction zone when required (i.e. multiple times). • It is expected that the space required will, subject to Planning and Security reviews, be provided using temporary accommodation located in the courtyards.	• Nuisance to occupants over a very long period of time will inevitably lead to constant interruption to the works, resulting in delays and further extending the overall programme for E1. • The replacement of existing services, whilst in use will almost certainly result in significant Disruption. • Greatest risk of damage caused to artefacts during the works and churn. • Failure to maintain effective security and segregation, whilst providing sufficient means of escape. • Works not completed prior to lifecycle replacement of the new M&E plant starting. • Risk that insufficient churn space is available at appropriate standard.
	Zoning		
	 Source: IOA Team analysis		

5.7 Delivery overview

Delivery of Option E1 will require work in 12 sequential work zones over 32 years without closure of PoW, Option 2 works in two sequential work zones over an 11 year period with substantial closure of the PoW and Option 3 one work zone over 6 year period with full decant of PoW.

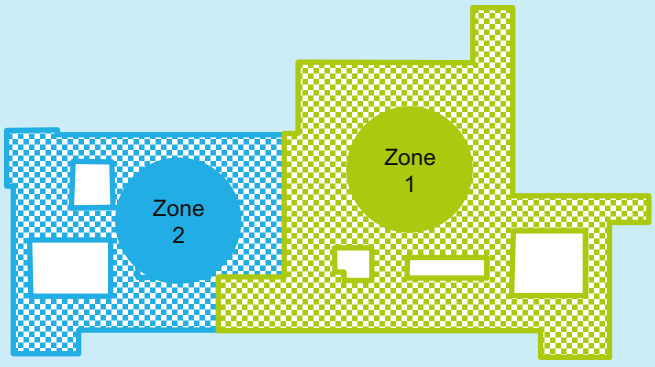
Key features and implications of each delivery Option

Table 50.2: Delivery options key features *(continued from previous page)*

	Overview	Decant / reoccupation	Risks

Delivery Option 2	• A substantial area of the PoW would be closed to users for a significant period while major work is carried out.
	• Major aspects of core Parliamentary business (effectively on a House by House basis) would relocate to a temporary building, but the PoW would not be closed.
	• A partial decant delivery method results in a delivery programme that is approximately twice the duration of a full decant delivery timeline. In addition to the periods of construction activity there are significant periods of decant and reoccupation activity in the interim periods.
	• The fire wardens will continue to operate as normal and the route for the fire engine through the arches will need to be maintained within the active construction zone, or an alternative solution that is acceptable to the Fire Officer, will need to be identified.
	• The building will retain and need to protect aspects of heritage items and equipment requiring restoration, forming part of the Programme scope of works. These include works of art, furniture, and fixed items including elements of the building fabric.
	• Security will need to be maintained to a high level as a significant proportion of the building will remain occupied during construction.
	• Additionally, when zone 1 is being worked on, the clock maintenance team will require access to Elizabeth Tower to keep the clock fully functional during implementation of the
	• Programme. There may be other regular maintenance access requirements that need to be satisfied during the delivery of the works. These access arrangements will need to be closely managed between the client and contractor(s).
		• One House would be vacated to a temporary decant building while the other House remains in its current location.
		• Construction work would then be undertaken in the vacated part of the building while business activities continue in the occupied part.
		• Upon completion of Phase 1:
		  • the vacated House would re-occupy their space;
		  • the Decant Building will be reconfigured, to suit the needs of the other House;
		  • the other House would move to the decant space; and
		  • Phase 2 of the PoW construction works would proceed.
			• Disruption and Nuisance to occupiers – noise, access restrictions, ceremonial restrictions, could impact the business of Parliament.
			• Inability to secure adequate decant accommodation.
			• Major temporary services may be required to keep occupied spaces fully functional.
			• Remaining building operation, use, security and functionality are potentially compromised due to site logistics.
			• Loss and damage could be caused to artefacts during the works and decanting.
			• Maintenance of safety systems / environment during the works.
			• Materials may require greater security screening due to the split occupancy site.
			• There is a risk that there may not be enough specialist skilled labour in the market to service the Programme.

Zoning



Source: IOA Team analysis

5.7 Delivery overview

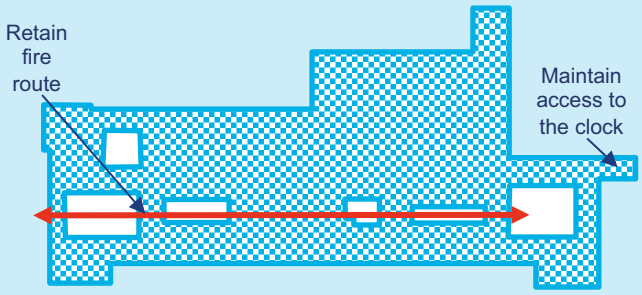
Delivery of Option E1 will require work in 12 sequential work zones over 32 years without closure of PoW, Option 2 works in two sequential work zones over an 11 year period with substantial closure of the PoW and Option 3 one work zone over 6 year period with full decant of PoW.

Key features and implications of each delivery Option

Table 50.3: Delivery options key features *(continued from previous page)*

	Overview	Decant / reoccupation	Risks
Delivery Option 3	• All occupants will be decanted for the construction phase of the works. • The schedule for completing the works is the shortest of the three Options. • The fire wardens will continue to operate as normal and the route for the fire engine through the arches within the existing courtyards will need to be maintained, or an alternative solution that is acceptable to the Fire Officer, will need to be identified. • The building will retain and need to protect aspects of heritage items and equipment requiring restoration, forming part of the Programme scope of works. These include works of art, furniture, and fixed items including elements of the building fabric. • Security would need to be maintained as the construction zone still creates a threat to fabric and heritage items. • Additionally, the clock maintenance team will require access to Elizabeth Tower to keep the clock fully functional during implementation of the Programme. There may be other regular maintenance access requirements that need to be satisfied during the delivery of the works. These access arrangements will need to be closely managed between the Client and contractor(s).	• All occupants and functions within the PoW will be relocated to available space outside the Palace leaving behind a vacant building.	• Inability to secure adequate decant accommodation. • Loss and damage could be caused to artefacts during the works and decanting. • The large site establishment could be visibly obtrusive. • There could be logistical challenges in dealing with high levels of deliveries requiring security screening • There is a risk that there may not be enough specialist labour in the market to service the Programme.

Zoning



Source: IOA Team analysis

5.8 Delivery approach: Option E1

Delivery Option 1 is the most complicated of the three delivery Options. The level of Disruption and Nuisance associated with this Option would be high and the prolonged delivery timescale results in significant logistical challenges needing to be addressed.

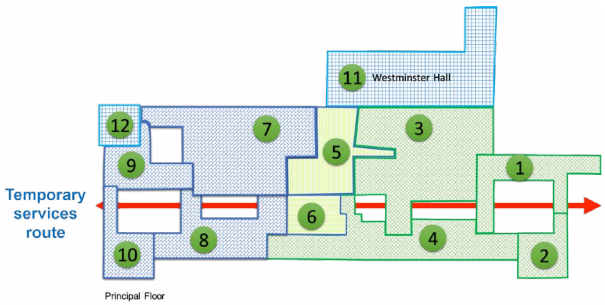
Introduction

- The IOA team established early in the study that Option 1 as originally defined could not work and therefore revised this option to deliver at a faster pace on the assumption that users of the building might be prepared to accept higher levels of Nuisance and Disruption than are currently considered possible if it allowed them to remain in occupation of the building during major works.
- E1 delivers the Programme on an ongoing rolling basis within an estimated timeline (in around 30 years), and is defined by three key considerations / requirements:
- Full unrestricted access will be required to the basement;
- Use of limited temporary accommodation to relocate staff and provide contractors with access within the Palace boundary; and
- A temporary Chamber will be required whilst work is completed in these zones.
- E1 will result in a significant increase in Nuisance and Disruption at the PoW, over a prolonged period. An acceptance of this is a prerequisite for considering E1.
- There are examples of programmes which have adopted such an approach. These include the British Museum although it should be noted that this was only possible due to the physical configuration of the building. Other major restoration programmes have necessitated the closure of the facility where technical constraints, health and safety considerations, Nuisance and Disruption has been assessed to be too significant, e.g. Rijksmuseum and the proposed works at the Canadian Parliament in Ottawa.

Delivery zones and sequencing

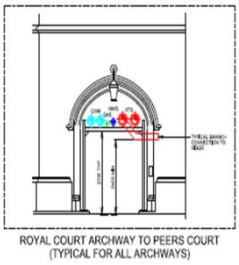
- The approach to delivering the works would be to split the PoW into work zones. These zones need to be large enough to ensure the production levels required to achieve the completion of the Programme in around 30 years could be met, but small enough to avoid significant churn of staff and users from their space, and for them to be rehoused in temporary accommodation or vacant space within the boundary of the PoW. Details of the zoning and delivery sequence of this Option are included in Volume 2, Appendix C.1.
- The zones divide the building into 12 key work areas across each floor to give a vertical division of the PoW. These zones could be delivered in any sequence to suit the business of Parliament and subject to mechanical and engineering design and installation constraints, once the works to replace the mechanical and electrical infrastructure in the basement are complete.
- Key drivers for dividing the building into zones are:
  - Fire compartmentation;
  - Means of access;
  - Means of escape; and
  - Primary service layouts and in particular lifts and risers.

Figure 41: Option E1 Upper Floor Zoning (plan)



Source: IOA Team analysis

Figure 42: Potential temporary service route through archways



Source: IOA Team analysis

Delivery approach

- The delivery approach is to replace the basement mechanical and electrical infrastructure first (to minimise risk of failure) and then to progress work on the upper floors in 12 zones. This Option does not include for decant to temporary accommodation outside of PoW. Therefore, occupiers of construction zone will need to churn internally into temporary and/or vacant accommodation within the Palace to allow works to take place. It is assumed that the required churn accommodation can be provided within the courtyards and the vacant space in Victoria Tower, following relocation of Archives which is assumed to be completed by 2020.
- The results of our analysis has led us to conclude that the Programme can only be delivered via E1 by applying the following core assumptions:

Full access to the basement

- The work would commence with the total replacement of core mechanical and electrical infrastructure in the basement.
- There will need to be an enabling phase installing new temporary infrastructure (one option for routing is shown in the diagrams above and opposite and further details are included in Volume 2, Appendix C.1 at ground level to allow the basement infrastructure to be shut down and removed.

5.8 Delivery approach: Option E1

Delivery Option 1 is the most complicated of the three delivery Options. The level of Disruption and Nuisance associated with this Option would be high and the prolonged delivery timescale results in significant logistical challenges needing to be addressed.

- The basement will need to be vacated in full to ensure the mechanical and electrical infrastructure can be worked on efficiently and to provide a designated site for the contractor to manage.

Restrictions

- The total duration to achieve the core objective i.e. to replace all of the mechanical and electrical systems, should not exceed an optimum life-cycle period of 25-30 years.
- The building would ideally be zoned around fire compartmentation lines.
- The overall approach is governed by the mechanical and electrical services strategy. The zones are to be aligned to riser locations, to enable secondary distribution systems to be connected back to both the temporary and new basement infrastructure.

Temporary relocation of staff

- To free up a zone for work to take place in, staff and users must be temporarily relocated to spaces within the PoW. Critical business adjacencies must be maintained, therefore temporary office accommodation will need to be created in the courtyards and it is very likely that this will result in virtually all courtyards being filled with temporary buildings.
- Our analysis shows that the work necessary to replace the mechanical and electrical systems in the Commons Chamber cannot be completed within the recess periods. This will therefore require a temporary move of the Chamber to one of three potential locations within the Palace boundary – New Palace Yard, Westminster Hall or Speaker's Court.
- The proposal is based on the assumption that a temporary Chamber could be located in Westminster Hall, and used as additional committee room space when not in use as a Chamber. However, the ideal location for a temporary Chamber will be the subject of a major security review and should be examined in detail during the next stages of the Programme.

Disruption

- The time taken in this approach (around 32 years) is significant and all occupants and users of the PoW will face significantly more Disruption, and Nuisance on a daily basis, than is currently experienced. E1A is likely to need multiple buffer zones as the delivery activity moves through the 12 zones. This will not necessarily mitigate noise transfer through the structure. In addition to the impact of noise and access Disruption, the introduction of temporary accommodation in the Courtyards, coupled with scaffolding around the perimeter of the building facade will most probably lead to loss of natural daylight and add to the general Nuisance factor. During the basement works there is no opportunity to create a buffer zone and therefore noise travel and Nuisance will be inevitable.
- The temporary services infrastructure will restrict the use of the courtyards throughout the works. The final route of this temporary infrastructure would require detailed analysis, bearing in mind it could be in place for approximately 32 years, should Scenario E1A (and to an extent delivery Option 2) be chosen.
- The location of a temporary Chamber could impact movements of occupiers and vehicles through the PoW site.

Logistics

- The PoW is in the heart of a major city constrained by a busy road network. Movement of construction related vehicles would most probably need to be controlled and restricted to certain times in the day.
- For the purpose of this Final Report, the IOA team assumes the Archives facility in Victoria Tower will be relocated (as defined within Outcome Level A) ahead of the assumed Q2 2020 start date. The timing will need to be planned to avoid any conflicts with the Programme.
- A significant number of temporary buildings will be located within Courtyards to create accommodation that subsequently allows one of the 12 work zones to be vacated, subject to mandatory approvals. This may impact drop-off locations for day to day operations, for example catering, and alternative arrangements may be required.
- Subject to the final location of the temporary Chamber not being in Westminster Hall, temporary committee rooms may, subject to planning consents, be provided in Westminster Hall, which will block existing public access points.
- Option E1 requires new temporary mechanical and electrical infrastructure to be installed at ground level. An ideal location for the piped infrastructure is along the spine road under the arches. This will result in clashes with catering delivery trucks and other supplies, which may therefore need a remote drop-off point in Black Rod's Garden.
- Subject to the temporary Chamber not being located in New Palace Yard, a Contractor's welfare and site establishment could be located in New Palace Yard.
- Subject to meeting the statutory provision of parking for mobility needs, there will be a loss of virtually all parking space within the PoW. Alternative arrangements will need to be considered.
- Access to certain records, books, papers that are kept in basement storage may not be readily accessible or retrievable.

Temporary accommodation

- A detailed temporary accommodation strategy has been provided to our team by PED. This outlines temporary accommodation plans to serve all temporary relocations of staff and users required to clear the 12 zones during the works.
- In order for delivery Option E1 to be successful, suitable temporary space will need to be provided. Potential locations for temporary accommodation include the courtyards, Speakers Green, River Terrace, Westminster Hall, Black Rod's Garden and Peers' car park. Vacated space in Victoria Tower could potentially be used for functions displaced from the basement.
- A strategy and programme will also need to be developed to secure any necessary planning or listed building consents and approvals required for the delivery of such temporary accommodation.

5.8 Delivery approach: Option E1

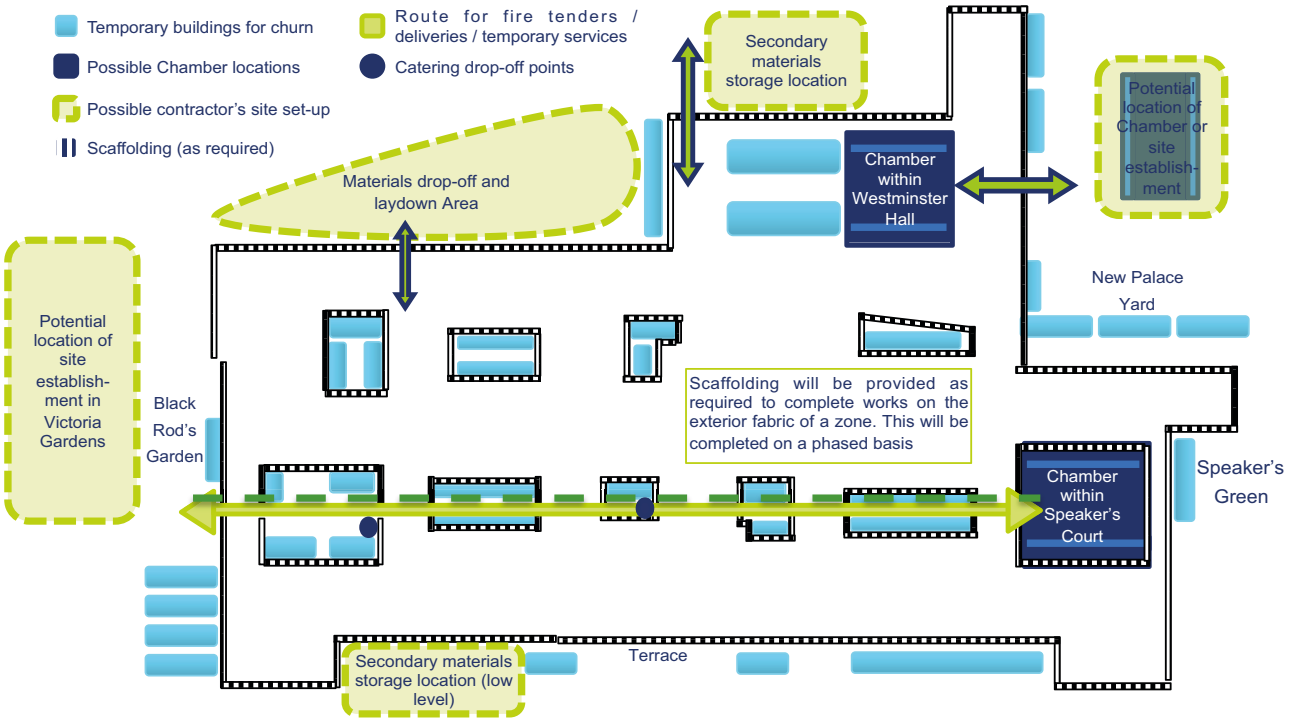
Churn accommodation to house relocated staff and users during the Programme will either be temporary or existing vacant space within the PoW. The type of accommodation required is planned to be bespoke to the function, therefore different spaces are designated to house each function. of PoW.

- Potential temporary accommodation location options have been reviewed and are shown on the plan below. The location of temporary accommodation differs depending on which function is to be relocated. For example, temporary catering accommodation locations differ from those proposed for office space and committee rooms. The locations have been devised to ensure they best suit their function.
- New Palace Yard, Speaker's Court and Westminster Hall provide potential opportunities for locating a temporary Chamber.

Summary of a possible workable option

- Delivery Option E1 maintains the full function of Parliament within the boundary of the PoW. This results in all of the courtyards being taken up by temporary accommodation to enable the necessary churn of the occupants from one of the 12 work zones.
- The temporary accommodation locations shown within the courtyards relies on that site accommodation required for the Programme will be located in Victoria Gardens. No allowance has been made for site waste, skips/recycling, or site vehicle turning circles within the boundary of the Palace of Westminster.
- Further analysis is required at the next stage to establish an exact floor area schedule that can be used to accurately plot the moves required to provide empty zones through the Programme.
- Compared to the areas currently occupied, the churn locations identified can provide a similar gross internal floor area for all functions in each zone, excluding the basement.
- There is insufficient temporary accommodation to House the basement facilities. The approach provided by PED, works on the assumption that basement office space can be reduced in size, or relocated off-site. There is no space available within the courtyards for the basement workshops, libraries, stores, changing or rest rooms, and the assumption is that they could be relocated off-site, or partially in the underground car park (storage etc.). This assumption has not been tested.
- It should be noted that all temporary buildings will require planning approval. This might present a risk, depending on the scale of the buildings and the period of time they will be in place.
- This Option presents a substantial loss of car parking, especially if the underground car park is required for other uses. This may have a substantial impact on the business of Parliament.
- This Option would have an impact on ceremonial events, such as state opening, lying in state and public access to the building. These impacts have not yet been fully tested.
- It is anticipated that multiple churns will be necessary to enable the business of Parliament to continue whilst the Restoration and Renewal works are undertaken. However, this will result in ongoing Nuisance and Disruption.

Figure 43: Option E1 site establishment overview



Source: IOA Team analysis

5.9 Delivery approach: Option 2

Delivery Option 2 involves the PoW being split into two zones each being decanted and subjected to Restoration and Renewal works in turn.

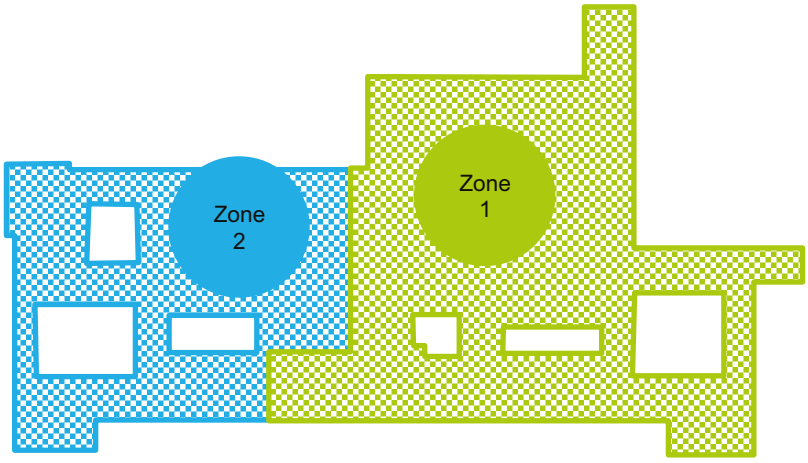
Introduction

- This Option is defined as a substantial area of the PoW being closed to users for a significant period while major work is carried out. A partial decant may disrupt some aspects of the work of Parliament requiring relocation to a temporary location but at no time is the Palace closed.
- In analysing this delivery Option the IOA team has reviewed the decanting and reoccupation approach against:
  - Issues of buildability, noise, dust and health and safety for all types of users;
  - Dependencies between both Houses of Parliament;
  - Dependencies between a particular Chamber with the associated Committee activity and those functions required for running the Parliamentary process;
  - The relationship between the two Houses and their particular ancillary accommodation, such as libraries, catering, offices and meeting areas; and
  - The requirement to address State, ceremonial and other traditional functions.
- Our analysis is based on:
  - A practical approach;
  - Decanting elements and functions of the PoW, where these elements are as large as practicable; and
  - Undertaking the decants in as few phases as possible.
- This results in dividing the PoW along the lines of the two Houses, for a partial decant.

Delivery zones and sequencing

- The House of Commons occupies 60% of the Palace of Westminster while The House of Lords Occupies the remaining 40%.
- We have proposed splitting the building in two along the lines shown below. Due to the configuration of the MEP, the logical sequence of the works is to start at the Northern end, decanting Zone 1, the HoC first.

Figure 44: Option 2 zoning



Source: IOA Team analysis

Delivery approach

- In a partial decant Option, one House would be vacated to a temporary decant building while the other House remains in its current location.
- A secure buffer zone would be created to split the PoW in two along the line shown. Fire evacuation routes would require suitable adjustment.
- Construction work would then be undertaken in the vacated part of the building while business activities continue in the occupied part
- Upon completion of Phase 1, the vacated House will re-occupy their space, followed by the other House vacating their space for Phase 2 of the construction works to proceed.

5.9 Delivery approach: Option 2

Delivery Option 2 involves the PoW being split into two zones each being decanted and subjected to Restoration and Renewal works in turn.

- A key risk is the availability of suitable space that will accommodate most if not all of the primary functions of the zone that is decanted, and conforms to the requirement for Members to be within eight minutes of the respective Chambers. Decant accommodation would need to be available and ready to operate prior to start of the Programme, which is currently assumed to be mid-2020.
- The fire wardens will continue to operate as normal. The route for the fire tenders through the arches within the existing Courtyards will need to be maintained or an alternative solution that is acceptable to the Fire Officer, will need to be identified.
- The building will still retain aspects of heritage items and equipment requiring restoration, forming part of the scope of works. These include works of art, furniture, and fixed items including elements of the building fabric. Due to a significant proportion of the collections having to remain on site, security will most probably need to be maintained in the construction zone to a high degree and possibly to the same extent as the existing fully occupied building.
- Additionally, the clock maintenance team will require access to Elizabeth Tower when zone 1 is being worked on to keep the clock fully functional during implementation of the Programme. There may be other regular maintenance access requirements that need to be satisfied during the delivery of the works. These access requirements will need to be closely managed between the client and contractor.
- An example of the likely high level sequence of work required to deliver Option 2 is set out below:
  - Decant the northern end of the PoW;
  - Create a secure buffer zone to divide the PoW in two;
  - Decommission primary services at basement level while maintaining the southern end of the Palace live from the existing main boiler House, south sub-station, summer boiler House and mains water service / gas intake at southern end (details on the temporary mechanical and electrical works can be found in Volume 2 Appendix C.2;
  - Strip out the northern end services installations;
  - Installation of new rationalised infrastructure at basement level and fit out on floors above;
  - Commission northern end utilising temporary low temperature hot water boilers and chillers;
  - Reoccupation of the northern end of the PoW;
  - Decant the southern end of the PoW;
  - Decommission remaining old services infrastructure in the basement and strip out for example, boilers, hot water services, generators and chillers;
  - Complete new rationalised infrastructure at basement level and the fit-out on floors above including new boilers, low carbon heat source, chillers and hot water supply generation;
  - Commission southern end from new plant including connections to northern end plus removal of any temporary plant; and
  - Reoccupation of the southern end of the PoW.

Disruption

- The level of Disruption the users and staff at the PoW will experience in Option 2 is considerably less than in Option E1. However, it will still be significant and greater than the level of Disruption that would be experienced under Option 3.
- With significant construction works required to the HoC and HoL, taking place over six and five year periods respectively whilst the other half of the PoW remains operational, the potential for Nuisance and Disruption is high.
- There is an inherent risk that over the significant period of time required to deliver the two phases, delay and additional costs could be incurred due to Parliamentary business constraining construction work to be completed out of hours or for it to be halted to avoid Nuisance and Disruption.
- Decanting from and reoccupation of the PoW will cause considerable Disruption to the users and staff. However, once located in the decant building, the level of Disruption experienced should be minimal. The level of Disruption could be minimised by ensuring that moves in and out of the building are completed during recess periods and avoiding periods around general elections.

Logistics

- The PoW is in the heart of a major city constrained by a busy road network. Movement of construction related vehicles would most probably need to be controlled and restricted to certain times in the day.
- For the purpose of this Final Report the IOA team assumes, the Archives facility in Victoria Tower will be relocated ahead of the assumed 2020 start date. The timing will need to be planned to avoid conflicts with the delivery Programme.
- This delivery Option needs to maintain one House within the Palace of Westminster, while the other House is in a temporary decant building. There will be logistical matters to consider relating to bicameral functions and activities that are normally provided between the two Houses, for example, the transfer of papers and nursing / medical space.
- The operational part of the Palace could lead to conflicts with the construction site for vehicular movement. It is likely that cars will not be permitted on the construction site, thus reducing the number of parking spaces used by occupants. The decant buildings may not offer the same level of parking capacity.
- The broadcast control room at committee floor level is a bicameral facility and will either need to be relocated during works to each part of the House or the dividing line will move leaving any work to this site to be done at a later date.

5.9 Delivery approach: Option 2

Delivery Option 2 decanting will be a coordinated and sequential activity.

Decant

- A detailed decant strategy has been provided to our team by PED.
- In order for delivery Option 2 to be successful, suitable decant space will need to be provided. Available space is currently under review, so for the purpose of this report we have referred to decant space as buildings X and Y and the northern and southern buildings. Decant space will be within 8 minutes walk of walk of the respective Chambers .

Summary of a potential delivery approach

- The phasing and decant plans opposite demonstrate one possible outcome to enable a partial decant of the Palace of Westminster and undertake the Programme in two phases.
- The strategy is based on any one House and associated functions moving out to buildings within the estate (or to accommodation secured for decant purposes), works being undertaken in the vacated part of the Palace, followed by a second phase where the second House and associated functions would move out to allow the scope of works to be delivered.
- Securing availability of suitable decant buildings that will accommodate most, if not all of the decanted functions of Parliament within 8 minutes walk of the respective Chambers is essential to deliver this Option. These buildings would need to be available and ready to operate from, prior to the start of the Programme, currently assumed to be mid-2020.
- For a mid-2020 start of the works, the decant buildings would have to be designed, adapted, fitted-out, and tested for all necessary security and business continuity / operational requirements.
- The location of decant buildings, relative to each other also needs to fulfil bicameral Parliamentary functions where possible.
- While the Chambers and associated functions and committee rooms could relocate to either Building X or Building Y, Members' and Peers' offices would be moved to parts of the Southern buildings. For the purposes of this report it has been assumed that a single building, Building X, is secured.

Example of House of Commons and House of Lords partial decant option

- The tables below and opposite outline where specific departments in the HoC and HoL could potentially be moved to under a partial decant option.
- Final locations for departments and functions will need to be agreed once the available space for decant has been established.

Figure 45: Option 2 decant summary – Southern End

Lords department	Moves to	Lords department	Moves to
Ground floor		**First floor**	
Peers' Offices	Decant Building X	Peers' Offices	Southern Buildings
Peers' Dining	Closed or Decant Building X	Committee Rooms	Decant Building X
PED	TBC	Lord Speaker's Accommodation	TBC
Police Accommodation	Decant Building X and Courtyard	**Upper floors**	
Principal floor	Decant Building X	Peers' Offices	Southern Buildings
The Lords Chamber	Decant Building X	Archives	New accommodation (Programme assumption)
Black Rod's Offices	Decant Building X		
Whips' Offices	Decant Building X		
Peers' Offices	Decant Building X		
Peers' Dining	Decant Building X		
Lords' Library	Decant Building X		
Robing Room and Royal Gallery	Decant Building X		
Lord Speaker's Accommodation	TBC		

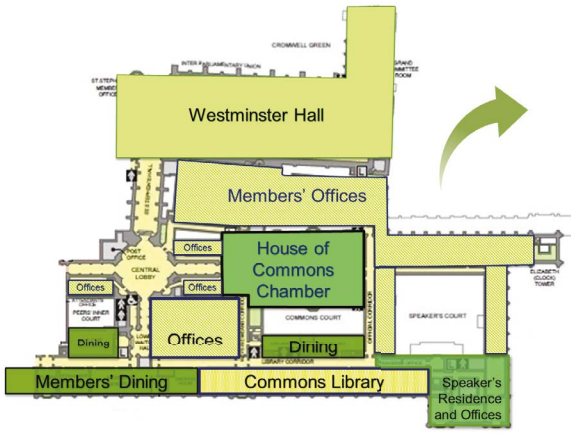
Source: IOA Team analysis

5.9 Delivery approach: Option 2

Delivery Option 2 decanting will be a coordinated and sequential activity.

Figure 46: Option 2 decant summary – Northern End

Commons department	Moves to	Commons department	Moves to
Ground floor		**Principal floor**	
Chapel	Closed (alternative place of worship to be provided)	The Commons Chamber	Decant Building X
Kitchen and Dining	Closed or Decant Building	Serjeant at Arms	Decant Building X
PED	TBC	All Support Space	Decant Building X
Members' Offices	Southern Buildings	Commons Library	Decant Building X
Speaker's Residence	TBC	Kitchen and Dining	Closed or Decant Building X
		Whips' Offices	Decant Building X
		Members' Offices	Southern Buildings
		Speaker's Residence	TBC
		First floor	
		Chamber Galleries	Decant Building X
		Committee Rooms	Decant Building X
		Reporters	Decant Building X
		Members' Offices	Southern Buildings
		Speakers' Residence	TBC
		Upper floors	
		Chamber Galleries	Decant Building X
		Committee Rooms	Decant Building X
		Reporters	Decant Building X
		Members' Offices	Southern Buildings
		Speaker's Residence	TBC



Source: IOA Team analysis

5.10 Delivery approach: Option 3

Option 3 consists of the PoW being fully vacated and works being completed in one construction phase. This option would provide the least ongoing Disruption to the users and staff of the PoW and would provide a contained construction environment.

Introduction

- All occupants and functions within the PoW will be relocated to available space outside the Palace leaving behind a vacant building.

Delivery zones and sequencing

- In a fully decanted PoW, the solid blue line shown opposite would effectively constitute the site boundary for a contractor working in all parts of the building.
- In addition, subject to appropriate planning conditions being addressed, site welfare facilities may be set-up within Victoria Gardens to alleviate pressures of working in a constrained site, by keeping internal courtyard areas clear and accessible for logistical reasons.

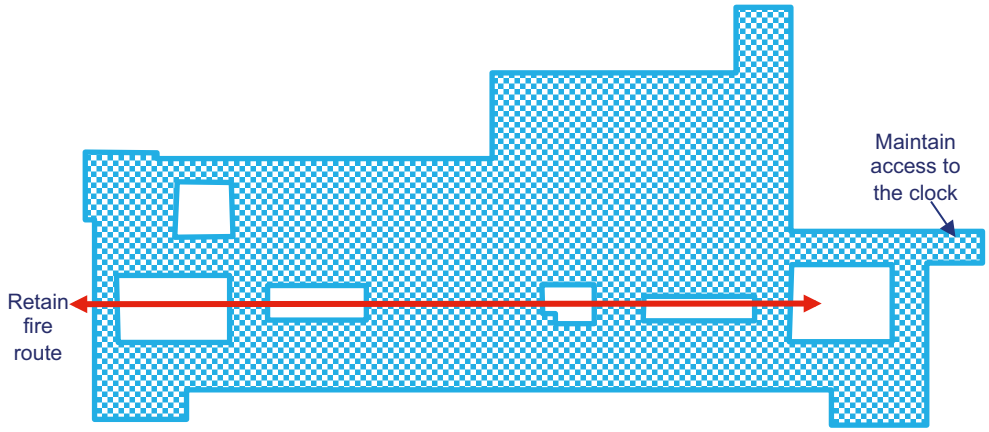
Delivery approach

- Our approach to the full decant option has been to assume a fully vacated PoW, providing contractors unconstrained access to undertake the works on all floors of the PoW simultaneously.
- This includes working in the basement and on all upper floors concurrently.
- It allows for the maximum number of work areas and therefore optimises resource utilisation, as more work faces are available at the same time.
- The work flow is dictated by the safe removal of asbestos, the careful strip out of redundant services and the connectivity of riser construction.
- The sequence of works will also be driven by the continuous flow of work trades. Besides key mechanical and electrical items of work this includes careful consideration of heritage items. An example sequence that could be used to form the normal work flow through the vacated zone of the building on the upper floors is:
  - Undertake a soft strip out and remove items of furniture;
  - Protect remaining items;
  - Create a suitable temporary environment by switching over to temporary services (enabling works);
  - Remove wall panelling;
  - Investigate risers, complete asbestos surveys and remove or encapsulate asbestos;
  - Strip-out redundant mechanical and electrical services;
  - Install new mechanical and electrical services;
  - Test and commission mechanical and electrical systems;
  - Undertake security sweep;
- Replace panels / close up areas;
  - Remove protection / final fix / decoration;
  - Return heritage items taken off-site for refurbishment / storage;
  - Deep clean and lock-up / security seal; and
  - Final security sweep.
- A key risk is the availability of suitable space that will accommodate most if not all of the primary functions of Parliament within eight minutes of the respective Chambers. These buildings would need to be available and ready to operate prior to start of the Programme, which is currently assumed to be mid-2020.
- The fire wardens will continue to operate as normal. The route for the fire tenders through the arches within the existing Courtyards will need to be maintained or an alternative solution that is acceptable to the Fire Officer, will need to be identified.
- The building will retain aspects of heritage items and equipment requiring restoration, forming part of the Programme scope of works. These include works of art, furniture, and fixed items including elements of the building fabric. Due to a significant proportion of the collections having to remain on site, security of these items will need to be closely monitored.
- Additionally, the clock maintenance team will require access to Elizabeth Tower to keep the clock fully functional during implementation of the Programme. There may be other regular maintenance access requirements that need to be satisfied during the delivery of the works. These access requirements will need to be closely managed between the client and contractor.
- Option 3 provides the opportunity to sequence all of the mechanical and electrical works as a single works programme. This will have less impact on the overall works programme than would be the case with Options E1 and 2 where services need to be maintained for PoW occupiers in the occupied areas of the Palace. The works would follow the typical sequence as set out in Volume 2, Appendix B.4.

5.10 Delivery approach: Option 3

Option 3 consists of the PoW being fully vacated and works being completed in one construction phase. This option would provide the least ongoing Disruption to the users and staff of the PoW and would provide a contained construction environment.

Figure 47: Option 3 zoning



Source: IOA Team analysis

Disruption

- Considerable Disruption will be experienced during the decanting and reoccupying of the PoW. However, once the building has been decanted, the level of Disruption that will be experienced in the decant buildings should be minimal and should be less than is currently experienced. This is because the decant buildings will be modern and no construction works will be carried out on them during the decant period.

Logistics

- The PoW is in the heart of a major city constrained by a busy road network. Movement of construction related vehicles would most probably need to be controlled and restricted to certain times in the day.
- The Archives facility in Victoria Tower is assumed to be relocated ahead of the assumed 2020 start date. The timing will need to be planned to avoid conflicts with the delivery Programme.
- Even in a fully decanted PoW, some technical operations, such as the clock and manual fire watch will have to be maintained. This raises issues around control of access within the construction site and the Palace, which will need to be addressed as part of the procurement strategy.

5.10 Delivery approach: Option 3

Delivery Option 3 consists of the PoW being fully vacated and works being completed in oneconstruction phase. This option would provide the least ongoing Disruption to the users and staff of the PoW and would provide the most easily managed construction environment.

Decant

- A detailed decant strategy has been provided to our team by the PED.
- In order for delivery Option 3 to be successful, suitable decant space will need to be provided. Available space is currently under review, so for the purposes of this report we have referred to the decant space as buildings X and Y and the northern and southern buildings.

Summary of a potential delivery approach

- Our approach for the full decant is based on the availability of suitable decant space to maintain continuity and business of Parliament. Available space has been identified by the Estates Team and is referred to in this report as Buildings X and Y, as decant space. Further in depth studies will be required to establish a detailed strategy if a full decant option is the preferred approach.
- Securing availability of suitable decant buildings that will accommodate most if not all of the decanted functions of Parliament within eight minutes of the respective Chambers is key to delivering this Option . These buildings would need to be available and ready to operate from, prior to the start of the Programme, currently assumed to be mid-2020.
- For a mid-2020 start of the works, the decant buildings would have to be designed, adapted, fitted-out, and tested for all necessary security and business continuity / operational requirements.
- The location of decant buildings, relative to each other also needs to fulfil bicameral Parliamentary functions.
- The two Chambers can be located in separate buildings as long as the associated functions of each Chamber meet the proximity criteria for maintaining Parliamentary business-as-usual as set down by the Client and reflected within the Architectural Workstrand Report..
- While the Chambers and associated functions and committee rooms would relocate to either Building X or Building Y, Member's and Peer's offices would be moved to parts of the Northern and Southern buildings respectively.

Example of House of Commons and House of Lords workable full decant option

- The tables below and opposite outline where specific departments in the HoC and HoL could be moved to under a full decant option.
- Final locations for departments will need to be agreed once the available space for decant has been established.

Figure 48: Option 3 Lords decant summary

Lords department	Moves to	Lords department	Moves to
Ground floor		**First floor**	
Peers' Offices	Decant Building X	Peers' Offices	Southern Buildings
Peers' Dining	Closed or Decant Building X	Committee Rooms	Decant Building X
PED	TBC	Lord Speaker's Accommodation	TBC
Police Accommodation	Decant Building X and Courtyard	**Upper floors**	
Principal floor	Decant Building X	Peers' Offices	Southern Buildings
The Lords Chamber	Decant Building X	Archives	New accommodation (Programme assumption)
Black Rod's Offices	Decant Building X		
Whips' Offices	Decant Building X		
Peers' Offices	Decant Building X		
Peers' Dining	Decant Building X		
Lords' Library	Decant Building X		
Robing Room and Royal Gallery	Decant Building X		
Lord Speaker's Accommodation	TBC		

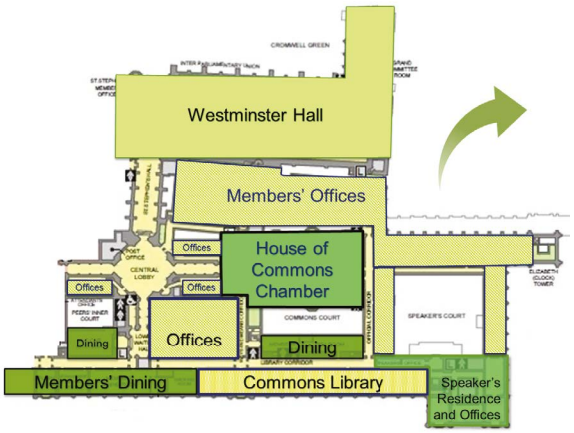
Source: IOA Team analysis

5.10 Delivery approach: Option 3

Delivery Option 3 consists of the PoW being fully vacated and works being completed in one construction phase. This option would provide the least ongoing Disruption to the users and staff of the PoW and would provide the most easily managed construction environment.

Figure 49: Option 3 Commons decant summary

Commons department	Moves to	Commons department	Moves to
Ground floor		**Principal floor**	
Chapel	Closed (alternative place of worship to be provided)	The Commons Chamber	Decant Building Y
Kitchen and Dining	Closed or Decant Building	Serjeant at Arms	Decant Building Y
PED	TBC	All Support Space	Decant Building Y
Members' Offices	Northern Buildings	Commons Library	Decant Building Y
Speaker's Residence	TBC	Kitchen and Dining	Closed or Decant Building Y
		Whips' Offices	Decant Building Y
		Members' Offices	Northern Buildings
		Speaker's Residence	TBC
		First floor	
		Chamber Galleries	Decant Building Y
		Committee Rooms	Decant Building Y
		Reporters	Decant Building Y
		Members' Offices	Northern Buildings
		Speakers' Residence	TBC
		Upper floors	
		Chamber Galleries	Decant Building Y
		Committee Rooms	Decant Building Y
		Reporters	Decant Building Y
		Members' Offices	Northern Buildings
		Speaker's Residence	TBC



Source: IOA Team analysis

5.11 Logistics

The logistics of delivering a Programme of this scale on such a high profile and constrained site are significant. Existing operations also have the potential to cause management problems under delivery Options E1 and 2. The location of a contractor's site area requires development and agreement with relevant parties, once a delivery Option has been chosen.

Logistics

- The Palace of Westminster is a highly constrained site in the middle of one of the busiest cities in the world. The use of the building poses some unique challenges, not least of which are the high levels of security on site and the varied use of the building by regular occupants and daily visitors.
- While demand for space is typical of major construction projects in live operational environments, the PoW presents significant challenges due to the number of parties that access the site in its day to day operations. This could lead to conflicts, associated delays and increased costs once the Programme is under way. A more detailed analysis and subsequent strategy for how works would be managed under Options E1 and 2, alongside day-to-day activities, will be required at the next stage if either Option is chosen.
- The two principal logistics considerations that will have an impact on the delivery of the works are the catering operation and a higher than usual level of security including the Off Site Consolidation Centre (OSCC).
- We have assumed that all contractor activity currently on site, delivering the medium-term projects, will be completed or will form part of the Programme scope of works.

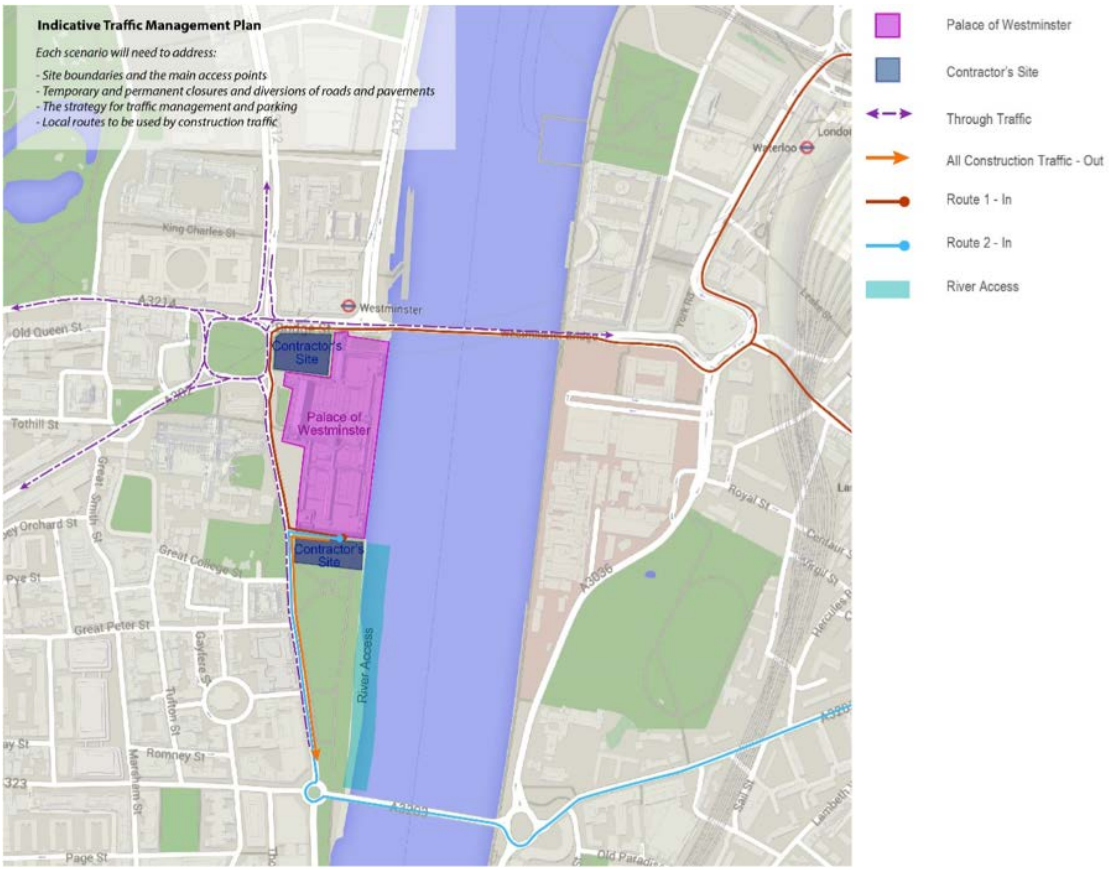
Security OSCC

- The off-site consolidation centre has been in operation for over two years. It was driven by the need to maintain enhanced security and to control the high volume of deliveries to the Palace of Westminster. It is located approximately 35-40 minutes away. All contractors working on the Programme will be required to use the OSCC for material deliveries. As this is a constrained Central London location, most large contractors are familiar with this operation though consideration may need to be given to a dedicated site closer to the PoW, which can handle the increase in volume of materials.

