

Outline Business Case: 2019

nVCC Enabling Works

Economic Case

ECONOMIC CASE

INDEX

Page N°

1. INTRODUCTION	E3
2. CRITICAL SUCCESS FACTORS.....	E5
3. THE OPTIONS FRAMEWORK.....	E7
4. THE SHORTLIST OPTIONS	E10
5. FINANCIAL COSTS AND QUANTIFIED BENEFITS.....	E12
6. ECONOMIC APPRAISAL	E20
7. SENSITIVITY OF THE PREFERRED WAY FORWARD	E24
8. THE PREFERRED OPTION.....	E27
9. CONCLUSION.....	E28
10. APPENDICIES	E29

1. INTRODUCTION

1.1 The case for a new Velindre Cancer Centre (nVCC) has been clearly articulated within the nVCC OBC. The deficiencies in the current Velindre Cancer Centre infrastructure have been identified as:

- There is no expansion space on the current site to, for example, install any additional linear accelerator machines, which limits the Trust's ability to expand its capacity to meet growing demand for clinical services;
- The majority of the patient environment is not fit for purpose and does not support optimal recovery and well-being;
- Parts of the existing Cancer Centre do not comply with statutory requirements and create challenges in maintaining the high levels of patient safety; and
- The existing infrastructure is unable to provide an environment to respond to increasing demand for cancer services.

1.2 The purpose of the nVCC Enabling Works Economic Case is to identify and appraise the potential options for the delivery of the nVCC Enabling Works Project objectives and to identify the option that provides the best value for money. The nVCC Enabling Works spending objectives are set down in the table below.

Table 1-1: Spending Objectives

Ref	Spending objective	Related benefits / considerations
SO1	To prepare site to allow MIM contractor to successfully deliver nVCC	<ul style="list-style-type: none">• Site ready by required date• Minimise MIM risks• Fully serviced site – utilities et al
SO2	To provide access to nVCC site	<ul style="list-style-type: none">• Allows primary and emergency access• Allows vehicle and pedestrian access• Allows specialist access (e.g. crane)• Reduces traffic congestion
SO3	To accommodate the potential Metro development	<ul style="list-style-type: none">• Enables development of Metro
SO4	To accommodate the future use of the nVCC site	<ul style="list-style-type: none">• Provides future proofing• Allows increase in service demand and capacity
SO5	To minimise disruption during the construction period of the Enabling Works	<ul style="list-style-type: none">• Reduced disruption to local area
SO6	To minimise environmental impact	<ul style="list-style-type: none">• Mitigates risk to local wildlife• Minimise environmental impact• Provide for Future Generations and Wellbeing requirements

1.3 The Economic Case outlines the option appraisal undertaken to identify the Preferred Option by the following Processes:

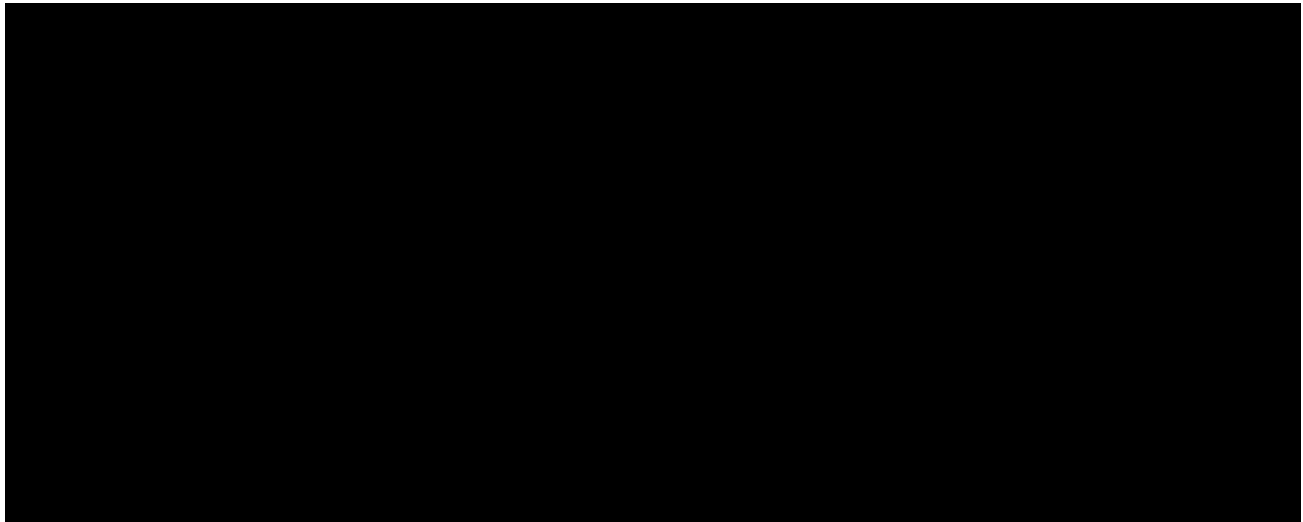
- Identification of the Critical Success Factors (CSFs) for the Project;
- Development of a longlist of options;