Catering deliveries

- By far the largest volume of traffic on site is related to the catering operations for both Houses. The IOA team has reviewed back-of-House activities of the catering teams to assess the impacts of construction work progressing in parallel. Using the only through route via the courtyards for construction deliveries in Options E1 and 2 means that there is potential for the operations to be disrupted.

Figure 50: Site Access overview



Source: IOA Team analysis

5.11 Logistics

The logistics of delivering a Programme of this scale on such a high profile and constrained site are significant. Existing operations also have the potential to cause management problems under delivery Options E1 and 2. The location of a contractor's site area requires development and agreement with relevant parties, once a delivery Option has been chosen.

Contractor's management and welfare establishment

- The area to the South of the Palace within Victoria Gardens is ideally suited to locate the contractor's welfare set up. This part of the site has good access, security control and can be screened from the building to minimise visual impact. Ideally the Contractor's offices and welfare facilities could be located in the gardens subject to approvals, so that the existing area in Black Rod's Gardens can be solely used for delivery vehicles to enter, deliver, turn around and exit.
- Similarly, the vehicular circulation area to the North West of the Palace, in New Palace Yard, offers a secondary location above the underground car park, for temporary site accommodation.
- The existing underground car park could be considered to accommodate a welfare set up although this area is restricted for space by its floor to soffit height and sloping floors.
- The garden to the North East of the PoW could be considered as an alternative location depending on the delivery Option adopted. This area is low lying, which could offer a visual shield, however the proximity to the sewer outfall pumping station may restrict the available space. There is some doubt over the ability to place heavy loads here and therefore the area may more appropriately be considered for a satellite office to House supervisory staff operating on the Commons' side of the Palace.
- Depending on the delivery Option and scale of the asbestos removal, dedicated decontamination units will likely be located close to the construction site, independent from the main welfare facilities. These could be located in the courtyards, as is the case for the existing medium term mechanical and electrical project. The courtyards could also serve as localised laydown points for materials, access for hoists and conduits for service diversions.
- The approach for provision of contractor's welfare facilities in all three delivery Options is similar and should have the following attributes:
- Good quality temporary accommodation that will provide a high standard of amenity for the operatives for a number of years;
- Well sign posted, clear access routes, with high quality protective hoardings and screens providing information for building users;
- The courtyards and interconnecting routes are to be left as clear as possible to allow a continuous connection through the site no matter which option is adopted;
- Separation of construction personnel from building occupants as far as practicable;
- Separation of construction and operational deliveries;
- Strict security regimes using monitored deliveries from the secure consolidation centre;
- A sympathetic approach to minimising the impact on the aesthetics of the building, e.g. hoist positions; and
- Satellite facilities such as toilets throughout, especially on the full decant scheme to reduce loss of productivity.

5.12 Planning context and approach

Planning decisions will be made by Westminster City Council on the basis of National and Development Plan policies. The recommended steps provide for early engagement to reach consensus on a strategic plan and conservations principles and the development of a consultation strategy.

Introduction

- This section identifies the relevant planning framework and the potential planning issues that may impact on the delivery of the works associated with each of the shortlisted Scenarios.

Planning framework and statutory regulations

- All parts of the PoW and both Houses of Parliament are defined as Crown Land or treated as if they were Crown Land under the Planning (Application to the Houses of Parliament) Order 2006.
- The statutory basis for the determination of planning decisions for works to the PoW is still governed under the Town and Country Planning and Listed Building Acts, as amended (a full list of the principal Acts and statutory planning regulations is provided in Volume 2, Appendix E.2.1). This means that the normal procedures must be followed to apply to the local planning authority for planning permission and listed building consent. This includes the need to screen for an Environmental Impact Assessment (EIA) under the Environmental Impact Regulations, 2011.
- The Crown benefits from certain provisions to help facilitate critical development and restrict access to sensitive information. This includes additional permitted development rights. The Crown also has immunity from the provisions of the Ancient Monuments and Archaeological Areas Act 1979.
- The historical significance of the PoW and the constraints that exist within the original design and fabric, means there may be a need to ease compliance with some requirements under, for example, Building Regulations. A close dialogue between English Heritage (EH) and Building Control will be required to reach agreement for alternative provision in areas where design flexibility can be accommodated.

Planning decision making

- The primary decision maker in the formal planning process is Westminster City Council (WCC), with significant input from EH's Government Historic Estates Unit. Due to the high profile nature and likely public interest in the programme, it is likely the decision on the majority of applications will be made at WCC's planning committee by Members, who will base their decision on Officer's recommendations. Smaller scale applications that attract less public interest may be determined by delegated powers at Officer level.
- The Greater London Authority (GLA) has powers to intervene on any application considered to be of strategic importance, e.g. if a protected vista is affected by development. The Secretary of State for Communities and Local Government (SoS) may also intervene and request to review an application if it conflicts with national policy in important ways, or is nationally significant. Under the special provisions relating to Crown land, the Crown can also request that applications are decided by the SoS, if it is considered to be in the interests of national security or they involve urgent works.
- If, during the pre-application consultation stage, WCC and EH consider the proposals may affect the Outstanding Universal Value of the World Heritage Site, EH will advise DCMS who will decide whether to consult UNESCO on the proposals.
- There are many other statutory (and non-statutory) consultees that may need or want to input into the planning decision making process. An initial non-exhaustive list of the likely interested parties is provided in Volume 2, Appendix E.2.1.

Planning policy framework

- The National Planning Policy Framework, 2012 (NPPF), and accompanying Planning Practice Guidance, 2014, set out the Government's guidance on planning policy and provide the strategic framework for all planning decisions. The NPPF is a material consideration in the determination of planning applications.
- Planning decisions must also be made in accordance with the policies in the relevant Development Plan. In Westminster, this is currently formed by the GLA's London Plan 2011 (as amended); and WCC's Westminster City Plan: Strategic Policies 2013, alongside the Saved Polices of the Unitary Development Plan (UDP), 2007.
- The site specific designations set out in these documents determine the relevant planning policies that need to be considered. The designations that cover the PoW and the immediate surrounding area are listed in Volume 2, Appendix E2.3. The Development Plan is supported by a range of Supplementary Planning Guidance (SPG) and other guidance produced by authoritative bodies such as EH and UNESCO. Some of the key documents likely to have an impact on the strategy pursued are listed in Volume 2, Appendix E2.4.

5.12 Planning context and approach

Planning decisions will be made by Westminster City Council on the basis of National and Development Plan policies. The recommended steps provide for early engagement to reach consensus on a strategic plan and conservations principles and the development of a consultation strategy.

Planning approach

- In the absence of a decision addressing how and to what extent the programme will be delivered, we recommend the following strategic steps are undertaken to best prepare for the full range of Scenarios being considered:

Table 51: recommended approach to Planning

Recommended steps	Outcome
Engage early with WCC and EH Timeframe: 2014-2017	As primary decision makers, it will be essential to secure the Senior Officer's support throughout the whole planning process. Early engagement helps to strengthen relationships and build trust, resolving any differences before the strategy is finalised and expenditure accrues on potentially contentious or abortive works.
Develop a strategic plan to guide applications Timeframe: 2015- 2016	Due to the highly sensitive heritage context and the potential timescales and scale of the works, it would be beneficial to produce a document setting out the strategic vision and direction of the Programme. In addition it would also be worth developing a strategy to guide any required applications. This would help to present the project to the decision makers and public. This document should be formally endorsed by WCC and EH to give it greater weight in the decision making process.
Develop a consultation strategy and approach Timeframe: 2015-2017	Public interest in works to the PoW will be wide ranging. A tailored consultation strategy will be an important component in delivering a successful planning outcome for the vision and strategic direction of the Programme and for all subsequent associated applications. In-principle support should be secured from the planning decision makers, before extending consultation to the wider net of interested parties. It is recommend that separate strategies for planning and political decision making are developed in parallel.
Planning Performance Agreement (PPA) with WCC and EH Timeframe: 2016	The timescale and quantity of the applications that will be needed to secure permission for works to the PoW, pose a potential resource issue for the planning decision making authorities. It may be appropriate for the Programme to establish a PPA in order to secure a dedicated resource within WCC and EH, with agreed timeframes for responses and regular meeting slots. However, there would be a financial implication to this approach, which will vary depending on the duration of the project.
Reach consensus with WCC and EH on conservation principles Timeframe: 2017-2018	Any works to PoW will be scrutinised in terms of its potential harm and heritage impact. It will be important to agree the most important aspects of the building with the primary decision makers at an early stage. It will be essential to gain consensus on the content of a reader friendly Conservation Management Plan (CMP) and to prepare a Conservation Strategy (CS) setting out the brief and scope of the Restoration and Renewal programme, identifying the agreed heritage and conservation outcomes for all rooms and areas of the PoW. These two documents will help to shape the Strategic Vision and provide the basis for discussions about those areas of the building that may be more adaptable to change.
Heritage Partnership Agreement (HPA) Timeframe: 2018	Once agreement has been reached on a CMP and CS, and there is a clearer understanding of the likely works, discussions should be progressed with WCC and EH on the development of a HPA. A HPA is a statutory agreement that sets out an understanding of the significance of the heritage asset, including identifying those elements of the building that are not of special interest. Once in place, a HPA can help reduce the number of listed building consent applications required for certain agreed works that may have a common specification and approach.

Source: IOA Team analysis

Planning issues and next steps

- The approach and recommended steps highlighted in the section above should provide a solid basis to progress the chosen Scenario through the planning system.
- Details of the schedule for the Planning application(s) is shown in Volume 2, Appendix B.3.

5.13 Planning costs and timescales

The key planning policy issues relate to the impact of the works on the heritage context and construction impacts. The key costs will be determined by the extent and detail of the required works as well as the timescales, phasing and programme.

Planning considerations

- Once a decision on the chosen Scenario has been made, a detailed planning strategy to confirm the phasing and grouping of the Programme works will need to be developed. The planning issues set out below should be considered ahead of making any formal decision:

Table 52: Planning Considerations

Planning consideration	Summary
Design/heritage	The primary planning policy consideration for the majority of the works for all Scenarios relates to the design and impact on the fabric of the Grade I listed building and its World Heritage Site (WHS) and Conservation Area setting. The CMP and CS will play a crucial role in agreeing a base position and justifying the planning strategy, including any potentially intrusive works.
Impact of mechanical and electrical plant	The physical impact of the mechanical and electrical plant associated with the Restoration and Renewal programme on the existing fabric, its structure and its setting (including views) will be scrutinised. Intrusive or highly visible plant, and/or in the most sensitive parts of the PoW will need to be assessed, together with the impact on the amenity of the surrounding occupiers in terms of noise and air quality.
New structures	The extent of development within the PoW could raise wider planning policy issues e.g. if a temporary Chamber or other structure is built, its use, scale, massing and siting would need to be considered. Section 106 Agreement (s106) or Community Infrastructure Levy (CIL) contributions may also be required.
Temporary changes of use	Other planning policy issues may be raised if there was a requirement to temporarily change the use of an existing building in the estate for the duration of the works. Consideration should be given to whether it would be more advantageous for separate planning applications to be submitted for individual buildings, and to separate potential policy issues from the main works to the PoW.
Transport and construction impacts during and after the works	The impacts on the transport network, noise and air quality both during and following the completion of the construction phase will need to be assessed. The impact on the road network is likely to differ for each Scenario being considered. A detailed construction management plan and servicing strategy will be essential to ensure impacts can be managed and mitigated, particularly in relation to Westminster Abbey and the World Heritage Site.
Timescales/construction compounds	The significant timescales that could be experienced with the delivery of the Programme could directly impact the planning decisions regarding the siting and quantity of construction compounds and how it affects the setting and appearance of the PoW. This may form an important aspect in the determination of future applications and should be carefully considered to ensure impacts on the most sensitive and significant parts of the PoW and the WHS are mitigated.
Sustainability	Sustainability is a Government priority and is reflected in planning polices at national and local level. Given the PoW's Grade 1 Listed status there may be greater constraints on incorporating sustainability measures, however, opportunities may exist to incorporate sustainability measures where new or temporary structures are proposed and plant is being replaced. It will be important to identify an overarching strategy for introducing sustainable measures to establish what is achievable (or desirable) in the context of the heritage setting. The principles could be included within the Strategic Vision for the Programme and these should be agreed with WCC and EH at an early stage.
Other environmental factors	Works affecting the ground, including any excavation or new structures (including compounds in place for a significant period) are likely to require an assessment of flood risk and an archaeological review (though the Crown benefits from certain planning exemptions on archaeological matters). Daylighting and Sunlighting assessments may also need to be undertaken for works involving new structures.
The Equalities Act/ Accessibility	An appropriate strategy for inclusive access during and following the completion of the works will need to be incorporated. Access in and around the grounds of the PoW may also be an issue, if there is a need to maintain public access during the works and/or there are any ceremonial rights of way that need to be preserved.

Source: IOA Team analysis

5.13 Planning costs and timescales

The key planning policy issues relate to the impact of the works on the heritage context and construction impacts. The key costs will be determined by the extent and detail of the required works as well as the timescales, phasing and programme.

Planning cost implications

- An accurate estimate of planning costs cannot be determined until the strategy has been clarified and the work phases agreed. The significant planning costs associated with the project will relate to:
  - **Resources necessary to produce planning documentation** – support producing the relevant documents and detailed drawings required for all submissions (refer to Volume 2, Appendix E2.5 for an example of the types of documents likely to be required). A greater number of submissions over a longer period of time will have an impact on the costs, whilst the requirement for an EIA could also increase costs if deemed necessary;
  - **Production of visual material** - detailed models and verified views are likely to be required to help present and justify the impact of the proposals to the decision makers and public;
  - **The relevant application fees** - payable to WCC to process the planning applications. The mechanical and electrical plant applications alone are likely to attract a significant fee. Other planning application fees could relate to changes of use or increases in floor area. There is currently no administrative charge for listed building applications, although WCC has indicated that in the near future this may change;
  - **The potential s106 and CIL contributions** – s106 costs are planning obligations which will need to be calculated once the proposals have been finalised. WCC is yet to adopt a CIL Charging Schedule but expects to have one in place by April 2015. The GLA adopted its CIL Charging Schedule on the 1st April 2012;
  - **The cost of entering into a PPA** – A PPA could help WCC resource the decision making process for the programme works. There is likely to be an annual cost for facilitating this resource capability, the cost of which will be subject to formal agreement with WCC. A separate arrangement and fee could be required for EH's services;
  - **Cost of a call-in, appeal or a Judicial Review (JR)** – costs would be associated with this additional layer of the decision making process, should the application(s) be called in by the SoS, or refused by the planning decision makers and as a result it was felt necessary to appeal the outcome. In the event that a third party is aggrieved by the decision making process, it may also seek a JR within six weeks of a decision This could add significant delay and costs, depending on the outcome of this process; and
  - **Public consultation** - there will be costs associated with implementing the public consultation strategy and approach. If there was substantial public objection to the works this could jeopardise the decision making process and increase the timescales involved for making a decision, which would have a subsequent and potential large impact on costs.

Timescales and programme

- **Determination of an application:** The statutory timescales for the determination of an application for planning permission and listed building consent is eight weeks from validation or thirteen weeks for a major larger scale application. If an EIA is required, this time period is extended to sixteen weeks. It is highly recommended that all applications are agreed in principle prior to submission to ensure issues can be rectified at the earliest opportunity, aiding a smoother transition through the formal process.
- **Development of scheme:** Based on the planning process alone (excluding the political context and decision making), a smaller scale application could take approximately four to six months to develop by the team and agree with the planning decision makers, presuming there is an agreed CMP and CS in place and the overarching strategy has been endorsed (in the form of the Strategic Plan). A larger scale application could take between nine and twelve months, potentially longer, if agreement is not reached with decision makers on certain aspects.
- **Implementation:** WCC will impose a timescale for the works to be implemented before any permission expires. This could have an impact on the phasing strategy. The normal implementation period for planning permissions and listed building consent is three years from the date permission is granted, although WCC may agree to a longer period (e.g. five years) if it can be demonstrated that there is a specific need for this extended time period. Agreeing a strategic plan with WCC and EH would help to mitigate this risk.
- **Post consent:** Permission may be granted subject to Conditions, which would also need to be satisfied (i.e. further submissions) within the timeframes agreed on the related consent. Changes introduced post consent will need to be approved formally. If changes to a planning permission are deemed to be non material or minor material, this can be fairly straight forward providing the principles are agreed with the decision making bodies and third parities are not affected significantly. The procedure for changing a listed building consent is not as flexible under current planning legislation. If the works deviate from any listed building consent granted, it is likely that WCC and EH would require a fresh application so the impact on listed fabric can be reassessed fully.

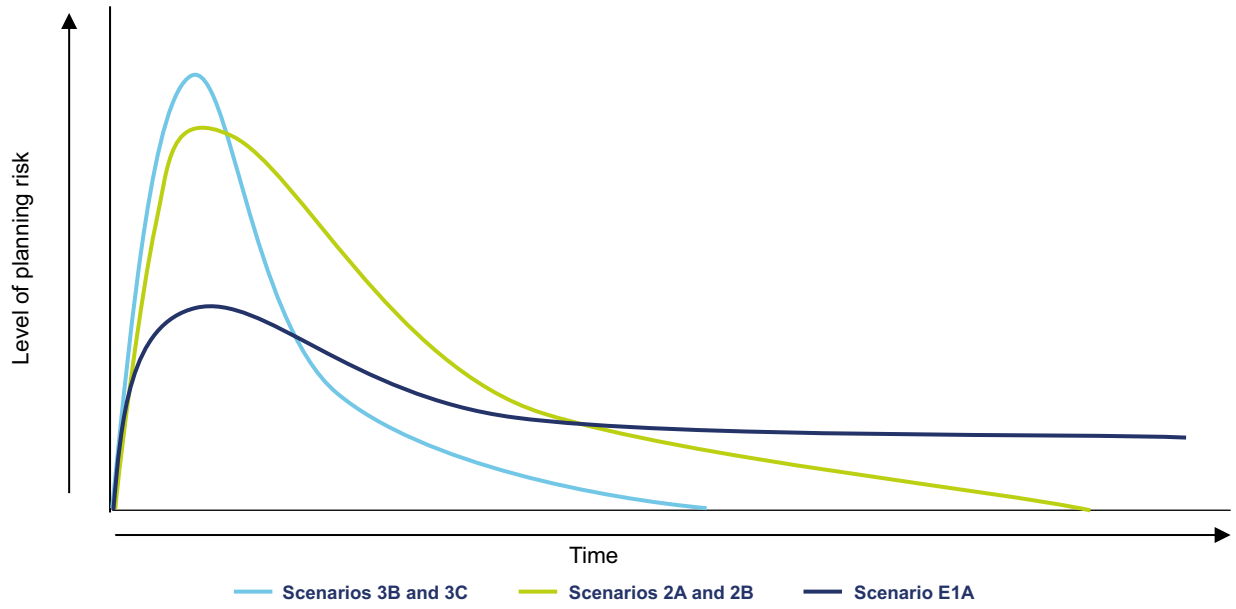
5.14 Planning risks

Each Scenario would have a number of complex planning matters to address. Given the content, scale, and heritage aspects of the proposed works, and the alternative methods of delivery, the planning risks for each Scenario will be considerable.

Planning risk

- There are potential planning risks with each Scenario being considered. The figure below outlines illustrative planning risk profiles, for each of the delivery Options. The key features of the risk profiles are:
  - Scenarios 3B and 3C have the highest level of risk at the beginning of the project due to the requirement for decant space, the scale of the contractor site set up and the associated general disturbance this approach would cause to the centre of Westminster. The risk reduces quickly once planning is achieved and the Judicial Review period has expired. The risk continues to subside at a steady rate, as conditions are discharged throughout the Programme. The planning risk will vary between scope Outcome Levels B and C, however, the decant and scale of the works are the key factors influencing the planning risk, resulting in the risk being relatively insensitive to scope;
  - Scenarios 2A and 2B have a high level of risk at the beginning of the Programme. The risk is mainly attributed to the requirement for decant space (albeit a lot less area is required than in Option 3, hence the lower risk peak) and the significant site set up that will be required by the contractor. The Planning risk will diminish at a slower rate than Scenarios 3B and 3C as the schedule duration is longer. The planning risk will vary between scope Outcome Levels A and B, however, the partial decant and scale of the works are the key factors influencing the planning risk. resulting in the risk being relatively insensitive to scope; and
  - Scenario E1A has a relatively lower level of risk, when compared to the other Scenarios. This is because the works are spread out over a longer period of time and they are therefore delivered on a far smaller scale during each phase. The contractor's site set up will be more modest in scale and the scope of the works is less when compared to Outcome Levels B and C. There is planning risk associated with the temporary Chamber and other temporary accommodation locations. However, once these items are addressed the planning risk will still remain at a residual level, which will run throughout the 30 year schedule for the works.

Figure 51: Illustrative planning risk



Source: IOA Team analysis

Summary, assessment and key risks for various Scenarios

- The main planning issue generic to all Scenarios include the policy considerations and impacts of the works on the heritage context. The significant planning officer resources required and implications this may have on the decision making process is also a common factor to all the Scenarios being considered.
- The nature and scale of the works will determine the rest of the planning issues likely to arise. Until a decision has been made on how Parliament will operate during the works and what the proposed works involve, it is not possible to devise a detailed phasing strategy and determine how this is likely to be packaged into planning and listed building applications. Nor is it possible to quantify costs.
- The table opposite provides an initial summary of some of the key planning issues and suggested approach for dealing with them. This is not intended to be exhaustive and will need to be developed as the project progresses.

5.14 Planning risks

Each Scenario would have a number of complex planning matters to address. Given the content, scale, and heritage aspects of the proposed works, and the alternative methods of delivery, the planning risks for each Scenario will be considerable.

Table 53: Recommended approach to Planning

Planning issues	Recommended approach
Timescales Drawn out planning process over many years. Permissions could expire or need to be changed before implemented. Personnel in decision-making authorities could change resulting in a lack of consistency. Policies and laws could change over time.	**All Scenarios** • The production of a Strategic Plan and CMP to underpin the strategy and seek endorsement on principles from the outset. • Enter into PPA with WCC and EH to agree outputs for decision making and responding. • Consider how to group works to ensure they can be implemented in life time of consent (three to five years). • Aim to secure works that need to be developed post consent via condition (as far as reasonably possible).
Prolonged impact of construction/Disruption Visual and operational impact of construction period on heritage context, road network and surrounding occupiers.	**All Scenarios** • Detailed management plan potentially tied into a s106 to sit alongside permissions. • Townscape/visual assessments to support applications to fully assess impact on setting. • Transport, noise and vibration studies to assess other impacts (maybe in EIA?). • WCC may require financial contributions if the impact is considered to be significant and requires mitigation measures. **3B and 3C** • Construction impact likely to be the most significant but potentially over a shorter duration. • Full consideration to the management principles and impact on the setting will need to be considered in a detailed review.
Consultation/ public interest Public interest will increase as the scope of works potentially increase/there is Disruption to the way Parliament operates during the works. There is also likely to be a greater number of formal consultees and bodies involved in the decision making process.	**All Scenarios** • Consultation strategy to be tailored accordingly **E1A** • Public interest may not be as great if business carries on as usual during the works and changes introduced incrementally. **2B, 2C, 3B and 3C** • Interest will be wide ranging. So will input required from more formal consultation bodies.
Sustainability strategy Potentially more difficult to implement sustainability measures if dealing with a greater number of minor applications.	**All Scenarios** • Overarching strategy to be agreed with WCC. **E1A** • This could prove difficult to manage due to the extended period of time that E1A will be delivered over.
Need for some change of use and/or temporary structures within wider Estate Triggering policy issues on use, also potential financial implications if s106 or CIL contributions required.	**2B, 2C, 3B and 3C** • Detailed assessment of planning policy when strategy and specific works proposed are known. • Consider submitting separate planning application for each site to ensure issues can be separated from main works.
Application submission Planning deliverables / documents are likely to increase if works implicate wider estate.	**All Scenarios** • Deliverables to be agreed with WCC when works known. • See Volume 2, Appendix E.2.5 for a list of typical documents that could be required.
Application(s) called in by SoS or GLA, or JR process initiated due to scale or importance of proposals	**All Scenarios:** • May be more likely if there is strong opposition/pressure from statutory consultees or third parties. Consultation strategy will play an important role in seeking support.
Need for EIA May be more likely if works implicate a greater area/setting.	**All Scenarios** • Screening request to be submitted to WCC at an early stage, when works are known.

5.15 Heritage and conservation: Context and approach

The variety and extent of all works in the Restoration and Renewal Programme needs to be evaluated in terms of its impact on the heritage and conservation of the PoW. The scope and brief for every aspect of the project must ensure that heritage and conservation informs the final design.

Context

- The PoW is among the most recognised buildings in the world. To many people it is a symbol of freedom and democracy. The importance of the PoW as a design icon created by Charles Barry in collaboration with Augustus Welby Pugin, results in the building being recognised both nationally as a Grade I Listed Building and internationally as a World Heritage Site in combination with Westminster Abbey and its surrounding landscape.
- Given the heritage status of the PoW, it is clear the overall design, the parliamentary and ceremonial functions, historical associations, and the local context, should remain at the centre of all thoughts about the Restoration and Renewal programme and how it is designed and implemented. While there is not yet any firm design for the project in place, the IOA report highlights the extent to which heritage and conservation has to be a key consideration for each Scenario. It offers examples of some of the risks likely to be encountered, which are based on a developing understanding of the building, the condition of the existing fabric and services, and suggests an approach and strategy for their management.

Approach and strategy

- The key recommendation of the approach and strategy is the need to comprehensively understand all the heritage aspects of the PoW and to have the full range of this information available well in advance of any design work being started, and presented in a user friendly format that can be expanded upon during the development of the design and during the construction phase. This would include creating separate illustrated asset registers of the historic loose furniture and furnishings, historic fixed furniture and furnishings, full asset register of each room and space to include details of panelling and fire places for example, digital copies of all known plans, photographs, all of which will take time to prepare and the work to prepare them should commence now.
- The information will be invaluable to the design team and the contractor when developing the design, helpful in emptying the building and preparing it for the works, and essential for use in creating the documentation necessary to obtain Planning and Listed Building Consents.
- Additionally, it is recommended that as well as a user-friendly Conservation Management Plan (CMP), a Conservation Strategy (CS) document is prepared that sets out the brief and scope of the Restoration and Renewal programme and explains the agreed heritage and conservation outcomes for all rooms and areas of the PoW. This will take time to prepare and should commence now. The Conservation Strategy will be helpful for discussions with Westminster City Council (WCC) and English Heritage (EH) to agree the overall heritage and conservation outcome, be invaluable to the design team and the contractor when developing the design and will form a key part of the documentation submitted with applications for Planning and Listed Building Consent.

Basis of the review

- To inform this work, the IOA team was provided with an architectural report that covered aspects of circulation, structure, fabric, energy and heritage. Additional Workstrand Reports covering a range of other subject areas were also supplied, albeit that none provided a coordinated or complete picture of the work required to be delivered by the Restoration and Renewal programme.
- To better understand the heritage and conservation aspects of the Workstrand Reports in relation to the PoW, the IOA team convened meetings with the authors of the Workstrand Reports and the external consultants contributing to them. In many instances the discussions resulted in the IOA Team being provided with additional reports and information.
- Although uncoordinated and incomplete, aspects included within the Workstrand Reports, provided at the outset of the IOA, as well as further information gleaned from the additional reports and details subsequently provided will have a bearing on heritage and conservation considerations for the project, and will require discussion with WCC and EH and significant applications for Planning and / or Listed Building Consents, as outlined in the table below:

Table 54: Workstrand heritage implications

Workstrand	Heritage implications
Access (Equalities Act 2010, Lifts, Vehicles)	• The design of enhancements to the PoW relating to the Equalities Act 2010 and improvements to the provision and siting of lifts will require careful consideration, and discussion with WCC and EH. Consideration will also need to be given to the Equalities Act 2010 in relation to any new decant building and to the route between all buildings that fall outside the red-line boundary of the PoW. • Conflicts during construction over vehicular use of the courtyards for deliveries from the Consolidation Centre, and access for fire tenders, will require careful consideration and discussion with WCC and EH. This will be particularly relevant in determining the boundary between work areas in all decants.
Accommodation	• Changes in the use of accommodation that vary the original purpose of a room, and any changes to the disposition of departments and users within the PoW and their relationship with the HoC and HoL Chambers may require careful consideration, and discussion with WCC and EH.
Archives	• The IOA team has assumed the archives will be removed from the PoW • Gallery / exhibition space may be required within the PoW and the location and design will require careful consideration and discussion with WCC and EH.

Source: IOA Team analysis

5.15 Heritage and conservation: Context and approach

The variety and extent of all works in the Restoration and Renewal Programme needs to be evaluated in terms of its impact on the heritage and conservation of the PoW. The scope and brief for every aspect of the project must ensure that heritage and conservation informs the final design.

Table 54: Workstrand heritage implications (continued)

Workstrand	Heritage Implications
Asbestos	• The removal or encapsulation of asbestos products will feature in a wide range of works to be carried out within the PoW. This will be noted in methodologies submitted to WCC and EH in response to Conditions attached to the Planning and Listed Building Consents.
Audio Visual	• The design of a new AV installation, including the routes of hidden infrastructure for cables, the running of visible cables and location, and the fixing of cameras and screens internally throughout the PoW will require careful consideration and discussion with WCC and EH.
Catering	• Although the kitchens, back-of-House areas, and dining rooms for both Houses have been the subject of major works in recent years, there are likely to be enhancements arising from the mechanical and electrical replacement works associated with services risers requiring careful consideration, and discussion with WCC and EH. • Conflicts during construction over vehicular use of the courtyards for the delivery and storage of fresh food, dry goods, beverages, laundry and the disposal of waste will be particularly relevant in determining the boundary between work areas in all decants.
Decant Strategy	• The requirement(s) for Planning and / or Listed Building Consent will vary according to which variation(s) of decant solution are adopted. • Routes through and from the PoW for the decant of personnel, furniture, room contents, heritage collections, etc.., from floors above ground level and from areas of the basement currently used by PED and the Police will require careful consideration and may require discussion with WCC and EH. • In addition, methodologies for the design of protective measures throughout the PoW, to prevent accidental damage during decant and construction, will need to be submitted to WCC and EH in response to Conditions attached to the Planning and Listed Building Consents.
Environment	• Environmental aspects to meet future targets and policies will be included within applications for Planning and Listed Building Consent covering the full scope of the Mechanical and Electrical works proposed.
Fire Safety	• Fire compartments within the PoW and installation of a fire suppression system to basement plant areas are currently being planned. Aspects of this will be included within applications for Planning and Listed Building Consent covering the full scope of Mechanical and Electrical works proposed.
Health and Safety	• Aspects of this will be included within applications for Planning and Listed Building Consent covering the full scope of works proposed.
Heritage Collections	• The Heritage Collections include: clocks, artworks on canvas and paper, loose furniture, fixed furniture, furnishings (including panelling and wallpaper), sculptures, murals, mosaics, stained and painted glass, light fittings and books. Illustrated asset registers of these and drawings regarding their location in the PoW will need to be prepared. • The protection in-situ or the decant of many items to an environmentally controlled secure store will require methodologies to be prepared covering the protection, moving and storage of each item. A schedule of conservation and repairs to each item will need to be prepared and requires careful consideration and discussion with WCC and EH, and be readily available to accompany all relevant applications for Listed Building Consent.
Mechanical and Electrical	• The installation of pipes and cables and plant in the PoW will be included within the design of enhancements and replacements included in applications for Listed Building Consent. The removal and replacement of pipes, cables and equipment in plant rooms and throughout the basement is likely to require an application for Planning Consent. • The routing and installation of temporary services through courtyards, connecting to risers within the ground floor (to continue serving the ground floor and above, and allowing the removal and replacement of services from the basement) will require applications for Planning and Listed Building Consents.
Networks	• Aspects of this will be included within applications for Planning and Listed Building Consent covering the full scope of Mechanical and Electrical works proposed.
Public Engagement / Education / Visitor Services / Retail	• Those aspects that fall within the scope of the Programme will be included in applications for Planning and Listed Building Consent covering the full scope of works that fall within the red-line boundary of the PoW.
Security	• The design of new enhancements for security will require careful consideration and discussion with WCC and EH, and require applications for Planning and Listed Building Consent.

Source: IOA Team analysis

5.16 Heritage and conservation risks

The delivery and associated risks for all works in the Programme need to be evaluated with regards to their impact on the heritage and conservation of the PoW. An informed conservation strategy must be prepared that reflects this and ensures potential impacts are understood.

Managing heritage and conservation risks arising from the design of the works

- Whilst the information provided and reviewed included some details about the heritage and conservation work needing to be carried out to the PoW, there are many aspects that remain unclear or are as yet unresolved. To fully understand the scope of the Programme and reduce the risks to the Client and to the heritage and conservation of the PoW, there would be considerable benefit in the preparation of an overall Conservation Strategy document that clearly sets out the required outcomes for all parts of the PoW, and the changes to be incorporated that will enhance the experience of all who use the building. This will be submitted as part of the Planning application/s.

Conservation Strategy

- The Conservation Strategy is an additional document to a Conservation Management Plan. The benefit of having a Conservation Strategy in place is that it would offer greater certainty as to the overall outcome for all users, reducing the potential for changes during the design and construction phases by creating a method for identifying and evaluating opportunities for managed change and thereby reducing conflict between different user groups. The Conservation Strategy would form a key part of the Planning consultation and application/s, and would define boundaries for the heritage and conservation works to be progressed within.
- In addition the Programme would benefit from the preparation of a series of strategic plans that will assist in the preparation of the Conservation Strategy.
  - The first strategic plan would relate specifically to the PoW and consider the future functional layout of the building;
  - A second strategic plan would consider the entire Parliamentary Estate, including the northern estate, the PoW and the southern estate, with a view to understanding the history and drivers behind its expansion, together with considering the location and provision of appropriate accommodation to cater for the future needs of an ever-developing Parliament; and
  - Lastly, given it is several decades since it was last considered, a further strategic plan could be prepared that extends the boundary to include the whole Government Quarter of Whitehall, and evaluating the creation of a larger pedestrianised Government / Parliamentary precinct.

Asset registers and building documentation

- A further risk to the heritage and conservation of the PoW is the incomplete and inconsistent documentation of the building, ranging from an incomplete set of plans showing the services, to incomplete heritage asset registers of each room and space recording the contents. This covers elements such as door furniture, timber panelling, fireplaces, bookcases and cupboards, thermometers, each of which will need to be recorded and photographed.
- Coupled with this there is a need to gather digital copies of all known historic drawings and photographs, with the area of the building they cover outlined and identified on a set of present day floor plans. This information in an easy to access format would be invaluable in providing the design team and the contractor with a full understanding of the building, thereby increasing the level of certainty and decreasing the associated risk.
- There is also a need for a comprehensive and illustrated asset register of all the heritage collections within the building to include, among many pieces of data, full details of the size and weight, the procedures for moving and the method for protection while in transit, and the conditions for off-site storage. This would be invaluable in ensuring the correct system of tracking and monitoring is in place, thereby helping to reduce the possibility of damage, and greatly assisting in the packing of each piece, and moving the items through the building, and their transfer off-site to an environmentally controlled storage building.

Implications for the heritage and conservation of the PoW arising from the delivery of the works

- Over recent decades given its Grade I listed status and being part of a World Heritage Site in combination with Westminster Abbey, the delivery of major and minor works within the PoW has been successfully carried out in consultation with Westminster City Council (WCC) as the consenting authority and English Heritage (EH) as the principal statutory consultee. The working relationship between the PoW, WCC and EH that has built up over the years is such, that a good understanding exists between all the parties and this will enable the development of the Programme to proceed within a well understood framework.

Implication in choice of procurement

- Implications to the heritage and conservation of the PoW will arise from the choice of procurement route depending on the Scenario selected and the chosen method of delivery. The procurement route could vary from a traditional form of procurement in answer to a well-developed scope of works, with a full set of drawings and specifications provided by a conservation architect, through to a design and build form, with the design, materials and proposed methodologies being provided by a wide range of sub-contractors,
- Whichever procurement route is chosen, there will be a need to manage a significant workforce within the PoW in order to prevent accidental physical damage to the historic fabric caused by the movement of people and materials through the building. This includes the installation of temporary or new services pipes, cables, and plant; and leakages during strip-out and testing post-installation.

5.16 Heritage and conservation risks

The delivery and associated risks for all works in the Programme need to be evaluated with regards to their impact on the heritage and conservation of the PoW. An informed conservation strategy must be prepared that reflects this and ensures potential impacts are understood.

Implications during construction

- Although work at the PoW to be carried out within the different Scenarios – E1A, 2A, 2B, 3B and 3C – is similar, the differences are principally in the methods of delivery and resultant timescales.
- Delivery Option E1 requires the building of a temporary Chamber within the red-line boundary that can be used as required by both Houses. The siting, massing and form of a temporary Chamber and the temporary connections to it from the PoW has implications and risks in heritage and conservation terms.
- Whilst Delivery Options 2 and 3 do not require a temporary Chamber, the contractors site establishment will be significant in scale and will potentially have implications and risks in heritage conservation terms.
- In addition, to prevent accidental damage to the historic fabric (for example mural paintings, stained and painted glass windows, statues, stone carvings and built-in furniture), protection will need to be put in place for the duration of the works. This must be carefully thought out so that they have no fixings into the building fabric, provide suitable environmental conditions that are easily monitored, and ensure that the separation of work zones remains intact.
- Coupled with this will be an expansion of the PoW fire team to manage the hot-works permit system, and to carry out inspections of such work as it is undertaken with continued monitoring of the area after the contractor has left site.
- As with any construction work of major scale and scope, there will be an impact on the PoW in terms of noise and vibration passing through the structure which may have unforeseen consequences such as creating higher levels of dust or the dislodging of loosened decorative items that are normally out of reach.
- Also, the routing of temporary pipework and cables to maintain services in use in some cases may require compromises, such as removing a window or door. Coupled with this will be the impact of scaffolding, temporary hoarding, CCTV, and the size and location of the contractor's compound on the appearance and setting of the Listed Building.
- There are, however, pieces of work within the Programme that will be particularly challenging as they fall outside the scale and scope of what is usually carried out to a grade 1 Listed Building. For example under Scenario E1A there will be the need to erect within the red-line boundary of the PoW a temporary Chamber and further associated accommodation. The possible locations for a temporary Chamber within the red-line boundary are limited and will require careful design, and discussion with WCC and EH.
- In addition there will need to be alterations to the PoW that provide access routes for users and visitors, toilets, services connectivity, and security measures. The design of such alterations and interventions will require considerable discussion with WCC and EH, and require applications for Planning and Listed Building Consent.
- Another factor that should not be overlooked is maintaining the environmental conditions within the building for the duration of the works in order to protect the fabric of the building and the original furniture, decorative finishes and artworks, and setting the environmental standards for any facility used for the temporary storage of such items. This will also include developing the appropriate approach for packing, moving and storing each individual item.
- A further matter that will require consideration in Options E1 and 2 is the continued provision of public access to the PoW during the works. This is not only concerned with providing access to the Public Gallery and attendance at Committees but also maintaining access for educational visits and tourism, all of which will need to be carefully considered. The continued provision of public access for visitors and tourists, may well be one of the conditions attached to both the Planning and Listed Building Consents.
- Additionally, when the PoW is fully decanted in Scenarios 3B and 3C there may well be a call to provide some controlled access so visitors and tourists can witness the conservation works being carried out, and for which a well-considered Health and Safety Plan will need to be prepared.

5.16 Heritage and conservation risks

The management of cost and risk for all works in the Restoration and Renewal Programme needs to reflect the heritage and conservation aspects of the PoW. This once in a lifetime project offers the opportunity for making major changes that might otherwise be difficult to achieve.

Approach and strategy for the management of risks by the Client

- The benefit of having a Conservation Strategy, strategic plans and asset registers in place as soon as possible is to ensure that sufficient details of the PoW are in place to inform and assist the Client, all Members of the design team, and the contractor in planning the works included in the Programme in greater detail and to help in refining the costs.
- In addition, having the strategic plans and asset registers in place at the outset will greatly assist the Client and the design team when engaging with WCC and EH, and help encourage their support for all aspects of the Programme.
- The support of WCC and EH will be particularly relevant in relation to Scenario E1A where there is a need to erect a temporary Chamber within the red-line boundary and carry out alterations to permit the churn of key occupants who need to be close to the Chamber in order for Parliament to function.
- The support of WCC and EH will also be of relevance in Scenarios E1A, 2A and 2B in connection with the routing and installation of temporary services through the courtyards and the ground floor which connect to key risers that will maintain those parts of the PoW that may remain occupied and functioning or where the environment needs to be carefully controlled to protect the historic fabric or art work. Once the full scope of the Programme has been established, the strategic plan and asset registers can be included as supporting documents to accompany the applications for Planning and Listed Building Consent.
- A strategy for managing the risks and to reduce the possibility of causing unintended harm to the historic fabric of the building will principally involve the appointment of a team of conservation architects with a heritage project manager, appointed as part of the design team. This team will use the strategic plans and asset registers to develop detailed design briefs for the works.
- As the brief and scope is developed there is likely to be a need to carry out investigative work, and to learn more about the hidden construction of the building. For example, a trial could be carried out to remove the timber linen-fold panelling from a room to inspect the hidden services and to determine a approach for removal and re-fitting the panelling. Connected with the removal and refitting of panelling it will also be possible to establish the approach for installing additional new or replacement services.
- There will also be a further need to carry out investigations associated with the location of asbestos within the building to help with the development of a strategy for its removal or encapsulation. A similar strategy will need to be developed in connection with the slight possibility that in the 19th Century animal hair mixed in plaster may have come from an infected animal. Testing may be required to samples of plaster in each area prior to it being worked on.
- There are risks around timing and order of materials that will need to be considered in further detail following this IOA, although these have already been accounted for in the detailed assessment of costs for each of the Scenarios. As the length of programme for Scenarios E1A, 2A and 2B is significant, there is the likelihood that the current specification of some materials, equipment and fittings will change or no longer be available, therefore, it may have to be accepted that in order to help protect the external appearance of the PoW, the contractor is permitted, for example, to purchase sufficient light fittings and switches, perhaps several year in advance of their being installed, to ensure there is a consistent internal and external appearance to relevant rooms. Such items may need to be store within the building until such time as they are fitted.
- In addition a better management of risk would be achieved by careful selection of a suitable contractor and sub-contractors. This will require the careful preparation of the Evaluation Criteria against which the contractors and sub-contractors can be assessed and ensure they have within their team the relevant skill-sets for the project, have a management team and key foremen with a sound knowledge of heritage philosophy, and that their approach for managing the construction site within the different Scenarios is well thought through and robust.
- By taking care in selecting the most appropriate contractor and sub-contractors will also provide comfort to WCC and EH that all the conditions attached to the Planning and Listed Building Consents will be carefully discharged through the careful preparation and submission of relevant documentation.

Financial implications of the management of these risks and costs for each of the shortlisted Scenarios

- During the IOA process a number of workshops were held to identify and consider the risks associated with each of the Scenarios – E1A, 2A, 2B, 3A and 3B. The risks identified include those noted above. The financial implications of each of the risks identified have also been scored and the management of each risk has been accounted for within the detailed assessment of costs for each Scenario.
- The risk registers for each Scenario are included in Volume 2, Appendix A.5.

5.16 Heritage and conservation risks

The management of cost and risk for all works in the Restoration and Renewal Programme needs to reflect the heritage and conservation aspects of the PoW. This once in a lifetime project offers the opportunity for making major changes that might otherwise be difficult to achieve.

Managing the business of Parliament from the PoW and potential heritage and conservation issues that may arise

- It is anticipated that the Programme will be developed, designed and carried out in such a way that it includes the necessary infrastructure and provision of access to permit the mechanical and electrical systems to be serviced and replaced more easily in future with less impact on the heritage and conservation of the PoW.
- In addition, the Programme could, where possible, include spare capacity within the containment to allow for some increase in the amount of network and communications cabling between hubs, and connectivity to the northern and southern estates, should this be required in future for the management of the business of Parliament from the Palace of Westminster.
- While it is difficult to predict the full range of heritage and conservation issues that might arise in future in relation to managing the business of Parliament from the PoW, some matters can already be identified where the interventions will need careful design consideration and discussion with WCC and EH. Some examples follow:
- Although every effort is made to provide office accommodation close to the Chambers for those MPs, Peers and their staff and staff of the House who are less able or use a wheelchair, currently there is very limited space within the HoC and HoL Chambers to accommodate them. In future additional space may need to be provided at short notice following an election, the creation of a life peer, or should an existing MP or Peer become incapacitated. In such circumstances the arrangements for making the necessary changes should already be in place so this can quickly and easily be carried out;
- Similarly, in the event of a Speaker, Deputy Speaker, Lord Speaker or Deputy Lord Speaker who uses a wheelchair being selected, or has other mobility needs that require changes to the Speaker's Chair, Lord Speaker's Woolsack, or require changes to the Clerk's Table, the changes to furniture and layout of the Chambers necessary to take account of this will present a significant challenge. In such circumstances the arrangements for making the necessary changes should already be in place so this can quickly and easily be carried out; and
- While in past years changes have been made to the use of some rooms within the PoW, these have mostly been to rooms that were not originally intended for primary Parliamentary or State use, and therefore these were not highly decorated. Future changes to managing the business of Parliament, for example to increase the number of Committee Rooms or providing additional smaller meeting rooms within the PoW for greater engagement between MPs and the electorate, or the need for a larger number of touch-down spaces within the libraries, or the use of lockers in corridors as a mini-office with IT and communications connectivity may require changes or interventions to the highly decorated rooms or internally to items of heritage furniture. Such interventions will need to be carefully designed and discussed with WCC and EH.

5.17 Sustainability: Context and carbon reduction targets

Current energy reduction targets are largely being met due to wider government initiatives. However, further detailed feasibility studies are required to fully assess and validate the existing target reduction rates for energy, CO2, water and waste.

Introduction

- This section of the report sets out an outline approach to the effective management of the environmental sustainability implications arising from each Scenario, both in terms of statutory obligations and commitments to manage the conservation of fuel and energy, water, waste and CO2 emissions.
- The table below outlines the sustainability scope of works for each Outcome Level.

Table 55: Sustainability scope

Scope of works	Level A	Level B	Level C
Heating – Low carbon energy sources	○	○	○
Cooling – an amount of heat rejection provided by borehole cooling	○	○	○
Domestic water services – Opportunity to incorporate rain water harvesting or borehole domestic water usage pending a feasibility study	○	○	○
Building fabric – assessment and completion of works that could be implemented to improve the thermal efficiency of the fabric.	○	○	○
Energy centre – an energy centre for the Palace alone within the grounds of the Palace footprint.		○	○
Renewable energy generation - through alternative energy forms		○	○
Installation of low energy solutions		○	○
Improved natural ventilation – dependent upon risers being freed up.		○	○
Enhanced installation of low energy solutions			○
Enhanced renewable energy generation			○
Ability to connect to a district energy network			○

Source: IOA Team analysis

- The ability to secure carbon reduction and meet other environmental standards is also influenced significantly by the selected Delivery Option. Option 3 will provide Parliament with the ability to deliver improvements much quicker than delivery option 2, and decades ahead of Delivery Option E1.

5.17 Sustainability: Context and carbon reduction targets

Current energy reduction targets are largely being met due to wider government initiatives. However, further detailed feasibility studies are required to fully assess and validate the existing target reduction rates for energy, CO_2, water and waste.

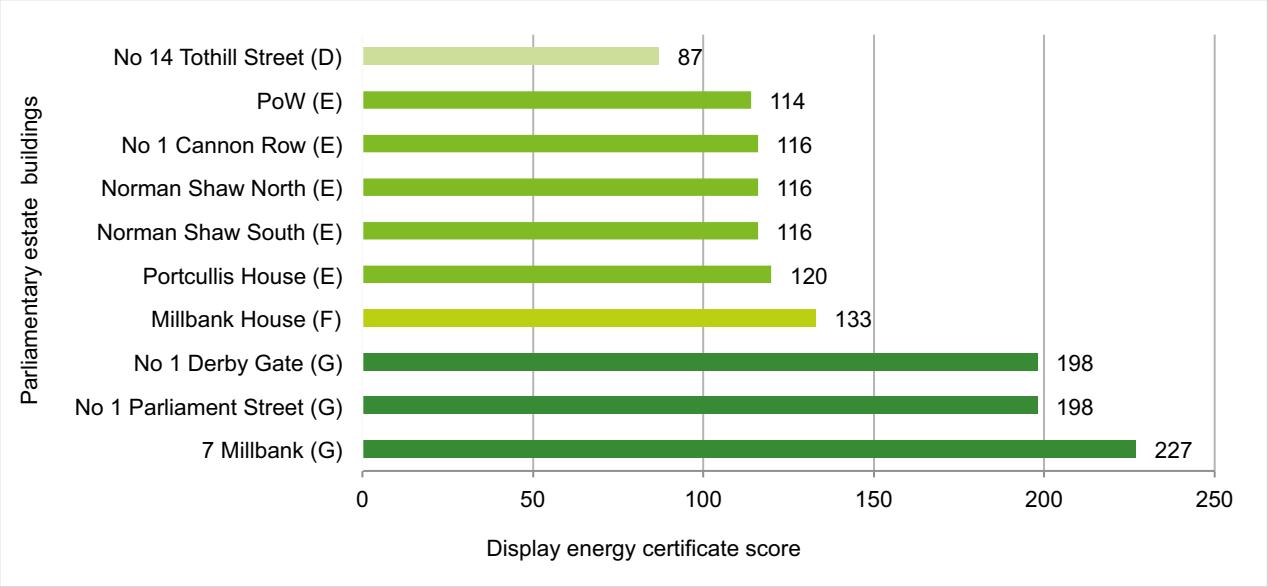
Energy and CO_2

- The Parliamentary Estates Directorate (PED) 2020 Vision Paper set out two carbon dioxide (CO_2) savings targets: 34% by 2020 and 50% by 2050, against a 2008/9 baseline across the whole estate. None of the Programme Options investigated will have a significant influence on meeting the 2020 target due to their likely implementation timeframe. However, they will influence meeting the 50% target.

Benchmarking

- The unique nature of the PoW makes any meaningful benchmarking very difficult. Display Energy Certificates (DECs) measure the energy performance of a building relative to a typical building which would achieve 100. In 2012/13 the PoW performed worse than a typical building (114 vs 100), but it compared well against other buildings in the parliamentary estate (second best performer). (See Figure below).

Figure 52: Parliamentary estate buildings – Display Energy Certificates summary



Source: Chapman Bathurst Report - Site Energy Requirements Phase 2 Section 1 November 2013

Grid Decarbonisation

- The Department of Energy and Climate Change (DECC) projections (Figure 2) suggest that CO_2 emissions for grid electricity will fall by 90% by 2050, as the UK moves to greater renewable and nuclear generation.
- The predicted de-carbonisation of the electricity grid means that the best option for saving CO_2 will change over time. Currently, technologies such as Combined Heat and Power (CHP) help displace CO_2 intensive grid electricity. As grid electricity de-carbonises, high efficiency heat pumps, utilizing low carbon grid electricity, will offer greater savings. Current DECC projections suggest the crossover point could be reached in less than 10 years, before the expected completion of the Programme.
- The modelling of seven mechanical and electrical building services packages by Chapman Bathurst (the mechanical and electrical engineers employed to carry out a review for PED) (see figure 1 – further details can be found in Volume 2, Appendix E.3) found that with current emission factors the highest carbon saving of 57% would be achieved by package 4, gas-fired Combined Cooling Heating and Power (CCHP). Under the projected 2050 conditions, the highest saving of 94% was achieved by package 2, which includes electric heat pumps. It is worth noting that under the same 2050 conditions, the PED 50% target would be met with no change to the current PoW M&E services.
- In line with DECC, Chapman Bathurst's 2050 modelling assumed grid electricity CO_2 emissions would fall to zero. Chapman Bathurst also assumed complete conversion to bio-methane of the gas grid. We have found no clear Government commitment to mains gas de-carbonisation. There remains significant uncertainty as to whether the electricity grid will de-carbonise at the rate DECC predicts. Based on recent performance, we consider this very unlikely and the DECC projections very optimistic.
- Given this significant uncertainty, it is essential that a decision on the final mechanical and electrical package is based on further assessment of the lifetime energy and CO_2 savings for the anticipated period of operation, and that the probability and sensitivity to de-carbonisation rates are considered. It is also essential that flexibility is maintained to allow a switch to alternative or emerging technologies over time.

5.18 Sustainability: Technical approaches

A number of energy saving technologies could be installed to reduce the PoW's energy consumption. Public sewer heat recovery and photovoltaics have the potential to provide the greatest savings. The Programme could help to reduce water consumption, to meet 2050 water usage targets.

- Long term, heat pumps are likely to be preferred and will require a heat/cooling sink. Chapman Bathurst and BDP explored borehole water extraction and the river Thames as heat sinks, both of which should be investigated further, in particular to determine the ability to obtain statutory consents.

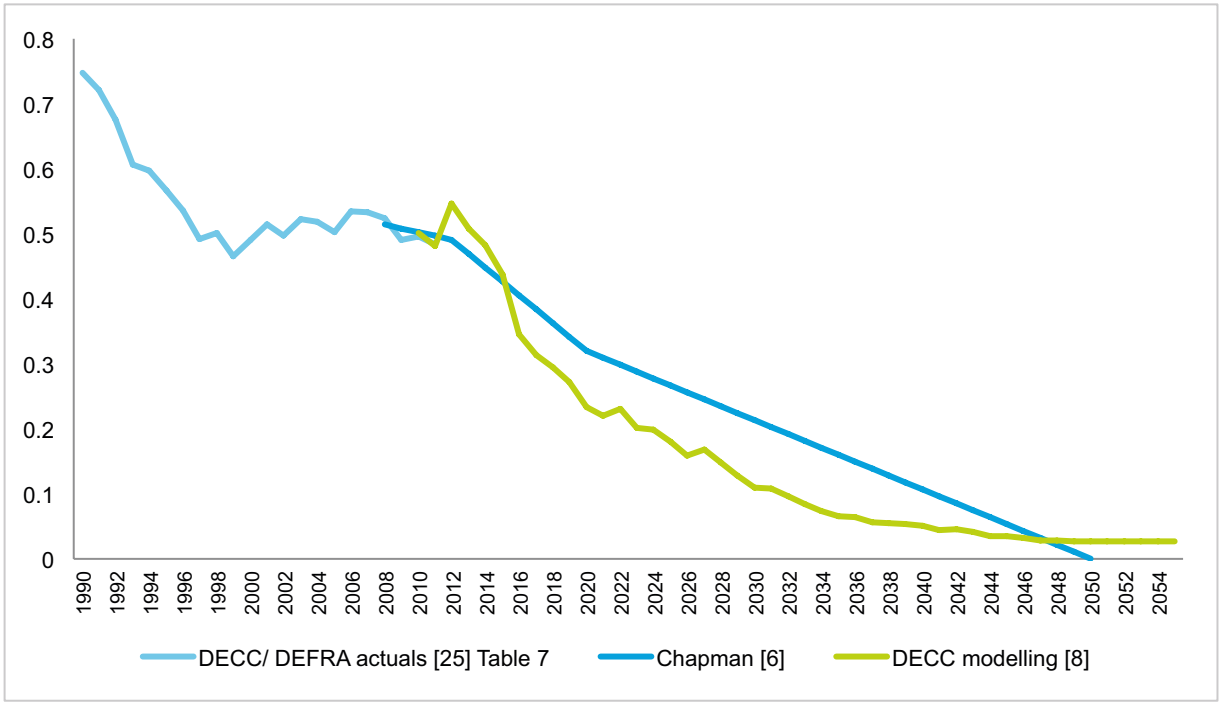
District Heating

- The London Plan strongly promotes the use of district heating including connection to existing networks. There is potential for the Pimlico or Whitehall district heating networks to be extended or joined at some point in the future. Chapman Bathurst's proposed M&E package 5 assumed a connection to such a future heating network. This offered the second highest CO_2 savings based on current emission factors and could potentially reduce plant space requirements on site. The deliverability of this option is uncertain but would need to be reviewed further prior to implementation including the proposed heat price and carbon emissions.

Costs and deliverability

- Chapman Bathurst concluded M&E packages 1 to 5 could be implemented under any of the five shortlisted Scenarios. Capital expenditure is predicted to be almost identical for packages 4 and 2 under all Options. Operational expenditure is around 10% higher for package 4 than package 2 implying lower running costs for heat pumps. Chapman Bathurst also noted that the mechanical plant represents approximately 9% of the overall total costs and the overall package cost varies by less than 2% for packages 1 to 5. The cost of the M&E plant is therefore unlikely to be a determining factor in the selection of a particular Option.

Figure 53: $C0_2$ emissions for grid electricity production

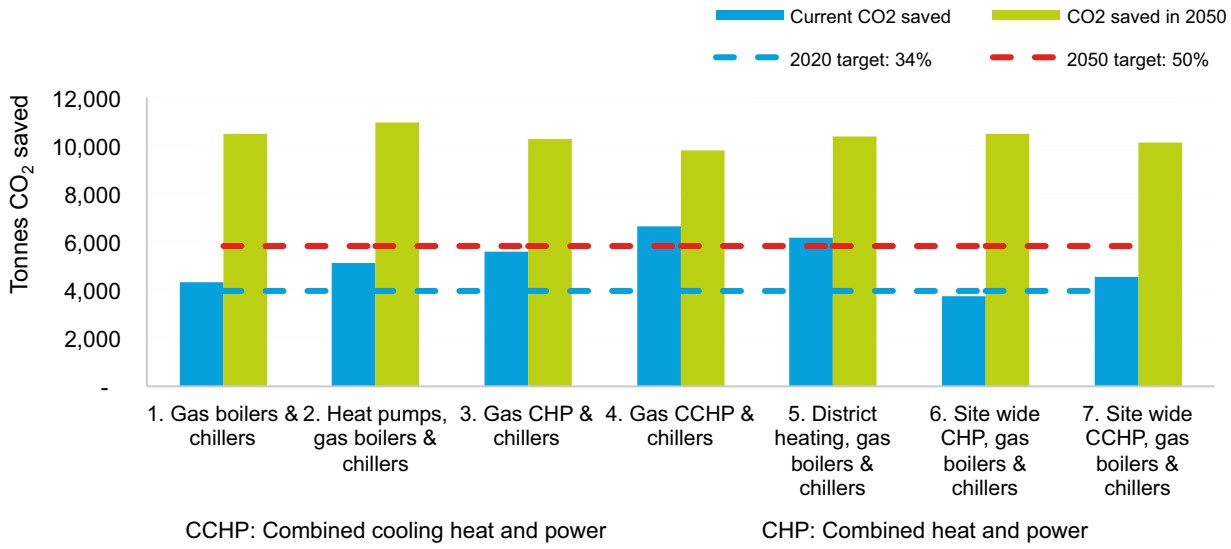


Source: IOA Team analysis - adapted from multiple sources

5.18 Sustainability: Technical approaches

A number of energy saving technologies could be installed to reduce the PoW's energy consumption. Public sewer heat recovery and photovoltaics have the potential to provide the greatest savings. The Programme could help to reduce water consumption, to meet 2050 water usage targets.

Figure 54: M&E packages Tonnes CO_2 saved (current & 2050) vs targets, compared with the 2008/9 baseline

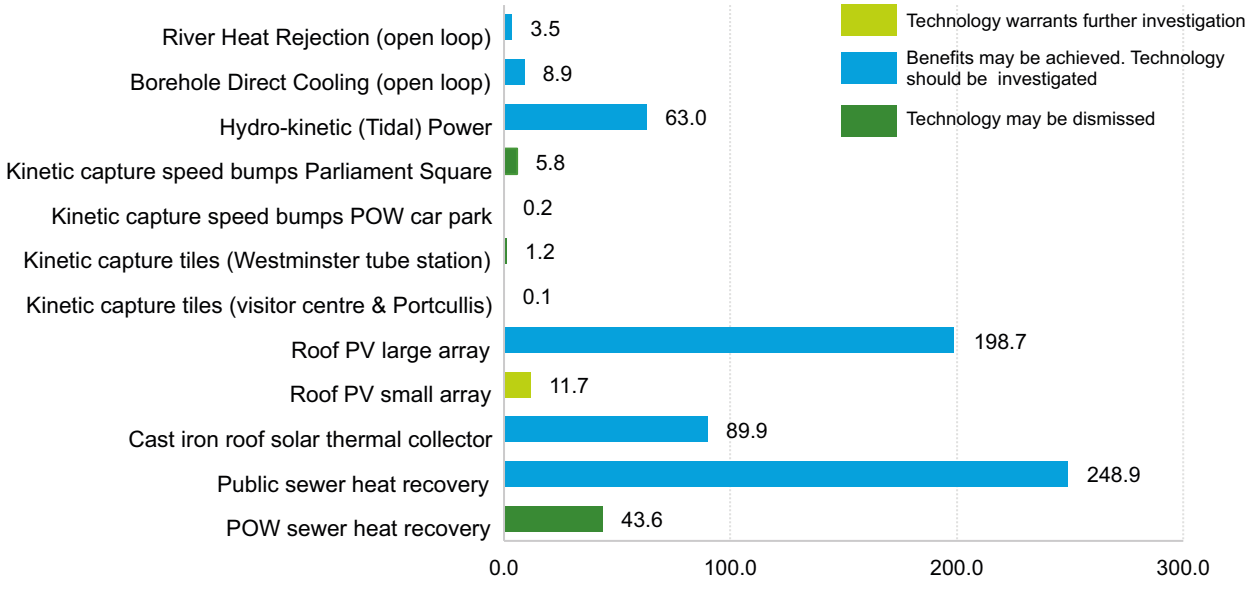


Source: IOA Team analysis - adapted from Chapman Bathurst Report

Novel technologies

- In addition to the base M&E packages, a range of novel technologies were investigated by Chapman Bathurst to reduce energy use and CO_2 emissions further (see Figure below). Compared to the M&E packages, these technologies offer a relatively small additional CO_2 savings in the short term and these savings will diminish as the grid de-carbonises. In the long term, novel technologies will continue to offer small energy and operational cost savings, warranting further investigation prior to implementation of the selected Option. However, some novel technologies have poor cost effectiveness and may be dismissed (see Figure 4).
- Of the options investigated, public sewer heat recovery has the potential to deliver the largest additional CO_2 saving (250 tonnes). Chapman Bathurst also noted that fuel cells (not shown in Figure 4) may deliver CO_2 savings between 1% and 11% above the CHP and CCHP packages in the short term, but no savings in the long term.
- Photovoltaic panels (PV) should also be investigated further as PV is a simple technology to install and operate, although the large PV array option may not be deliverable due to the likely visual impacts.

Figure 55: Novel technologies Tonnes CO_2 saved (current)



Source: IOA Team analysis - adapted from Chapman Bathurst Report

5.19 Sustainability: Waste management

PED's current estate wide waste reduction target should be met before the Programme begins on site. The Programme should therefore focus on reducing site waste during the build process. PED should establish a clear sustainability vision, which will inform the strategic brief

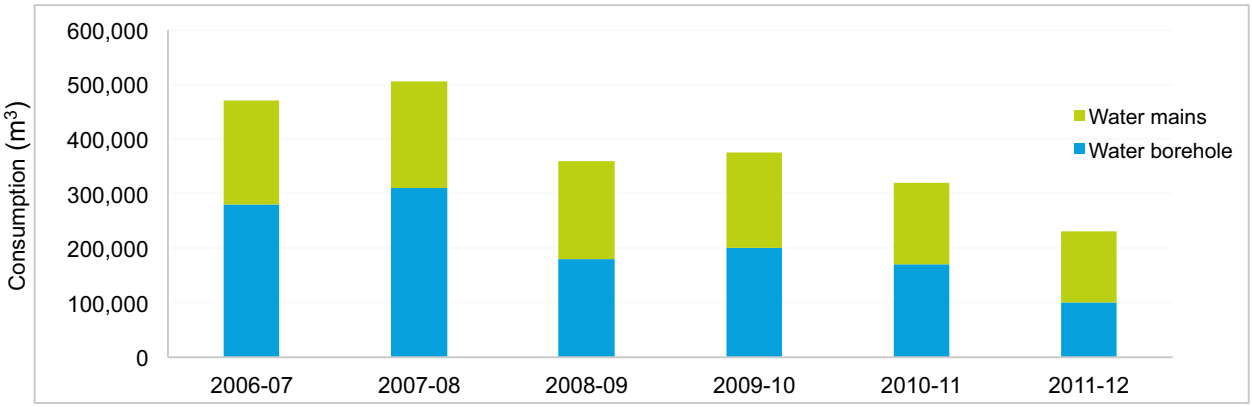
Energy efficiency improvements

- Energy efficiency improvements will help reduce energy consumption, costs and CO_2 emissions but in some cases are constrained by heritage and conservation considerations. Chapman Bathurst's modelling of the seven M&E work packages assumed existing lighting would be replaced with energy efficient lighting and controls. This made a significant contribution to the overall savings identified in Figure 54 on the previous page and should be a priority for the works.
- Both Chapman Bathurst and BDP identified secondary glazing and roof insulation as feasible fabric improvement measures, but identified limited opportunity to enhance wall insulation due to heritage issues. There are substantial differences in the savings estimated for fabric improvements by Chapman Bathurst and BDP which appear to relate to differing assumptions about the areas that can be treated and the approach to estimating the potential CO_2 savings. Chapman Bathurst predicted fabric savings of 0-1% using thermodynamic modelling. BDP's earlier work based predictions on steady state heat loss calculations and predicted CO_2 savings of 6.4% for secondary glazing, 1.7% for roof insulation and a further 5.7% from the resulting reduction in air leakage. As part of the implementation works a further assessment should be undertaken in conjunction with heritage and conservation officers to identify the full extent of fabric efficiency improvements that are deliverable.
- As the carbon content of grid electricity reduces, an increased focus on energy use and costs is expected. A shift to greater use of electricity for heating, and electric vehicles to tackle air-quality, will increase the strain on London's electricity distribution infrastructure. This is expected to create greater incentives for electricity demand management which should be investigated further.

Water

- PED's water saving target (40% by 2020/21 over a 2008/9 baseline) was raised to 50% due to early achievement of the 40% reduction, mostly through borehole water savings at Portcullis House. Smaller mains water savings were also achieved across the parliamentary estate. The Programme works are likely to have a limited influence on achieving the 2020/21 targets due to the expected implementation date for the works.

Figure 56: Parliamentary Estate Water Consumption



Source : Extracted from House of Lords Annual Report 2011/12

- Chapman Bathurst's M&E work did not focus on water saving measures. It noted a mains water consumption of circa 70,000m3 in 2012/13, but did not provide a 2008/9 baseline to assess progress against the 50% target. In 2007, BDP identified potential water savings of circa 10,000m3/annum by installing rainwater storage tanks in six of the courtyards. It is likely that at least some of this saving is deliverable and should be investigated further. In addition to PED targets, many water reduction measures have a relatively low cost and are strongly promoted through the London planning system. Prior to implementation, a full review of mains water demand reduction measures should be carried out to assess their contribution to reducing both water use and CO_2 emissions, their cost effectiveness and their ability to reduce mains water dependency. This review will also need to take account of required licenses and ongoing management issues of each measure. This review should at least address:
  - Low water use fittings (showers, taps, WCs);
  - Low water use appliances (dishwashers, washing machines, kitchen appliances);
  - Low water use M&E strategies (plant condensate or use of borehole water to flush WCs);
  - Borehole water extraction for non-potable uses, for pre-cooling, and/ or heat sink;
  - Water reuse including rainwater and grey water collection;
  - Water metering and sub-metering to key water uses; and
  - Leak detection.

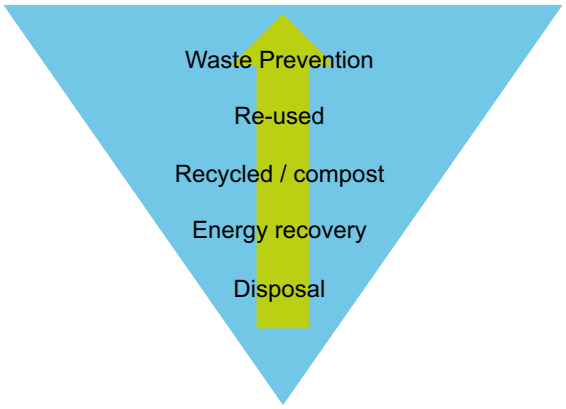
5.19 Sustainability: Waste management

PED's current estate wide waste reduction target should be met before the Programme begins on site. The Programme should therefore focus on reducing site waste during the build process. PED should establish a clear sustainability vision, which will inform the strategic brief

Waste

- PED's waste reduction target (25% by 2020/21 over a 2008/9 baseline) was increased to 30% due to early achievements. The House of Lords Annual Report 2012/13 notes that PED was behind trajectory to achieve its 75% recycling target by 2020/21. The Programme works will have a limited influence on achieving the 2020/21 target due to expected implementation timeframes.
- Chapman Bathurst and BDP M&E appraisals did not focus on waste, and the choice of M&E technologies will have little impact on the operational waste generated at the PoW.
- Options E1 and 2 are likely to be the least resource efficient because they would require temporary services. These materials could not be used in the final building and would thus be waste.
- A detailed demolition protocol that implements a good practice waste hierarchy (figure below) should be followed for the selected Option and accompanied by the development of a detailed site waste management plan.

Figure 57 – Waste hierarchy



Source: Aecom

- The potential scope is expected to provide the greatest opportunity for influencing operational waste reductions, in particular strategies for creating space for the effective waste segregation, storage and collection. Offsite prefabrication of mechanical and electrical and architectural components may also offer limited opportunities for waste reduction during construction and should be explored.
- The detailed design of systems at implementation should draw on industry guidance, to review opportunities for resource efficiency. This should include lifecycle environmental assessment of the materials and components selected.

Future Brief

- PED should establish a clear sustainability vision in addition to its existing sustainability targets. Such vision should commit PED to implementing the energy hierarchy ("be lean, clean, green") across its estate and activities.
- The selection of an optimum scope of works will be heavily influenced by factors such as: available technologies, grid carbon intensities, London planning policy and legislation. These factors are subject to frequent changes, and will need to inform any future decision to ensure Programme proposals suit the regime prevailing at the time they are submitted for statutory approvals.
- Further detailed feasibility studies of the more promising M&E packages and technologies (e.g. packages 2 and 4 as identified to date) will need to be undertaken. These studies will need to address:
  - Cumulative whole life energy, CO2 and costs for the likely period of operation, taking account of grid emissions that are likely to apply in each future year;
  - The availability of any offsite district heating / cooling networks and their ability to deliver energy cost or carbon savings;
  - Opportunities for intelligent energy demand management measures aimed at addressing the anticipated increases in peak demand on London's power infrastructure;
  - The impacts of climate change and the need to ensure resilience to warmer/ drier summers and more intense storm events.
  - Air quality implications of the preferred technology options;
  - "Soft Landings" (mandatory for Government projects from 2016) to enable easy monitoring, interrogation and optimisation of system performance and ensure effective commissioning;
  - Opportunities for water and waste reduction in both construction and operation; and
  - Resource efficiency of the selected M&E package.

5.20 Design management approach

Design Management is essential for successful delivery of the Programme and will be closely integrated with the procurement and contract strategies. The approach to design management will be influenced by the adopted delivery Option and the client's willingness to accept risk.

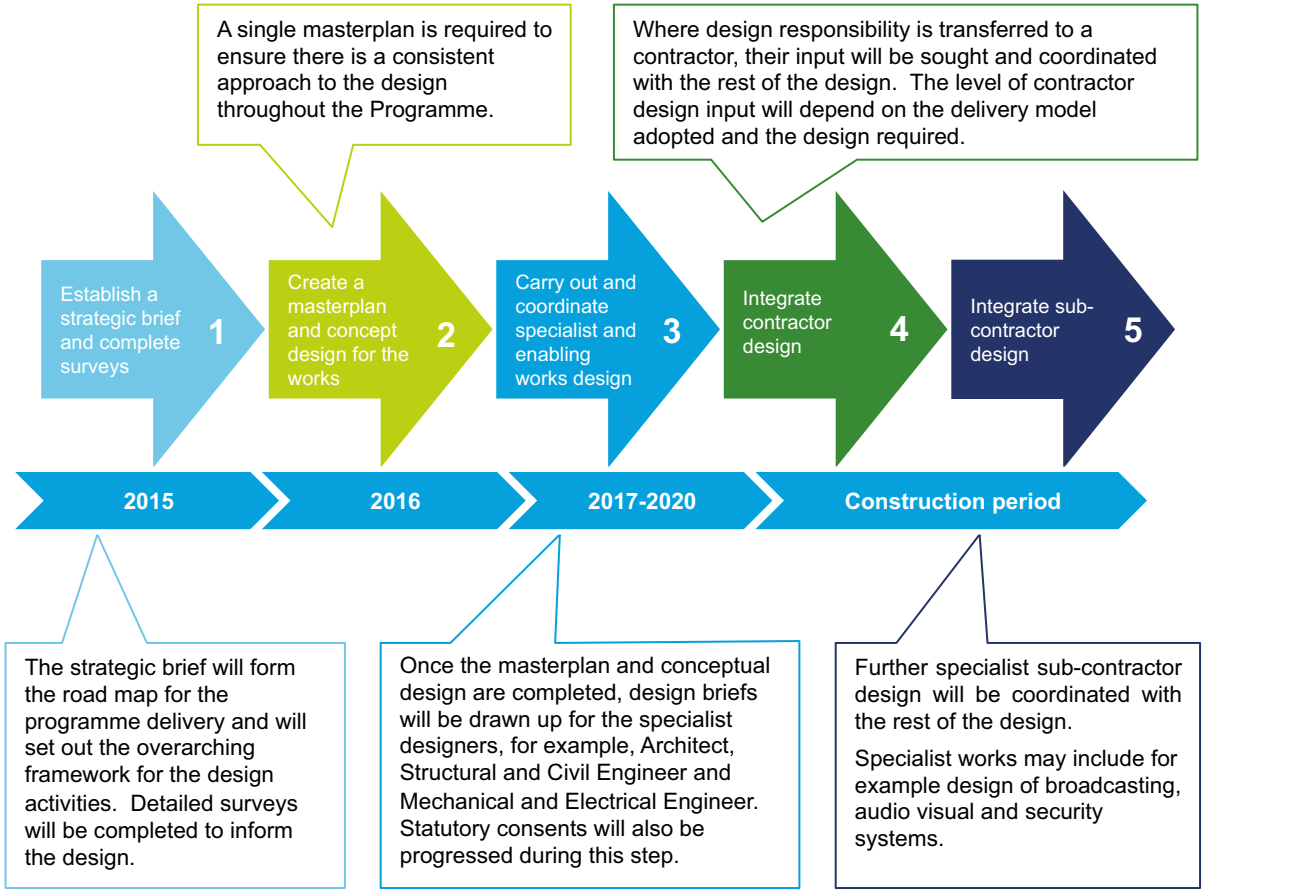
Introduction

- The proposed approach to managing design is applicable to all three delivery Options. The Outcome Level would not impact the approach, however, it could potentially impact the specific designers that are required to deliver the Programme. Once the scope of works has been agreed in the next stages, design disciplines required and the approach can be finalised for the Programme.
- The Programme presents one of the most logistically and technically challenging restoration and renewal projects undertaken on a Grade I Listed Building in a UNESCO world heritage site. The success of the programme will depend to a large extent on the successful management of the design, which will have to draw together a range of bespoke disciplines and specialisms that should be aligned to the adopted delivery Option.
- The extent of control the Client would like to retain for the design and subsequent outputs, will inform how design is procured and how the process is to be managed. For example design risk could be transferred to the market for standard elements of work under a design and build contract, where a subcontractor or consultant would complete the design work directly for a contractor.
- However, for specialist heritage and conservation works that will be monitored by bodies such as English Heritage, the Client may wish to manage the design of these elements more directly. The gilding works required in the Lords Chamber and the refurbishment of the clock are good examples, where it is likely that the Client would wish to maintain close control over the execution of any refurbishment work to ensure the quality of finish is high.
- Decisions on how risk could be transferred will need to be taken for each package of design work, to ensure that the correct structure and team is set up from the beginning of the Programme. This final agreed approach will be formalised in the procurement strategy.

Approach to design

- The proposed approach and process to designing the Restoration and Renewal works is set out below. Please see Volume 2, Appendix E.4: Design Management for further details on the proposed activities for each step.

Figure 58: Restoration and Renewal programme works process



Source: IOA Team analysis

5.20 Design management approach

Design Management is essential for successful delivery of the Programme and will be closely integrated with the procurement and contract strategies. The approach to design management will be influenced by the adopted delivery Option and the client's willingness to accept risk.

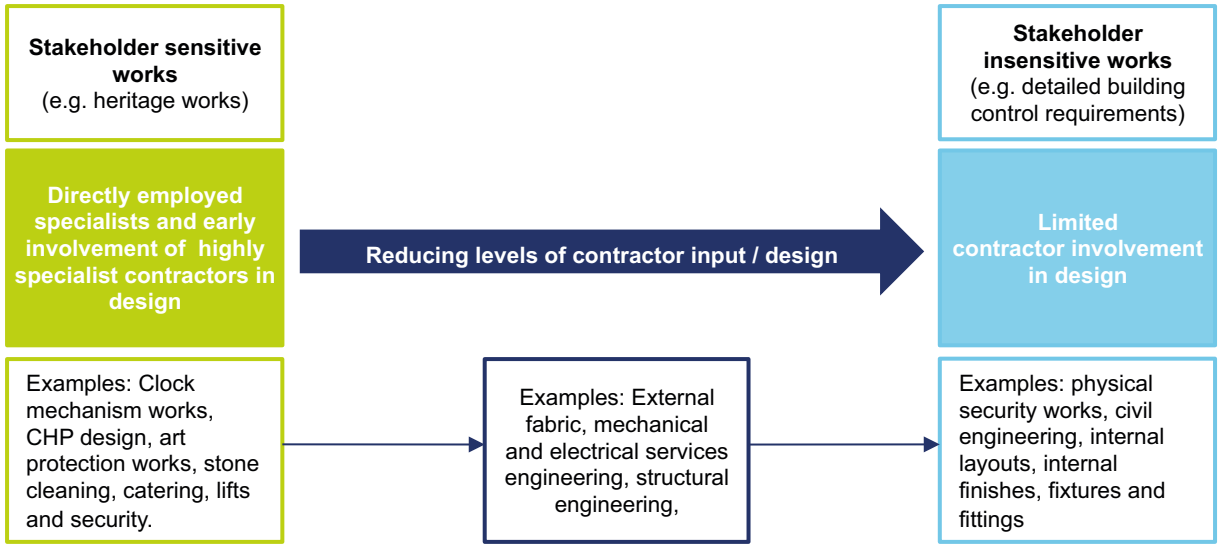
Building Information Modelling (BIM) and Integrated Project Delivery (IPD)

- Government have mandated that public sector centrally procured construction projects will be delivered using BIM by 2016.
- BIM is the process by which designers and contractors collaboratively develop and interrogate a computer-based three-dimensional visual representation of the built environment, including existing facilities and conditions, alterations and proposed new works. A key decision that could play an important role in all delivery Options, is the potential application of Building Information Modelling (BIM) in the Programme.
- A programme of this scale and complexity will require multiple designers, from a wide range of disciplines. In order to maximise the potential of large multi-disciplinary teams there needs to be a sound design framework that is flexible, transferable, available to all disciplines and assists co-ordination, communication and design delivery. BIM can provide this framework.
- BIM should be implemented from the beginning of the project to ensure that all surveys and due diligence feed into the framework. This information can then be used to inform the design.
- The use of BIM for the Programme needs to be carefully evaluated, for example, the value of investing in BIM may be reduced in congested areas (e.g. plant rooms) affecting the accuracy of surveys, and the return on the investment in BIM reduces as the schedule for delivery extends.
- BIM would also support a fully integrated design approach to the Programme. This is often known as Integrated Project Delivery(IPD). IPD is an approach to delivering projects that integrates people, systems, business structures, and practices into a process that collaboratively uses the skills of all participants to optimise programme results.
- Relationships between the major parties in construction programmes using traditional delivery approaches have grown increasingly adversarial and antagonistic to the effect of being counterproductive for all. The IPD approach recognises this and offers benefits of early sharing of information and insight to a range of stakeholders, including early contractor involvement and key decision makers. This should lead to an increase in workflow efficiency and a reduction in cost.
- Further commentary on IPD and details on how BIM could be used in the Programme and how it could be used in each delivery Option, are included in Volume 2, Appendix E.5.

Management of the design activities

- The expectation is that the Client relationships with design will be very complex to manage and will likely be a mix of directly employed personnel, through to contractor led design packages. This will result in a number of contractors needing to be involved early in the Programme.

Figure 59: Approaches to managing design risk



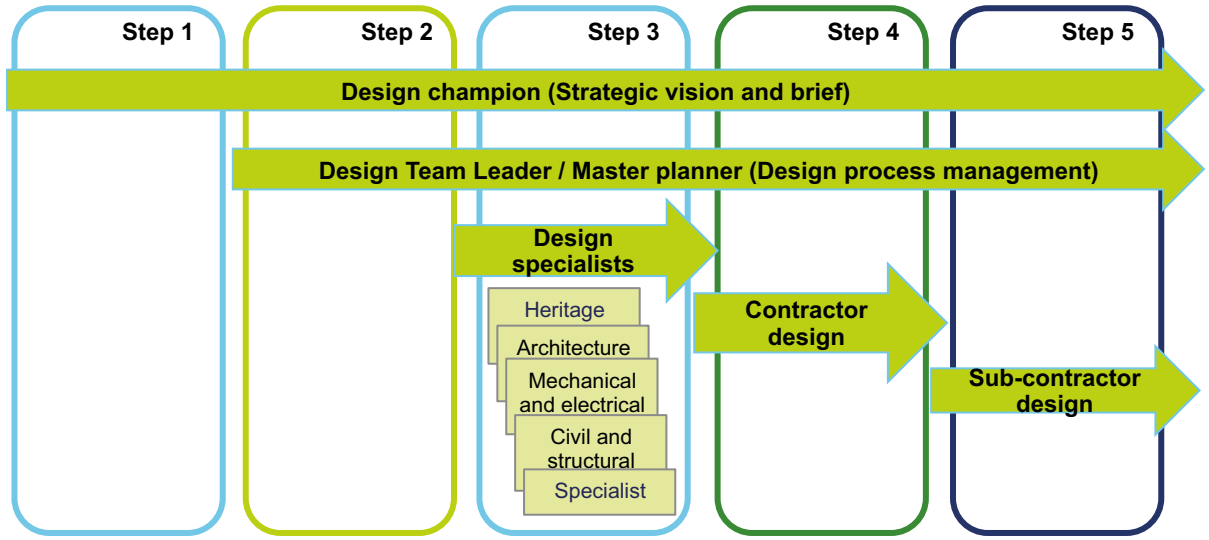
Source: IOA Team analysis

- It is expected that the majority of contractors that will have a design input, would not be involved in design until step 3, i.e. After the masterplan and concept design are completed. However, this could vary depending on the complexity and buildability impact of the design package, and the expected benefit that earlier involvement may bring. For example, specialist design packages such as the energy centre, may require very early involvement to ensure that an outline planning application could include details on this element. Conversely, less specialist design, for example primary plant and infrastructure, could be designed with limited contractor involvement.

5.20 Design management approach

Successful design management will require clear lines of communication and approvals. Final accountability will depend on the delivery model that is agreed.

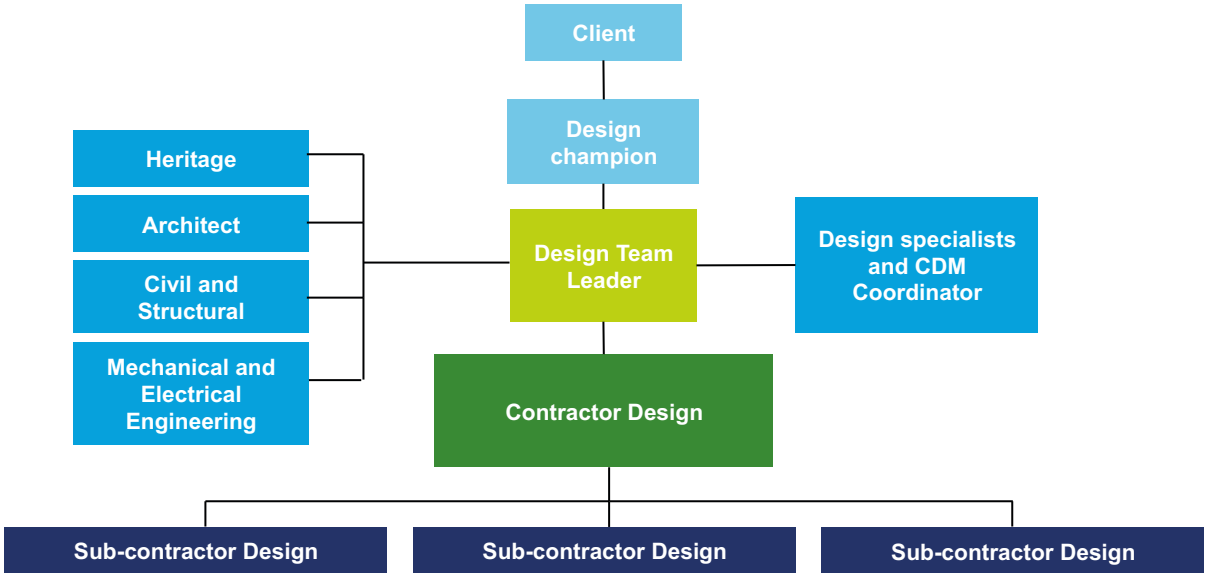
Figure 60: Design management approach



Source: IOA Team analysis

- The Design Champion should establish the framework for the vision of the Programme. The individual or firm carrying out this role will need to work closely alongside the Client team, the Programme Management office and the Design Team Lead. to establish a design strategy. This strategy will inform the approach to managing design risk on the Programme, and the resultant briefs that are developed for each of the design disciplines.
- The proposed management structure required to manage the approach and the complexities of design risk apportionment is set out below.

Figure 61: Proposed management structure



Source: IOA Team analysis

5.20 Design management approach

Successful design management will require clear lines of communication and approvals. Final accountability will depend on the delivery model that is agreed.

- The Design Team Leader will coordinate and manage the design team and contractor design inputs, as and when contractors with design responsibilities are appointed. Depending on the delivery model this role could be an appointment that is directly made by the Client team or potentially it could be the responsibility of a delivery vehicle. The Design Team Leader will liaise with the Design Champion to prepare design briefs for all of the key design specialists.
- The final approach to design, the management of design and early contractor/sub-contractor involvement, should be reviewed and agreed once a final scope of works and delivery Option has been decided upon. Once a clear brief is known, a bespoke solution can be drawn up that is informed by the delivery model, the packaging strategy and the Client's appetite for risk.
- Set our below are the levels of management proposed to run the design delivery for the Programme and the associated lines of communication and approvals. Final contractual lines of communication will depend on the delivery model that is agreed.

Key risks to the management of design

- Whilst the design approach is likely to be similar for each of the delivery Options, each Option carries different levels of risk associated with the management of design.
- The table below summarises some of the key risks that could impact the design management, during each delivery Option.

Table 56: Design management risks

Risk	Delivery Option E1	Delivery Option 2	Delivery Option 3
Stakeholder approvals impacting the design, schedule and cost Achieving stakeholder approvals will be more complicated in a drawn out schedule . Remaining true to the masterplan will also become increasingly hard on those Options with longer durations as the risk of Client, design or product led variations increases.			
Future proofing Designing the building to be future proof is more difficult in Option E1 compared to 2 and 3, this is due to the longer schedule for delivery. The longer schedule results in delay in the building being completed to a modern standard that can then be easily adapted in the future.			
Lack of continuity of resource Whilst management protocols could be put in place to ensure knowledge leakage is kept to a minimum, it will be very hard to maintain momentum and detailed knowledge of the Programme over significant periods of time.			
Ability to rationalise and consolidate spaces and services There are greater opportunities to rationalise and consolidate spaces and service runs in Options 2 and 3. The lack of access to a sizeable area of the PoW in Option E1 restricts the ability to change the existing state.			

Source: IOA Team analysis

5.21 Accessibility

The programme offers significant opportunities to improve the accessibility throughout the PoW. Core access principles can be divided into policy, aids and adaptation components. Developing a strategy for accessibility within the PoW should be considered following the completion of the IOA.

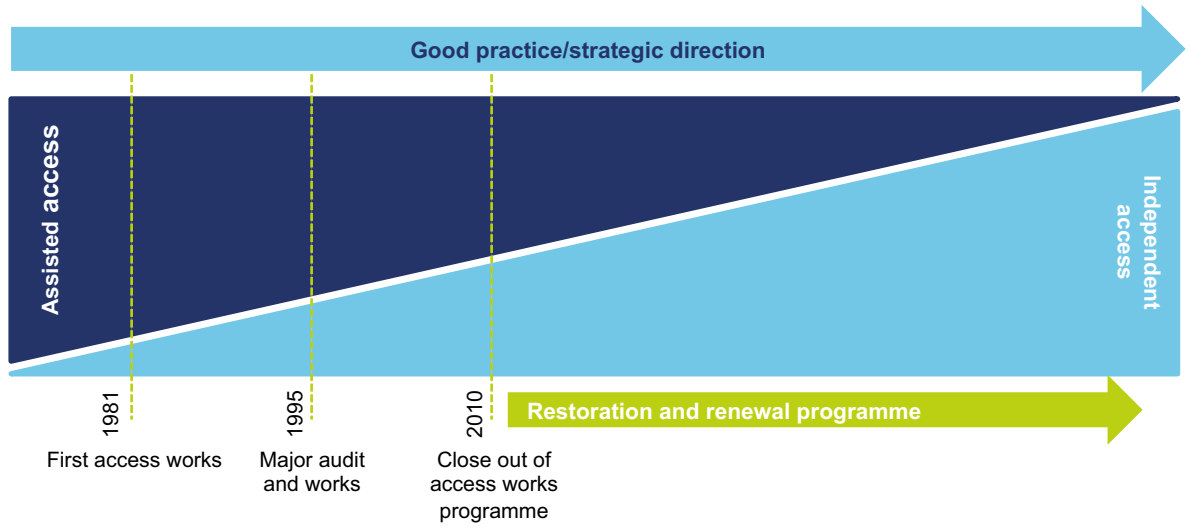
Overview

- The PoW like other historic complexes, faces the challenge of preserving its historic fabric while providing an inclusive environment and ensuring that the business of Parliament continues to operate efficiently. Elements of the PoW provide a good standard of access, however there are areas that fall below standards particularly undersized lifts, poorly distributed WCs and unclear evacuation arrangements.
- A review of the access provision uses a sequential journey method, which involved examining the obstacles faced by disabled people obtaining information about access prior to arrival, travelling to the location, accessing the building facilities and departing the PoW.
- The programme provides a significant opportunity to comprehensively improve the access amenities. However, carrying out any work on a rolling programme (in accordance with Scenario E1A), may not guarantee the comprehensive change necessary to fully address the accessibility issues. An upfront capital investment in physical improvements will reduce long-term management and maintenance costs as disabled people will independently engage with the building, without requiring the assistance of staff, whilst good quality access provisions could also reduce the cost of routine maintenance.