- Evaluation of the longlist of options against the CSFs and the Spending Objectives for the Project to identify a shortlist;
- An economic appraisal of the shortlist of the options; and
- Provide a recommendation of the preferred way forward in the form of a Preferred Option.

1.4 The outcome of the option appraisal supports and justifies the decision to proceed with the Project. It does this by identifying a Preferred Option which will deliver the benefits required and provide the best value for money.

Context

1.5 The Welsh Government approved the Trust's Strategic Outline Programme (SOP) in 2015 for the delivery of Cancer Services in South East Wales. The approval of the SOP resulted in the requirement to develop an Outline Business Case for a nVCC.



2 CRITICAL SUCCESS FACTORS

- 2.1 As outlined in the Welsh Government's Better Business Case Guidance, the Critical Success Factors (CSFs) are the attributes essential for successful delivery of the Project.
- 2.2 The Project Group developed the CSFs for the Project and in doing so considered the Welsh Government priorities as outlined in the NHS Infrastructure Investment Criteria. The criteria is outlined below:

Figure 2-1: NHS Infrastructure Investment Criteria

- **Health gain:** improving patient outcomes and meeting forecast changes in demand;
- **Affordability:** given the long term revenue assumptions, there should be an explicit reference to reducing revenue costs;
- **Clinical and skills sustainability:** reducing service and workforce vulnerabilities, and demonstrating solutions that are flexible and robust to a range of future scenarios;
- **Equity:** where peoples highest health need are targeted first; and
- **Value for money:** optimising public value by making the most economic, efficient and effective use of resources.

- 2.3 The CSFs that were identified are as follows:
- Strategic fit;
 - Value for money;
 - Capacity and capability;
 - Potential affordability; and,
 - Potential achievability.
- 2.4 The CSFs are used to assess each option and they have also been aligned to the infrastructure investment criteria, as outlined in the table below:

Table 2-1: Critical Success Factors

CSF	The option will be assessed in relation to how well it:
Strategic fit	<ul style="list-style-type: none">• Meets agreed spending objectives and business needs• Aligns with national and local strategy / policy• Enables delivery of nVCC Project
Value for money	<ul style="list-style-type: none">• Optimises public value (social, economic, environmental) in terms of potential costs, benefits, and risks
Capacity and capability	<ul style="list-style-type: none">• Matches the ability and capacity of workforce and/or potential suppliers to deliver the required services• Is likely to be attractive to potential suppliers
Potential affordability	<ul style="list-style-type: none">• Can be funded from available sources of finance• Initial high-level costs align with funding expectations
Potential achievability	<ul style="list-style-type: none">• Is likely to be delivered given the Trust's and partner organisations' ability to respond to the scale of change required• Matches level of available skills required for successful delivery• Can be delivered within the required timescales

- 2.5 The CSFs are used alongside the Project spending objectives, and the infrastructure investment criteria, to evaluate possible options for the delivery of the Project.
- 2.6 The possible options for the delivery of the Project will be identified using the Options Framework presented in the next section. The approach to the economic appraisal is outlined in Appendix OBC/EC1.