Strategy for access

- In theory a building may be wholly inaccessible, with a heavy reliance upon staff support, or fully accessible with no reliance upon support. In practice most buildings will lie somewhere between the two extremes. In historic buildings, such as the PoW, visitors' dependence upon staff support may be acceptable but will generate higher operational costs for staff time and the need for training. In places of work, and even in historic buildings such as the PoW, good practice would aim towards full physical access and independence, thereby reducing operational costs while increasing convenience for all.
- The visual below illustrates the preferred good practice and strategic direction towards independent access within the PoW, with it viewed primarily as a place of work. This strategy may need to be developed further upon completion of the IOA.

Figure 62: Access strategy overview



Principles to adopt

- It is recommended that a set of access principles are adopted, based on those outlined below, to guide the development of future PoW proposals. These principles can be prioritised into three categories, which include policy; provision of technical aids; and adaptations or extension to the building.

1. Policy

- In order to comply with policy the following issues will need to be addressed:
  - Focus the PoW accessibility strategy on the provision of independent access for Members and Pass holders;
  - Designate a senior member of staff with overall responsibility for disabled access and escape;
  - Set up a Programme access group, to include Members and pass holders, to comment on existing access arrangements and to inform design proposals (and decant arrangements, if appropriate) as they progress; and
  - Future proof the Programme by setting up a group to monitor the development of access regulations and standards as they alter throughout the duration of the Programme.

2. Provision of technical aids and support technology

- The following actions should be adopted:
  - Continue and expand upon the provision of technical aids and support technology to address information, navigation and mobility requirements;

5.21 Accessibility

The programme offers significant opportunities to improve the accessibility throughout the PoW. Core access principles can be divided into policy, aids and adaptation components. Developing a strategy for accessibility within the PoW should be considered following the completion of the IOA.

- Ensure that relevant staff are trained in the use of technical aids and support technology; and
- Procure effective maintenance arrangements for all specialised equipment, backed up by appropriately qualified personnel.

3. Adaptations or extensions to the building fabric

- The following issues may need to be considered:
  - Benchmarking the project against compliance with Building Regulations and also incorporate good practice where the opportunity allows;
  - Integrating arrival arrangements with public transport and adjacent public access improvements;
  - Identify and safeguard suitable surface level car parking for disabled Members and staff, adjacent to appropriate entrances;
  - Upgrade relevant entrances to facilitate independent use, providing access to assistance if required;
  - Incorporate outstanding recommendations from earlier access audits as part of the design;
  - Provide fully compliant lifts at strategic locations in the building, for day to day passenger use and means of escape, including in Westminster Hall;
  - Rationalise accessible WC provision, adjacent to lifts where feasible; and
  - Improve access in both Chambers by providing adaptable seating to ensure that all Members, including wheelchair users, can sit alongside Party colleagues.

Overview of existing provision

- The analysis the IOA team undertook suggested that there is a considerable difference in the provision of accessibility for different stakeholders. In summary Peers are best served by existing arrangements, and thus also disabled staff who work with them. Elected Members and their staff are less well served than Peers. Journalists are the least well provided for and invited guests are better served than the visiting public touring the building, but both groups depend on assistance.
- Additional analysis indicates an inconsistency of provision across the elements of the sequential journey. Arrival and entrance arrangements vary from good to poor, with the public least well served. Ramps are in place where required and stairs are robust, though they may benefit from minor improvements. Reception arrangements again vary, with elected Members and journalists least well served. Horizontal circulation is good, particularly at Principal Level, and benefits all groups. By contrast the provision of accessible WCs and their distribution is poor, especially for elected Members. Arrangements for means of escape, while in place, are not exemplary. This in part reflects the ad hoc distribution of lifts and their limited size.

Access implications for each delivery Option

- Each of the delivery Options under consideration will have an impact on short term and long term access provision. In terms of outcome, it can be assumed that Outcome C will have the capability of providing the most comprehensive access opportunities.

Scenario E1A: Rolling programme

- The proposal to do work on a rolling programme envisages a timetable of up to 30 years to completion and may not provide the window required to allow a comprehensive approach to access improvements. This would thus continue the pattern of delivery adopted over the past three decades This Scenario is also likely to require a continuing provision of alternative temporary arrangements during the construction period such as accessible WCs and ramps and supplementary staff assistance to guide visitors through revised routes that avoid building work.

Scenarios 2A, 2B, 3B and 3C: Partial or full decant

- In terms of access the implications of a partial or a full decant depend in part on the accessibility of the decant provision. Each building under consideration appears to have good access arrangements. With each of the buildings it would be possible to design a fully accessible Chamber, demonstrating the benefits of improved access for all. The advantage of decant, either partial or full, is that improvements to the PoW can be addressed comprehensively and completed in a shorter period ensuring that meaningfully enhanced access can be provided in the shortest time possible.

Next steps

- The IOA team recommends that the Carden and Godfrey's November 2010 review of access audits is supplemented by a strategic review, with an emphasis on arrangements for emergency evacuation procedures and that the consultation process that started in 2013 is continued and expanded to include more Members and other stakeholders.
- We would further advise that an access audit is undertaken of the buildings identified for decant purposes to ensure they have the potential for meeting the necessary requirements. In tandem PED may wish to commission an Access Management Plan (AMP) to ensure that a commitment to existing and future access provision is fully embedded within the PoW.

Palace of Westminster Restoration and Renewal Programme Independent Options Appraisal

Final Report
Volume 1

Chapter 6 – Scenario booklets

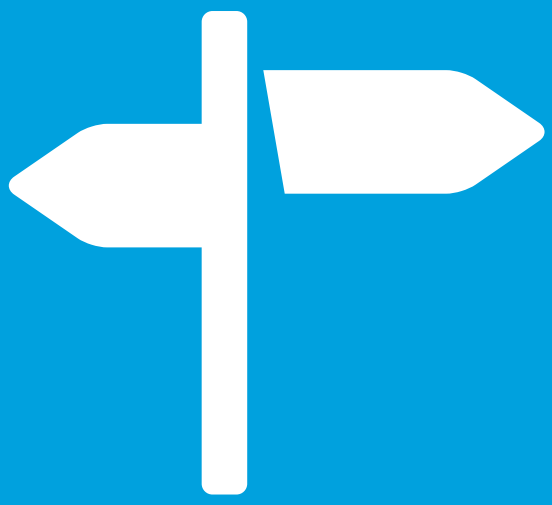
This final report (the "Final Report") has been prepared by Deloitte LLP ("Deloitte") for The Corporate Officer of the House of Lords and Corporate Officer of the House of Commons (Acting Jointly) in accordance with the contract with them dated 23rd December 2013 ("the Contract") and on the basis of the scope and limitations set out below.

No party other than The Corporate Officer of the House of Lords and Corporate Officer of the House of Commons (Acting Jointly) is entitled to rely on the Final Report for any purpose whatsoever and Deloitte LLP accepts no responsibility or liability or duty of care to any third party.

The Final Report has been prepared solely for the purposes of satisfying the 'Core Objective' of the Independent Options Appraisal as set out in the Contract i.e.: 'an independently produced costed options appraisal of the Scenarios, in order to enable Parliament to reach a well-founded decision in principle on the means of restoring and renewing the Palace of Westminster while maintaining business continuity.'

8 September 2014

6. Scenario booklets



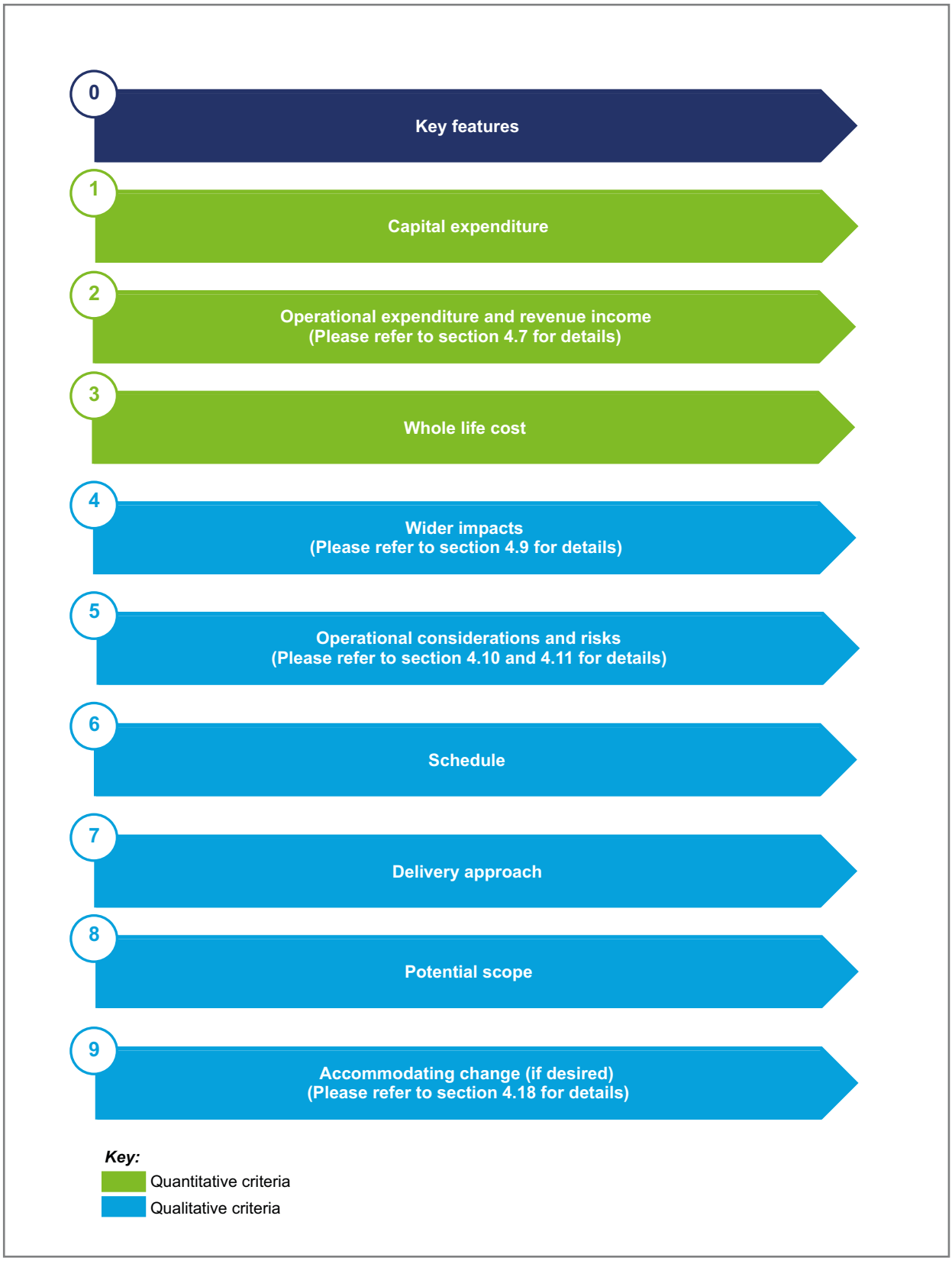
6.1 Scenario E1A

6.1.1 Overview

Scenario E1A involves a rolling programme of works across 12 zones. It will require multiple relocations to temporary accommodation to allow the Programme of works to be delivered. Its most likely duration is 32 years and it has an estimated capital cost of £5.7bn (P50)

Key components of Scenario overview

Figure 63: Key components of Scenario overview



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Scenario E1A involves a rolling programme of works across 12 zones. It will require multiple relocations to temporary accommodation to allow the Programme of works to be delivered. Its most likely duration is 32 years and it has an estimated capital cost of £5.7bn (P50)

Table 57: Overview of Scenario E1A

Category	Key features and supporting commentary
1. Capital expenditure (capital expenditure)	The total required capital expenditure is £5.67bn (based on P50). The majority of the expenditure is derived from the inflationary impact and the associated risk both to the construction and programme delivery (based on P50) rather than the core construction expenditure. This is due to the extended length of time that the Scenario is delivered over. The cashflow requirements in the first five years of the Programme are less than £50m (£10m per year), however thereafter and for the remainder of the Programme, based on five year periods, capital requirement remains between £600m and £1bn respectively.
2. Operational expenditure and revenue income	The total annual FM operational expenditure is £70.42m per annum. The current services will need to be maintained as part of business as usual, plus an enhanced level of FM spend due to the nature of the Programme. The lifecycle replacement programme will need to be closely monitored and the probability of additional revenue expenditure being needed is greatly increased. This is due to the risk of an unforeseen incident for example, a building services failure, occurring over the prolonged schedule. The existing revenue expenditure profile will continue over the long term, however could be gradually reduced as new plant and services are installed. The implications for operational management and interface between the working PoW and multiple construction activities and zones will be an ongoing management and security burden for a number of decades.
3. Whole life cost	NPC: £7.9bn (P50). Due to the extended period for delivery E1A presents the lowest net present cost as the costs are spread over a prolonged period of time. However, the net present costs should be considered against the operational impact and or risk to the business of Parliament, which is relatively high due to the delivery schedule and complexity of the works. The opportunity of addressing potential risks at an early opportunity is also missed.
4. Wider impacts	A relatively modest rate of progress will limit the extent to which opportunities may cascade out regionally and nationally, beyond that currently experienced from the PoW. Limited opportunity to preserve existing capabilities e.g. some limited succession planning for specific heritage trades, and potentially build some capacity, the demand for this will be relatively limited given the overall schedule of the Programme. Limited opportunity to embrace the full extent of good industry programme delivery practice, given the difficulty in establishing a clear end date with supporting interim milestones. The ability to convey positive messages about the programme will be impeded by the prolonged period over which the programme is being delivered.
5. Operational risk/ impact	The business risk profile could remain at its current levels for the foreseeable future, especially given the amount of capital investment required over the next five years is relatively low. The rate at which the operational risk will reduce over time will be gradual and steady. Members and other users of the PoW will be subjected to high levels of nuisance (the contractors will need to access 12 construction zones) and the multiple moves to temporary accommodation within the PoW will disrupt the core business of Parliament.
6. Schedule	Based on the assumed construction start date, Q2 2020, the overall schedule to deliver the Programme of works is most likely to be 32 years. This time period assumes that an occupied PoW will adopt different rules of engagement for a likely contractor to progress the necessary construction activity. The overall schedule has been reviewed against other similar programmes for delivery output, key resources and rate of capital expenditure.
7. Delivery approach	The IOA team analysis concludes that to enable this approach, a complete strip-out and replacement of the basement services infrastructure should be undertaken first to de-risk the method of replacing all of the mechanical and electrical plant and services over a much longer delivery period. Temporary infrastructure will have to be provided to allow this to happen at ground floor level.
8. Potential scope	To include: compliance with policy and legislation of the World Heritage and Grade 1 listing status of the PoW. Repaired or replaced systems on a like for like basis to contemporary standards of design and quality therefore optimising costs and benefits. Building environment standards that are expected for public buildings will be achieved.
9. Accommodating change (if desired)	There is little or no ability to materially deliver future proofing due to the overall programme schedule. No improvement in use of space or additional amenity for users and visitors. There will be limited ability to make adaptations to core business processes. There is little opportunity to embed any desired cultural changes as there is no pivotal event e.g. decant that would support changes to culture and the configuration and functionality of the PoW remains the same upon completion of the Programme.

Source: IOA Team analysis

Why deliver this Scenario?

- The core business of Parliament will remain within the PoW and the Houses will remain co-located.
- There is no need to acquire any decant buildings therefore mitigating a programme risk.
- It is the lowest in Net Present Whole Life Cost terms.
- It is the most affordable.

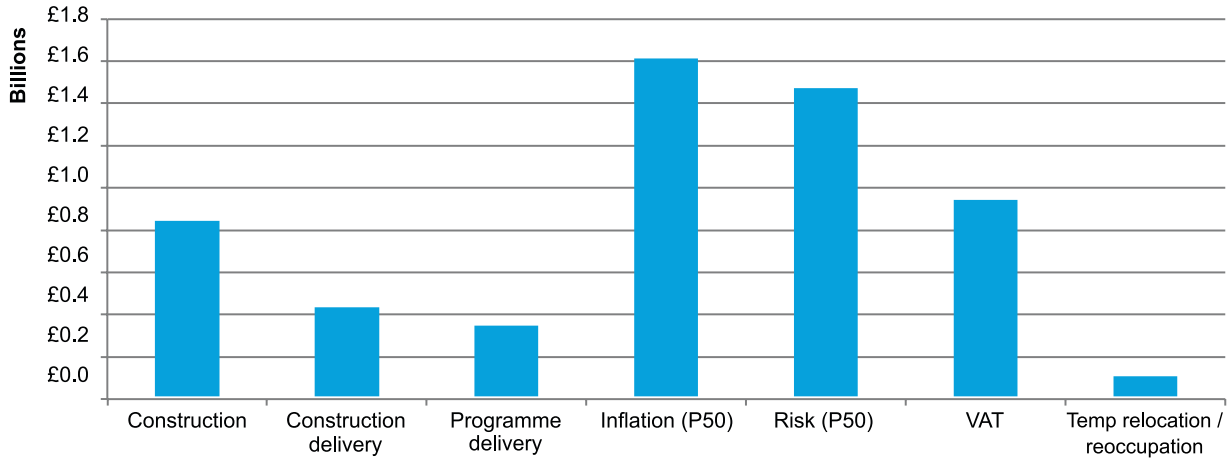
6.1.2 Capital expenditure

Scenario E1A has the highest capital cost of all Scenarios, £5.67 bn. It also has the greatest level of risk and inflation as a proportion of the total cost. The mechanical and electrical costs represent 34% of the construction and construction delivery cost total

Capital expenditure - based on P50

- The chart below outlines the component elements of the capital expenditure for Scenario E1A. Definitions of the component elements are included on the following page.
- Inflation, risk, VAT, and construction delivery represent the largest areas of cost for this Scenario and they are also the differentiators in cost terms with other scenarios.
- Inflation and risk are of particular significance with the large inflation allowance reflecting the prolonged delivery period the and uncertain duration and the risk allowance similarly reflecting the inherent risks resulting from the delivery approach.

Figure 64: Capital expenditure based on P50

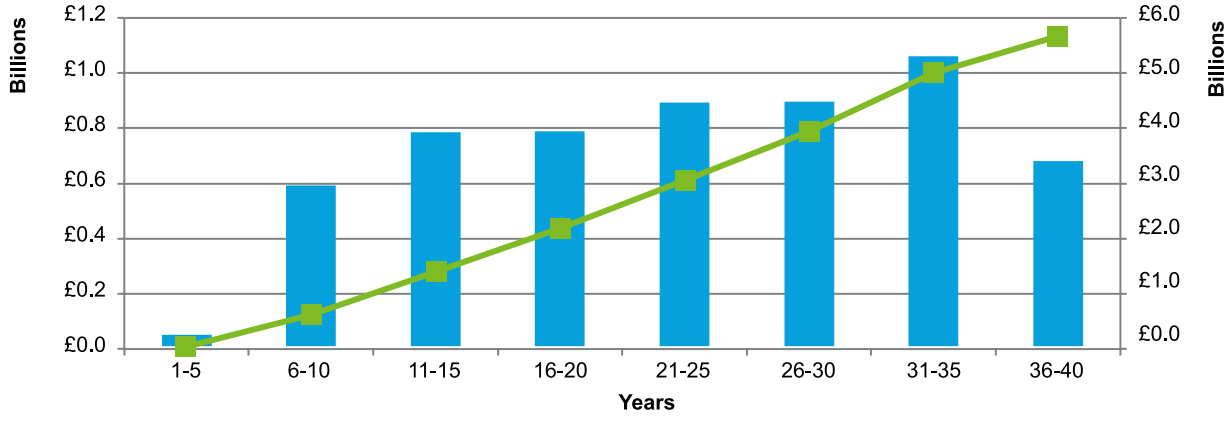


Source: IOA Team analysis

Capital expenditure cashflow – based on P50

- The chart below outlines the P50 cash flow for Scenario E1A.
- The bar chart highlights the five yearly expenditure (left hand scale) and the line graph represents the cumulative cashflow totals (right hand scale).
- The start date of the cash flow is Q3 2014 and is based on the P50 costs.
- The lowest expenditure is expected to occur between years 1-5. During this time the delivery model will be developed and the design will be progressed. The costs associated with this work are more modest than the costs incurred once construction begins.
  - highest expenditure is expected to occur between years 31-35 as multiple zones are being worked on simultaneously during this period.

Figure 65: Capital expenditure cashflow based on P50



Source: IOA Team analysis

6.1.2 Capital expenditure

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Elemental breakdown of initial capital expenditure

- The table below provides an elemental breakdown to the initial capital cost required under Scenario E1A. The sub total is based on P50 figures, however the elemental costs (including inflation, risk, VAT and temporary relocation/reoccupation) are presented on a P10, P50 and P90 range.

Table 58: Elemental breakdown of initial capital expenditure

Element		Item	Cost (£m)	Total (£m)
Construction	Building works	Fabric – envelope	97	**832**
		Fabric – internal finishes	86	
		Other building works	143	
		Additional scope	70	
	Mechanical and electrical services	Services	436	
Construction delivery	Base method related costs		156	**423**
	PoW specific costs		46	
	Option specific		161	
	Overheads and profit		60	
Programme delivery	Programme management and technical support		78	**336**
	Client assurance and legal		12	
	Project team and design costs		246	
Sub-total (P50)				**1,591**

Element		P10 (£m)		P50 (£m)		P90 (£m)	
Inflation	Pre commencement	260	**1,196**	347	**1,599**	553	**2,545**
	Construction phase	936		1,252		1,992	
Risk	Construction delivery	1,098	**1,214**	1,319	**1,458**	1,542	**1,704**
	Programme management	116		139		162	
VAT @ 20%		**800**		**930**		**1,168**	
Temporary relocation / reoccupation		**83**		**94**		**114**	
Total		**4,884**		**5,672**		**7,122**	

Source: IOA Team analysis

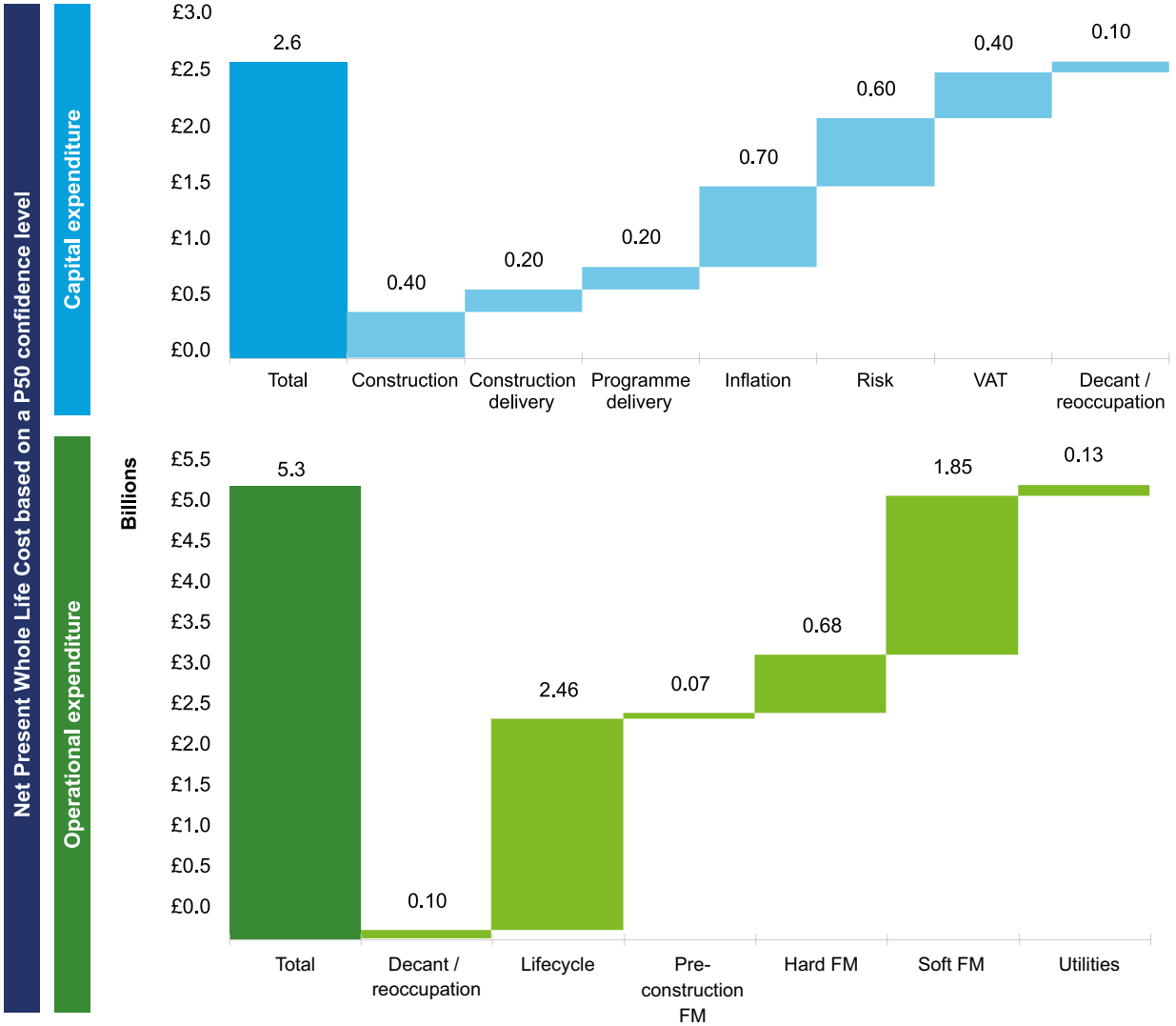
6.1.3 Estimated whole life cost

Scenario E1A in the most expensive of the five scenarios in undiscounted whole life cost terms, but because of the prolonged duration of delivery it has the lowest Net Present Whole Life Cost at P50 – i.e. once it has been discounted to today's terms

Introduction

- The purpose of creating a whole life cost model for each of the scenarios is to allow a like for like comparison to be made between programmes and expenditure profiles that differ significantly in nature.
- Ultimately, Net Present Whole Life Cost will be used to inform the Outline Business Case.
- Whole life cost is modelled over 60 years (a standard Treasury Green Book duration for major infrastructure programmes) and the components of Whole Life Cost Discounted by 3% per annum from the date at which they would be incurred, to today (Q2 2014).
- Over a 60 year period, Operational expenditure are more than twice those of Capital expenditure. The Lifecycle replacement costs are the most significant of all of the scenarios as the existing building services and components will remaining in situ for the longest period, thus requiring the greatest investment.

Figure 66: Net Present Whole Life Cost based on a P50 confidence level



Source: IOA Team analysis

6.1.3 Estimated whole life cost

Scenario E1A in the most expensive of the five scenarios in undiscounted whole life cost terms, but because of the prolonged duration of delivery it has the lowest Net Present Whole Life Cost at P50 – i.e. once it has been discounted to today's terms

Components of whole life cost

- The components of whole life cost are as follows:
  - Capital Expenditure:
    - Construction: The scope of works;
    - Construction Delivery: Contractor's preliminary costs, logistics, temporary accommodation, security etc..
    - Programme Delivery: Professional fees
    - Inflation: Modelled at a P50 level at 3.64%
    - Risk: An allowance reflecting a basket of risks particularly those that would have a time impact if realised.
    - VAT: at the current prevailing rate of 20%
    - Churn / relocation: the cost of temporary buildings including acquisition and fit out required to facilitate a particular scenario.
  - Operational Expenditure:
    - Churn / relocation: the operational costs of any temporary buildings.
    - Lifecycle Costs: The cost of replacing building components as they become life expired.
    - Pre construction FM: The cost of Facilities Management associated with zones that have yet to be completed
    - Hard Facilities Management: Maintenance of building components (e.g. boiler servicing)
    - Soft Facilities Management: Cleaning, security and other 'people focussed' aspects.
    - Utilities: Gas, power, telecoms etc..

Summary of Net Present Cost

- The table below outlines the capital and operational costs based on a P10-P90 confidence level:

Table 59: Summary of Net Present Cost

	P10	P50	P90
Capital expenditure	£2.2bn	£2.6bn	£3.3bn
Operational expenditure	£4.7bn	£5.3bn	£8.1bn
Total whole life cost	**£6.9bn**	**£7.9bn**	**£11.4bn**

Source: IOA Team analysis

6.1.4 Operational considerations and risks

As a result of its prolonged delivery duration, the reduction in residual risk of system failure diminishes at the slowest rate. In addition the delivery approach is most likely to create further operational risk as a result of the disruptive nature of working within an occupied building

Operational risk/impact

- The key operational considerations for Scenario E1A have been summarised within the tables below. The key principles include the following:
  - Working in an existing building that is fully operational;
  - Ability to effect a sustainable and flexible temporary accommodation strategy; and
  - Ability to preserve heritage and tradition.

Key: Unlikely to meet Parliamentary requirements ○
Likely to meet Parliamentary requirements ●

Table 60: Delivery Option 1 – Operational considerations

	Delivery Option 1 – Operational considerations	Illustrative scale	Potential actions to adopt
1	**Operational impact - Excessive Nuisance:** The completion of the works could cause excessive Nuisance within the PoW. Noise, dust and general contractor presence all have the potential to directly impact the core business of Parliament. During the programme there are likely to be approx. 170 contractors on site at any one time, which compares to only approx. 30-40 today. Any conflict could also have an adverse impact on the rate of delivery of the works e.g. if ongoing works are stopped.	○	• Contractors are to be limited to the amount of noise and dust creation during [normal business hours]. • Contractors are to be given clear operating procedures which must be integrated to minimise Nuisance factors.
2	**Temporary relocation of PoW occupants:** Despite remaining within the PoW, Members, Peers, staff and functions (e.g. libraries) will have to relocate within the PoW and neighbouring estate to enable the programme of works to be undertaken. This process is likely to be repeated multiple times during the programme and will potentially affect all Members, Peers and staff of the PoW at some point during the Programme. Each construction zone is likely to be needed for a period of approximately two to four years.	◑	• A robust logistical process will need to be finalised identifying all of the necessary steps in order to complete all churn events.
3	**Fire safety management:** The fire strategy may have to be closely managed and regularly amended to suit the day to day activities on site. This process will need to be carried out at the point when each phase is completed, but also during each phase to ensure a safe means of escape and clear fire routes are constantly maintained.	○	• Fire strategy to be periodically refreshed and updated. • London fire brigade to be consulted on a regular basis during the programme.
4	**Security:** A separate Security Report has been prepared to cover this.		• See separate security report
5	**Ceremonial impacts:** The programme works may impact the existing ceremonial processes. Depending on the final sequencing of zones, alternative arrangements would need to be agreed prior to the commencement of the programme works. If the ceremony occurs near or through a construction zone, close management and potential unplanned adjustments may be required to successfully meet the ceremony demands.	◔	• Alternative arrangements will need to be planned and agreed prior to the commencement of the works. • Ceremonial events to take place away from construction sites, where at all possible.
6	**Site logistics:** The coordination of existing site deliveries with additional construction traffic will be a key issue requiring management attention. The number of new deliveries to be accommodated because of the programme works will be far greater than in the current arrangements at the PoW.	◔	• A new site delivery plan will need to be agreed. • Materials associated for the programme works may need to be delivered to a separate site for screening and security

Source: IOA Team analysis

6.1.4 Operational considerations and risks

As a result of its prolonged delivery duration, the reduction in residual risk of system failure diminishes at the slowest rate. In addition the delivery approach is most likely to create further operational risk as a result of the disruptive nature of working within an occupied building

Table 61: Delivery Option 1 – Operational risks

	Delivery Option 1 – Operational risks	Potential mitigating actions	Illustrative rating
1	**Operational impact** - Catastrophic failure: The works will be completed on a zone by zone basis over 30 years and involve numerous churn events. This significant time period for delivery, means that the risk of a catastrophic failure occurring in the existing plant is high for longer in this Option, when compared to Options 2 and 3.	• Create and implement robust decant and relocation plan (as few moves as practical and over the shortest overall timescale) • Test and keep disaster recovery and business continuity accommodation on standby	
2	**Operational impact** - Invasive works: The required works to provide temporary infrastructure and to allow works in the basement to be completed, could seriously impact the core business of parliament. There are many interfaces, complicated connections and diversions required to deliver this enabling phase of works. Each interface, connection or diversions has the potential to take longer than expected, or could be completed incorrectly or fail during testing and use.	• Agree protocols with both Houses including any revised rules of engagement for invasive works • Establish and maintain delivery plan for all invasive works • Plan for contingent activity, should unforeseen matters be encountered	
3	**Temporary accommodation** – insufficient, inadequate, or unacceptable temporary accommodation to facilitate this delivery Option and temporary Chamber location: Locations for staff to churn within the POW during the works and / or a temporary Chamber to be located, could be challenging to deliver. This could in turn directly and adversely impact the business of Parliament.	• Identify and test swing space opportunities • Establish and implement strategic moves plan	
4	**Ongoing terms of engagement:** Members and users (including support staff) change the planned construction activities and logistics of the programme of works. Such changes could take place on a recurring basis given the nature of the small scale works, but could impact the overall schedule.	• Confirm revised terms of engagement for works in occupied accommodation • Implement and monitor activity for compliance with the revised terms	

Source: IOA Team analysis

Key:

Low Risk Medium Risk High Risk

6.1.5 Schedule

The most likely duration of Scenario E1A is 32 years, following which, the core objectives of the programme are likely to have been achieved. It is proposed that basement services infrastructure should be replaced first, followed by zonal progression of works through the upper floors

Overview

- Scenario E1A attempts to deliver the objectives of the Programme while existing occupants remain within the Palace. Delivery Option E1 offers a lower number of simultaneous work areas when compared to Options 2 and 3, which results in an overall timeline to completion that is five times the delivery period for a full decant option.
- In appraising E1A, the IOA Team has assumed that there will be an acceptance of higher levels of nuisance than currently experienced. Examples of day to day nuisance include noise disturbance, loss of direct access routes to destinations within the Palace, loss of car parking spaces, and increased quantities of scaffolding and temporary buildings in courtyards for extended periods of time resulting in a loss of natural light. A risk allowance for out of hours work has been included in the schedule to mitigate any delay that may arise.
- The initial timeline analysis has been undertaken with consideration of the unique nature of the PoW as a heritage asset, and the home of the UK Parliament.
- The schedule developed for E1A has been based on working practices and constraints that influence current works at the PoW. The durations have then been compared to durations for similar projects and they have also been challenged independently by Skanska PLC, a major contractor.

Table 62: Scenario E1A – Key dates

Scenario E1A – Key dates	
Pre-business case	2014-16
Design	2015-19
Enabling works	2015-20
Construction works	2020-51
Handover	Included in Construction
Reoccupation	Included in Construction

Source: IOA Team analysis

Construction schedule

- The following construction schedule has been developed for E1A.

Table 63: Construction schedule

Scenario	Lower range	Most likely	Upper range
Scenario E1A	25 years	32 years	40 years

Source: IOA Team analysis

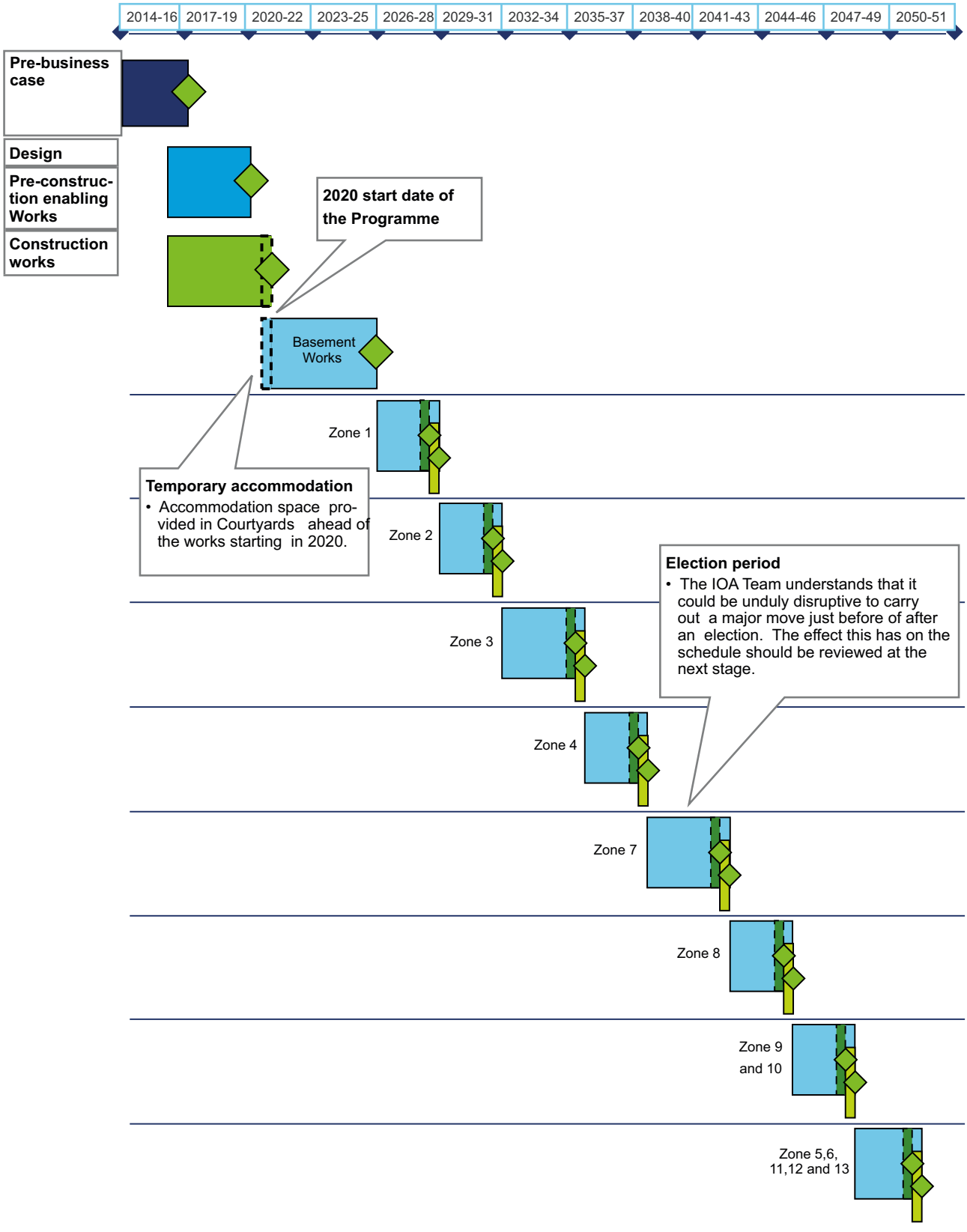
Key assumptions

- The following key assumptions underpin the assessed programme period for this scenario:
  - An assumed start date in Q2 2020;
  - A six month period of on site surveys and enabling works prior to full construction work commencing;
  - The testing and commissioning activity will overlap with physical construction work. There will be a dedicated period to complete the testing, commissioning, balancing and trial running of all new systems, prior to reoccupation;
  - There is a dedicated period for the relocation of occupants and their business functions back to the PoW after each zone is completed; and
  - It is assumed that the Programme is not currently impacted by move constraints around election dates.

6.1.5 Schedule

The most likely duration of Scenario E1A is 32 years, following which, the core objectives of the programme are likely to have been achieved. It is proposed that basement services infrastructure should be replaced first, followed by zonal progression of works through the upper floors

Figure 67: Scenario E1A schedule



Source: IOA Team analysis

Key:

Construction Works | Handover | Reoccupation

6.1.6 Delivery approach

Scenario E1A is delivered in multiple phases, with works being undertaken in zones sequentially. Each Chamber will need to be relocated to a temporary facility built within the PoW in one of three possible locations, New Palace Yard, Westminster Hall or Speaker's Court

Key delivery risks

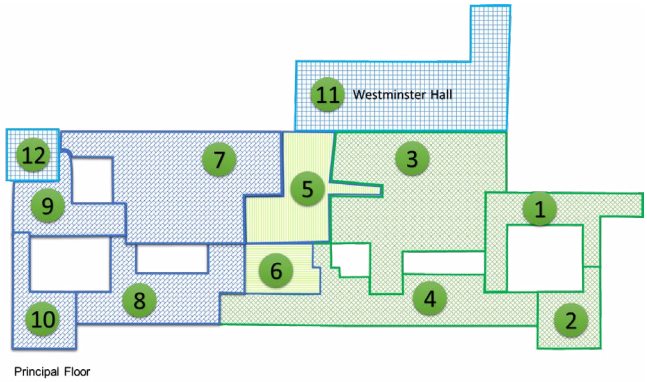
- The following key risks are applicable to this scenario:
  - It may not be possible to replace existing services while spaces in the PoW above the basement are in use, without causing Disruption;
  - The risk of damage caused to artefacts during the works is increased;
  - Disruption to occupiers could result in works being stopped (very long term exposure to construction activities and their associated impact could prove to be unbearable);
  - Maintaining effective security and segregation, whilst providing sufficient means of escape;
  - Works not completed prior to lifecycle replacement starting; and
  - Planning approval for temporary buildings may be difficult to obtain.

Delivery approach

- The delivery approach is to replace the basement mechanical and electrical infrastructure first (to minimise risk of failure) and then to progress work on the upper floors in 12 zones. This option does not include for decant and therefore people or functions occupying space in the construction zone will need to temporarily relocate within temporary and/or vacant accommodation in the Palace. It is assumed that the required temporary accommodation can be provided within the courtyards and the vacant space will be available in Victoria Tower on the assumption that the archives move out.
- The overall schedule for option E1A has been reviewed against other similar projects for delivery output, key resources and rate of capital spend. The IOA Teams' analysis shows that a complete strip-out and replacement of the basement services infrastructure should be undertaken first to de-risk the method of replacing all of the mechanical and electrical services over a much longer delivery period. Works on the upper floors will then need to be undertaken in 12 zones through the building. All heritage and architectural finishes will be restored once the critical mechanical and electrical services activity is complete in each zone. And in parallel where possible to do so.
- The delivery approach for E1A does not provide the same level of continuity of construction work when compared to Options 2 and 3. There will be periods when users and staff are moving back to a completed zone and vacating the next zone before the construction activity can continue. Further detailed analysis will be required to analyse the impact of this reduced work flow as it is likely to impact availability of resources through the supply chain.

Zones and sequencing

Figure 68: Zones and sequencing



Source: IOA Team analysis

- The building would be notionally split into 12 construction zones above ground, plus the basement as a single zone.
- The approach to delivering the works would be to split the PoW into work zones. These zones need to be large enough to ensure the production levels required can be met, but small enough to avoid significant decant of staff and users from the building, and for them to be rehoused in temporary accommodation or vacant space within the boundary of the PoW.
- The zones divide the building into 12 key work areas across each floor to give a vertical division of the PoW. These zones could be delivered in any sequence to suit the business of Parliament, once the works to replace the mechanical and electrical infrastructure in the basement are complete.

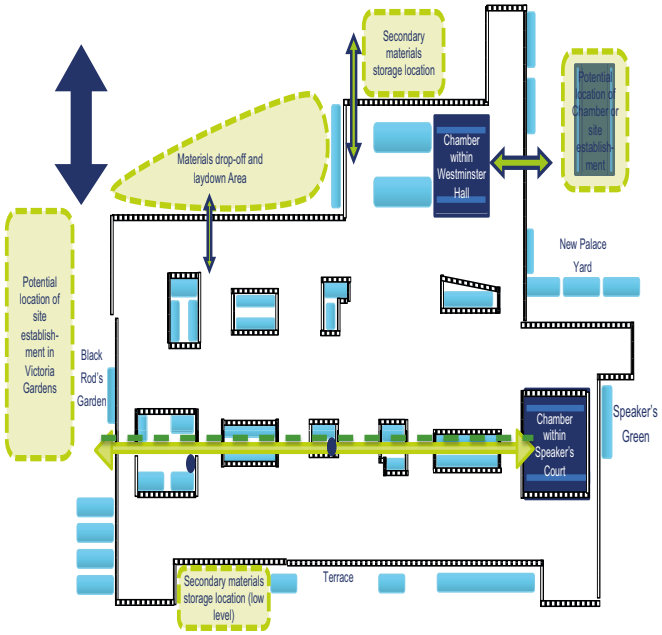
6.1.6 Delivery approach

Scenario E1A is delivered in multiple phases, with works being undertaken in zones sequentially. Each Chamber will need to be relocated to a temporary facility built within the PoW in one of three possible locations, New Palace Yard, Westminster Hall or Speaker's Court

Temporary relocation of staff

Figure 69: Temporary relocation of staff

(Please see section 5.8 for details on the potential layout of the temporary accommodation)



Source: IOA Team analysis

- Limited temporary relocation of users (i.e. moving users from their existing locations to temporary accommodation or vacant space) within the boundary of the PoW, will provide the free space to form a construction zone when required.
- The schedule start date is assumed to be Q2 2020 (immediately following the General Election). The temporary accommodation and other works required to enable the Programme, are assumed to be completed prior to the start of the Programme.
- The schedule assumes a zone-by-zone move of occupants from the PoW to temporary buildings within the courtyards or to vacate space within the PoW.
- PED has undertaken a high-level analysis of space requirements and the ability to accommodate occupants or functions in each zone within temporary accommodation. This analysis demonstrated that occupants could be accommodated in temporary facilities on the PoW site. However, further detailed analysis should be undertaken once detailed temporary works designs have been developed, to ensure there are no conflicting requirements for space.

Approach to mechanical and electrical works

Figure 70: Approach to mechanical and electrical works

Source: IOA Team analysis

- Scenario E1A requires new temporary mechanical and electrical infrastructure to be installed at Ground level. A potential location for the piped infrastructure is along the spine road under the arches. This will result in clashes with catering delivery trucks and other supplies, which may therefore need a remote drop-off point in Black Rod's Garden.
- Once the temporary infrastructure is in place, the work would commence with the total replacement of core mechanical and electrical infrastructure in the basement.
- Further details on the routing of temporary infrastructure required is included in Volume 2, Appendix C.1.

6.1.7 Potential scope

Scope includes the total replacement of all plant, services infrastructure plus the removal of asbestos. All internal spaces will be refurbished, including conservation works to heritage items and fabric. All external fabric repaired, cleaned and refurbished

Summary of Scenario E1A potential scope

- The table below outlines the illustrative scope of works that is to be provided in Scenario E1A. For greater detail on the works included in each Scenario please see Volume 2, Appendix D.1.
- Examples of the scope of work that could be provided in Scenario E1A are:
  - All mechanical and electrical services replaced;
  - All interior fabric restored and refurbished;
  - External fabric restored and cleaned;
  - Works carried out to improve access for all;
  - New lifts to provide improved access within PoW;
  - Permanent education facilities;
  - Improved security zoning;
  - Improved protection of the building from fire; and
  - Asbestos removed from all areas where work is carried out.

Table 64.1: Summary of Scenario E1A potential scope

Ref	Description
A	**General works**
A10	Building exterior
A10.1	External fabric
A10.2	External works
A10.3	External mechanical and electrical services
A20	Building interior
A20.1	Plant
A20.2	Horizontal and vertical services infrastructure
A20.3	IT systems
A20.4	Security systems
A20.5	Mechanical and electrical services works per room / space / zone
A20.6	Architectural works
A20.7	Asbestos works
B	**Specific items**
B10	**Lifts**
B10.1	Replace or refurbish existing lifts
B10.2	New lift and shafts
B10.3	Structural works associated with existing lifts to extend shaft to serve additional floors
B10.4	Structural works associated with existing lifts to provide step-free access at ground floor level
B10.5	Provision of new local lifts to address step changes and achieve greater step free access
B10.6	Replacement of existing goods and people lifts
B10.7	Replacement of existing goods only lifts
B20	**Archives – Archives are assumed to relocate to a new off site building**
B30	**Fire compartmentation works – Further works completed to improve fire compartmentation**

Source: IOA Team analysis

6.1.7 Potential scope

Scope includes the total replacement of all plant, services infrastructure plus the removal of asbestos. All internal spaces will be refurbished, including conservation works to heritage items and fabric. All external fabric repaired, cleaned and refurbished

Table 64.2: Summary of Scenario E1A potential scope

Ref	Description
B40	**Architectural interventions**
B40.1	**Security driven**
B40.1.1	Installation of new access control systems on doors and areas to provide greater demarcation of security zones
B40.1.2	Increase in size of the visitor screening area - extension to the existing Cromwell Green screening area - assume double in size
B40.1.3	Replace existing vehicle protection measures with more appropriate design
B40.2	**Catering driven**
B40.2.1	Replacement of the terrace marquees on the river front terrace
B40.3	**Business driven / support driven**
B40.3.1	Permanent education centre
B40.3.3	Basement, PED Craft, team workshops - relocate Change of use opportunity. Space is unsuitable for usage with health and safety risks associated with dust and fumes. Move craft team to alternative location. Space available for alternative usage.
B40.3.4	Basement, Lords' and Commons' Library Archive Relocate change in use Change of use opportunity. Space is unsuitable for usage with damp/RH and space issues. Move archive to alternative location (off site)
B50	**Mechanical and electrical enhancements / additions**
B50.1.1	Installation of new access control systems on doors and areas to provide greater demarcation of security zones within the palace (3 zones)
B50.1.2	Installation of Improved external CCTV

Source: IOA Team analysis

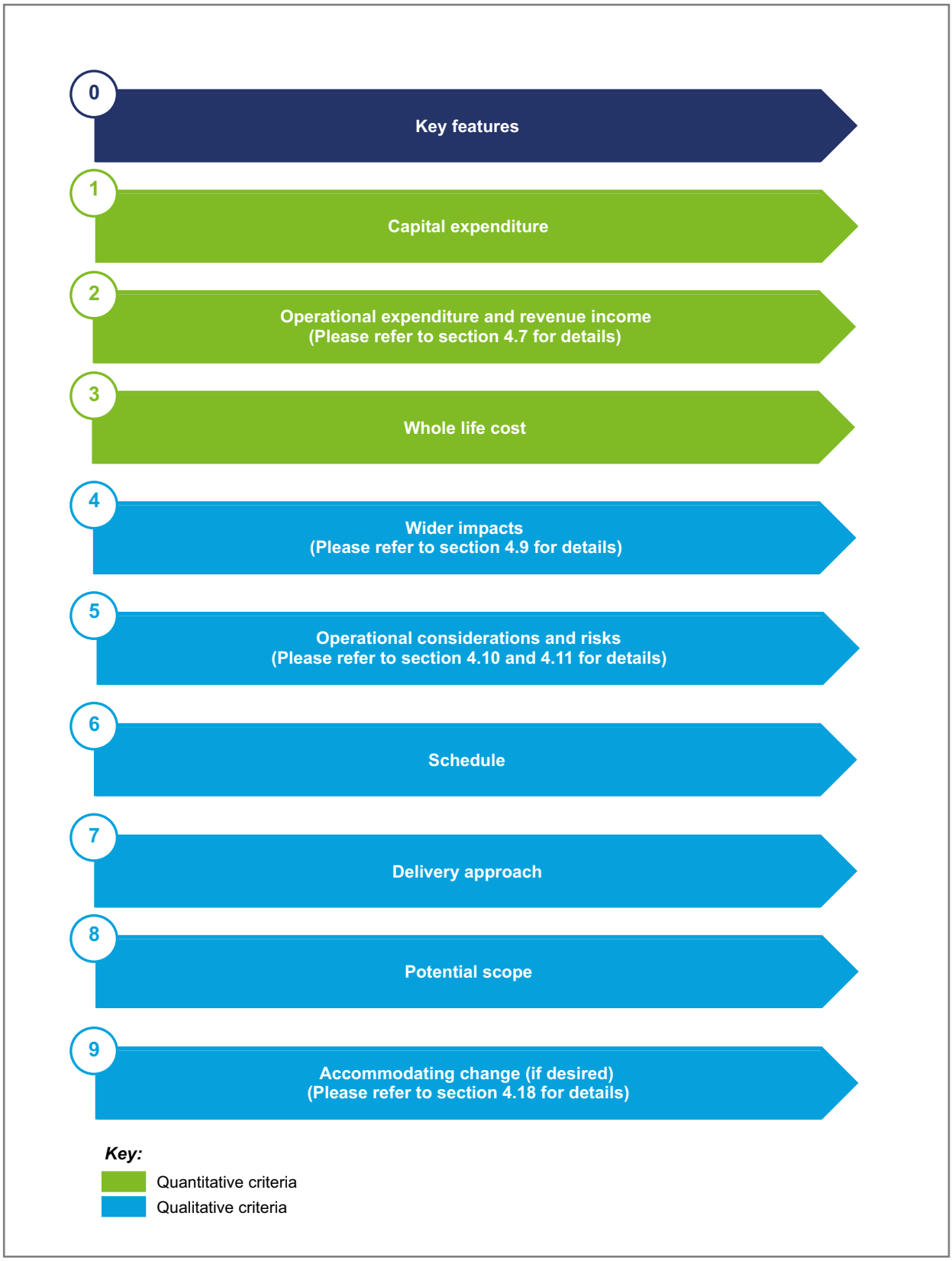
6.2 Scenario 2A

6.2.1 Overview

Scenario 2A involves a partial decant of the PoW, which should reduce operational risk, but does not deliver any enhanced amenity or functionality. It is delivered in an overall time period of 11 years with an estimated capital cost of £3.9bn

Key components of Scenario overview

Figure 71: Key components of Scenario overview



6.2.1 Overview

Scenario 2A involves a partial decant of the PoW, which should reduce operational risk, but does not deliver any enhanced amenity or functionality. It is delivered in an overall time period of 11 years with an estimated capital cost of £3.9bn

Table 65: Overview of Scenario 2A

Category	Key features and supporting commentary
1. Capital expenditure (capital expenditure)	The total required capital expenditure is £3.94bn (based on P50). The expenditure is principally derived from the inflationary impact and the associated risks of the Programme. The cashflow requirement over the first five years of the Programme is £450m.
2. Operational expenditure and revenue income	The total annual FM operational expenditure is £46.32m. The current services will need to be maintained as part of business as usual, however only covering half of the PoW. The lifecycle replacement programme will need to maintained for the occupied half of the PoW, until such time the new plant and services are installed. The implications for operational management and interface (including large and potentially intrusive buffer zones) between the occupied half of the PoW and the unoccupied (i.e. the construction activities) could be an ongoing management and security burden over the Programme schedule.
3. Whole life cost	NPC £8.4bn (P50). Early investment does increase the relative contribution to the NPC of this Scenario, and also ensures the early retention of the fabric elements and the quality standards of the historic building. Simultaneously business continuity risk including catastrophic failure of building services is reduced at a reasonable rate.
4. Wider impacts	The rate of progress and Outcome Level will limit the extent to which positive wider impacts could be extracted. Some opportunity to embrace the full extent of good industry programme delivery practice, given the Programme schedule. Careful communication management will need to be monitored especially around the requirement of a double decant and reoccupation.
5. Operational risk/ impact	The business risk profile will reduce at a reasonable rate especially given the partial decant and the capital investment. Members and other users of the PoW will be subjected to an increased level of Nuisance (contractors undertaking works across the unoccupied half of the PoW) and the relocation to a single decant building. Once within the decant building the Disruption and Nuisance factors should remain at relatively low levels.
6. Schedule	Based on assumed construction start date (Q2 2020), the overall schedule to delivery the Programme of works is 11 years based on the most likely programme. This time period assumes that a partially vacated Palace of Westminster is available by the start date for a contractor to commence construction activity. The overall schedule for option 2A has been reviewed against other similar projects for delivery output, key resources and rate of capital spend. Our analysis shows that there is a 50% chance of completing works in one House within one Parliamentary term.
7. Delivery approach	The PoW will be split into two substantial construction zones. One at a time, each of the zones will be closed to users for a significant period of time while major work is carried out. One House and then the other will be required to relocate to temporary accommodation, however the PoW would not be closed. A significant proportion of the collections will remain on site and therefore security will need to be maintained to a high degree and possibly to the same level and extent in the construction zone as in the occupied zone. The clock maintenance team will still require access to Elizabeth Tower throughout the entire Programme. The access arrangements will need to be closely managed between the client function and the supply chain.
8. Potential scope	To include: Compliance with policy and legislation of the World Heritage and Grade 1 listing status of the PoW; Repaired or replaced systems on a like for like basis to contemporary standards of design and quality, optimising costs and benefits; Building environment standards expected of public buildings will be achieved.
9. Accommodating change (if desired)	Potentially some opportunity to deliver future proofing, however lifecycle replacement will start to encroach on the Programme i.e. services plant life expectancy may expire ahead of Programme completion in some areas of the PoW. Does not deliver any improvement in use of space or additional amenity for all users and visitors. Reconfigured space is not delivered. The configuration and functionality of the PoW remains unchanged at the end of the programme, there may be some opportunities to make adaptations to core business processes for functions that are relocated to the decant building(s).

Source: IOA Team analysis

Why deliver this Scenario?

- Scenario 2A would deliver the Programme Objectives far quicker than E1A and would therefore reduce operational risk in less time.
- A phased decant and reoccupation could be adopted, thereby potentially reducing the period when a House may be temporarily relocated from the PoW.
- Enhanced business processes and ways or working could be adopted when moving out and then back into the PoW.
- The public may have an opportunity to access the PoW during the Programme works as a large zone of the PoW will not be in use by Parliament. These public visits could raise awareness of the Programme.

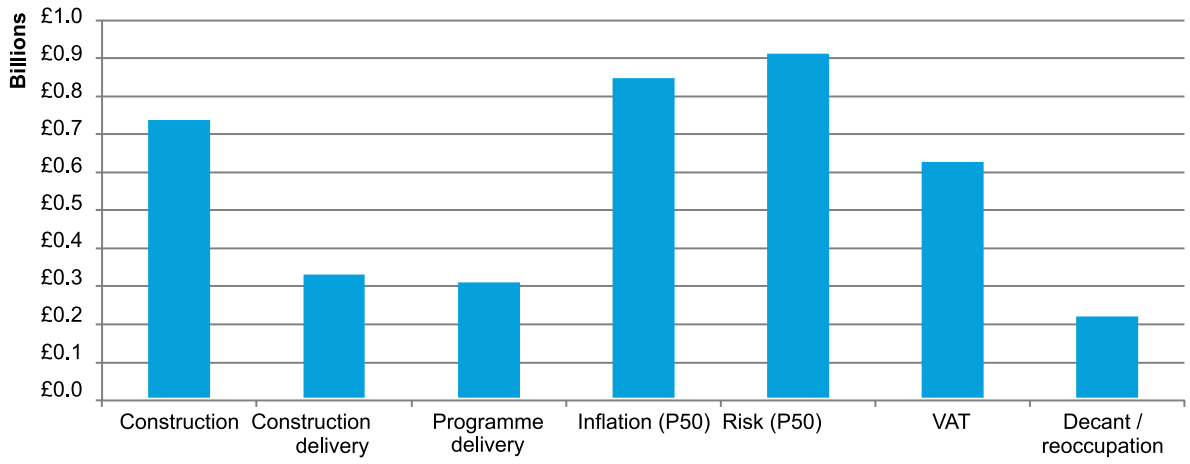
6.2.2 Capital expenditure

Of the total estimated cost for delivering Scenario 2A, inflation and risk represent the most significant cost elements. However, they are lower in 2A than for Scenario E1A

Capital expenditure

- The chart below outlines the component elements of the capital expenditure for Scenario 2A. Definitions of the component elements are included on the following page.
- Inflation, risk, VAT and construction represent the largest areas of expenditure for this Scenario. However, all areas are lower in cost than in E1A.
- The high cost of inflation reflects the significant schedule duration and the risk allowance reflects the inherent risks resulting from the delivery Option, for example, unavailability of decant space.

Figure 72: Capital expenditure based on P50

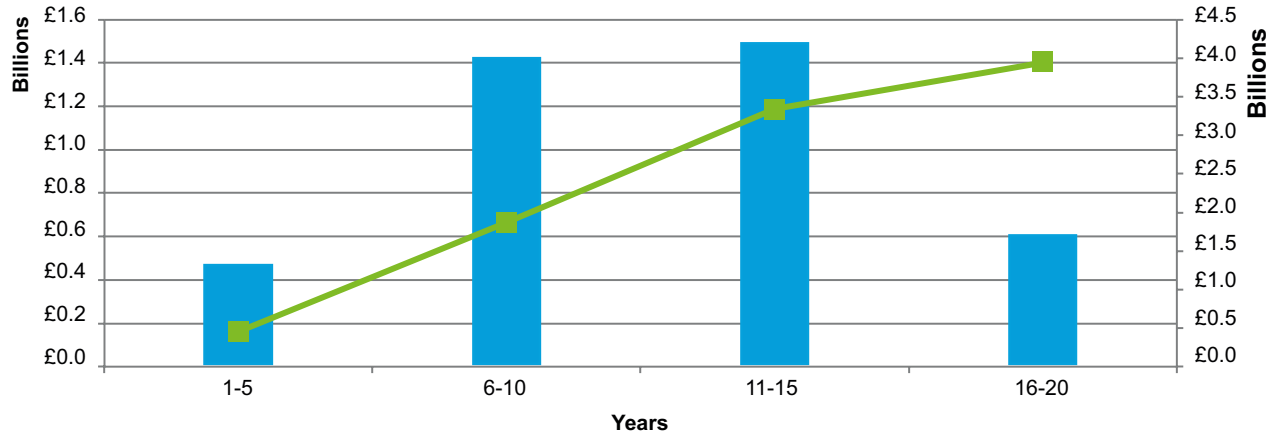


Source: IOA Team analysis

Initial capital expenditure cashflow – based on P50

- The chart below outlines the P50 cashflow for Scenario 2A.
- The bar chart highlights the five yearly expenditure (left hand scale) and the line graph represents the cumulative cashflow totals (right hand scale).
- The start date of the cashflow is Q3 2014 and is based on the P50 costs.
- The lowest expenditure is expected to occur between years 1-5. During this time the delivery model will be developed and the design will be progressed. The costs associated with this work are more modest than the costs incurred once construction begins.
- The highest expenditure is expected to occur between years 11-15. This period is when Phase 1 completes and staff and users move back into the PoW. Phase 2 works will then begin once the second zone of the PoW has been decanted.

Figure 73: Initial capital expenditure cashflow based on P50



Source: IOA Team analysis

6.2.2 Capital expenditure

Of the total estimated cost for delivering Scenario 2A, inflation and risk represent the most significant cost elements. However, they are lower in 2A than for Scenario E1A

Elemental breakdown of initial capital expenditure

- The table below provides an elemental breakdown to the initial capital cost required under Scenario 2A. The sub total is based on P50 figures, however the elemental costs (including inflation, risk, VAT and decant/reoccupation are presented on a P10, P50 and P90 range

Table 66: Elemental breakdown of initial capital expenditure

Element		Item	Cost (£m)	Total (£m)
Construction	Building works	Fabric – envelope	83	**730**
		Fabric – internal finishes	73	
		Other building works	126	
		Additional scope	61	
	Mechanical and electrical services	Services	387	
Construction delivery	Base method related costs		139	**323**
	PoW specific costs		34	
	Option specific		100	
	Overheads and profit		50	
Programme delivery	Programme management and technical support		102	**303**
	Client assurance and legal		34	
	Project team and design costs		167	
Sub-total (P50)				**1,356**

Element		P10 (£m)		P50 (£m)		P90 (£m)	
Inflation	Pre commencement	221	**628**	296	**841**	471	**1,337**
	Construction phase	407		545		866	
Risk	Construction delivery	640	**728**	795	**905**	945	**1,705**
	Programme management	88		110		130	
VAT @ 20%		**542**		**620**		**754**	
Temporary relocation / reoccupation		**98**		**215**		**301**	
Total		**3,352**		**3,937**		**4,823**	

Source: IOA Team analysis

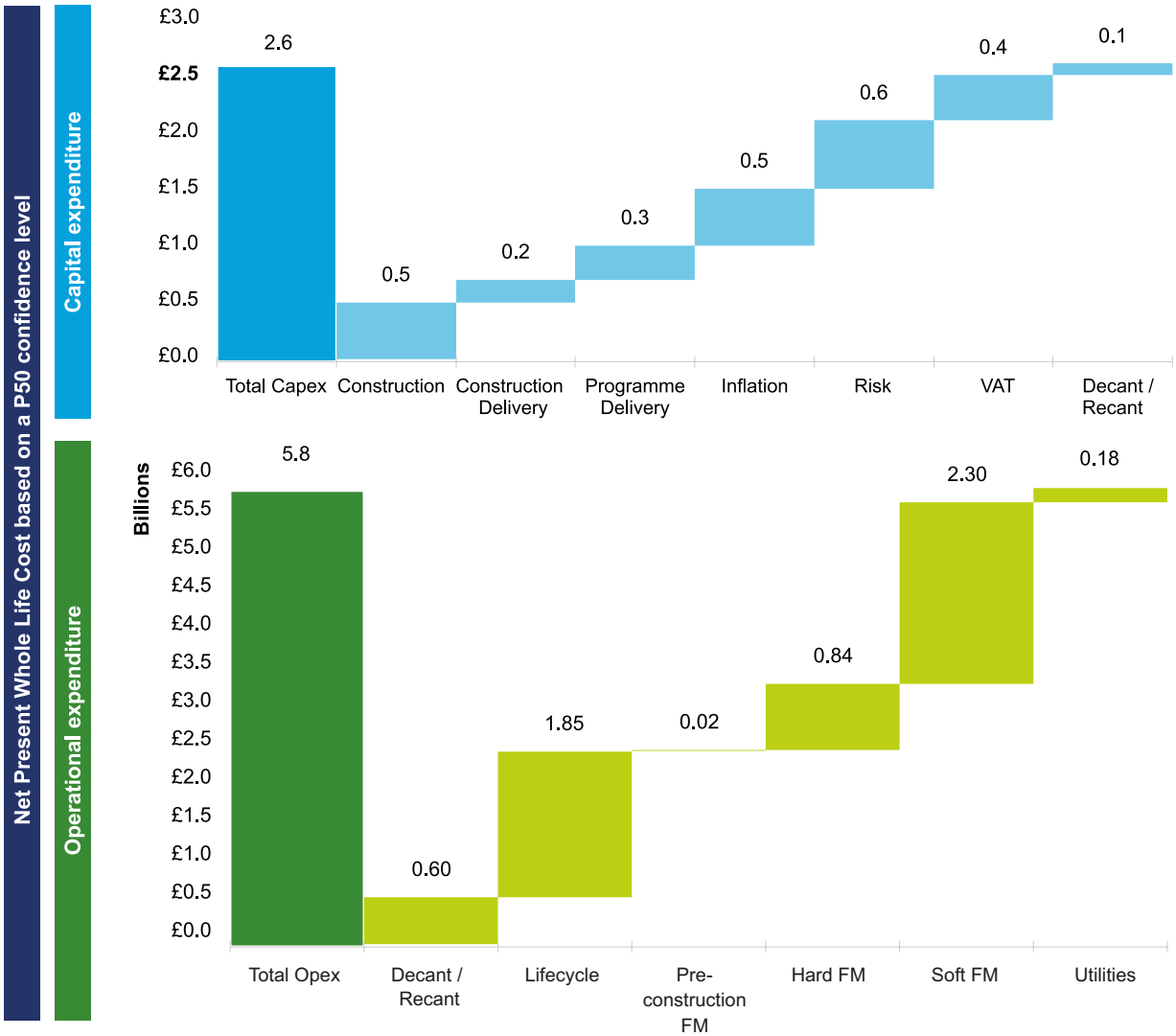
6.2.3 Estimated whole life cost

Scenario 2A would require an initial discounted capital cost of £2.6bn (P50). The discounted operational costs add a further £5.8bn (P50), therefore the net present cost of all whole life costs is estimated to be £8.4bn (P50)

Introduction

- The purpose of creating a whole life cost model for each of the scenarios is to allow a like for like comparison to be made between programmes and expenditure profiles that differ significantly in nature.
- Ultimately, Net Present Whole Life Cost will be used to inform the Outline Business Case. Whole life cost is modelled over 60 years (a standard Treasury Green Book duration for major infrastructure programmes) and the components of Whole Life Cost Discounted by 3% per annum from the date at which they would be incurred, to today (Q2 2014).
- Over a 60 year period, Operational expenditure is more than twice that of Capital expenditure. Soft FM costs are the most significant costs due to the maintenance and security issues of occupying two sites.

Figure 74: Net Present Whole Life Cost based on a P50 confidence level



Source: IOA Team analysis

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Scenario 2A would require an initial discounted capital cost of £2.6bn (P50). The discounted operational costs add a further £5.8bn (P50), therefore the net present cost of all whole life costs is estimated to be £8.4bn (P50)

Components of whole life cost

- The components of whole life cost are as follows:
  - Capital Expenditure:
    - Construction: The scope of works.
    - Construction Delivery: Contractor's preliminary costs, logistics, temporary accommodation, security etc..
    - Programme Delivery: Professional fees
    - Inflation: Modelled at a P50 level at 3.64%
    - Risk: An allowance reflecting a basket of risks particularly those that would have a time impact if realised.
    - VAT: at the current prevailing rate of 20%
    - Decant / relocation: the cost of temporary buildings including acquisition and fit out required to facilitate a particular scenario.
  - Operational Expenditure:
    - Decant / relocation: the operational costs of any temporary buildings.
    - Lifecycle Costs: The cost of replacing building components as they become life expired.
    - Pre construction FM: The cost of Facilities Management associated with zones that have yet to be completed
    - Hard Facilities Management: Maintenance of building components (e.g. boiler servicing)
    - Soft Facilities Management: Cleaning, security and other 'people focussed' aspects.

Summary of Net Present Cost

- The table below outlines the capital and operational costs based on a P10-P90 confidence level:

Table 67: Summary of Net Present Cost

	P10	P50	P90
Capital expenditure	£2.2bn	£2.6bn	£3.2bn
Operational expenditure	£5.2bn	£5.8bn	£8.2bn
Total whole life cost	**£7.4bn**	**£8.4bn**	**£11.4bn**

Source: IOA Team analysis

6.2.4 Operational considerations and risks

The key operational risk in Scenario 2A is the risk of Nuisance or Disruption caused by works being completed in close proximity to the Chambers and offices. The risks of delivering this Scenario are lower than Scenario E1A, but higher than Scenarios 3B and 3C

Operational risk/impact

- The key operational considerations for Scenario 2A have been summarised within the tables below. The key principles include the following:
  - Working in an existing building that is fully operational;
  - Managing Nuisance and Disruption caused by works being carried out in close proximity to the remaining operational zone of the PoW; and
  - Ability to effect a suitable decant strategy.

Key: Unlikely to meet Parliamentary requirements ○ Likely to meet Parliamentary requirements ●

Table 68: Delivery Option 2 – Operational considerations

	Delivery Option 2 – Operational considerations	Illustrative scale	Potential actions to adopt
1	**Operational impact – Nuisance:** There could be significant Nuisance during the programme works, despite only half the PoW being occupied. Noise, dust and general contractor presence are all likely to directly impact the core business of Parliament. These Nuisance factors could manifest itself in minor delays to programme.	○	• Greater control over the contractors may need to be adopted given the PoW is still partially occupied. • Nuisance levels are to be actively monitored and recorded.
2	**Decant / reoccupation Disruption:** Members of both Houses will have to vacate the PoW at the appropriate times. This process will cause Disruption to individuals during both the decant and the reoccupation. This will be more disruptive than Delivery Option 3 as the Houses will not be collocated.	◑	• A decant plan will need to be developed setting out which Members will decant /reoccupation and when.
3	**Fire safety management:** The fire strategy may have to be closely managed and regularly amended to suit the day to day activities on site. This process will need to be carried out at the point when each phase is completed, but also during each phase to ensure a safe means of escape and clear fire routes are constantly maintained.	○	• Fire strategy to be periodically refreshed and updated. • London fire brigade to be consulted on a regular basis during the programme.
4	**Security management:** A separate Security Report has been prepared to cover this.		• See separate security report
5	**Ceremonial impacts:** Issues with only half the building. The considerations could potential be worse in this delivery Option rather than 1 and 3.	◑	• Bespoke ceremonial arrangements will need to be finalised, which take account of the varying circumstances of the PoW.
6	**Site Logistics:** With the PoW split in two, logistics will prove challenging. The way deliveries are managed will have to change from the existing process, which could result in some teething issues.	◑	• A new site delivery plan will need to be agreed addressing both the occupied and non occupied (contractor run) sides of the PoW. • Materials associated for the Programme works may need to be delivered to a separate site for screening and security.

Source: IOA Team analysis

6.2.4 Operational considerations and risks

The key operational risk in Scenario 2A is the risk of Nuisance or Disruption caused by works being completed in close proximity to the Chambers and offices. The risks of delivering this Scenario are lower than Scenario E1A, but higher than Scenarios 3B and 3C

Table 69: Delivery Option 2 – Operational risk

	Delivery Option 2 – Operational risk	Potential mitigating actions	Illustrative rating
1	**Operational impact** - invasive works: A temporary infrastructure solution will be needed to allow half the PoW to be restored and renewed, however this could become a Nuisance to the business of parliament e.g. service diversions are likely to pass through the construction site and the partially occupied PoW and therefore could be subject to damage and or create more Nuisance during the programme schedule.	• Agree protocols with both Houses including any revised rules of engagement for invasive works • Establish and maintain delivery plan for all invasive works • Plan for contingent activity, should unforeseen matters be encountered	
2	**Availability of decant premises:** There is a significant risk that premises may not be available that are suitable to accommodate one of the Houses. This dependency could dictate which delivery Option is actually deliverable and feasible.	• Research market conditions • Identify suitable options • Understand market implications and availability challenges • Effect transaction	
3	**Delivery and completion of decant building fit out:** The remodelling required to the decant building to meet Parliamentary requirements, is likely to be significant. These fit out works will need to be completed and the facilities thoroughly tested ahead of the programme start date, to ensure any associated risk to Parliament are minimised. The timeframe for these works will be considerable and therefore requires decant premises to be secured in the near future.	• Set out space utilisation plans • Develop outline and detailed plans and specifications • Procurement and delivery of fit out • Test decant building thoroughly	
4	Security and fire risks: Given that the site will be partially occupied it will be a challenge to manage any breach of the site boundary. The site will be in close proximity to the working business of Parliament and a construction site.	• Define clear access routes • Implement security measures • Establish, maintain and adapt fire detection	
5	**Ongoing terms of engagement:** Approval of overarching decant solution. Occupiers may not agree to the Disruption of decanting during the programme of works.	• Confirm revised terms of engagement for works in occupied accommodation • Implement and monitor activity for compliance with the revised terms	

Source: IOA Team analysis

Key:

Low Risk Medium Risk High Risk

6.2.5 Schedule

Scenario 2A is likely to deliver the core objectives of the Programme in a period of 11 years. The works are proposed to be delivered in two phases, with one Chamber and the associated accommodation moving out in each phase

Overview

- Each House of the Palace of Westminster would be closed to users in turn, for a significant period while major work is carried out. They would require relocation to a temporary location, but the Palace would not be closed.
- A partial decant delivery method results in a delivery programme that is approximately twice the duration of a full decant delivery timeline.
- The building will retain aspects of heritage items and equipment requiring restoration, forming part of the Programme scope of works. These include works of art, furniture, and fixed items including elements of the building fabric. Due to a significant proportion of the collections having to remain on site, security will need to be maintained to a high degree and possibly to the same extent in the construction zone as the occupied zone.
- Additionally, when zone 1 is being worked on, the clock maintenance team will require access to Elizabeth Tower to keep the clock fully functional during implementation of the Programme. There may be other regular maintenance access requirements that need to be satisfied during the delivery of the works. These access arrangements will need to be closely managed between the client and contractor.

Table 70: Scenario 2A – Key dates

Scenario 2A – Key dates	Phase 1	Phase 2
Pre-business case	2014-16	
Design	2015-19	
Pre-construction enabling works	2015-20	-
Construction works	2020-25	2027-29
Handover	2025	2030-31
Reoccupation	2026	2031

Source: IOA Team analysis

Construction schedule

- The following construction schedule has been developed for Scenario 2A.

Table 71: Construction schedule

Scenario	Lower range	Most likely	Upper range
Scenario 2A	9 years	11 years	14 years

Source: IOA Team analysis

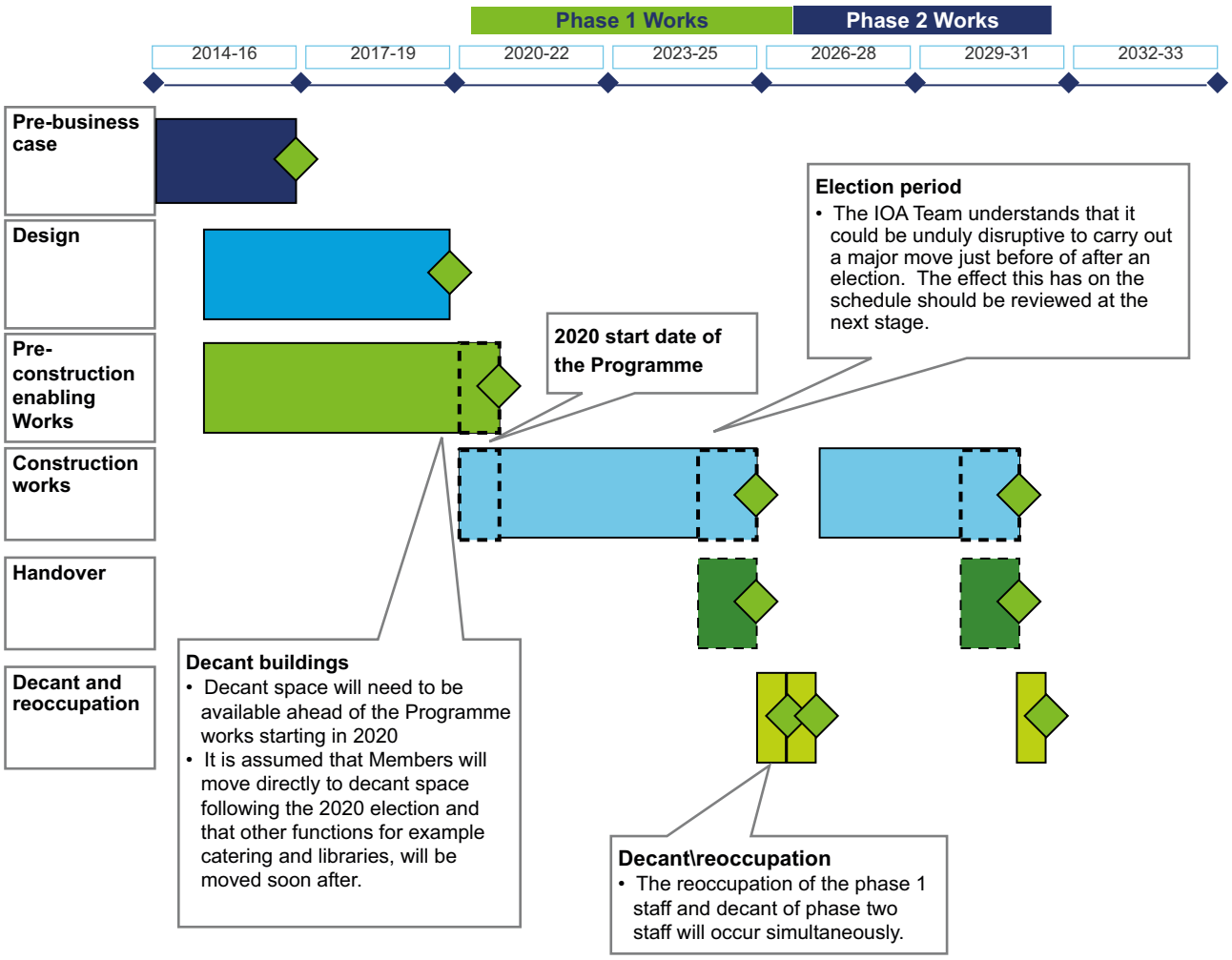
Key assumptions

- The following key assumptions underpin the assessed programme period for this scenario:
  - An assumed start date in Q2 2020;
  - A six month period of site surveys and enabling works prior to full construction work commencing. Further enabling works will also be required in advance of Phase 2.
  - The testing and commissioning activity will overlap with physical construction work. There will need to be a dedicated period to complete the testing, commissioning, balancing and trial running of all new systems, prior to reoccupation;
  - There is a dedicated period for moving occupants and their business functions back to the PoW; and
  - It is assumed that the Programme is not currently impacted by move constraints around election dates.

6.2.5 Schedule

Scenario 2A is likely to deliver the core objectives of the Programme in a period of 11 years. The works are proposed to be delivered in two phases, with one Chamber and the associated accommodation moving out in each phase

Figure 75: Scenario 2A schedule



Source: IOA Team analysis

Key:

Construction Works | Handover | Reoccupation

6.2.6 Delivery approach

Scenario 2A is delivered in two phases. The Chambers and associated support space will move to a decant location outside the PoW. Once one zone is completed the staff and users will reoccupy the PoW and the second zone will be decanted for works to be carried out

Key delivery risks

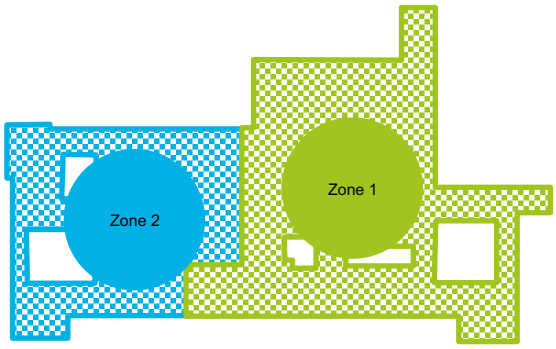
- The following key risks are applicable to this scenario:
  - Inability to secure adequate decant accommodation;
  - Major temporary services may be required to keep occupied spaces fully functional;
  - Remaining building operation, use, security and functionality potentially compromised due to site logistics;
  - Damage could be caused to artefacts during the works;
  - Maintenance of safety systems / environment during the works;
  - Disruption and Nuisance to occupiers – noise, access restrictions, ceremonial restrictions, could impact the business of Parliament;
  - Materials may require greater security screening due to the split occupancy site; and
  - There is a risk that there may not be enough specialist labour in the market to service the Programme.

Delivery approach

- In a partial decant Option, one House would be vacated to a temporary decant building while the other House remains in its current location.
- A secure buffer zone would be created to split the PoW in two along the line shown. Fire evacuation routes would require suitable adjustment.
- Construction work would then be undertaken in the vacated part of the building while business activities continue in the occupied part. Upon completion of Phase 1, the vacated House will re-occupy their space, followed by the other House vacating their space for Phase 2 of the construction works to proceed.

Zones and sequencing

Figure 75A: Zones and sequencing



Source: IOA Team analysis

- The House of Commons occupies 60% of The Palace of Westminster while The House of Lords Occupies the remaining 40%.
- We have proposed splitting the building in two along the lines shown adjacent. Due to the configuration of the MEP, the logical sequence of the works is to start at the Northern end, decanting Zone 1, the HoC first.

- An example of the likely high level sequence of work required to deliver Option 2 is set out below:
  - Decant the northern end of the Palace of Westminster;
  - Create a secure buffer zone to divide the PoW in two;
  - Decommission primary services at basement level while maintaining the southern end of the Palace live from the existing main boiler House, south sub-station, summer boiler House and mains water service / gas intake at southern end;
  - Strip out the northern end services installations, installation of new rationalised infrastructure at basement level and fit out on floors above;
  - Commission northern end utilising temporary low temperature hot water boilers and chillers;
  - Reoccupation of northern end;
  - Decant the southern end of the Palace of Westminster;
  - Decommission remaining old services infrastructure in the basement and strip out for example, boilers, hot water services, generators and chillers;
  - Complete new rationalised infrastructure at basement level and the fit-out on floors above including new boilers, low carbon heat source, chillers and hot water supply generation;
  - Commission southern end from new plant including connections to northern end plus removal of northern end temporary plant; and
  - Reoccupation of southern end.

6.2.6 Delivery approach

Scenario 2A is delivered in two phases. The Chambers and associated support space will move to a decant location outside the PoW. Once one zone is completed the staff and users will reoccupy the PoW and the second zone will be decanted for works to be carried out

Temporary relocation of staff

Table 72: Temporary relocation of staff

Commons department	Moves to
Ground floor	
Chapel	Closed (alternative place of worship to be provided)
Kitchen and Dining	Closed or Decant Building
PED	TBC
Members' Offices	Southern Buildings
Speaker's Residence	TBC
Principal floor	
The Commons Chamber	Decant Building X
Serjeant at Arms	Decant Building X
All Support Space	Decant Building X
Commons Library	Decant Building X
Kitchen and Dining	Closed or Decant Building X
Whips' Offices	Decant Building X
Members' Offices	Southern Buildings
Speaker's Residence	TBC
First floor	
Chamber Galleries	Decant Building X
Committee Rooms	Decant Building X
Reporters	Decant Building X
Members' Offices	Southern Buildings
Speakers' Residence	TBC
Upper floors	
Chamber Galleries	Decant Building X
Committee Rooms	Decant Building X
Reporters	Decant Building X
Members' Offices	Southern Buildings
Speaker's Residence	TBC

Lords department	Moves to
Ground floor	
Peers' Offices	Decant Building X
Peers' Dining	CLOSED or Decant Building X
PED	TBC
Police Accommodation	Decant Building X and Courtyard
Principal floor	
The Lords Chamber	Decant Building X
Black Rod's Offices	Decant Building X
Whips' Offices	Decant Building X
Peers' Offices	Decant Building X
Peers' Dining	CLOSED or Building X
Lords' Library	Decant Building X
Robing Room and Royal Gallery	Decant Building X
Lord Speaker's Accommodation	TBC
First floor	
Peers' Offices	Southern Buildings
Committee Rooms	Decant Building X
Lord Speaker's Accommodation	TBC
Upper floors	
Peers' Offices	Southern Buildings
Archives	New accommodation (Programme assumption)

- The phasing and decant plans adjacent demonstrate one possible outcome to enable a partial decant of the Palace of Westminster and undertake the Programme in two phases.
- The HoC and HoL Chambers will have to decant to a temporary Chamber to allow works to be completed in these areas.
- The strategy is based on any one House and associated functions moving out to buildings within the estate, works being undertaken in the vacated part of the Palace, followed by a second phase where the second House and associated functions would move out to allow the scope of works to be delivered.
- To deliver this Scenario, only the Southern estate and building X are expected to be used.
- Securing availability of suitable decant buildings that will accommodate all of the decanted functions of Parliament within eight minutes of the respective Chambers, is essential to deliver this Option. These buildings would need to be available and ready to operate prior to the start of the Programme, currently assumed to be mid-2020.
- For a mid-2020 start of the works, the decant buildings would have to be designed, adapted, fitted-out, and tested for all necessary security and business continuity / operational requirements.
- While the Chambers and associated functions and committee rooms would relocate to either Building X or Building Y, Members' and Peers' offices would be moved to parts of the Southern buildings.

Source: IOA Team analysis

6.2.7 Potential scope

The total replacement of all plant, services infrastructure, and systems plus removal of asbestos. All internal spaces refurbished, including conservation works to heritage items and fabric. All external fabric repaired, cleaned and refurbished including Elizabeth Tower and the clock

Summary of Scenario 2A potential scope

- The table below outlines the illustrative scope of works that is to be provided in Scenario 2A. For greater detail on the works included in each Scenario please see Volume 2, Appendix D.1.
- Examples of the scope of work that could be provided in Scenario 2A are:
  - All mechanical and electrical services replaced;
  - All interior fabric restored and refurbished;
  - External fabric restored and cleaned;
  - Works carried out to improve access for all;
  - New lifts to provide improved access within PoW;
  - Permanent education facilities;
  - Assumed archives relocation to an off site facility;
  - Improved security zoning;
  - Improved protection of the building from fire; and
  - Asbestos removed from all areas where work is carried out.