3 THE OPTIONS FRAMEWORK

- 3.1 The Options Framework, as outlined in the Welsh Government's Better Business Case Guidance, provides a systematic approach to identifying and filtering a broad range of options for operational scope, service solutions, service delivery vehicles, implementation timeframes and the funding mechanism for a project. An overview of these key dimensions is provided in the following table:

Table 3-1: Options Framework

Dimension	Description
Scope	What is the potential coverage of the project?
Service solution	How the preferred scope of the project can be delivered?
Service delivery	Who can deliver the preferred scope and solution for the project?
Implementation	The timing and phasing of project delivery in relation to the preferred scope, service solution and delivery arrangements for the project.
Funding	Potential funding requirements for delivering the preferred scope, solution, service delivery and implementation arrangements for the project.

- 3.2 The process for identifying and assessing options takes each of the key dimensions in turn and completes the following steps:
- Identification of a wide range of realistic potential options within that dimension (Longlisting);
 - An analysis for each option to assess how well the option meets the Projects spending objectives and CSFs; and to identify the main advantages and disadvantages of the option; and
 - Using the outputs of the analysis to determine whether the option will be carried forward as a possible solution, or discounted at this stage (Shortlisting).
- 3.3 The longlisted options were assessed by the Project Group against the spending objectives and CSFs.
- 3.4 The Project Group identified a longlist of possible options as presented overleaf in table 3-2:

Table 3-2: Longlist of Options

Option	Description
Option 1: Longwood Drive 1 (above cutting)	<ul style="list-style-type: none"> Primary access from the north from Longwood Drive across the top of the embankment Emergency access from the south via bridge from Hollybush estate to the south
Option 2: Longwood Drive 2 (in cutting)	<ul style="list-style-type: none"> Primary access from the north from Longwood Drive in the cutting Emergency access from the south via bridge from Hollybush estate to the south
Option 3: Asda 1	<ul style="list-style-type: none"> Primary access from the north via a new bridge at south of Asda car park Emergency access from the south via bridge from Hollybush estate to the south
Option 4 : Asda 2	<ul style="list-style-type: none"> Primary access from the north via a new bridge at south of Asda car park Ancillary access from the south via bridge from Hollybush estate to the south
Option 5: Asda 3	<ul style="list-style-type: none"> Primary access from the north via a new bridge at south of Asda car park Ancillary access from the south via Park Road on the playing fields
Option 6: Asda 4	<ul style="list-style-type: none"> Primary access from the north via a new bridge at south of Asda car park Ancillary access from the south via Park Road using existing Whitchurch Hospital access
Option 7: Asda 5	<ul style="list-style-type: none"> Primary access from the north via a new bridge at south of Asda car park Ancillary access from the south via Velindre Road
Option 8: Asda 6	<ul style="list-style-type: none"> Primary access from the north via a new bridge at south of Asda car park Ancillary access from the south via Park Road utilising bridge structure from Lady Coryton Triangle
Option 9: Park Road 1	<ul style="list-style-type: none"> Primary access from the south via Park Road on the playing fields Emergency access from the south via Velindre Road
Option 10: Park Road 2	<ul style="list-style-type: none"> Primary access from the south via Park Road using existing Whitchurch Hospital access Emergency access from the south via Velindre Road
Option 11: Park Road 3	<ul style="list-style-type: none"> Primary access from the south via Park Road using existing Whitchurch Hospital access Emergency access via Hollybush (utilising existing planning)
Option 12: Asda 7	<ul style="list-style-type: none"> Primary access from the north via a new bridge at south of Asda car park Ancillary access via existing ancillary access on Whitchurch Hospital Site, which may be provided by a guarantee of ancillary access via an NHS Partner or 'owned' by the Trust

Note: All the options include the temporary construction access to allow the enabling works construction – refer to Strategic Case (Section 8).

- 3.5 The detailed exercise of identifying and assessing the longlist of options is outlined in Appendix OBC/EC2.

4 THE SHORTLIST OPTIONS

4.1 Following on from the longlisting section, the process continued by undertaking a detailed assessment of the longlisted options to identify a shortlist of possible options to be appraised. The results of the shortlisting process are presented in table 4-1 below:

Table 4-1: Shortlisting of Options

		Option 1: Longwood	Option 2: Longwood	Option 3: Asda 1	Option 4 : Asda 2	Option 5: Asda 3	Option 6: Asda 4	Option 7: Asda 5	Option 8: Asda 6	Option 9: Park Road 1	Option 10: Park Road 2	Option 11: Park Road 3	Option 12: Asda 7
SO1	To prepare site to allow MIM contractor to successfully deliver nVCC	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
SO2	To provide access to nVCC site	Y	Y	?	Y	Y	Y	Y	Y	Y	Y	Y	Y
SO3	To accommodate the potential Metro development	X	X	?	?	Y	Y	Y	?	Y	Y	?	Y
SO4	To accommodate the future use of the nVCC site	Y	Y	?	Y	Y	Y	Y	Y	Y	Y	?	Y
SO5	To minimise disruption during the construction period of the Enabling Works	Y	Y	Y	?	?	?	?	X	?	?	?	?
SO6	To minimise environmental impact	X	Y	Y	X	?	Y	Y	X	?	Y	Y	Y
CSF1	Strategic fit	Y	Y	Y	Y	Y	Y	Y	Y	?	?	?	Y
CSF2	Potential value for money	?	?	?	?	?	?	?	?	?	?	?	?
CSF3	Supply side capacity / capability	Y	Y	?	?	?	?	?	?	Y	Y	Y	?
CSF4	Potential affordability	?	?	?	?	?	?	?	?	?	?	?	?
CSF5	Potential achievability	X	X	?	X	?	?	?	X	?	?	?	?
Assessment		Discount	Discount	Possible	Discount	Possible	Possible	Possible	Discount	Possible	Possible	Possible	Possible

4.2 The Project Board and Scrutiny Committee reviewed the shortlist of options by testing the following:

- Was the option likely to deliver the spending objectives and CSFs of the project?
- Was the option likely to deliver sufficient benefits?
- Was the option practical and feasible?
- Was the option deliverable within the constraints of the project?
- Was the option deliverable without incurring an unacceptable degree of risk?

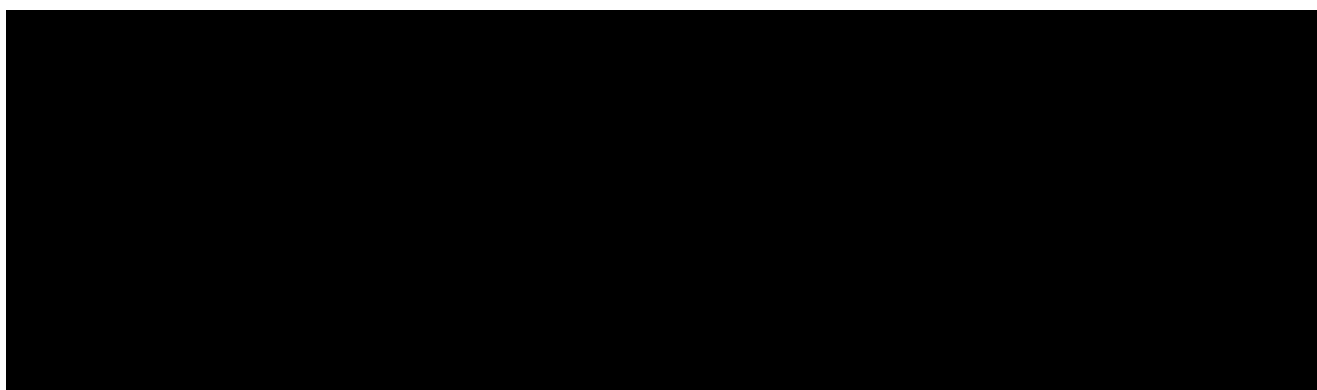
4.3 Following the review, the shortlist of options was approved by the Velindre University NHS Trust Board.