Table 73.1: Summary of Scenario 2A potential scope

Ref	Description
A	**General works**
A10	Building exterior
A10.1	External fabric
A10.2	External works
A10.3	External mechanical and electrical services
A20	Building interior
A20.1	Plant
A20.2	Horizontal and vertical services infrastructure
A20.3	IT systems
A20.4	Security systems
A20.5	Mechanical and electrical services works per room / space / zone
A20.6	Architectural works
A20.7	Asbestos works
B	**Specific items**
B10	**Lifts**
B10.1	Replace or refurbish existing lifts
B10.2	New lift and shafts
B10.3	Structural works associated with existing lifts to extend shaft to serve additional floors
B10.4	Structural works associated with existing lifts to provide step-free access at ground floor level
B10.5	Provision of new local lifts to address step changes and achieve greater step free access
B10.6	Replacement of existing goods and people lifts
B10.7	Replacement of existing goods only lifts
B20	**Archives – Archives are assumed to relocate to a new off site building**
B30	**Fire compartmentation works – Further works completed to improve fire compartmentation**

Source: IOA Team analysis

6.2.7 Potential scope

The total replacement of all plant, services infrastructure, and systems plus removal of asbestos. All internal spaces refurbished, including conservation works to heritage items and fabric. All external fabric repaired, cleaned and refurbished including Elizabeth Tower and the clock

Table 73.2: Summary of Scenario 2A potential scope

Ref	Description
B40	**Architectural interventions**
B40.1	**Security driven**
B40.1.1	Installation of new access control systems on doors and areas to provide greater demarcation of security zones
B40.1.2	Increase in size of the visitor screening area - extension to the existing Cromwell Green screening area - assume double in size
B40.1.3	Replace existing vehicle protection measures with more appropriate design
B40.2	**Catering driven**
B40.2.1	Replacement of the terrace marquees on the river front terrace
B40.3	**Business driven / support driven**
B40.3.1	Permanent education centre
B40.3.3	Basement, PED Craft, team workshops - relocate Change of use opportunity. Space is unsuitable for usage with health and safety risks associated with dust and fumes. Move craft team to alternative location. Space available for alternative usage.
B40.3.4	Basement, Lords' and Commons' Library Archive Relocate change in use Change of use opportunity. Space is unsuitable for usage with damp/RH and space issues. Move archive to alternative location (off site)
B50	**Mechanical and electrical enhancements / additions**
B50.1.1	Installation of new access control systems on doors and areas to provide greater demarcation of security zones within the palace (3 zones)
B50.1.2	Installation of Improved external CCTV

Source: IOA Team analysis

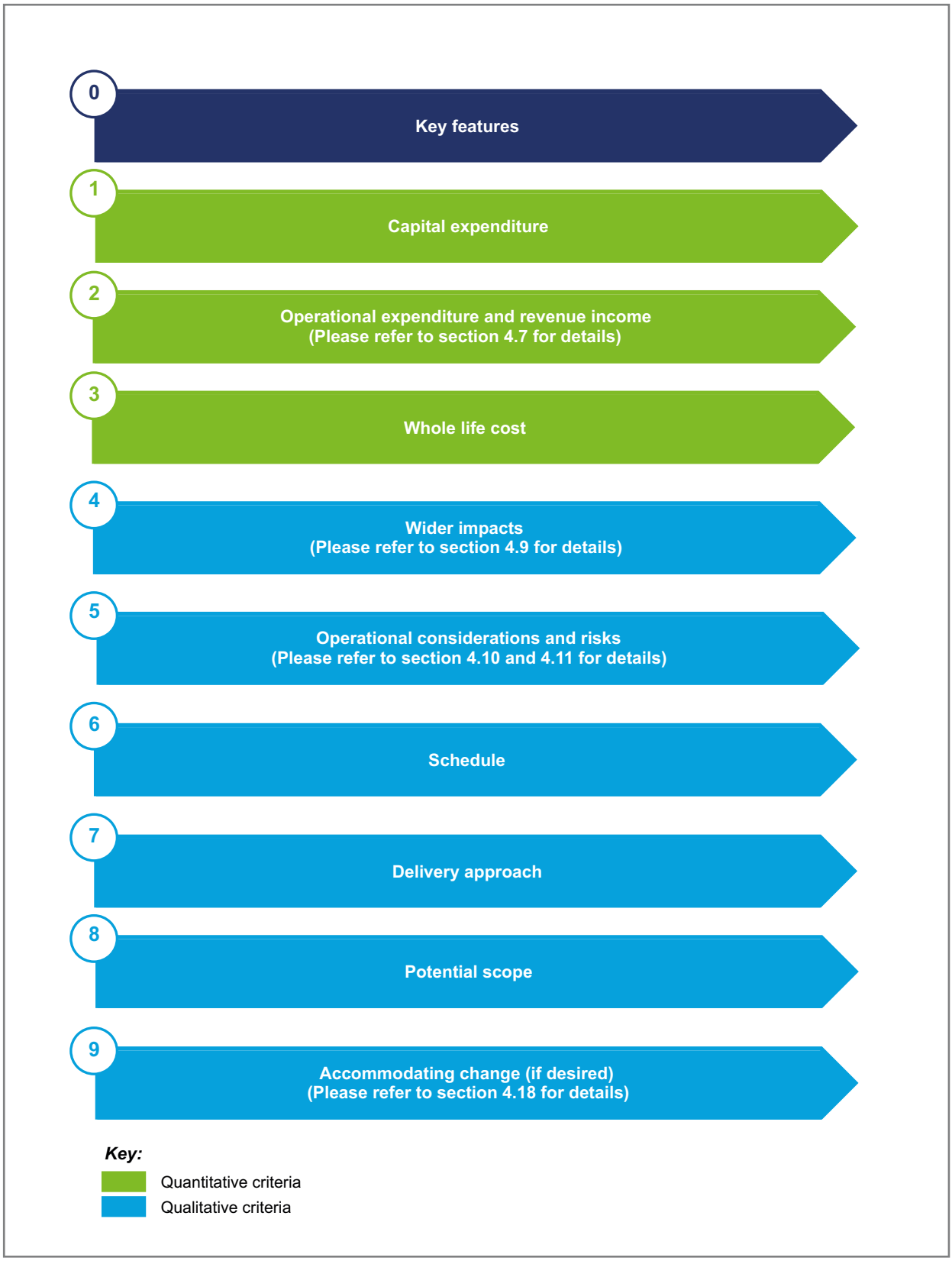
6.3 Scenario 2B

6.3.1 Overview

Scenario 2B involves a partial decant of the PoW and delivers some enhanced amenity and functionality once works are completed. It is delivered in an overall time period of 11 years with an estimated P50 capital cost of £4.4bn

Key components of Scenario overview

Figure 76: Key components of Scenario overview



6.3.1 Overview

Scenario 2B involves a partial decant of the PoW and delivers some enhanced amenity and functionality once works are completed. It is delivered in an overall time period of 11 years with an estimated P50 capital cost of £4.4bn

Table 74: Overview of Scenario 2B

Category	Key features and supporting commentary
1. Capital expenditure (capital expenditure)	The total required capital expenditure is £4.42bn (based on P50). The expenditure is principally derived from the inflationary impact and the associated risks of the Programme. The cashflow requirement over the first five years of the Programme is £450m.
2. Operational expenditure and revenue income	The total annual FM operational expenditure is £46.39m. The current services will need to be maintained as part of business as usual, however only covering half of the PoW. The lifecycle replacement programme will need to maintained for the occupied half of the PoW, until such time the new plant and services are installed. The implications for operational management and interface (including large and potentially intrusive buffer zones) between the occupied half of the PoW and the unoccupied (i.e. the construction activities) could be an ongoing management and security burden over the Programme schedule.
3. Whole life cost	NPC £9.1 bn. Early investment does increase the relative contribution to the NPC costs of this Scenario, but does ensure the early retention of the fabric elements and the quality standards for this historic and Grade 1 listed building. Simultaneously business continuity risk including catastrophic failure of building services is reduced at a reasonable rate.
4. Wider impacts	The rate of progress and Outcome Level will limit the extent to which positive wider impacts could be extracted. Some opportunity to embrace the full extent of good industry programme delivery practice, given the Programme schedule. Careful communication management will need to be monitored especially around the requirement of a double decant and reoccupation.
5. Operational risk/ impact	The business risk profile will reduce at a reasonable rate especially given the partial decant and the capital investment. Members and other users of the PoW will be subjected to increased levels of Nuisance (contractors undertaking works across the unoccupied half of the PoW) and the relocation to a single decant building. Once within the decant building the Disruption and Nuisance factors should remain at relatively low levels.
6. Schedule	Based on assumed construction start date (Q2 2020), the overall schedule to delivery the Programme of works is 11 years based on the most likely programme. This time period assumes that a partially vacated Palace of Westminster is available by the start date for a contractor to commence construction activity. The overall schedule for option 2B has been reviewed against other similar projects for delivery output, key resources and rate of capital spend. Our analysis shows that there is a 50% chance of completing works in one House within one Parliamentary term.
7. Delivery approach	The PoW will be split into two substantial construction zones that will be sequentially closed to users for a significant period of time, while major works are carried out. Some aspects of Parliamentary business will be required to relocate to temporary accommodation, however the PoW would not be closed. A significant proportion of the collections will remain on site and therefore security will need to maintained to a high degree and possibly to the same level and extent as in the construction zone as the occupied zone. The clock maintenance team will still require access to Elizabeth Tower throughout the entire Programme. The access arrangements will need to be closely managed between the client function and the supply chain.
8. Potential scope	To include: Compliance with policy and legislation of the World Heritage and Grade 1 listing status of the PoW; Repaired or replaced systems on a like for like basis to contemporary standards of design and quality, optimising costs and benefits; Building environment standards expected of public buildings will be achieved; Achieving any additional built environment policy objectives stated by both Houses; Provide facilities to meet the stated objectives of both Houses (such as inclusion, outreach and education); Defined improvements to amenities and functionality within the constraints of the present design of the PoW. Future proofing of infrastructure and provision for change to the current occupation where the requirement can be only loosely anticipated, over an indefinite period.
9. Accommodating change (if desired)	Potentially some opportunity to deliver future proofing, however lifecycle replacement will start to encroach on the Programme i.e. services plant life expectancy may expire ahead of Programme completion in some areas of the PoW. Delivers improvement in use of space and additional amenity for users and visitors and spaces will be reconfigured to enhance facilities. There may be some opportunities to make adaptations to core business processes for functions that are relocated to the decant building(s).

Source: IOA Team analysis

Why deliver this Scenario?

- Scenario 2B would delivery the Programme Objectives far quicker than E1A and therefore reduces operational risk quicker.
- This Scenario will deliver improved amenity and functionality compared to the existing PoW.
- Moving out of and back into the PoW could provide an opportunity to facilitate new and enhanced business processes and ways of working could be adopted.
- The public may have an opportunity to access the PoW during the works as a large zone of the PoW will not be in use by Parliament. Public visits could be used to help raise Programme awareness and the profile of the works.

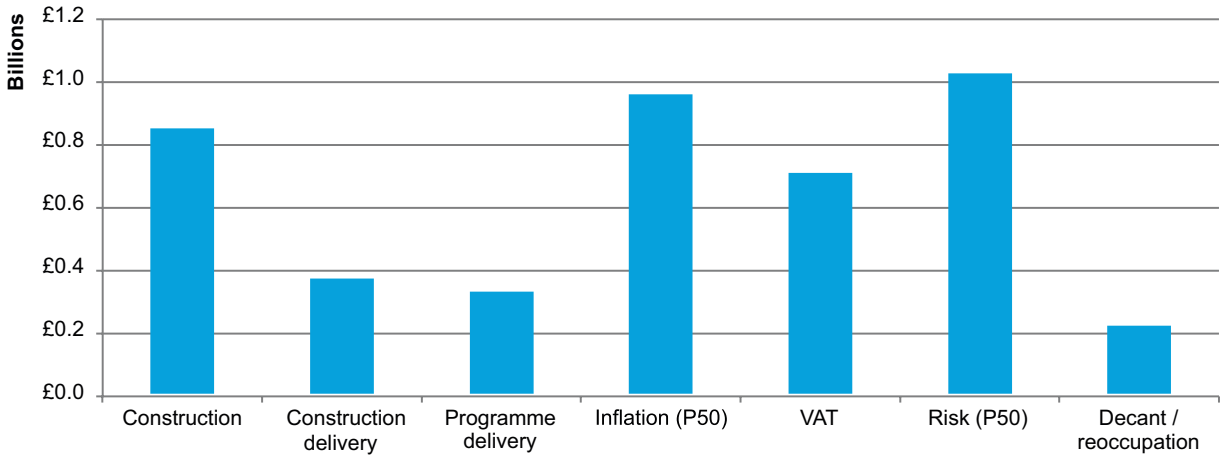
6.3.2 Capital expenditure

Risk and inflation represent the most significant components of the overall capital cost for Scenario 2B. However, theses costs are lower than for Scenario E1A

Capital expenditure

- The chart below outlines the component elements of the capital expenditure for Scenario 2B. Definitions of the component elements are included on the following page.
- Inflation, risk, VAT and construction represent the largest areas of expenditure for this Scenario. However, all areas are lower in cost than in E1A.
- The high cost of inflation reflects the significant schedule duration and the risk allowance reflects the inherent risks resulting from the delivery Option, for example, unavailability of decant space.

Figure 77: Capital expenditure based on P50

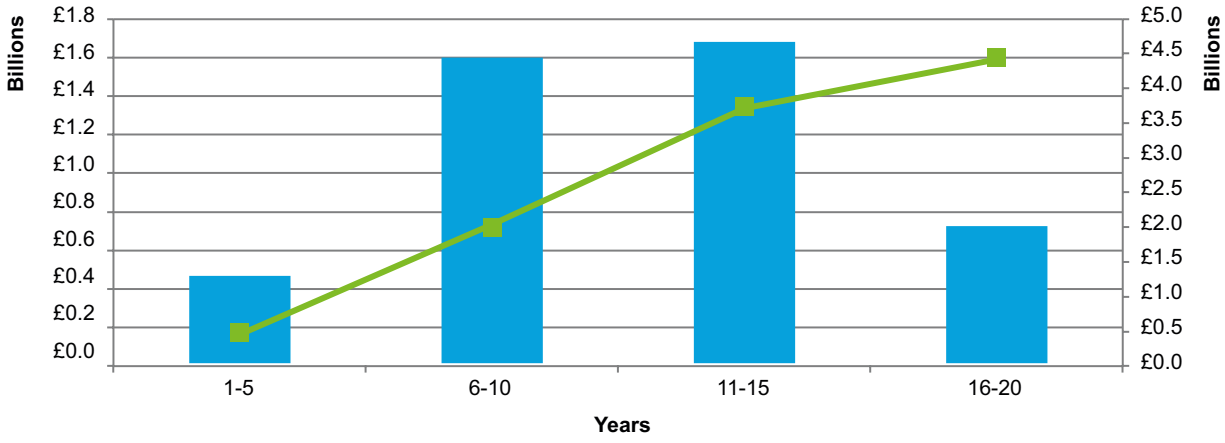


Source: IOA Team analysis

Initial capital expenditure cashflow – based on P50

- The chart below outlines the P50 cashflow for Scenario 2B.
- The bar chart highlights the five yearly expenditure (left hand scale) and the line graph represents the cumulative cashflow totals (right hand scale).
- The start date of the cashflow is Q3 2014 and is based on the P50 costs.
- The lowest expenditure is expected to occur between years 1-5. During this time the delivery model will be developed and the design will be progressed. The costs associated with this work are more modest than the costs incurred once construction begins.
- The highest expenditure is expected to occur between years 11-15. This period is when Phase 1 completes and staff and users move back into the PoW. Phase 2 works will then begin once the second zone of the PoW has been decanted.

Figure 78: Initial capital expenditure based on P50



Source: IOA Team analysis

6.3.2 Capital expenditure

Risk and inflation represent the most significant components of the overall capital cost for Scenario 2B. However, these costs are lower than for Scenario E1A

Elemental breakdown of initial capital expenditure

- The table below provides an elemental breakdown to the initial capital cost required under Scenario 2B. The sub total is based on P50 figures, however the elemental costs (including inflation, risk, VAT and decant/reoccupation are presented on a P10, P50 and P90 range.

Table 75: Elemental breakdown of the capital expenditure

Element		Item	Cost (£m)	Total (£m)
Construction	Building works	Fabric – envelope	83	**844**
		Fabric – internal finishes	73	
		Other building works	126	
		Additional scope	175	
	Mechanical and electrical services	Services	387	
Construction delivery	Base method related costs		160	**365**
	PoW specific costs		36	
	Option specific		111	
	Overheads and profit		58	
Programme delivery	Programme management and technical support		102	**325**
	Client assurance and legal		34	
	Project team and design costs		189	
Sub-total (P50)				**1,534**

Element		P10 (£m)		P50 (£m)		P90 (£m)	
Inflation	Pre commencement	250	**712**	335	**953**	533	**1,516**
	Construction phase	462		618		983	
Risk	Construction delivery	724	**819**	900	**1,018**	1,070	**1,210**
	Programme management	95		118		140	
VAT @ 20%		**613**		**701**		**852**	
Temporary relocation / reoccupation		**98**		**215**		**301**	
Total		**3,776**		**4,421**		**5,413**	

Source: IOA Team analysis

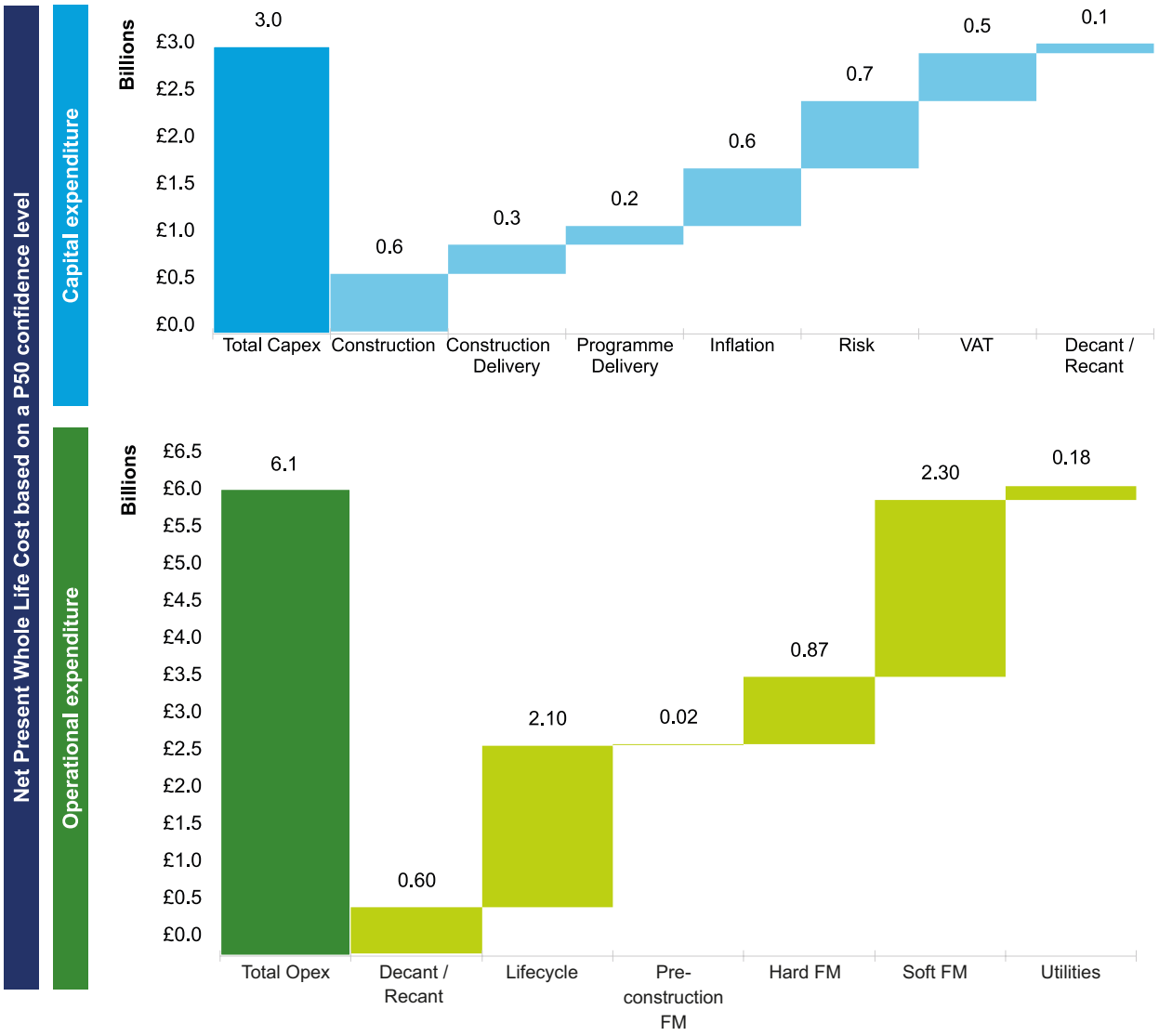
6.3.3 Estimated whole life cost

Scenario 2B would require an initial discounted total capital cost of £3.0bn. Taking into account all operational costs (including decant/reoccupation costs) at £6.1bn, with the Net Present Whole Life Cost is estimated to be £9.1bn

Introduction

- The purpose of creating a whole life cost model for each of the scenarios is to allow a like for like comparison to be made between programmes and expenditure profiles that differ significantly in nature.
- Ultimately, Net Present Whole Life Cost will be used to inform the Outline Business Case. Whole life cost is modelled over 60 years (a standard Treasury Green Book duration for major infrastructure programmes) and the components of Whole Life Cost Discounted by 3% per annum from the date at which they would be incurred, to today (Q2 2014).
- Over a 60 year period, Operational expenditure is more than twice those of Capital expenditure. Soft FM costs are the most significant costs due to the maintenance and security issues of occupying two sites.

Figure 79: Net Present Whole Life Cost based on a P50 confidence level



Source: IOA Team analysis

6.3.3 Estimated whole life cost

Scenario 2B would require an initial discounted total capital cost of £3.0bn. Taking into account all operational costs (including decant/reoccupation costs) at £6.1bn, with the Net Present Whole Life Cost is estimated to be £9.1bn

Components of whole life cost

- The components of whole life cost are as follows:
  - Capital Expenditure:
    - Construction: The scope of works.
    - Construction Delivery: Contractor's preliminary costs, logistics, temporary accommodation, security etc..
    - Programme Delivery: Professional fees
    - Inflation: Modelled at a P50 level at 3.64%
    - Risk: An allowance reflecting a basket of risks particularly those that would have a time impact if realised.
    - VAT: at the current prevailing rate of 20%
    - Decant / relocation: the cost of temporary buildings including acquisition and fit out required to facilitate a particular scenario.
  - Operational Expenditure:
    - Decant / relocation: the operational costs of any temporary buildings.
    - Lifecycle Costs: The cost of replacing building components as they become life expired.
    - Pre construction FM: The cost of Facilities Management associated with zones that have yet to be completed
    - Hard Facilities Management: Maintenance of building components (e.g. boiler servicing)
    - Soft Facilities Management: Cleaning, security and other 'people focussed' aspects.
    - Utilities: Gas, power, telecoms etc..

Net Present Cost

- The table below outlines the capital and operational costs based on a P10-P90 confidence level:

Table 76: Summary of Net Present Cost

	P10	P50	P90
Capital expenditure	£2.5bn	£3.0bn	£3.6bn
Operational expenditure	£5.5bn	£6.1bn	£8.8bn
Total whole life cost	**£8.0bn**	**£9.1bn**	**£12.4bn**

Source: IOA Team analysis

6.3.4 Operational considerations and risks

A key operational risk in Scenario 2B is Nuisance or Disruption caused by works being completed in close proximity to the Chambers and offices. Availability of suitable decant space is also a key operational consideration

Operational risk/impact

- The key operational considerations for Scenario 2B have been summarised within the tables below. The key considerations include:
  - Nuisance associated with working in an existing building that is fully operational;
  - Ability to effect a suitable decant strategy; and
  - Security and fire risks associated with a contractor occupying a major part of the building.

Key: Unlikely to meet Parliamentary requirements ○
Likely to meet Parliamentary requirements ●

Table 77: Delivery Option 2 – Operational considerations

	Delivery Option 2 – Operational considerations	Illustrative scale	Potential actions to adopt
1	**Operational impact – Nuisance:** There could be significant Nuisance during the programme works, despite only half the PoW being occupied. Noise, dust and general contractor presence are all likely to directly impact the core business of Parliament. These Nuisance factors could manifest itself in minor delays to programme.	○	• Greater control over the contractors may need to be adopted given the PoW is still partially occupied. • Nuisance levels are to be actively monitored and recorded.
2	**Decant / reoccupation Disruption:** Members of both Houses will have to vacate the PoW at the appropriate times. This process will cause Disruption to individuals during both the decant and the reoccupation. This will be more disruptive than Delivery Option 3 as the Houses will not be collocated.	◑	• A decant plan will need to be developed setting out which Members will decant /reoccupation and when.
3	**Fire safety management:** The fire strategy may have to be closely managed and regularly amended to suit the day to day activities on site. This process will need to be carried out at the point when each phase is completed, but also during each phase to ensure a safe means of escape and clear fire routes are constantly maintained.	○	• Fire strategy to be periodically refreshed and updated. • London fire brigade to be consulted on a regular basis during the programme.
4	**Security management:** A separate Security Report has been prepared to cover this.		• See separate security report
5	**Ceremonial impacts:** Issues with only half the building. The considerations could potential be worse in this delivery Option rather than 1 and 3.	◕	• Bespoke ceremonial arrangements will need to be finalised, which take account of the varying circumstances of the PoW.
6	**Site Logistics:** With the PoW split in two, logistics will prove challenging. The way deliveries are managed will have to change from the existing process, which could result in some teething issues.	◕	• A new site delivery plan will need to be agreed addressing both the occupied and non occupied (contractor run) sides of the PoW. • Materials associated for the Programme works may need to be delivered to a separate site for screening and security.

Source: IOA Team analysis

6.3.4 Operational considerations and risks

A key operational risk in Scenario 2B is Nuisance or Disruption caused by works being completed in close proximity to the Chambers and offices. Availability of suitable decant space is also a key operational consideration

Table 78: Delivery Option 2 – Operational risk

	Delivery Option 2 – Operational risk	Potential mitigating actions	Illustrative rating
1	**Operational impact - invasive works:** A temporary infrastructure solution will be needed to allow half the PoW to be restored and renewed, however this could become a Nuisance to the business of parliament e.g. service diversions are likely to pass through the construction site and the partially occupied PoW and therefore could be subject to damage and or create more Nuisance during the programme schedule.	• Agree protocols with both Houses including any revised rules of engagement for invasive works • Establish and maintain delivery plan for all invasive works • Plan for contingent activity, should unforeseen matters be encountered	
2	**Availability of decant premises:** There is a significant risk that premises may not be available that are suitable to House one of the Chambers. This dependency could dictate which delivery Option is actually deliverable and feasible.	• Research market conditions • Identify suitable options • Understand market implications and availability challenges • Effect transaction	
3	**Delivery and completion of decant building fit out:** The remodelling required to the decant building to meet Parliamentary requirements, is likely to be significant. These fit out works will need to be completed and the facilities thoroughly tested ahead of the programme start date, to ensure any associated risk to Parliament are minimised. The timeframe for these works will be considerable and therefore requires decant premises to be secured in the near future.	• Set out space utilisation plans • Develop outline and detailed plans and specifications • Procurement and delivery of fit out • Test decant building thoroughly	
4	**Security and fire risks:** Given that the site will be partially occupied it will be a challenge to manage any breach of the site boundary. The site will be in close proximity to the working business of Parliament and a construction site.	• Define clear access routes • Implement security measures • Establish, maintain and adapt fire detection	
5	**Ongoing terms of engagement:** Approval of overarching decant solution. Occupiers may not agree to the Disruption of decanting during the programme of works.	• Confirm revised terms of engagement for works in occupied accommodation • Implement and monitor activity for compliance with the revised terms	

Source: IOA Team analysis

Key:

Low Risk Medium Risk High Risk

6.3.5 Schedule

Scenario 2B is likely to deliver the core objectives of the Programme in a period of 11 years. The works are proposed to be delivered in two phases, with one Chamber and the associated accommodation moving out in each phase

Overview

- Each House of the Palace of Westminster would be closed to users in turn, for a significant period while major work is carried out. They would require relocation to a temporary location, but the Palace would not be closed.
- A partial decant delivery method results in a delivery programme that is approximately twice the duration of a full decant delivery timeline.
- The building will retain aspects of heritage items and equipment requiring restoration, forming part of the Programme scope of works. These include works of art, furniture, and fixed items including elements of the building fabric. Due to a significant proportion of the collections having to remain on site, security will need to be maintained to a high degree and possibly to the same extent in the construction zone as the occupied zone.
- Additionally, when zone 1 is being worked on, the clock maintenance team will require access to Elizabeth Tower to keep the clock fully functional during implementation of the Programme. There may be other regular maintenance access requirements that need to be satisfied during the delivery of the works. These access arrangements will need to be closely managed between the client and contractor.

Table 79: Scenario 2B key dates

Scenario 2B – Key dates	Phase 1	Phase 2
Pre-business case	2014-16	
Design	2015-19	
Pre-construction enabling works	2015-20	-
Construction works	2020-25	2027-29
Handover	2025	2030-31
Reoccupation	2026	2031

Source: IOA Team analysis

Construction schedule

- The following construction schedule has been developed for Scenario 2B.

Table 80: Construction schedule

Scenario	Lower range	Most likely	Upper range
Scenario 2B	9 years	11 years	14 years

Source: IOA Team analysis

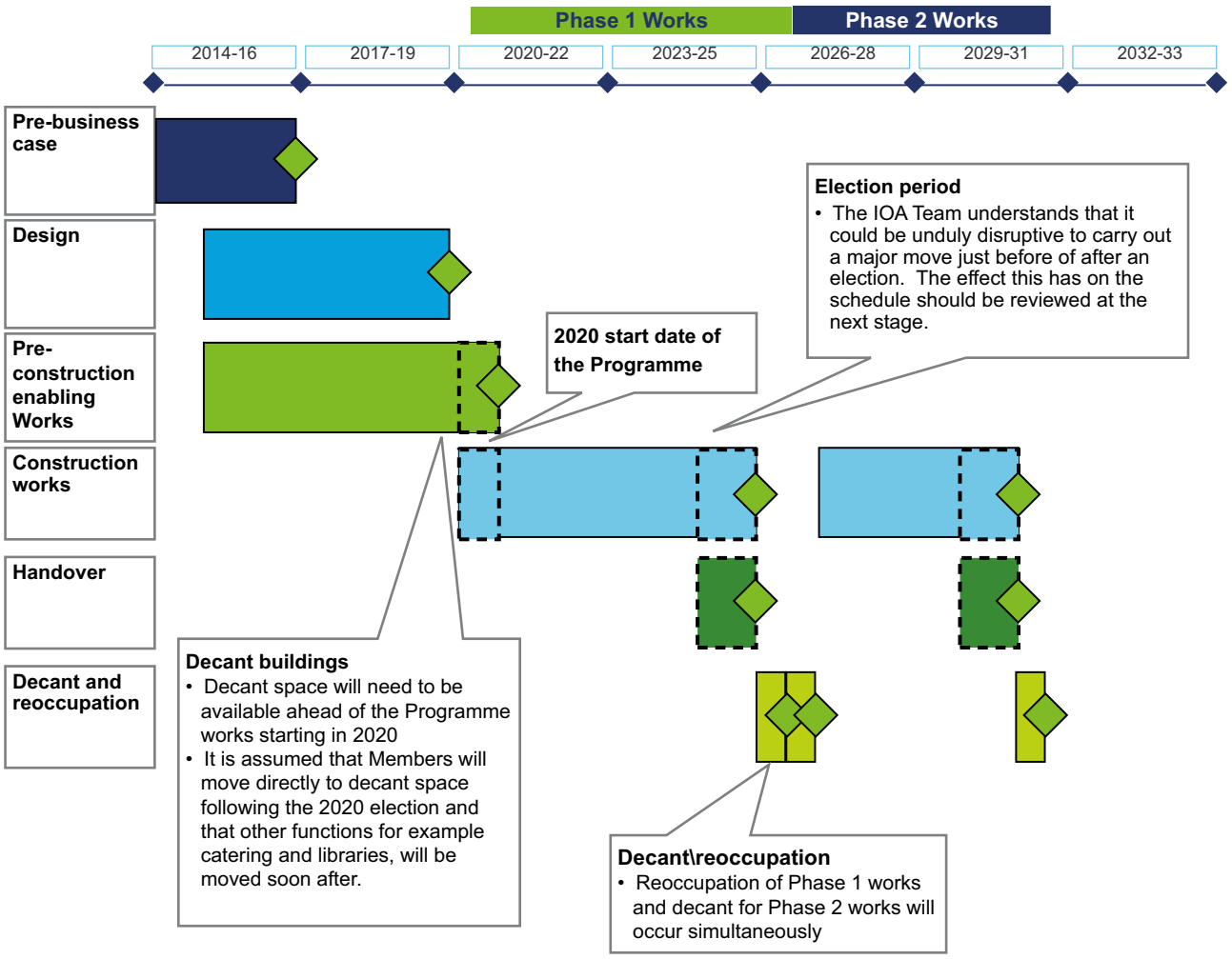
Key assumptions

- The following key assumptions underpin the assessed programme period for this scenario:
  - An assumed start date in Q2 2020;
  - A six month period of site surveys and enabling works prior to full construction work commencing;
  - The testing and commissioning activity will overlap with physical construction work. There will be a dedicated period to complete the testing, commissioning, balancing and trial running of all new systems, prior to reoccupation;
  - There is a dedicated period for moving occupants and their business functions back to the PoW; and
  - It is assumed that the Programme is not currently impacted by move constraints around election dates.

6.3.5 Schedule

Scenario 2B is likely to deliver the core objectives of the Programme in a period of 11 years. The works are proposed to be delivered in two phases, with one Chamber and the associated accommodation moving out in each phase

Figure 80: Scenario 2B schedule



Source: IOA Team analysis

Key:

Construction Works | Handover | Reoccupation

6.3.6 Delivery approach

Scenario 2B is delivered in two phases. The Chambers and associated support space will move to a decant location outside the PoW. Once one zone is completed the staff and users will reoccupy the PoW and the second zone will be decanted for works to be carried out

Key delivery risks

- The following key risks are applicable to this scenario:
  - Inability to secure adequate decant accommodation;
  - Major temporary services may be required to keep occupied spaces fully functional;
  - Remaining building operation, use, security and functionality potentially compromised due to site logistics;
  - Damage could be caused to artefacts during the works;
  - Maintenance of safety systems / environment during the works;
  - Disruption and Nuisance to occupiers – noise, access restrictions, ceremonial restrictions, could impact the business of Parliament;
  - Materials may require greater security screening due to the split occupancy site; and
  - There is a risk that there may not be enough specialist labour in the market to service the Programme.

Delivery approach

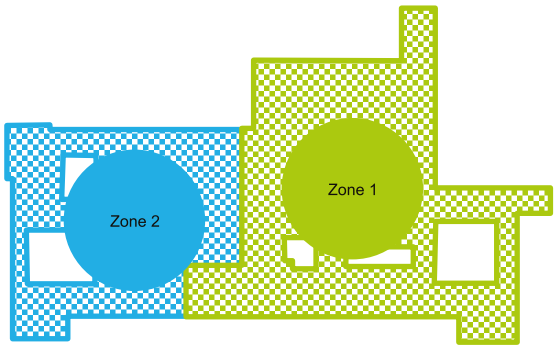
In a partial decant Option, one House would be vacated to a temporary decant building while the other House remains in its current location.

A secure buffer zone would be created to split the PoW in two along the line shown. Fire evacuation routes would require suitable adjustment.

Construction work would then be undertaken in the vacated part of the building while business activities continue in the occupied part. Upon completion of Phase 1, the vacated House will re-occupy their space, followed by the other House vacating their space for Phase 2 of the construction works to proceed.

Zones and sequencing

Figure 81: Zones and sequencing



- The House of Commons occupies 60% of The Palace of Westminster while The House of Lords Occupies the remaining 40%.
- We have proposed splitting the building in two along the lines shown adjacent. Due to the configuration of the MEP, the logical sequence of the works is to start at the Northern end, decanting Zone 1, the HoC first.

Source: IOA Team analysis

- An example of the likely high level sequence of work required to deliver Option 2 is set out below:
  - Decant the northern end of the Palace of Westminster;
  - Create a secure buffer zone to divide the PoW in two;
  - Decommission primary services at basement level while maintaining the southern end of the Palace live from the existing main boiler House, south sub-station, summer boiler House and mains water service / gas intake at southern end;
  - Strip out the northern end services installations;
  - Installation of new rationalised infrastructure at basement level and fit out on floors above;
  - Commission northern end utilising temporary low temperature hot water boilers and chillers;
  - Reoccupation of northern end;
  - Decant the southern end of the Palace of Westminster;
  - Decommission remaining old services infrastructure in the basement and strip out for example, boilers, hot water services, generators and chillers;
  - Complete new rationalised infrastructure at basement level and the fit-out on floors above including new boilers, low carbon heat source, chillers and hot water supply generation;
  - Commission southern end from new plant including connections to northern end plus removal of northern end temporary plant; and
  - Reoccupation of southern end.

6.3.6 Delivery approach

Scenario 2B is delivered in two phases. The Chambers and associated support space will move to a decant location outside the PoW. Once one zone is completed the staff and users will reoccupy the PoW and the second zone will be decanted for works to be carried out

Temporary relocation of staff

Table 81: Temporary relocation of staff

Commons department	Moves to
Ground floor	
Chapel	Closed (alternative place of worship to be provided)
Kitchen and Dining	Closed or Decant Building
PED	TBC
Members' Offices	Southern Buildings
Principal floor	
Serjeant at Arms	Decant Building X
All Support Space	Decant Building X
Commons Library	Decant Building X
Kitchen and Dining	Closed or Decant Building X
Whips' Offices	Decant Building X
Members' Offices	Southern Buildings
Speaker's Residence	TBC
First floor	
Chamber Galleries	Decant Building X
Committee Rooms	Decant Building X
Reporters	Decant Building X
Members' Offices	Southern Buildings
Speakers' Residence	TBC
Upper floors	
Chamber Galleries	Decant Building X
Committee Rooms	Decant Building X
Reporters	Decant Building X
Members' Offices	Southern Buildings
Speaker's Residence	TBC

Lords department	Moves to
Ground floor	
Peers' Offices	Decant Building X
Peers' Dining	Closed or Decant Building X
PED	TBC
Police Accommodation	Decant Building X and Courtyard
Principal floor	
The Lords Chamber	Decant Building X
Black Rod's Offices	Decant Building X
Whips' Offices	Decant Building X
Peers' Offices	Decant Building X
Peers' Dining	Closed or Building X
Lords' Library	Decant Building X
Robing Room and Royal Gallery	Decant Building X
Lord Speaker's Accommodation	TBC
First floor	
Peers' Offices	Southern Buildings
Committee Rooms	Decant Building X
Lord Speaker's Accommodation	TBC
Upper floors	
Peers' Offices	Southern Buildings
Archives	New accommodation (Programme assumption)

- The phasing and decant plans adjacent demonstrate one possible outcome to enable a partial decant of the Palace of Westminster and undertake the Programme in two phases.
- The HoC and HoL Chambers will have to decant to a temporary Chamber to allow works to be completed in these areas.
- The strategy is based on any one House and associated functions moving out to buildings within the estate, works being undertaken in the vacated part of the Palace, followed by a second phase where the second House and associated functions would move out to allow the scope of works to be delivered.
- To deliver this Scenario, only the Southern estate and building X are expected to be used.
- Securing availability of suitable decant buildings that will accommodate all of the decanted functions of Parliament within eight minutes of the respective Chambers, is essential to deliver this Option. These buildings would need to be available and ready to operate prior to the start of the Programme, currently assumed to be mid-2020.
- For a mid-2020 start of the works, the decant buildings would have to be designed, adapted, fitted-out, and tested for all necessary security and business continuity / operational requirements.
- While the Chambers and associated functions and committee rooms would relocate to either Building X or Building Y, Members' and Peers' offices would be moved to parts of the Southern buildings.

Source: IOA Team analysis

6.3.7 Potential scope

The scope for this Scenario builds upon Outcome Level A to enhance security, catering, business, and support driven needs. Office space will be improved, additional amenity will be provided and the building will be more energy efficient

Summary of Scenario 2B potential scope

- The table below indicates the illustrative cope of works that is to be provided in Scenario 2B. For greater detail on the works included in each Scenario please see Volume 2, Appendix D.1.
  - Examples of scope of work, additional to Outcome Level A that could be provided in Scenario 2B are:
  - Upper floor office areas could be remodelled and upgraded;
  - Comfort cooling could be provided to additional areas;
  - A new media centre could be provided;
  - An on site energy centre could be provided;
  - Courtyards could be landscaped and pedestrianised;
  - Additional lifts could be provided for example in Elizabeth Tower;
  - Cloister Court could be made more accessible;
  - Boiler House Court could be remodelled to create a larger courtyard; and
  - The modern building addition could be removed from Chancellors Court.

Table 82.1: Summary of Scenario 2B potential scope

Ref	Description
A	**General works**
A10	Building exterior
A10.1	External fabric
A10.2	External works
A10.3	External mechanical and electrical services
A20	Building interior
A20.1	Plant
A20.2	Horizontal and vertical services infrastructure
A20.3	IT systems
A20.4	Security systems
A20.5	Mechanical and electrical services works per room / space / zone
A20.6	Architectural works
A20.7	Asbestos works
B	**Specific items**
B10	**Lifts**
B10.1	Replace or refurbish existing lifts
B10.2	New lift and shafts
B10.3	Structural works associated with existing lifts to extend shaft to serve additional floors
B10.4	Structural works associated with existing lifts to provide step-free access at ground floor level
B10.5	Provision of new local lifts to address step changes and achieve greater step free access
B10.6	Replacement of existing goods and people lifts
B10.7	Replacement of existing goods only lifts
B10.8	Install new duplex lifts for additional evacuation and business resilience
B10.9	Victoria Tower
B20	**Archives** – Archives are assumed to relocate to a new off site building
B30	**Fire compartmentation works** – Further works completed to improve fire compartmentation

Source: IOA Team analysis

6.3.7 Potential scope

The scope for this Scenario builds upon Outcome Level A to enhance security, catering, business, and support driven needs. Office space will be improved, additional amenity will be provided and the building will be more energy efficient

Table 82.2: Summary of Scenario 2B potential scope

Ref	Description
B40	**Architectural interventions**
B40.1	**Security driven**
B40.1.1	Installation of new access control systems on doors and areas to provide greater demarcation of security zones
B40.1.2	Increase in size of the visitor screening area - extension to the existing Cromwell Green screening area - assume double in size
B40.1.3	Replace existing vehicle protection measures with more appropriate design
B40.1.4	Install further blast rated secondary glazing
B40.1.5	Internal CCTV to be fitted in agreed areas
B40.1.6	Increased protection from threats from river
B40.2	**Catering driven**
B40.2.1	Replacement of the terrace marquees on the river front terrace
B40.2.3	Rationalisation of the Kitchens – re-planned and potentially relocated - To result in an assumed 10% reduction in area from current
B40.2.4	Improvements to banqueting and event facilities - access to them and capacity
B40.3	**Business driven / support driven**
B40.3.1	Permanent education centre
B40.3.3	Basement, PED Craft, team workshops - relocate Change of use opportunity. Space is unsuitable for usage with health and safety risks associated with dust and fumes. Move craft team to alternative location. Space available for alternative usage.
B40.3.4	Basement, Lords' and Commons' Library Archive Relocate change in use Change of use opportunity. Space is unsuitable for usage with damp/RH and space issues. Move archive to alternative location (off site)
B40.4	**Space Planning**
B40.4.1	Re-organisation of the internal space allocation to provide: - Increased break out, formal and informal meeting areas - greater changing areas + staff areas - more flexible accommodation and co-location of departmental teams
B40.5	**Media Centre**
B40.5.1	Create a Media Centre with space for interviews both off and on camera - this to be a facility within the Palace
B40.6	**Courtyards**
B40.6.1	Removal of Goods and waste distribution from Courtyards by: - New delivery and distribution regime, making use of basement corridors (enhanced by new mechanical and electrical installation reducing service volume in key corridors). - New vertical circulation extending to basement to improve local distribution - New point of delivery in Black Rods Garden, with link to underground distribution. - Existing boiler House [redacted] to form part of distribution system (taking advantage of, and dependant on, creation of off-site energy centres proposed by mechanical and electrical strategy). Or extend the existing boiler House to create a link down to the basement to allow service route to work - Opportunities to pedestrianize and landscape the courtyards as a result of the above
B40.6.2	Cloister Court - Removal of current ground floor usage, full repair and restoration to open ambulatory - Landscaping to Cloister Court
B40.6.3	Whips Area - Small external zone used as a main through route - Glass roof over to create internal space.
B40.6.4	Boiler House Court - Demolition of 20th century single storey structures within courtyard (PED Offices

Source: IOA Team analysis

6.3.7 Potential scope

The scope for this Scenario builds upon Outcome Level A to enhance security, catering, business, and support driven needs. Office space will be improved, additional amenity will be provided and the building will be more energy efficient

Table 82.3: Summary of Scenario 2B potential scope

Ref	Description
B40.6.5	The Bandstand - Removal of ground floor level partitioning, including Engineers Control area throughout area below Central - Reform floor and staircase access down to basement level - Form pedestrian access routes across bandstand area linking Whip's Area and Boiler House Court through to the Common's and Peer's Inner Courts.
B40.6.6	Chancellor's Court - Demolish lightweight glass building - Demolish cover to basement stairs - Landscape and pedestrianize courtyard - Change of use – Police area between Chancellor's and Royal Court to become office accommodation and ancillary facilities
B40.6.7	Peer's Court and Inner Court, Commons Court and Inner Court - Courtyards to be pedestrianized and landscaped retaining vehicle access for emergency use only. - Relocation of servicing and refuse provision away from courtyards - Rationalisation (or relocation) of catering areas fronting onto these courtyards to create new office accommodation (notably Peer's Court)
B40.7	**PoW Interiors**
B40.7.1	Westminster Hall Rooms - Remove meeting rooms from ground floor W rooms. - Remove/change usage of upper level IPU and Jubilee rooms. Extend Jubilee Café to provide open air seating in Cromwell Green - Provide visitor information, exhibition, shop and WC facilities across both floors
B40.7.1	North East Turret, light well - Remove Library usage of former central light-well at ground floor level, demolish internal structures, repair and rediscover light well for full height of building
B40.7.2	Third Floor, Upper Committee Corridor north and south - Poor quality Members and staff rooms, half with natural light via roof-light. Modern insertion, retaining east facing cast iron roof, and extending flat roof out to west side. - Demolish, retaining cast iron roof element. Rebuild with generous glazing to west (concealed) side. Re-plan to make best use of available natural light, likely to include larger open plan areas and access corridor to poorly lit (east) side. Make better use of existing dormer windows to cast iron roof.
B40.7.3	Peers Court and Commons Court rooms – east side - Rooms at 1st and 2nd floor levels including 'T' Block to Commons Court. Members' rooms of inadequate quality and layout. Refurbish, retaining envelope. Explore improving natural light penetration to Committee Corridor.
B40.7.4	Offices, west of Speaker's Court. 2nd floor level - Change of use, subject to reduction or relocation of reporters facilities. Refurbish offices to provide additional offices for Members and facilities, or to accommodate secretarial use moved from basement
B40.7.5	Reporters' Restaurant and kitchen area. 2nd floor level - Change of use to office accommodation. Refurbish and reorder to provide additional offices for Members and related facilities
B40.7.6	Committee Offices, north end of Committee Corridor, 1st and 2nd floor level - Change of use to office accommodation. Refurbish and reorder to provide additional offices for Members
B40.7.7	The Clock Tower (Elizabeth Tower) - New lift to north-west corner of tower, running from ground to level 10 (access unlikely to bell level above due to space and aesthetic restrictions). Removal of accommodation at ground floor to allow route through to lift. - Improved visitor facilities at intermediate levels, into repaired and refurbished rooms. Possible exhibition space depending on safe access / visitor numbers.
B40.7.8	Create bespoke storage on site for use by the Heritage Collections - Works of Art - historic furniture - books - architectural items - for ceremonial items

Source: IOA Team analysis

6.3.7 Potential scope

The scope for this Scenario builds upon Outcome Level A to enhance security, catering, business, and support driven needs. Office space will be improved, additional amenity will be provided and the building will be more energy efficient

Table 82.4: Summary of Scenario 2B potential scope

Ref	Description
B40.7.9	Create off site storage facility for Heritage Collections Use
B40.7.10	Create on site workshop facilities for Heritage Collection conservation works - minimum requirement; - multi-purpose with dry/clean lab and a wet/dirty lab
B50	**Mechanical and electrical enhancements / additions**
B50.1.1	Installation of new access control systems on doors and areas to provide greater demarcation of security zones within the palace (3 zones)
B50.1.2	Installation of Improved external CCTV
B50.1.3	Install fire suppression in building where possible
B50.1.4	Install CCTV for fire detection aspects
B50.1.5	Energy Centre for Palace alone (within palace) or Estate Wide Energy Centre
B50.1.6	Extend Comfort cooling to additional areas of the PoW
B50.1.7	Installation of renewable energy generation
B50.1.8	Install renewable energy systems

Source: IOA Team analysis

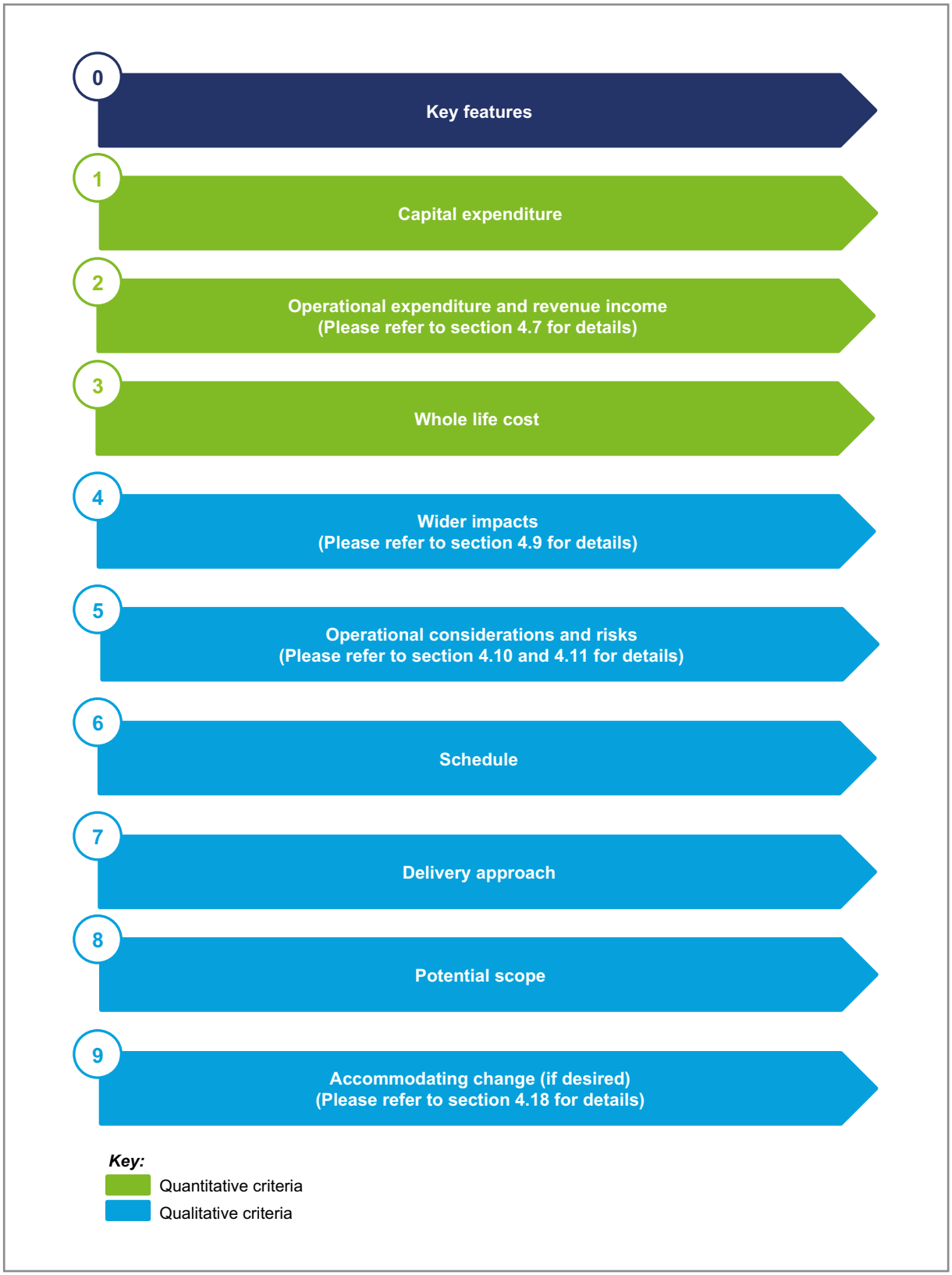
6.4 Scenario 3B

6.4.1 Overview

Scenario 3B involves a full decant of the PoW, and delivers enhanced amenity and functionality once works are completed. The works could be completed with a most likely schedule, in six years with an estimated capital cost of £3.5bn

Key components of Scenario overview

Figure 82: Key components of Scenario overview



6.4.1 Overview

Scenario 3B involves a full decant of the PoW, and delivers enhanced amenity and functionality once works are completed. The works could be completed with a most likely schedule, in six years with an estimated capital cost of £3.5bn

Table 83: Overview of Scenario 3B

Category	Key features and supporting commentary
1. Capital expenditure (capital expenditure)	The total required capital expenditure is £3.52bn (based on P50). The construction work costs represents the lowest across all of the Scenarios at £720m. The cashflow requirements in the first five years of the programme is £760m, which is similar to Scenario 3C.
2. Operational expenditure and revenue income	The total annual FM operational expenditure at the PoW is £19.05m.
3. Whole life cost	NPC £8.3 bn. Early investment does increase the relative contribution to the NPC costs of this Scenario, but does ensure the early retention of the fabric elements and the quality standards for this historic and Grade 1 listed building.
4. Wider impacts	This delivery Option affords the greatest opportunity to secure regional and national opportunities for individuals and businesses across the UK. This Scenario could provide an opportunity to establish and deliver an exemplar programme. It also provides a significant opportunity to engage with a large labour force, given the nature of the programme. Initiatives could be run, for example heritage and mechanical and electrical services skills academies, to provide wider economic benefit.
5. Operational risk/ impact	Operational risk levels should fall at a fast rate as a result of the decant. Members of both Houses will have to vacate the PoW, albeit this is likely to be on a phased basis. This process should cause relatively short term Disruption to individuals during both the decant and reoccupation of the PoW. Once within the decant building the Disruption and Nuisance factors should remain at relatively low levels. The PoW will not be able to accommodate any ceremonies and therefore the ceremonial processes will have to be revised and agreed to suit the new logistical constraints. Opportunities could be made available in the decant spaces.
6. Schedule	Based on assumed construction start date (Q2 2020), the overall schedule to deliver the Programme of works is 6 years based on the most likely programme. This time period assumes that the PoW is completely vacated and is available by the start date for a contractor to commence construction activity. The overall schedule has been reviewed against other similar projects for delivery output, key resources and rate of capital spend.
7. Delivery approach	All occupants will be decanted from the PoW for the construction phase of the Programme works. This delivery approach for completing the Programme of works is the shortest of the three delivery Options. The fire wardens will continue to operate as normal and the route for the fire engine through the arches within the existing courtyards will need to be maintained, or an alternative solution that is acceptable to the Fire Officer, will need to be identified. A significant proportion of the collections will have to remain on site, and therefore the security of these items will need to be closely monitored.
8. Potential scope	To include: Compliance with policy and legislation of the World Heritage and Grade 1 listing status of the PoW; Repaired or replaced systems on a like for like basis to contemporary standards of design and quality, optimising costs and benefits; Building environment standards expected of public buildings will be achieved; Achieving any additional built environment policy objectives stated by both Houses; Provide facilities to meet the stated objectives of both Houses (such as inclusion, outreach and education); Defined improvements to amenities and functionality within the constraints of the present design of the PoW. Future proofing of infrastructure and provision for change to the current occupation, where the requirement can be only loosely anticipated, over an indefinite period.
9. Accommodating change (if desired)	Provides extensive opportunities to effect any desired changes in culture arising from a full decant and the additional scope to improve accommodation and infrastructure. This provides the best opportunity for the introduction of more extensive improvements in functionality to support any desired improvements to business processes and to fully embed these as part of the relocation to the decant facilities. Delivers more efficient and economic use of space with additional amenities and functionality for all users and visitors. New reconfigured space is also delivered. e.g. upper floor office areas could be remodelled and upgraded.

Source: IOA Team analysis

Why deliver this Scenario?

- Scenario 3B would deliver the Programme works far quicker than delivery Options E1 and 2. It therefore reduces operational risk the quickest along with Scenario 3C.
- The Scenario will deliver improved amenity and functionality when compared to the existing PoW.
- There is a greater opportunity to future proof the PoW infrastructure.
- Moving out of and back into the PoW could provide an opportunity to facilitate new and enhanced business processes and ways of working could be adopted.

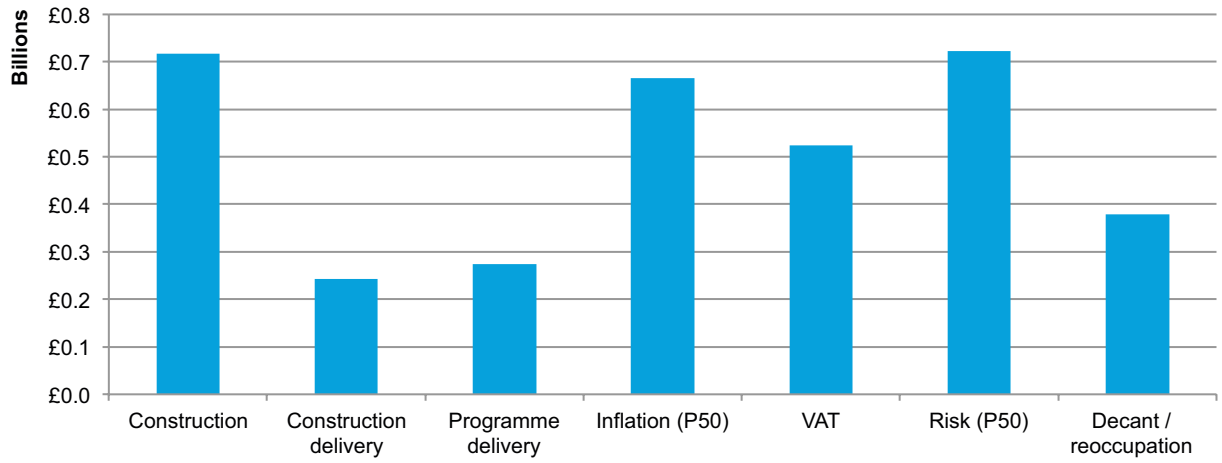
6.4.2 Capital expenditure

Of the total estimated cost for delivering Scenario 3B, risk and construction represent the most significant cost items. However, these costs are lower than in all of the other Scenarios

Capital expenditure

- The chart below outlines the component elements of the capital expenditure for Scenario 3B. Definitions of the component elements are included on the following page.
- Inflation, risk, VAT and construction represent the largest areas of cost for this Scenario. However, in general all areas have lower costs associated with them than those included in Scenarios E1A, 2A and 2B.
- Inflation is lowest in this Scenario and Scenario 3C, due to delivery Option 3 having the shortest schedule.
- The base construction cost for this Scenario is lower than for Scenario 2B as there will not be additional costs associated with subdividing the construction into two phases.

Figure 83: Capital expenditure based on P50

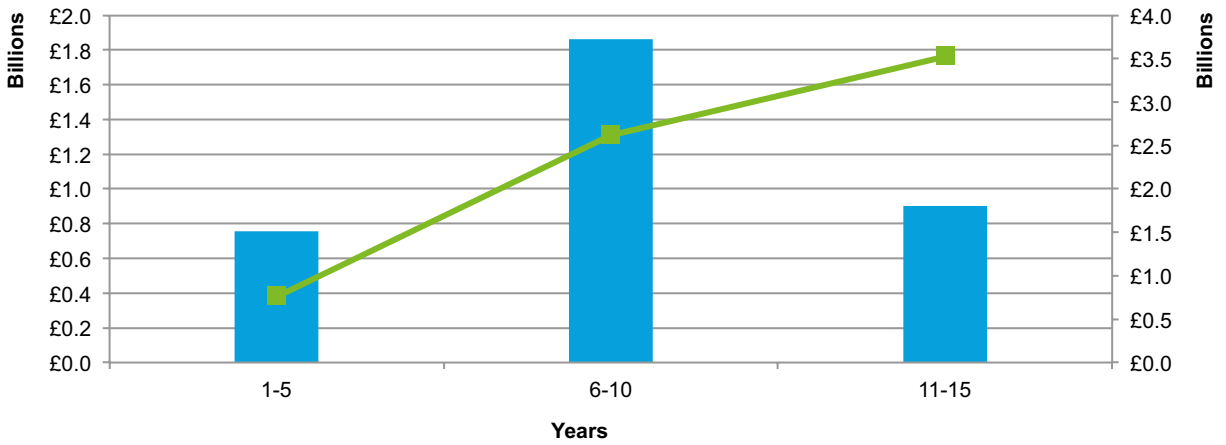


Source: IOA Team analysis

Initial capital expenditure cashflow – based on P50

- The chart below outlines the P50 cashflow for Scenario 3B.
- The bar chart highlights the five yearly expenditure (left hand scale) and the line graph represents the cumulative cashflow totals (right hand scale).
- The start date of the cashflow is Q3 2014 and is based on the P50 costs.
- The lowest expenditure is expected to occur between years 1-5. During this time the delivery model will be developed and the design will be progressed. The costs associated with this work are more modest than the costs incurred once construction begins.
- The highest expenditure is expected to occur between years 6-10, as the construction work reaches its peak.

Figure 84: Initial capital expenditure cashflow based on P50



Source: IOA Team analysis

6.4.2 Capital expenditure

Of the total estimated cost for delivering Scenario 3B, risk and construction represent the most significant cost items. However, these costs are lower than in all of the other Scenarios

Elemental breakdown of initial capital expenditure

- The table below provides an elemental breakdown to the initial capital cost required under Scenario 3B. The sub total is based on P50 figures, however the elemental costs (including inflation, risk, VAT and decant/reoccupation are presented on a P10, P50 and P90 range.

Table 84: Elemental breakdown of the capital expenditure

Element		Item	Cost (£m)	Total (£m)
Construction	Building works	Fabric – envelope	79	**716**
		Fabric – internal finishes	70	
		Other building works	121	
		Additional scope	166	
	Mechanical and electrical services	Services	280	
Construction delivery	Base method related costs		136	**242**
	PoW specific costs		39	
	Option specific		21	
	Overheads and profit		46	
Programme delivery	Programme management and technical support		96	**274**
	Client assurance and legal		24	
	Project team and design costs		154	
Sub-total (P50)				**1,232**

Element		P10 (£m)		P50 (£m)		P90 (£m)	
Inflation	Pre commencement	201	**497**	269	**665**	428	**1,058**
	Construction phase	296		396		630	
Risk	Construction delivery	487	**557**	632	**723**	768	**879**
	Programme management	70		91		111	
VAT @ 20%		457		524		634	
Temporary relocation / reoccupation		240		379		491	
Total		**2,983**		**3,523**		**4,294**	

Source: IOA Team analysis

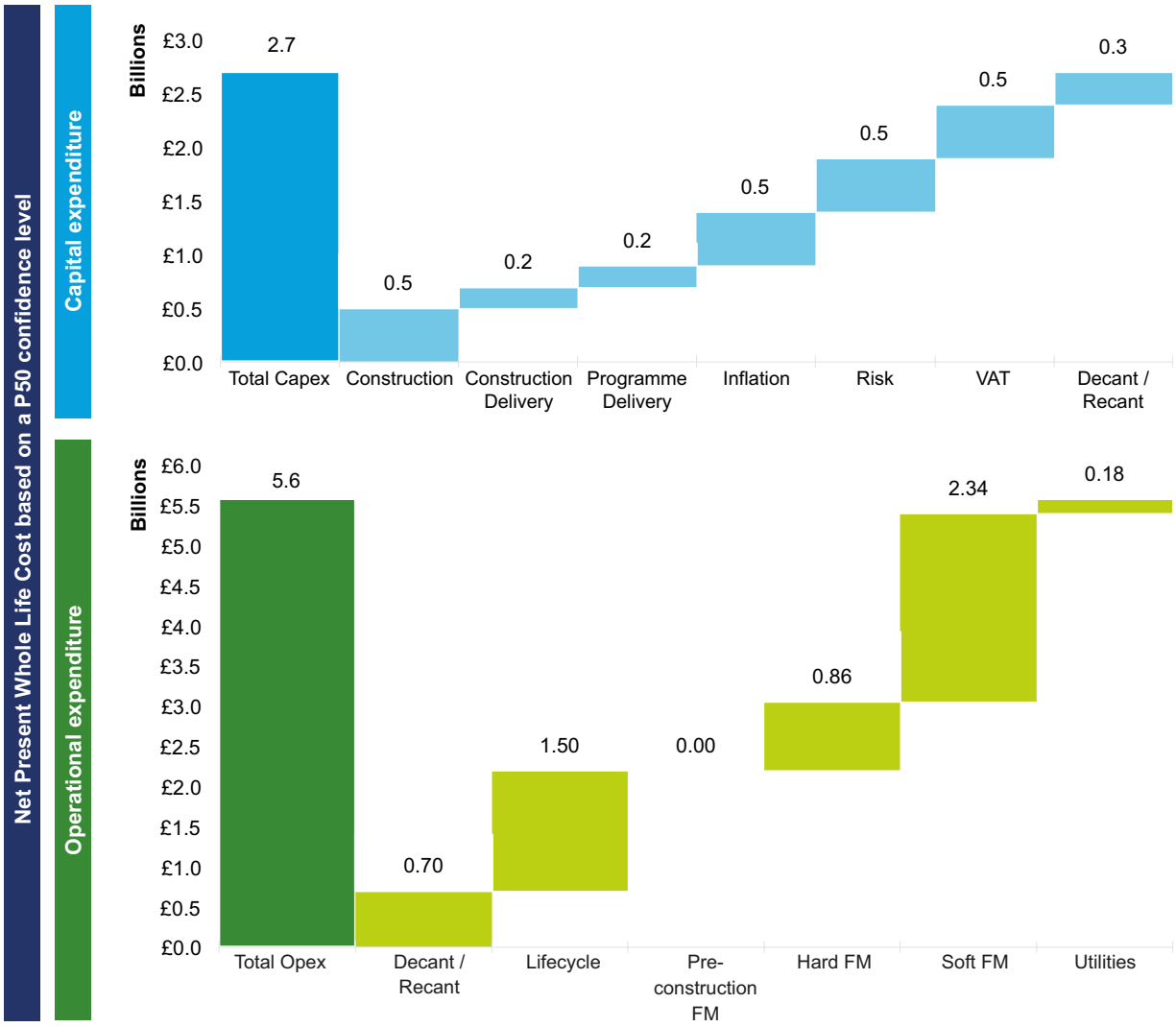
6.4.3 Estimated whole life cost

Scenario 3B would require an initial upfront discounted capital cost of £2.7bn. Taking into account all operational costs (including decant/reoccupation costs) at a discounted cost of £5.6bn, the net present cost of all whole life costs is estimated to be £8.3bn (P50)

Introduction

- The purpose of creating a whole life cost model for each of the scenarios is to allow a like for like comparison to be made between programmes and expenditure profiles that differ significantly in nature.
- Ultimately, Net Present Whole Life Cost will be used to inform the Outline Business Case. Whole life cost is modelled over 60 years (a standard Treasury Green Book duration for major infrastructure programmes) and the components of Whole Life Cost Discounted by 3% per annum from the date at which they would be incurred, to today (Q2 2014).
- Over a 60 year period, Operational costs are twice those of Capital expenditure. The Lifecycle replacement costs are the most significant of all of the scenarios as the existing building services and components will remaining in situ for the longest period, thus requiring the greatest investment.

Figure 85: Net Present Whole Life Cost based on a P50 confidence level



Source: IOA Team analysis

6.4.3 Estimated whole life cost

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Components of whole life cost

- The components of whole life cost are as follows:
  - Capital Expenditure:
    - Construction: The scope of works.
    - Construction Delivery: Contractor's preliminary costs, logistics, temporary accommodation, security etc..
    - Programme Delivery: Professional fees
    - Inflation: Modelled at a P50 level at 3.64%
    - Risk: An allowance reflecting a basket of risks particularly those that would have a time impact if realised.
    - VAT: at the current prevailing rate of 20%
    - Decant / relocation: the cost of temporary buildings including acquisition and fit out required to facilitate a particular scenario.
- Operational Expenditure:
  - Decant / relocation: the operational costs of any temporary buildings.
  - Lifecycle Costs: The cost of replacing building components as they become life expired.
  - Pre construction FM: The cost of Facilities Management associated with zones that have yet to be completed
  - Hard Facilities Management: Maintenance of building components (e.g. boiler servicing)
  - Soft Facilities Management: Cleaning, security and other 'people focussed' aspects.
  - Utilities: Gas, power, telecoms etc..

Net Present Cost

- The table below outlines the capital and operational costs based on a P10-P90 confidence level:

Table 85: Summary of Net Present Cost

	P10	P50	P90
Capital expenditure	£2.3bn	£2.7bn	£3.3bn
Operational expenditure	£5.2bn	£5.6bn	£7.5bn
Total whole life cost	**£7.5bn**	**£8.3bn**	**£10.8bn**

Source: IOA Team analysis

6.4.4 Operational considerations and risks

A key operational risk for Scenario 3B is that suitable decant space may not be available. The Scenario will also need to reflect security risk and ceremonial considerations arising from the relocation to a new decant building

Operational risk/impact

- The key operational considerations for Scenario 3B have been summarised within the tables below. The key considerations include:
  - Ability to effect a suitable decant strategy;
  - Security management; and
  - Impacts on ceremonies.

Key: Unlikely to meet Parliamentary requirements

Likely to meet Parliamentary requirements

Table 86: Delivery Option 3 – Operational considerations

	Delivery Option 3 – Operational considerations	Illustrative scale	Potential actions to adopt
1	**Operational impact - Decant / reoccupation Disruption:** Members of both Houses will have to vacate the PoW (likely to be on a phased basis) at the appropriate time. This process will cause relatively short term Disruption to individuals during both the decant and the reoccupation periods.		• On site support is to be provided within the decant buildings including technology and way finding. The same principle is to be adopted upon reoccupation into the PoW.
2	**Security management:** A separate Security Report has been prepared to cover this.		• See separate security report
3	**Ceremonial impacts:** The PoW will not be able to accommodate any ceremonies and therefore the ceremonial processes will have to be revised and agreed to suit the new logistical constraints. Opportunities could be made available in the decant spaces.		• Alternative measures will need to be agreed in order to host ceremonial events at another building.

Source: IOA Team analysis

6.4.4 Operational considerations and risks

A key operational risk for Scenario 3B is that suitable decant space may not be available. The Scenario will also need to reflect security risk and ceremonial considerations arising from the relocation to a new decant building

Table 87: Delivery Option 3 – Operational risk

	Delivery Option 3 – Operational risk	Potential mitigating actions	Illustrative rating
1	**Availability of decant premises:** There is a high risk that there may not be sufficient available space in the market to decant both Houses to. If enough space is not available, this delivery Option may not be feasible.	• Research market conditions • Identify suitable options • Understand market implications and availability challenges • Effect transactions (likely to be more than one)	
2	**Decant and completion of decant building fit out:** The remodelling required to the decant buildings to meet Parliamentary requirements, will be significant. These works will need to be completed and the facilities thoroughly tested pre 2020, to ensure there is no risk to the business of Parliament. The timeframe for these works will be considerable and therefore requires decant premises to be procured in the near future, potentially prior to a decision on which Scenario is favoured, to avoid delay to the 2020 start date.	• Set out space utilisation plans • Develop outline and detailed plans and specifications • Procurement and delivery of fit out • Test decant building thoroughly	
3	**Ongoing terms of engagement:** Approval of overarching decant solution. Occupiers may not agree to the Disruption of decanting during the programme of works.	• Confirm revised terms of engagement for works in occupied accommodation • Implement and monitor activity for compliance with the revised terms	

Key:

Low Risk  Medium Risk  High Risk 

Source: IOA Team analysis

6.4.5 Schedule

Scenario 3B would most likely deliver the core objectives of the Programme in a period of six years. Our analysis suggests that it is highly unlikely that the works could be completed within a five year Parliamentary term

Overview

- For Scenario 3B, the full decant option assumes a fully vacated PoW, providing contractors unconstrained access to undertake works on all floors of the PoW simultaneously. Schedules are based on the understanding that a future contractor will have vacant possession of the PoW to undertake the Programme of works in an unhindered manner.
- A typical sequence assumes that works can proceed continuously from start to finish and this determines the quickest possible delivery opportunity for the Programme. Our analysis assumes that work must proceed on a number of floors, zones and areas in parallel, thus providing continuity of work rather than a stop-start approach.
- The vacated building will still require a suitable environment to preserve heritage items (including artwork) and this could be achieved by using a mixture of existing, temporary and new mechanical and electrical systems.
- The IOA Teams' analysis of the schedule has divided the work in to a number of phases with the key dates as shown below:

Table 88: Scenario 3B key dates

Scenario 3B – Key dates	
Pre-business case	2014-16
Design	2015-19
Pre-construction enabling works	2015-20
Construction works	2020-25
Handover	2025
Reoccupation	2026

Source: IOA Team analysis

Construction schedule

- The following construction schedule has been developed for Scenario 3B.

Table 89: Construction schedule

Scenario	Lower range	Most likely	Upper range
Scenario 3B	5 years	6 years	8 years

Source: IOA Team analysis

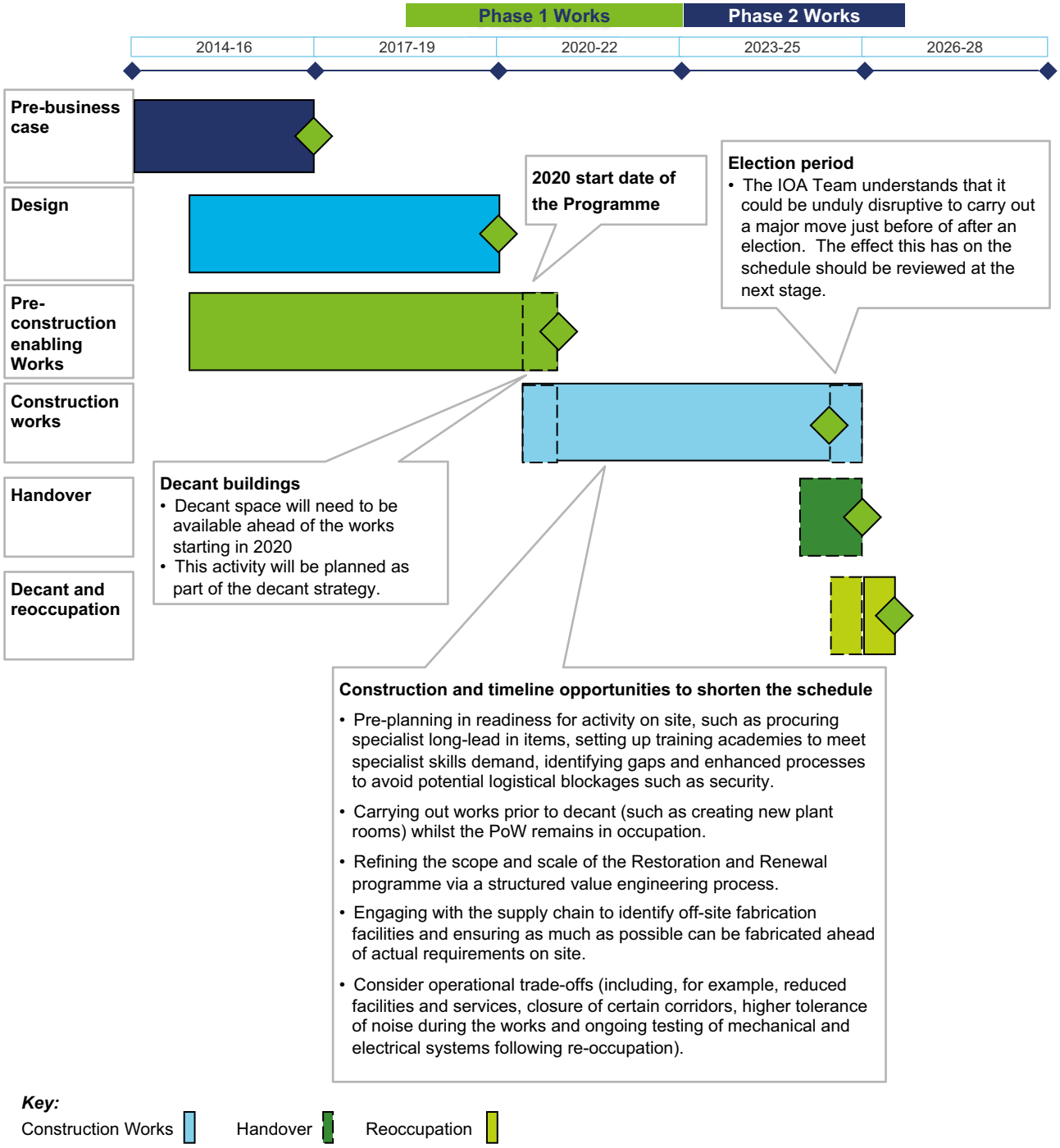
Key assumptions

- The following key assumptions underpin the assessed programme period for this scenario:
  - An assumed start date in Q2 2020;
  - A six month period of site surveys and enabling works prior to full construction work commencing;
  - The testing and commissioning activity will overlap with physical construction work. There will be a dedicated period to complete the testing, commissioning, balancing and trial running of all new systems, prior to reoccupation;
  - There is a dedicated period for moving occupants and their business functions back to the PoW; and
  - It is assumed that the Programme is not currently impacted by move constraints around election dates.

6.4.5 Schedule

Scenario 3B would most likely deliver the core objectives of the Programme in a period of six years. Our analysis suggests that it is highly unlikely that the works could be completed within a five year Parliamentary term

Figure 86: Scenario 3B schedule



6.4.6 Delivery approach

All occupants and functions will be relocated to available space outside the PoW leaving behind a vacant building. The key risk to delivering this Scenario is the availability of suitable decant space

Delivery approach

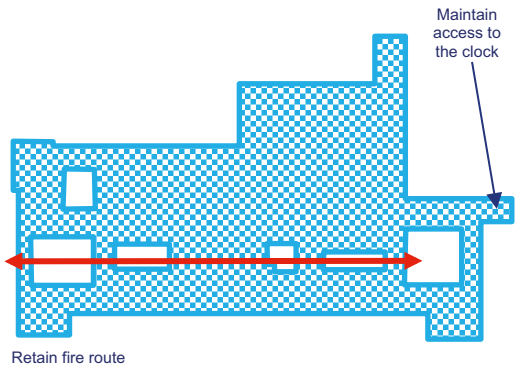
- Our approach for the full decant is based on the availability of suitable decant space to maintain continuity and business of Parliament. One workable solution for decant space has been identified by the Estates Team and buildings that will be used are referred to in this report as Buildings X and Y. Further detailed studies will be required to establish a detailed strategy if a full decant option is the preferred approach.
- Securing availability of suitable decant buildings that will accommodate most if not all of the decanted functions of Parliament within eight minutes of the respective Chambers is key to delivering this Option . These buildings would need to be available and ready to operate from, prior to the start of the Programme, currently assumed to be mid-2020.
- For a mid-2020 start of the works, the decant buildings would have to be designed, adapted, fitted-out, and tested for all necessary security and business continuity / operational requirements.
- The location of decant buildings, relative to each other also needs to fulfil bicameral Parliamentary functions.
- The two Chambers can be located in separate buildings as long as the associated functions of each Chamber meet the proximity criteria included in the Architectural Workstrand Report.
- While the Chambers and associated functions and Committee rooms would relocate to either Building X or Building Y, Member's and Peer's offices would be moved to parts of the Northern and Southern buildings respectively.

Key delivery risks

- Inability to secure adequate decant accommodation.
- Artefacts and artwork could be damaged if the internal environment is not closely controlled.
- Damage could be caused to artefacts during the works.
- The large site establishment could be visibly obtrusive.
- There could be logistical challenges in dealing with high levels of deliveries requiring security screening
- There is a risk that there may not be enough specialist labour in the market to service the Programme.

Zones and sequencing

Figure 87: Zones and sequencing



Source: IOA Team analysis

- The sequence of works is driven by the continuous flow of work trades. Besides key mechanical and electrical items of work this includes careful consideration of heritage items. An example sequence that could be used to form the normal work flow through the vacated zone of the building on the upper floors is:
  - Undertake a soft strip out and remove items of furniture;
  - Protect remaining items;
  - Create a suitable temporary environment by switching over to temporary services;
  - Remove wall panelling;
  - Investigate risers, complete asbestos surveys and remove or encapsulate asbestos;
  - Strip-out redundant mechanical and electrical services;
  - Install new mechanical and electrical services;
  - Test and commission mechanical and electrical systems;
  - Undertake security sweep;
  - Replace panels / close up areas;
  - Complete heritage restoration of fabric;
  - Remove protection / final fix / decoration;
  - Return heritage items taken off-site for refurbishment / storage;
  - Deep clean and lock-up / security seal; and
  - Final security sweep.

6.4.6 Delivery approach

All occupants and functions will be relocated to available space outside the PoW leaving behind a vacant building. The key risk to delivering this Scenario is the availability of suitable decant space

Temporary relocation of staff

Table 90: Temporary relocation of staff

Commons department	Moves to
Ground floor	
Chapel	Closed (alternative place of worship to be provided)
Kitchen and Dining	Closed or Decant Building
PED	TBC
Members' Offices	Southern Buildings
Principal floor	
Serjeant at Arms	Decant Building Y
All Support Space	Decant Building Y
Commons Library	Decant Building Y
Kitchen and Dining	Closed or Decant Building X
Whips' Offices	Decant Building Y
Members' Offices	Southern Buildings
Speaker's Residence	TBC
First floor	
Chamber Galleries	Decant Building Y
Committee Rooms	Decant Building Y
Reporters	Decant Building Y
Members' Offices	Southern Buildings
Speakers' Residence	TBC
Upper floors	
Chamber Galleries	Decant Building Y
Committee Rooms	Decant Building Y
Reporters	Decant Building Y
Members' Offices	Southern Buildings
Speaker's Residence	TBC

Lords department	Moves to
Ground floor	
Peers' Offices	Decant Building X
Peers' Dining	Closed or Decant Building X
PED	TBC
Police Accommodation	Decant Building Y and Courtyard
Principal floor	
The Lords Chamber	Decant Building X
Black Rod's Offices	Decant Building X
Whips' Offices	Decant Building X
Peers' Offices	Decant Building X
Peers' Dining	Closed or Building X
Lords' Library	Decant Building X
Robing Room and Royal Gallery	Decant Building X
Lord Speaker's Accommodation	TBC
First floor	
Peers' Offices	Southern Buildings
Committee Rooms	Decant Building X
Lord Speaker's Accommodation	TBC
Upper floors	
Peers' Offices	Southern Buildings
Archives	New accommodation (Programme assumption)

- All occupants and functions within the PoW will be relocated to available space outside the Palace leaving behind a vacant building.
- The tables below outline where specific departments in the HoC and HoL could be moved to under a full decant option.
- Final locations for departments will need to be agreed once the available space for decant has been established and a detailed transition plan has been put in place.

Source: IOA Team analysis

6.4.7 Potential scope

The scope for this Scenario builds upon Outcome Level A to enhance security, catering, business, and support driven needs. Office space will be improved, additional amenity will be provided and the building will be more energy efficient

Summary of Scenario 3B potential scope

- The table below outlines the illustrative scope of work that is proposed to be provided in Scenario 3B. For greater detail on the potential work included in each Scenario please see Volume 2, Appendix D.1.
- Examples of scope of work, additional to Outcome Level A that could be provided in Scenario 3B are:
  - Upper floor office areas could be remodelled and upgraded;
  - Comfort cooling could be provided to additional areas;
  - A new media centre could be provided;
  - An on site energy centre could be provided;
  - Courtyards could be landscaped and pedestrianised;
  - Additional lifts could be provided for example in Elizabeth Tower;
  - Cloister Court could be made more accessible;
  - Boiler House Court could be remodelled to create a larger courtyard; and
  - The modern building addition could be removed from Chancellors Court.

Table 91.1: Summary of Scenario 3B potential scope

Ref	Description
A	General works
A10	Building exterior
A10.1	External fabric
A10.2	External works
A10.3	External mechanical and electrical services
A20	Building interior
A20.1	Plant
A20.2	Horizontal and vertical services infrastructure
A20.3	IT systems
A20.4	Security systems
A20.5	Mechanical and electrical services works per room / space / zone
A20.6	Architectural works
A20.7	Asbestos works
B	Specific items
B10	Lifts
B10.1	Replace or refurbish existing lifts
B10.2	New lift and shafts
B10.3	Structural works associated with existing lifts to extend shaft to serve additional floors
B10.4	Structural works associated with existing lifts to provide step-free access at ground floor level
B10.5	Provision of new local lifts to address step changes and achieve greater step free access
B10.6	Replacement of existing goods and people lifts
B10.7	Replacement of existing goods only lifts
B10.8	Install new duplex lifts for additional evacuation and business resilience
B10.9	Victoria Tower
B20	**Archives** – Archives are assumed to relocate to a new off site building
B30	**Fire compartmentation works** – Further works completed to improve fire compartmentation

Source: IOA Team analysis

6.4.7 Potential scope

The scope for this Scenario builds upon Outcome Level A to enhance security, catering, business, and support driven needs. Office space will be improved, additional amenity will be provided and the building will be more energy efficient

Table 91.2: Summary of Scenario 3B potential scope

Ref	Description
B40	Architectural interventions
B40.1	Security driven
B40.1.1	Installation of new access control systems on doors and areas to provide greater demarcation of security zones
B40.1.2	Increase in size of the visitor screening area - extension to the existing Cromwell Green screening area - assume double in size
B40.1.3	Replace existing vehicle protection measures with more appropriate design
B40.1.4	Install further blast rated secondary glazing
B40.1.5	Internal CCTV to be fitted in agreed areas
B40.1.6	Increased protection from threats from river
B40.2	Catering driven
B40.2.1	Replacement of the terrace marquees on the river front terrace
B40.2.3	Rationalisation of the Kitchens – re-planned and potentially relocated - To result in an assumed 10% reduction in area from current
B40.2.4	Improvements to banqueting and event facilities - access to them and capacity
B40.3	Business driven / support driven
B40.3.1	Permanent education centre
B40.3.3	Basement, PED Craft, team workshops - relocate Change of use opportunity. Space is unsuitable for usage with health and safety risks associated with dust and fumes. Move craft team to alternative location. Space available for alternative usage.
B40.3.4	Basement, Lords' and Commons' Library Archive Relocate change in use Change of use opportunity. Space is unsuitable for usage with damp/RH and space issues. Move archive to alternative location (off site)
B40.4	Space Planning
B40.4.1	Re-organisation of the internal space allocation to provide: - Increased break out, formal and informal meeting areas - greater changing areas + staff areas - more flexible accommodation and co-location of departmental teams
B40.5	Media Centre
B40.5.1	Create a Media Centre with space for interviews both off and on camera - this to be a facility within the Palace
B40.6	Courtyards
B40.6.1	Removal of Goods and waste distribution from Courtyards by: - New delivery and distribution regime, making use of basement corridors (enhanced by new mechanical and electrical installation reducing service volume in key corridors). - New vertical circulation extending to basement to improve local distribution - New point of delivery in Black Rods Garden, with link to underground distribution. - Existing boiler House [redacted] to form part of distribution system (taking advantage of, and dependant on, creation of off-site energy centres proposed by mechanical and electrical strategy). Or extend the existing boiler House to create a link down to the basement to allow service route to work - Opportunities to pedestrianize and landscape the courtyards as a result of the above
B40.6.2	Cloister Court - Removal of current ground floor usage, full repair and restoration to open ambulatory - Landscaping to Cloister Court
B40.6.3	Whips Area - Small external zone used as a main through route - Glass roof over to create internal space.
B40.6.4	Boiler House Court - Demolition of 20th century single storey structures within courtyard (PED Offices

Source: IOA Team analysis

6.4.7 Potential scope

The scope for this Scenario builds upon Outcome Level A to enhance security, catering, business, and support driven needs. Office space will be improved, additional amenity will be provided and the building will be more energy efficient

Table 91.3: Summary of Scenario 3B potential scope

Ref	Description
B40.6.5	The Bandstand - Removal of ground floor level partitioning, including Engineers Control area throughout area below Central - Reform floor and staircase access down to basement level - Form pedestrian access routes across bandstand area linking Whip's Area and Boiler House Court through to the Common's and Peer's Inner Courts.
B40.6.6	Chancellor's Court - Demolish lightweight glass building - Demolish cover to basement stairs - Landscape and pedestrianize courtyard - Change of use – Police area between Chancellor's and Royal Court to become office accommodation and ancillary facilities
B40.6.7	Peer's Court and Inner Court, Commons Court and Inner Court - Courtyards to be pedestrianized and landscaped retaining vehicle access for emergency use only. - Relocation of servicing and refuse provision away from courtyards - Rationalisation (or relocation) of catering areas fronting onto these courtyards to create new office accommodation (notably Peer's Court)
B40.7	PoW Interiors
B40.7.1	Westminster Hall Rooms - Remove meeting rooms from ground floor W rooms. - Remove/change usage of upper level IPU and Jubilee rooms. Extend Jubilee Café to provide open air seating in Cromwell Green - Provide visitor information, exhibition, shop and WC facilities across both floors
B40.7.1	North East Turret, light well - Remove Library usage of former central light-well at ground floor level, demolish internal structures, repair and rediscover light well for full height of building
B40.7.2	Third Floor, Upper Committee Corridor north and south - Poor quality Members and staff rooms, half with natural light via roof-light. Modern insertion, retaining east facing cast iron roof, and extending flat roof out to west side. - Demolish, retaining cast iron roof element. Rebuild with generous glazing to west (concealed) side. Re-plan to make best use of available natural light, likely to include larger open plan areas and access corridor to poorly lit (east) side. Make better use of existing dormer windows to cast iron roof.
B40.7.3	Peers Court and Commons Court rooms – east side - Rooms at 1st and 2nd floor levels including 'T' Block to Commons Court. Members' rooms of inadequate quality and layout. Refurbish, retaining envelope. Explore improving natural light penetration to Committee Corridor.
B40.7.4	Offices, west of Speaker's Court. 2nd floor level - Change of use, subject to reduction or relocation of reporters facilities. Refurbish offices to provide additional offices for Members and facilities, or to accommodate secretarial use moved from basement
B40.7.5	Reporters' Restaurant and kitchen area. 2nd floor level - Change of use to office accommodation. Refurbish and reorder to provide additional offices for Members and related facilities
B40.7.6	Committee Offices, north end of Committee Corridor, 1st and 2nd floor level - Change of use to office accommodation. Refurbish and reorder to provide additional offices for Members
B40.7.7	The Clock Tower (Elizabeth Tower) - New lift to north-west corner of tower, running from ground to level 10 (access unlikely to bell level above due to space and aesthetic restrictions). Removal of accommodation at ground floor to allow route through to lift. - Improved visitor facilities at intermediate levels, into repaired and refurbished rooms. Possible exhibition space depending on safe access / visitor numbers.
B40.7.8	Create bespoke storage on site for use by the Heritage Collections - Works of Art - historic furniture - books - architectural items - for ceremonial items

Source: IOA Team analysis

6.4.7 Potential scope

The scope for this Scenario builds upon Outcome Level A to enhance security, catering, business, and support driven needs. Office space will be improved, additional amenity will be provided and the building will be more energy efficient

Table 91.4: Summary of Scenario 3B potential scope

Ref	Description
B40.7.9	Create off site storage facility for Heritage Collections Use
B40.7.10	Create on site workshop facilities for Heritage Collection conservation works - minimum requirement; - multi-purpose with dry/clean lab and a wet/dirty lab
B50	Mechanical and electrical enhancements / additions
B50.1.1	Installation of new access control systems on doors and areas to provide greater demarcation of security zones within the palace (3 zones)
B50.1.2	Installation of Improved external CCTV
B50.1.3	Install fire suppression in building where possible
B50.1.4	Install CCTV for fire detection aspects
B50.1.5	Energy Centre for Palace alone (within palace) or Estate Wide Energy Centre
B50.1.6	Extend Comfort cooling to additional areas of the PoW
B50.1.7	Installation of renewable energy generation
B50.1.8	Install Renewable Energy Systems