4.4 Initially, there was a Final shortlist of **eight** options which are presented below in table 4-2:

Table 4-2: Initial Final Shortlist of Options

Option type	Long list ref		Access routes
Asda	Longlist 3	Asda 1	<ul style="list-style-type: none"> • Primary: New bridge at south of Asda car park • Emergency: Bridge from Hollybush estate
Asda Plus	Longlist 5	Asda 3	<ul style="list-style-type: none"> • Primary: New bridge at south of Asda car park • Ancillary: Park Road on the playing fields
	Longlist 6	Asda 4	<ul style="list-style-type: none"> • Primary: New bridge at south of Asda car park • Ancillary: Park Road using existing Whitchurch Hospital access
	Longlist 7	Asda 5	<ul style="list-style-type: none"> • Primary: New bridge at south of Asda car park • Ancillary: Velindre Road
	Longlist 12	Asda 7	<ul style="list-style-type: none"> • Primary: New bridge at south of Asda car park • Ancillary: Any ancillary access via existing Whitchurch site
Park Road	Longlist 9	Park Road 1	<ul style="list-style-type: none"> • Primary: Park Road on the playing fields • Emergency: Velindre Road
	Longlist 10	Park Road 2	<ul style="list-style-type: none"> • Primary: Park Road using existing Whitchurch Hospital access • Emergency: Velindre Road
	Longlist 11	Park Road 3	<ul style="list-style-type: none"> • Primary: Park Road using existing Whitchurch Hospital access • Emergency: Bridge from Hollybush estate

4.5 The detailed exercise of identifying the initial shortlist of options is outlined in Appendix OBC/EC3.



- 4.9 In reviewing the OBC, the Project Team identified that the core requirements of our business case are a primary access and an emergency access to the nVCC site.
- 4.10 All of the options deliver the core requirements (as per 2.3) but options 5, 6, 7 and 12 included additional features to deliver additional flexibility. However, they also introduce delay to the delivery of the core requirements
- 4.11 On the back of this further review, Longlist options 5,6,7 and 12 that include additional features (that incur delay) to the primary Asda access, are not short-listed for consideration in this business case.
- 4.12 The revised Final shortlist of **four** options are presented below in table 4-3.

Table 4-3: Revised Final Shortlist of Options

Option type	Long list ref		Access routes
Asda	Longlist 3	Asda 1	<ul style="list-style-type: none"> Primary: New bridge at south of Asda car park Emergency: Bridge from Hollybush estate
Park Road	Longlist 9	Park Road 1	<ul style="list-style-type: none"> Primary: Park Road on the playing fields Emergency: Velindre Road
	Longlist 10	Park Road 2	<ul style="list-style-type: none"> Primary: Park Road using existing Whitchurch Hospital access Emergency: Velindre Road
	Longlist 11	Park Road 3	<ul style="list-style-type: none"> Primary: Park Road using existing Whitchurch Hospital access Emergency: Bridge from Hollybush estate

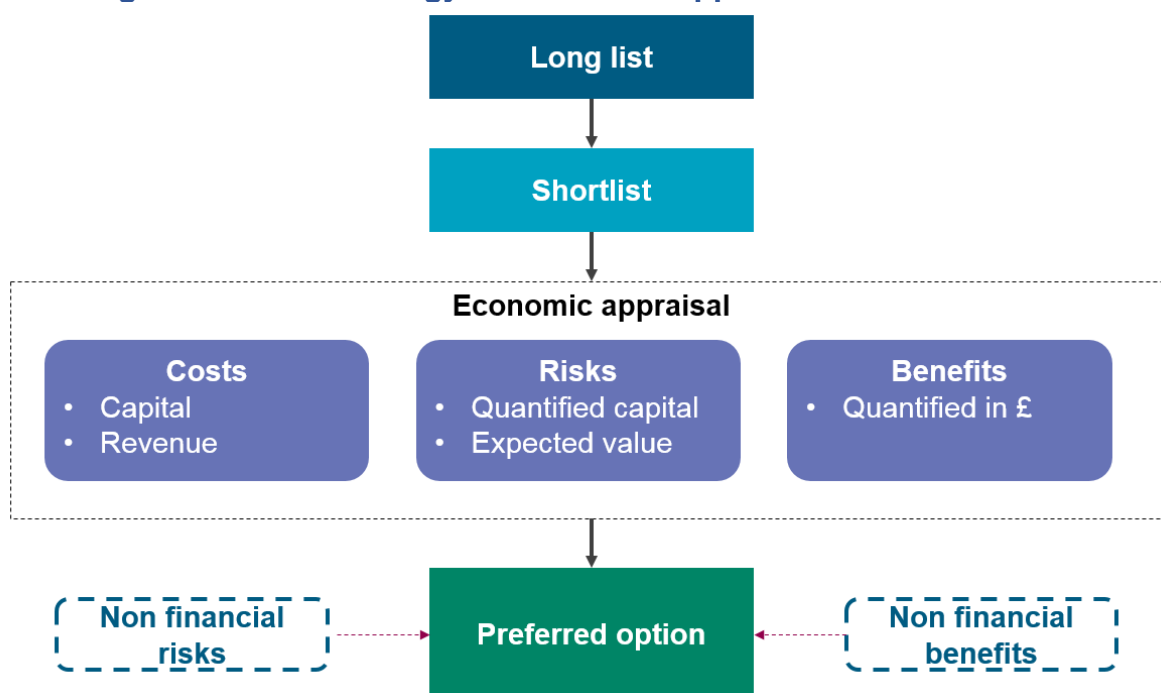
- 4.13 The Economic Appraisal, and the identification of financial costs and quantified benefits, of the shortlisted options is presented in Sections 5 and 6.

5 FINANCIAL COSTS AND QUANTIFIED BENEFITS

Estimating costs for the Economic Appraisal

- 5.1 The treatment of costs and benefits within the Economic Appraisal is in line with current Welsh Government's Better Business Case Guidance.
- 5.2 The Economic Appraisal process utilises key outputs from other parts of the OBC process, in particular the design outputs and project plans, in establishing the capital and revenue (recurring and non-recurring) implications of each option.
- 5.3 The general approach to the economic appraisal is summarised below:

Figure 5-1: Methodology to Economic Appraisal



Capital Costs

- 5.4 The Trust and its Technical Advisors, in partnership with NHS Wales Specialist Estates Services, has prepared the capital costs based on an appraisal of the capital requirements of each option.
- 5.5 These are derived primarily from the option technical designs and associated technical information (see Appendix OBC/EC4) with appropriate adjustments to reflect the costs of delivering the options given planning conditions and commercial access constraints. The capital requirements differ for each of the eight shortlisted options.

- 5.6 An overview of the capital requirements of the eight options is provided in table 5-1.

Table 5-1: Capital requirements

	Asda 1	Park Rd 1	Park Rd 2	Park Rd 3
Works, access	◆	◆	◆	◆
Bridge construction	2			
nVCC site preparation	✓	✓	✓	✓
Incoming utilities	✓	✓	✓	✓
Third party costs	✓			
Easement cost	✓	✓	✓	✓
Planning costs	✓	✓	✓	✓
+ Southern access		✓	✓	✓
Professional fees	◆	◆	◆	◆
Legal costs	✓	✓	✓	✓
Warranted surveys	✓	✓	✓	✓
Velindre costs	✓	✓	✓	✓

- 5.7 The capital cost calculations and assumptions have been developed by the Trust and its Technical and professional Advisors, and have been shared and agreed with NHS Wales Specialist Estates Services. For further details refer to the Capital Cost Forms (Appendix OBC/EC5). The assumptions used to calculate the costs are provided below.