Source: IOA Team analysis

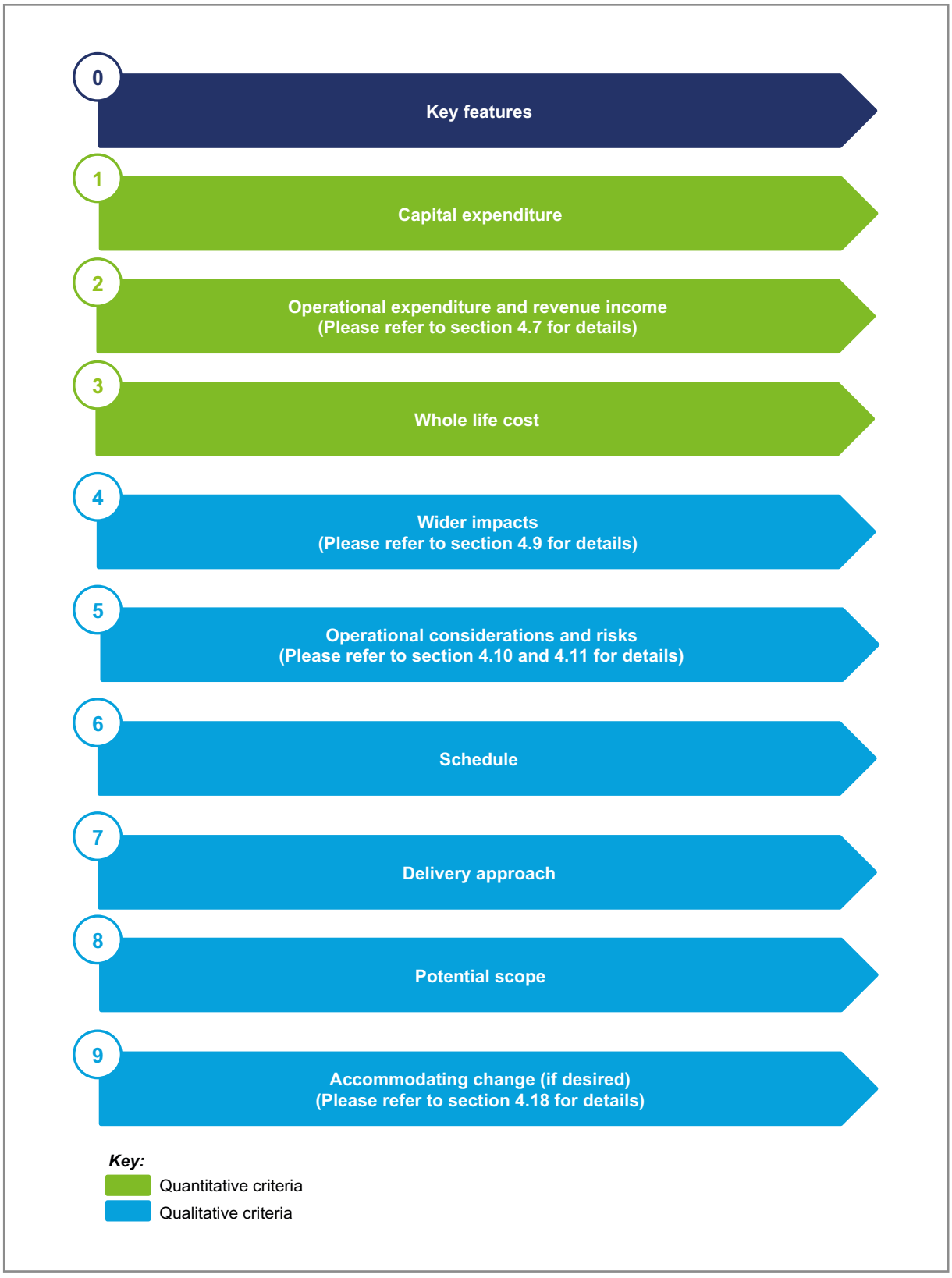
6.5 Scenario 3C

6.5.1 Overview

Scenario 3C involves full decant of the PoW, and delivers additional enhanced amenity and functionality once works are completed. It involves a similar most likely delivery schedule to Scenario 3B, of six years and has an estimated capital cost of £3.9bn (P50)

Key components of Scenario overview

Figure 88: Key components of Scenario overview



6.5.1 Overview

Scenario 3C involves full decant of the PoW, and delivers additional enhanced amenity and functionality once works are completed. It involves a similar most likely delivery schedule to Scenario 3B, of six years and has an estimated capital cost of £3.9bn (P50)

Table 92: Overview of Scenario 3C

Category	Key features and supporting commentary
1. Capital expenditure (capital expenditure)	The total required capital expenditure is £3.87bn (based on P50). Of which the construction costs account for £810m. The cashflow requirement in the first five years of the programme is £760m, which is similar to Scenario 3B.
2. Operational expenditure and revenue income	The total annual FM operational expenditure at the PoW is £20.39m.
3. Whole life cost	NPC £9.1 bn. Early investment does increase the relative contribution to the NPC costs of this Scenario, but does ensure the early retention of the fabric elements and the quality standards for this historic and Grade 1 listed building.
4. Wider impacts	This delivery Option affords the greatest opportunity to secure regional and national opportunities for individuals and businesses across the UK. This Scenario could provide an opportunity to establish and deliver an exemplar programme. It also provides a significant opportunity to engage with a large labour force, given the nature of the programme. Initiatives could be run, for example heritage and mechanical and electrical services skills academies, to provide wider economic benefit.
5. Operational risk/ impact	Operational risk levels should fall at a fast rate as a result of the decant. Members of both Houses will have to vacate the PoW, albeit this is likely to be on a phased basis. This process should cause relatively short term Disruption to individuals during both the decant and reoccupation of the PoW. Once within the decant building the Disruption and Nuisance factors should remain at relatively low levels. The PoW will not be able to accommodate any ceremonies and therefore the ceremonial processes will have to be revised and agreed to suit the new logistical constraints. Opportunities could be made available in the decant spaces.
6. Schedule	Based on assumed construction start date (Q2 2020), the overall schedule to deliver the Programme of works is 6 years based on the most likely programme. This time period assumes that the PoW is completely vacated and is available by the start date for a contractor to commence construction activity. The overall schedule has been reviewed against other similar projects for delivery output, key resources and rate of capital spend.
7. Delivery approach	All occupants will be decanted from the PoW for the construction phase of the Programme works. This delivery approach for completing the Programme of works is the shortest of the three delivery Options. The fire wardens will continue to operate as normal and the route for the fire engine through the arches within the existing courtyards will need to be maintained, or an alternative solution that is acceptable to the Fire Officer, will need to be identified. A significant proportion of the collections will have to remain on site, and therefore the security of these items will need to be closely monitored.
8. Potential scope	To include: Compliance with policy and legislation of the World Heritage and Grade 1 listing status of the PoW; Repaired or replaced systems on a like for like basis to contemporary standards of design and quality, optimising costs and benefits; Building environment standards expected of public buildings will be achieved; Achieving any additional built environment policy objectives stated by both Houses; Provide facilities to meet the stated objectives of both Houses (such as inclusion, outreach and education); Defined improvements to amenities and functionality within the constraints of the present design of the PoW. Future proofing of infrastructure and provision for change to the current occupation where the requirement can be only loosely anticipated, over an indefinite period; Significantly defined improvements e.g. high performance and long life cycles appropriate to each building system; Significant improvements to amenities and functionality within the constraints of the present design of the PoW and outside of the site boundary.
9. Accommodating change (if desired)	Provides extensive opportunities to effect any desired changes in culture arising from a full decant and the additional scope to improve accommodation and infrastructure. This provides the best opportunity for the introduction of more extensive improvements in functionality to support any desired improvements to business processes and to fully embed these as part of the relocation to the decant facilities. Delivers significantly more efficient and economic use of space with additional amenities and functionality for all users and visitors. New reconfigured space is also delivered. e.g. potential enclosure of a number of courtyards. Much greater opportunity to seek future proofing initiatives and secure long term operating benefits and costs savings within the PoW, principally due to the rate of progress and much shorter overall programme schedule.

Source: IOA Team analysis

Why deliver this Scenario?

- Scenario 3C would deliver the Programme works far quicker than delivery Options E1 and 2. It therefore reduces operational risk the quickest along with Scenario 3B.
- The Outcome Level will deliver significantly improved amenity and functionality compared to the existing PoW.
- There is a greater opportunity to future proof the PoW infrastructure.
- Moving out of and back into the PoW could provide an opportunity to facilitate new and enhanced business processes and ways of working could be adopted.
- The running costs and carbon footprint would reduce associated with the investment in sustainable technologies.

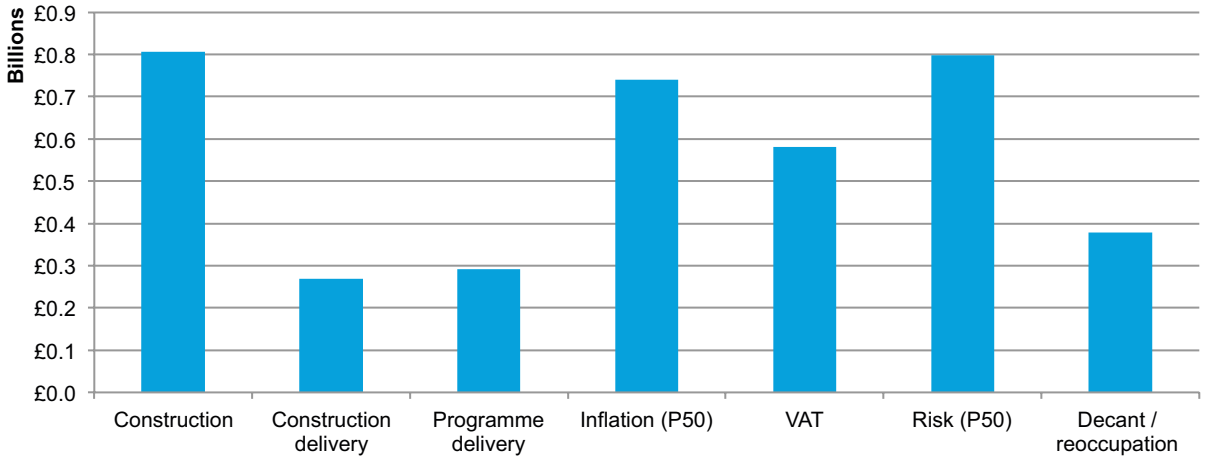
6.5.2 Capital expenditure

Construction and risk represent the most significant cost components of Scenario 3C. These costs are higher than they are in Scenario 3B, but they are still lower than Scenarios E1A and 2B

Capital expenditure

- The chart below outlines the component elements of the capital expenditure for Scenario 3C. Definitions of the component elements are included on the following page.
- Inflation, risk, VAT and construction represent the largest areas of cost for this Scenario. However, in general all areas have lower costs associated with them than those included in Scenarios E1A, 2A and 2B.
- Inflation is lowest in this Scenario and Scenario 3B, due to delivery Option 3 having the shortest schedule.
- The base construction cost for this Scenario is lower than for Scenario 2B as there will not be additional costs associated with subdividing the construction into two phases.

Figure 89: Capital expenditure based on P50

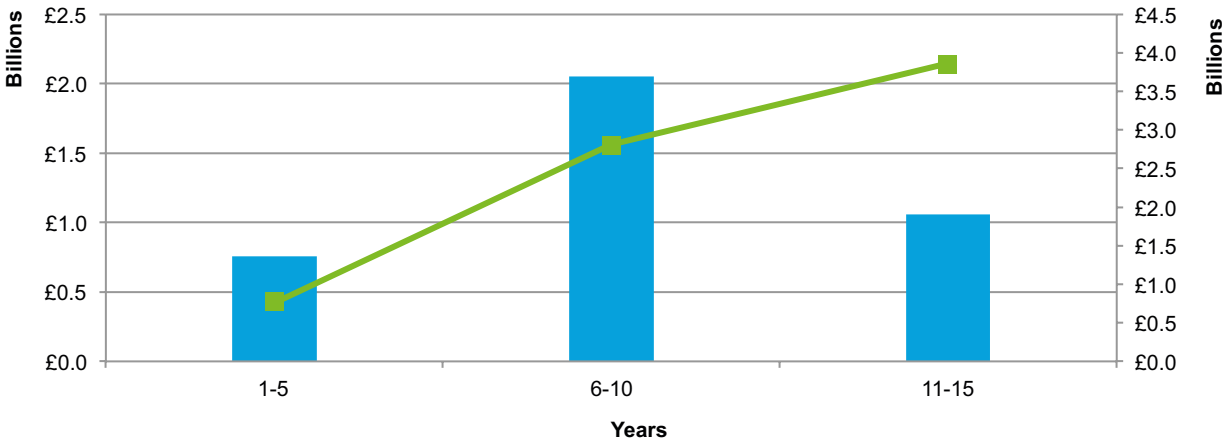


Source: IOA Team analysis

Initial capital expenditure cashflow – based on P50

- The chart below outlines the P50 cashflow for Scenario 3C.
- The bar chart highlights the five yearly expenditure (left hand scale) and the line graph represents the cumulative cashflow totals (right hand scale).
- The start date of the cashflow is Q3 2014 and is based on the P50 costs.
- The lowest expenditure is expected to occur between years 1-5. During this time the delivery model will be developed and the design will be progressed. The costs associated with this work are more modest than the costs incurred once construction begins.
- The highest expenditure is expected to occur between years 6-10, as the construction works reaches its peak.

Figure 90: Initial capital expenditure cashflow based on P50



Source: IOA Team analysis

6.5.2 Capital expenditure

Construction and risk represent the most significant cost components of Scenario 3C. These costs are higher than they are in Scenario 3B, but they are still lower than Scenarios E1A and 2B

Elemental breakdown of initial capital expenditure

- The table below provides an elemental breakdown to the initial capital cost required under Scenario 2B. The sub total is based on P50 figures, however the elemental costs (including inflation, risk, VAT and decant/reoccupation are presented on a P10, P50 and P90 range.

Table 92: Elemental breakdown of the capital expenditure

Element		Item	Cost (£m)	Total (£m)
Construction	Building works	Fabric – envelope	79	**807**
		Fabric – internal finishes	70	
		Other building works	121	
		Additional scope	257	
	Mechanical and electrical services	Services	280	
Construction delivery	Base method related costs		153	**268**
	PoW specific costs		41	
	Option specific		23	
	Overheads and profit		51	
Programme delivery	Programme management and technical support		96	**291**
	Client assurance and legal		24	
	Project team and design costs		171	
Sub-total (P50)				**1,366**

Element		P10 (£m)		P50 (£m)		P90 (£m)	
Inflation	Pre commencement	223	**554**	298	**740**	475	**1,179**
	Construction phase	331		442		704	
Risk	Construction delivery	541	**616**	702	**799**	853	**971**
	Programme management	75		97		118	
VAT @ 20%		**507**		**581**		**703**	
Temporary relocation / reoccupation		**240**		**379**		**491**	
Total		**3,283**		**3,865**		**4,710**	

Source: IOA Team analysis

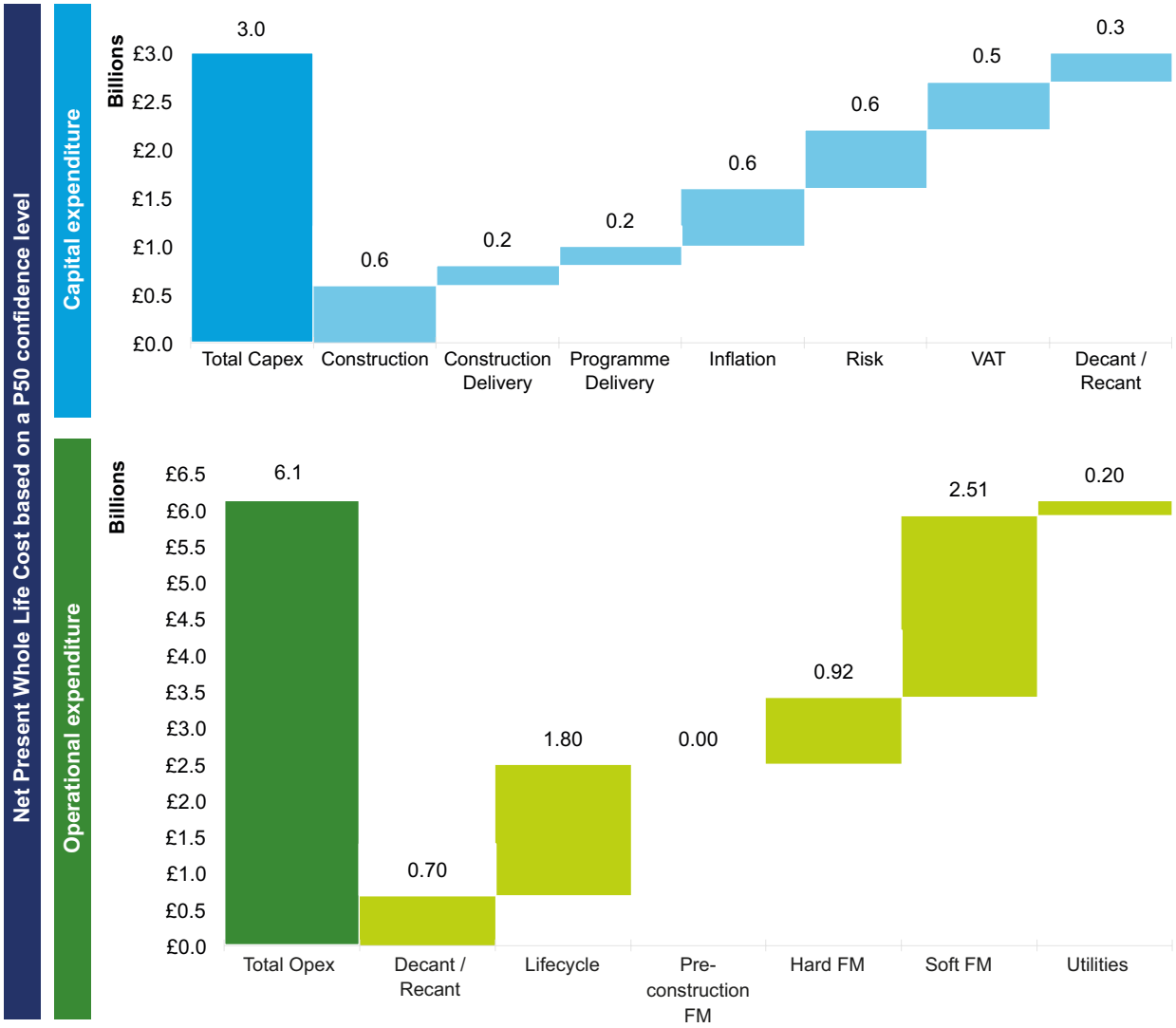
6.5.3 Estimated whole life cost

Scenario 3C has an estimated discounted capital cost of £3.0bn (P50). Taking into account all discounted operational costs of £6.1bn (P50) (including decant/reoccupation costs), the net present cost of all whole life costs is estimated to be £9.1bn at a P50 confidence level

Introduction

- The purpose of creating a whole life cost model for each of the scenarios is to allow a like for like comparison to be made between programmes and expenditure profiles that differ significantly in nature.
- Ultimately, Net Present Whole Life Cost will be used to inform the Outline Business Case. Whole life cost is modelled over 60 years (a standard Treasury Green Book duration for major infrastructure programmes) and the components of Whole Life Cost Discounted by 3% per annum from the date at which they would be incurred, to today (Q2 2014).
- Over a 60 year period, Operational costs are twice those of Capital expenditure. The Lifecycle replacement costs are the most significant of all of the scenarios as the existing building services and components will remaining in situ for the longest period, thus requiring the greatest investment.

Figure 91: Net Present Whole Life Cost based on a P50 confidence level



Source: IOA Team analysis

6.5.3 Estimated whole life cost

Scenario 3C has an estimated discounted capital cost of £3.0bn (P50). Taking into account all discounted operational costs of £6.1bn (P50) (including decant/reoccupation costs), the net present cost of all whole life costs is estimated to be £9.1bn at a P50 confidence level

Components of whole life cost

- The components of whole life cost are as follows:
  - Capital Expenditure:
    - Construction: The scope of works.
    - Construction Delivery: Contractor's preliminary costs, logistics, temporary accommodation, security etc..
    - Programme Delivery: Professional fees
    - Inflation: Modelled at a P50 level at 3.64%
    - Risk: An allowance reflecting a basket of risks particularly those that would have a time impact if realised.
    - VAT: at the current prevailing rate of 20%
    - Decant / relocation: the cost of temporary buildings including acquisition and fit out required to facilitate a particular scenario.
  - Operational Expenditure:
    - Decant / relocation: the operational costs of any temporary buildings.
    - Lifecycle Costs: The cost of replacing building components as they become life expired.
    - Pre construction FM: The cost of Facilities Management associated with zones that have yet to be completed
    - Hard Facilities Management: Maintenance of building components (e.g.. boiler servicing)
    - Soft Facilities Management: Cleaning, security and other 'people focussed' aspects.
    - Utilities: Gas, power, telecoms etc..

Net Present Cost

- The table below outlines the capital and operational costs based on a P10-P90 confidence level:

Table 93: Summary of Net Present Cost

	P10	P50	P90
Capital expenditure	£2.5bn	£3.0bn	£3.6bn
Operational expenditure	£5.7bn	£6.1bn	£8.4bn
Total whole life cost	**£8.2bn**	**£9.1bn**	**£12.0bn**

Source: IOA Team analysis

6.5.4 Operational considerations and risks

A key operational risk for Scenario 3C is that suitable decant space may not be available. The Scenario will also need to have consideration of security risk and ceremonial considerations

Operational risk/impact

- The key operational considerations for Scenario 3B have been summarised within the tables below. The key considerations include:
  - Ability to effect a suitable decant strategy;
  - Security management; and
  - Impacts on ceremonies.

Key: Unlikely to meet Parliamentary requirements ○
Likely to meet Parliamentary requirements ●

Table 94: Delivery Option 3 – Operational considerations

	Delivery Option 3 – Operational considerations	Illustrative scale	Potential actions to adopt
1	**Operational impact - Decant / reoccupation Disruption:** Members of both Houses will have to vacate the PoW (likely to be on a phased basis) at the appropriate time. This process will cause relatively short term Disruption to individuals during both the decant and the reoccupation periods.		• On site support is to be provided within the decant buildings including technology and way finding. The same principle is to be adopted upon reoccupation into the PoW.
2	**Security management:** A separate Security Report has been prepared to cover this.		• See separate security report
3	**Ceremonial impacts:** The PoW will not be able to accommodate any ceremonies and therefore the ceremonial processes will have to be revised and agreed to suit the new logistical constraints. Opportunities could be made available in the decant spaces.		• Alternative measures will need to be agreed in order to host ceremonial events at another building.

Source: IOA Team analysis

6.5.4 Operational considerations and risks

A key operational risk for Scenario 3C is that suitable decant space may not be available. The Scenario will also need to have consideration of security risk and ceremonial considerations

Table 95: Delivery Option 3 – Operational risk

	Delivery Option 3 – Operational risk	Potential mitigating actions	Illustrative rating
1	**Availability of decant premises:** There is a high risk that there may not be sufficient available space in the market to decant both Houses to. If enough space is not available, this delivery Option may not be feasible.	• Research market conditions • Identify suitable options • Understand market implications and availability challenges • Effect transactions (likely to be more than one)	
2	**Decant and completion of decant building fit out:** The remodelling required to the decant buildings to meet Parliamentary requirements, will be significant. These works will need to be completed and the facilities thoroughly tested pre 2020, to ensure there is no risk to the business of Parliament. The timeframe for these works will be considerable and therefore requires decant premises to be procured in the near future, potentially prior to a decision on which Scenario is favoured, to avoid delay to the 2020 start date.	• Set out space utilisation plans • Develop outline and detailed plans and specifications • Procurement and delivery of fit out • Test decant building thoroughly	
3	**Ongoing terms of engagement:** Approval of overarching decant solution. Occupiers may not agree to the Disruption of decanting during the programme of works.	• Confirm revised terms of engagement for works in occupied accommodation • Implement and monitor activity for compliance with the revised terms	

Key:

Low Risk Medium Risk High Risk

Source: IOA Team analysis

6.5.5 Schedule

Scenario 3C would most likely deliver the core objectives of the Programme in a period of six years. Our analysis suggests that it is highly unlikely that the works could be completed within a five year Parliamentary term

Overview

- For Scenario 3C, the full decant option assumes a fully vacated PoW, providing contractors unconstrained access to undertake works on all floors of the PoW simultaneously. Schedules are based on the understanding that a future contractor will have vacant possession of the PoW to undertake the Programme of works in an unhindered manner.
- A typical sequence assumes that works can proceed continuously from start to finish and this determines the quickest possible delivery opportunity for the Programme. Our analysis assumes that work must proceed on a number of floors, zones and areas in parallel, thus providing continuity of work rather than a stop-start approach.
- The vacated building will still require a suitable environment to preserve heritage items (including artwork) and this could be achieved by using a mixture of existing, temporary and new mechanical and electrical systems.
- The IOA Teams' analysis of the schedule has divided the work in to a number of phases with the key dates as shown below:

Table 96: Scenario 3C key stages

Scenario 3C – Key dates	
Pre-business case	2014-16
Design	2015-19
Pre-construction enabling works	2015-20
Construction works	2020-25
Handover	2025
Reoccupation	2026

Source: IOA Team analysis

Construction schedule

- The following construction schedule has been developed for Scenario 3C.

Table 97: Construction schedule

Scenario	Lower range	Most likely	Upper range
Scenario 3C	5 years	6 years	8 years

Source: IOA Team analysis

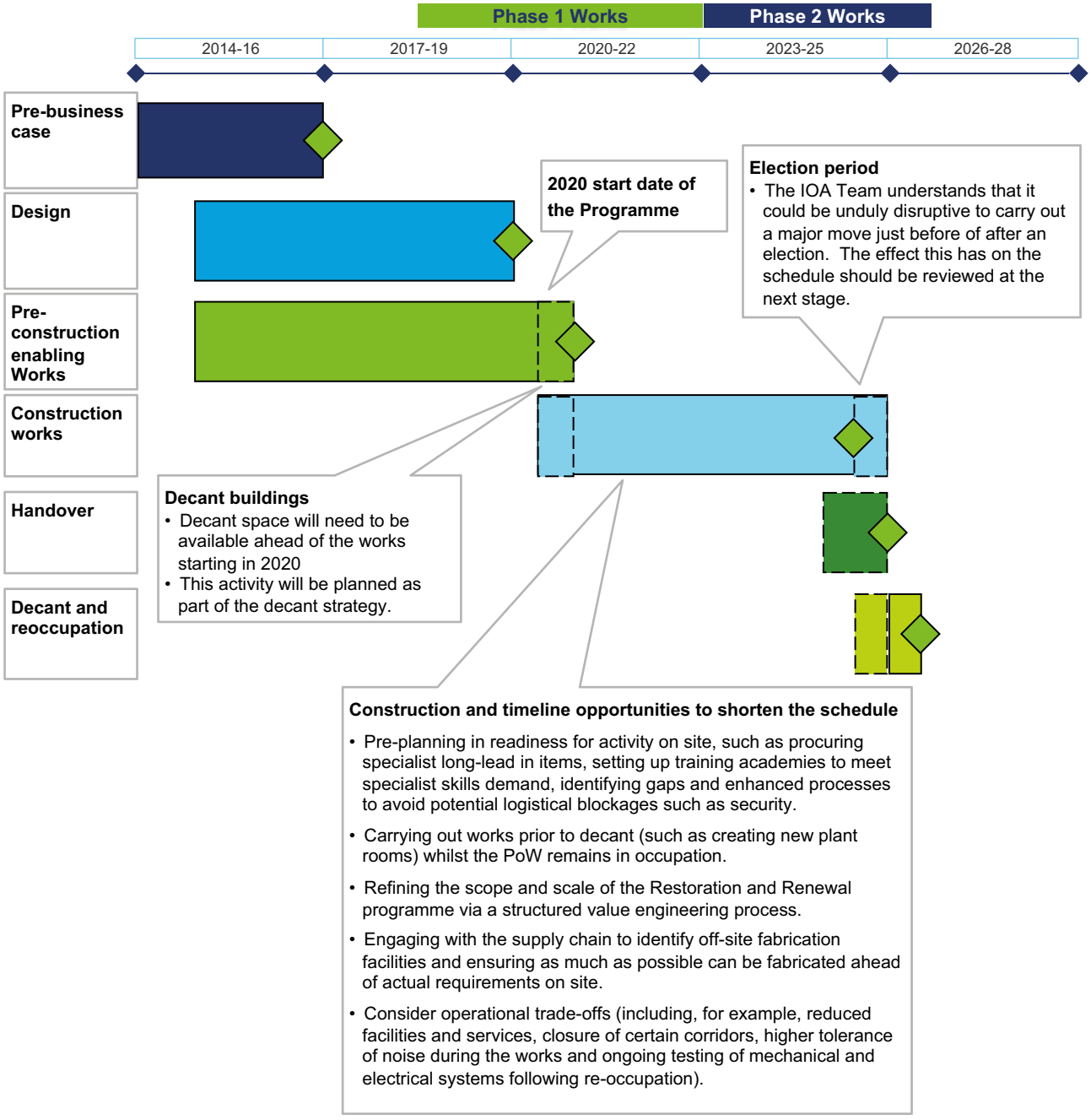
Key assumptions

- The assumptions underpin the assessed programme period for this scenario:
  - An assumed start date in Q2 2020;
  - A six month period of site surveys and enabling works prior to full construction work commencing;
  - The testing and commissioning activity will overlap with physical construction work. There will be a dedicated period to complete the testing, commissioning, balancing and trial running of all new systems, prior to reoccupation;
  - There is a dedicated period for moving occupants and their business functions back to the PoW; and
  - It is assumed that the Programme is not currently impacted by move constraints around election e following key dates.

6.5.5 Schedule

Scenario 3C would most likely deliver the core objectives of the Programme in a period of six years. Our analysis suggests that it is highly unlikely that the works could be completed within a five year Parliamentary term

Figure 92: Scenario 3C schedule



Source: IOA Team analysis

6.5.6 Delivery approach

All occupants and functions will be relocated to available space outside the PoW leaving behind a vacant building. The key risk to delivering this Scenario is the availability of suitable decant space

Delivery approach

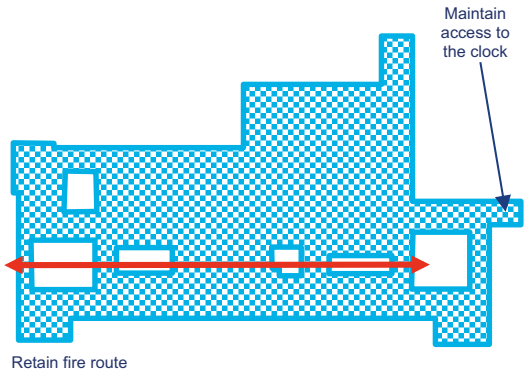
- Our approach for the full decant is based on the availability of suitable decant space to maintain continuity and business of Parliament. One workable solution for decant space has been identified by the Estates Team and buildings that will be used are referred to in this report as Buildings X and Y. Further detailed studies will be required to establish a detailed strategy if a full decant option is the preferred approach.
- Securing availability of suitable decant buildings that will accommodate most if not all of the decanted functions of Parliament within eight minutes of the respective Chambers is key to delivering this Option . These buildings would need to be available and ready to operate from, prior to the start of the Programme, currently assumed to be mid-2020.
- For a mid-2020 start of the works, the decant buildings would have to be designed, adapted, fitted-out, and tested for all necessary security and business continuity / operational requirements.
- The location of decant buildings, relative to each other also needs to fulfil bicameral Parliamentary functions.
- The two Chambers can be located in separate buildings as long as the associated functions of each Chamber meet the proximity criteria included in the Architectural Workstrand Report.
- While the Chambers and associated functions and Committee rooms would relocate to either Building X or Building Y, Member's and Peer's offices would be moved to parts of the Northern and Southern buildings respectively.

Key delivery risks

- Inability to secure adequate decant accommodation.
- Artefacts and artwork could be damaged if the internal environment is not closely controlled.
- Damage could be caused to artefacts during the works.
- The large site establishment could be visibly obtrusive.
- There could be logistical challenges in dealing with high levels of deliveries requiring security screening
- There is a risk that there may not be enough specialist labour in the market to service the Programme.

Zones and sequencing

Figure 93: Zones and sequencing



Source: IOA Team analysis

- The sequence of works is driven by the continuous flow of work trades. Besides key mechanical and electrical items of work this includes careful consideration of heritage items. An example sequence that could be used to form the normal work flow through the vacated zone of the building on the upper floors is:
  - Undertake a soft strip out and remove items of furniture;
  - Protect remaining items;
  - Create a suitable temporary environment by switching over to temporary services;
  - Remove wall panelling;
  - Investigate risers, complete asbestos surveys and remove or encapsulate asbestos;
  - Strip-out redundant mechanical and electrical services;
  - Install new mechanical and electrical services;
  - Test and commission mechanical and electrical systems;
  - Undertake security sweep;
  - Replace panels / close up areas;
  - Complete heritage restoration of fabric;
  - Remove protection / final fix / decoration;
  - Return heritage items taken off-site for refurbishment / storage;
  - Deep clean and lock-up / security seal; and
  - Final security sweep.

6.5.6 Delivery approach

All occupants and functions will be relocated to available space outside the PoW leaving behind a vacant building. The key risk to delivering this Scenario is the availability of suitable decant space

Temporary relocation of staff

Table 98: Temporary relocation of staff

Commons department	Moves to
Ground floor	
Chapel	Closed (alternative place of worship to be provided)
Kitchen and Dining	Closed or Decant Building
PED	TBC
Members' Offices	Southern Buildings
Principal floor	
Serjeant at Arms	Decant Building Y
All Support Space	Decant Building Y
Commons Library	Decant Building Y
Kitchen and Dining	Closed or Decant Building X
Whips' Offices	Decant Building Y
Members' Offices	Southern Buildings
Speaker's Residence	TBC
First floor	
Chamber Galleries	Decant Building Y
Committee Rooms	Decant Building Y
Reporters	Decant Building Y
Members' Offices	Southern Buildings
Speakers' Residence	TBC
Upper floors	
Chamber Galleries	Decant Building Y
Committee Rooms	Decant Building Y
Reporters	Decant Building Y
Members' Offices	Southern Buildings
Speaker's Residence	TBC

Lords department	Moves to
Ground floor	
Peers' Offices	Decant Building X
Peers' Dining	Closed or Decant Building X
PED	TBC
Police Accommodation	Decant Building Y and Courtyard
Principal floor	
The Lords Chamber	Decant Building X
Black Rod's Offices	Decant Building X
Whips' Offices	Decant Building X
Peers' Offices	Decant Building X
Peers' Dining	Closed or Building X
Lords' Library	Decant Building X
Robing Room and Royal Gallery	Decant Building X
Lord Speaker's Accommodation	TBC
First floor	
Peers' Offices	Southern Buildings
Committee Rooms	Decant Building X
Lord Speaker's Accommodation	TBC
Upper floors	
Peers' Offices	Southern Buildings
Archives	New accommodation (Programme assumption)

- All occupants and functions within the PoW will be relocated to available space outside the Palace leaving behind a vacant building.
- The tables below outline where specific departments in the HoC and HoL could be moved to under a full decant option.
- Final locations for departments will need to be agreed once the available space for decant has been established and a detailed transition plan has been put in place.

Source: IOA Team analysis

6.5.7 Potential scope

The scope in Scenario 3C includes that within 3B, but with additional amenity provided through the creation of covered courtyards, informal meeting and greeting areas for the HoC and HoL, as well as improved air conditioning

Summary of Scenario 3C potential scope

- The table below outlines the illustrative scope of works that is to be provided in Scenario 3C. For greater detail on the works included in each Scenario please see Volume 2, Appendix D.1.
  - Examples of scope of work, additional to Outcome Levels A and B that could be provided in Scenario 3C are:
  - Star Chamber Court could be glazed over to form an atrium;
  - There is potential to develop part of the car park for other purposes;
  - State Officers Court could be glazed over to form an atrium; and
  - A new visitors centre could be provided.

Table 94.1: Summary of Scenario 3C potential scope

Ref	Description
A	**General works**
A10	Building exterior
A10.1	External fabric
A10.2	External works
A10.3	External mechanical and electrical services
A20	Building interior
A20.1	Plant
A20.2	Horizontal and vertical services infrastructure
A20.3	IT systems
A20.4	Security systems
A20.5	Mechanical and electrical services works per room / space / zone
A20.6	Architectural works
A20.7	Asbestos works
B	**Specific items**
B10	**Lifts**
B10.1	Replace or refurbish existing lifts
B10.2	New lift and shafts
B10.3	Structural works associated with existing lifts to extend shaft to serve additional floors
B10.4	Structural works associated with existing lifts to provide step-free access at ground floor level
B10.5	Provision of new local lifts to address step changes and achieve greater step free access
B10.6	Replacement of existing goods and people lifts
B10.7	Replacement of existing goods only lifts
B10.8	Install new duplex lifts for additional evacuation and business resilience
B10.9	Victoria Tower
B20	**Archives** – Archives are assumed to relocate to a new off site building
B30	**Fire compartmentation works** – Further works completed to improve fire compartmentation
B40	**Architectural interventions**
B40.1	**Security driven**
B40.1.1	Installation of new access control systems on doors and areas to provide greater demarcation of security zones
B40.1.2	Increase in size of the visitor screening area - extension to the existing Cromwell Green screening area - assume double in size
B40.1.3	Replace existing vehicle protection measures with more appropriate design
B40.1.4	Install further blast rated secondary glazing

Source: IOA Team analysis

6.5.7 Potential scope

The scope in Scenario 3C includes that within 3B, but with additional amenity provided through the creation of covered courtyards, informal meeting and greeting areas for the HoC and HoL, as well as improved air conditioning

Table 94.2: Summary of Scenario 3C potential scope

Ref	Description
B40.1.5	Internal CCTV to be fitted in agreed areas
B40.1.6	Increased protection from threats from river
B40.1.7	Bomb Shelters/refuge areas
B40.2	**Catering driven**
B40.2.1	Replacement of the terrace marquees on the river front terrace
B40.2.3	Rationalisation of the Kitchens – re-planned and potentially relocated - To result in an assumed 10% reduction in area from current
B40.2.4	Improvements to banqueting and event facilities - access to them and capacity
B40.2.5	Further rationalisation of the Kitchens – re-planned and potentially relocated - To result in an assumed further 15% reduction in area from Outcome B
B40.3	**Business driven / support driven**
B40.3.1	Permanent education centre
B40.3.2	Visitor Centre for Entire Site - would potentially Accommodate: - Education Centre Facilities - Exhibition Space - Large scale conference space - Visitor facilities - Screening if secure route to palace
B40.3.3	Basement, PED Craft, team workshops - relocate Change of use opportunity. Space is unsuitable for usage with health and safety risks associated with dust and fumes. Move craft team to alternative location. Space available for alternative usage.
B40.3.4	Basement, Lords' and Commons' Library Archive Relocate change in use Change of use opportunity. Space is unsuitable for usage with damp/RH and space issues. Move archive to alternative location (off site)
B40.4	**Space Planning**
B40.4.1	Re-organisation of the internal space allocation to provide: - Increased break out, formal and informal meeting areas - greater changing areas + staff areas - more flexible accommodation and co-location of departmental teams
B40.5	**Media Centre**
B40.5.1	Create a Media Centre with space for interviews both off and on camera - this to be a facility within the Palace
B40.6	**Courtyards**
B40.6.1	Removal of Goods and waste distribution from Courtyards by: - New delivery and distribution regime, making use of basement corridors (enhanced by new mechanical and electrical installation reducing service volume in key corridors). - New vertical circulation extending to basement to improve local distribution - New point of delivery in Black Rods Garden, with link to underground distribution. - Existing boiler House [redacted] to form part of distribution system (taking advantage of, and dependant on, creation of off-site energy centres proposed by mechanical and electrical strategy). Or extend the existing boiler House to create a link down to the basement to allow service route to work - Opportunities to pedestrianize and landscape the courtyards as a result of the above
B40.6.2	Cloister Court - Removal of current ground floor usage, full repair and restoration to open ambulatory - Landscaping to Cloister Court
B40.6.3	Whips Area - Small external zone used as a main through route - Glass roof over to create internal space.
B40.6.4	Boiler House Court - Demolition of 20th century single storey structures within courtyard (PED Offices

Source: IOA Team analysis

6.5.7 Potential scope

The scope in Scenario 3C includes that within 3B, but with additional amenity provided through the creation of covered courtyards, informal meeting and greeting areas for the HoC and HoL, as well as improved air conditioning

Table 94.3: Summary of Scenario 3C potential scope

Ref	Description
B40.6.5	The Bandstand - Removal of ground floor level partitioning, including Engineers Control area throughout area below Central - Reform floor and staircase access down to basement level - Form pedestrian access routes across bandstand area linking Whip's Area and Boiler House Court through to the Common's and Peer's Inner Courts.
B40.6.6	Chancellor's Court - Demolish lightweight glass building - Demolish cover to basement stairs - Landscape and pedestrianize courtyard - Change of use – Police area between Chancellor's and Royal Court to become office accommodation and ancillary facilities
B40.6.7	Peer's Court and Inner Court, Commons Court and Inner Court - Courtyards to be pedestrianized and landscaped retaining vehicle access for emergency use only. - Relocation of servicing and refuse provision away from courtyards - Rationalisation (or relocation) of catering areas fronting onto these courtyards to create new office accommodation (notably Peer's Court)
B40.6.8	Boiler House Court - Opening up at ground level to create a basement level courtyard. - Extending lift to serve basement Creation of office accommodation at basement level - Glass roof over new courtyard to include cover to pedestrian route at ground floor level
B40.6.9	Star Chamber Court - Removal of 1970s accommodation block, including Member's Cloakroom - Glass roof over to create internal space. - Relocation of access to underground car park - Rediscovery of earlier entrance sequence through double archway - New entrance on axis to Cloister Court - Consider provision of escalators to improve access to Principal floor level
B40.6.10	State Officers Court - Opening up at ground level to create a basement level courtyard. - Extending lift to serve basement, new staircase provided within State Officer's Court (NOTE the lift in question is covered by a possible new Duplex lift) - Creation of office accommodation at basement level, with related facilities - Glass roof over courtyard to create internal space - Historic link through to Peer's Court re-opened Lobby
B40.7	**Palace Interiors**
B40.7.1	Westminster Hall Rooms - Remove meeting rooms from ground floor W rooms. - Remove/change usage of upper level IPU and Jubilee rooms. Extend Jubilee Café to provide open air seating in Cromwell Green - Provide visitor information, exhibition, shop and WC facilities across both floors
B40.7.1	North East Turret, light well - Remove Library usage of former central light-well at ground floor level, demolish internal structures, repair and rediscover light well for full height of building
B40.7.2	Third Floor, Upper Committee Corridor north and south - Poor quality Members and staff rooms, half with natural light via roof-light. Modern insertion, retaining east facing cast iron roof, and extending flat roof out to west side. - Demolish, retaining cast iron roof element. Rebuild with generous glazing to west (concealed) side. Re-plan to make best use of available natural light, likely to include larger open plan areas and access corridor to poorly lit (east) side. Make better use of existing dormer windows to cast iron roof.
B40.7.3	Peers Court and Commons Court rooms – east side - Rooms at 1st and 2nd floor levels including 'T' Block to Commons Court. Members' rooms of inadequate quality and layout. Refurbish, retaining envelope. Explore improving natural light penetration to Committee Corridor.

Source: IOA Team analysis

6.5.7 Potential scope

The scope in Scenario 3C includes that within 3B, but with additional amenity provided through the creation of covered courtyards, informal meeting and greeting areas for the HoC and HoL, as well as improved air conditioning

Table 94.4: Summary of Scenario 3C potential scope

Ref	Description
B40.7.4	Offices, west of Speaker's Court. 2nd floor level - Change of use, subject to reduction or relocation of reporters facilities. Refurbish offices to provide additional offices for Members and facilities, or to accommodate secretarial use moved from basement
B40.7.5	Reporters' Restaurant and kitchen area. 2nd floor level - Change of use to office accommodation. Refurbish and reorder to provide additional offices for Members and related facilities
B40.7.6	Committee Offices, north end of Committee Corridor, 1st and 2nd floor level - Change of use to office accommodation. Refurbish and reorder to provide additional offices for Members
B40.7.7	The Clock Tower (Elizabeth Tower) - New lift to north-west corner of tower, running from ground to level 10 (access unlikely to bell level above due to space and aesthetic restrictions). Removal of accommodation at ground floor to allow route through to lift. - Improved visitor facilities at intermediate levels, into repaired and refurbished rooms. Possible exhibition space depending on safe access / visitor numbers.
B40.7.8	Create bespoke storage on site for use by the Heritage Collections - Works of Art - historic furniture - books - architectural items - for ceremonial items
B40.7.9	Create off site storage facility for Heritage Collections Use
B40.7.10	Create on site workshop facilities for Heritage Collection conservation works - minimum requirement; - multi-purpose with dry/clean lab and a wet/dirty lab
B40.8	**New Palace Yard and Car Park** - Re-landscape to include lowering level of central grass area (to former level) and reducing impact of vehicular roundabout. - Explore possible new structure to north side of yard (note Barry unbuilt scheme with prominent range of buildings running east towards the Clock Tower and south towards St Stephens's Entrance). New structure to have upper floor at pavement (Bridge Street) level, providing alternative pass holders' entrance. Link at ground floor level into Colonnade. - Redevelop top level of underground car park to provide informal meeting rooms/reception space, with natural light from landscaped courtyard above
B50	**Mechanical and electrical enhancements / additions**
B50.1.1	Installation of new access control systems on doors and areas to provide greater demarcation of security zones within the palace (3 zones)
B50.1.2	Installation of Improved external CCTV
B50.1.3	Install fire suppression in building where possible
B50.1.4	Install CCTV for fire detection aspects
B50.1.5	Energy Centre for Palace alone (within palace) or Estate Wide Energy Centre
B50.1.6	Extend Comfort cooling to additional areas of the PoW
B50.1.7	Installation of renewable energy generation
B50.1.8	Install Renewable Energy Systems
B50.1.9	Enhancing Conditions within both Chambers
B50.1.10	Mixed mode ventilation - given limitation of natural ventilation and security upgrades will need mechanical ventilation to more areas
B50.1.11	Closed environmental control of heritage areas

Source: IOA Team analysis