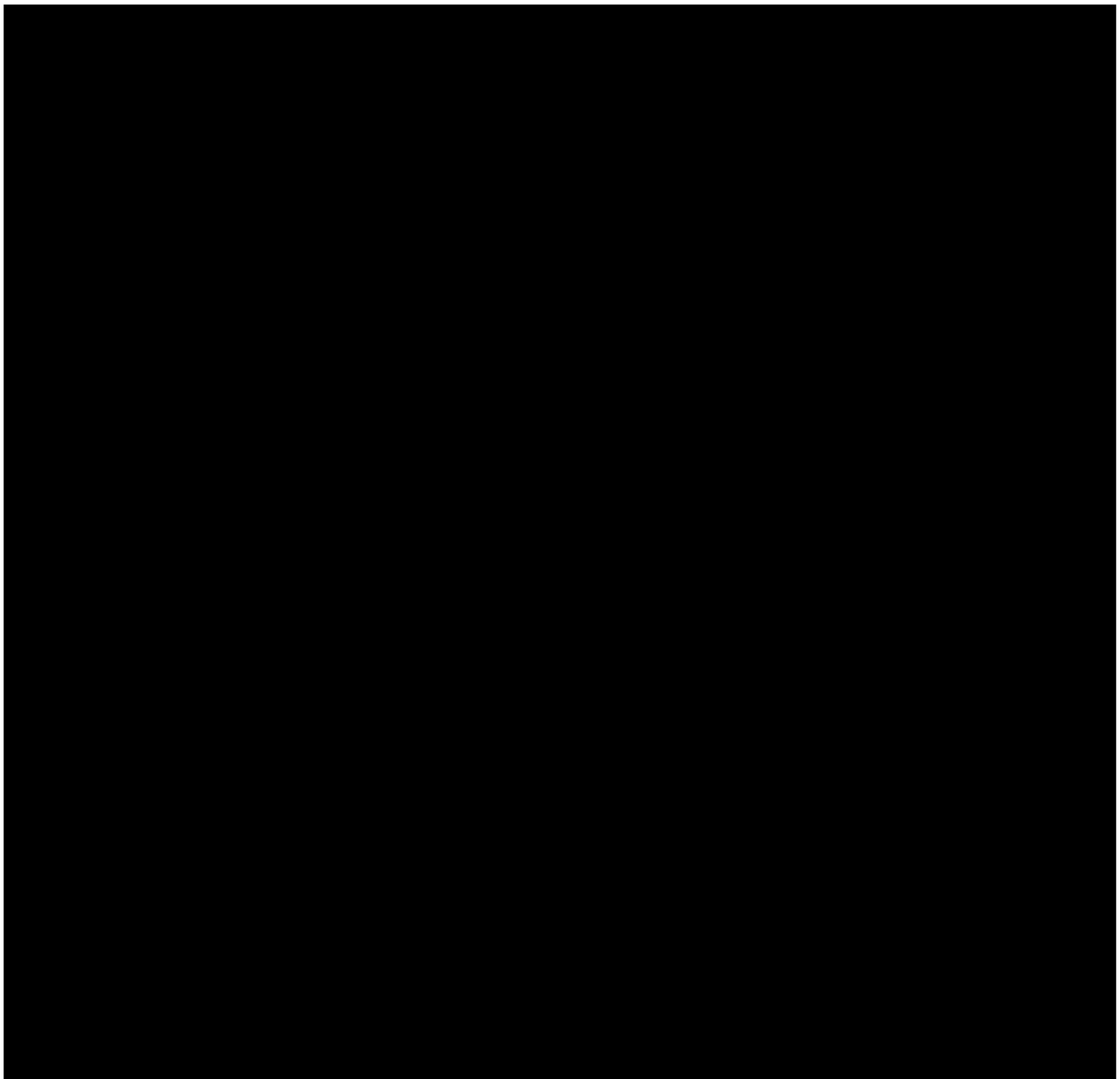
Table 5-2: Main Capital Cost Assumptions

- Property, land, highways and opportunity costs includes the diminution of the Whitchurch site as outlined in the impact assessment prepared by Trust's Property Advisers (Savills).
- Easement costs have been estimated in relation to the use of land for each option. For the purposes of the economic appraisal this has been adjusted to remove any inter public service transfers.
- Construction costs have been calculated by the Trust's Technical Advisors (Faithful + Gould).
- Appropriate on-costs have been applied to cover capital expenditure associated with utilities, fees, legal costs, etc.
- The phasing of the capital costs is based on the project plan.
- Contingencies reflects the capital risks within each of the shortlisted options and are based on an assessment by the Trust and their Technical and Professional Advisers. These have been quantified either based on a % of costs or detailed risk quantification exercise.
- Section 106 associated costs for the Green Infrastructure Plan has been included.

- Project delivery cost has been included.
- VAT is allowed for at the 20% rate. However, there has been an element of VAT reclaim assumed in developing the construction costs which has been informed by the Trust's VAT advisors.

Economic Consumption of Whitchurch Site

- 5.8 A high-level assessment of the impact of the eight shortlisted access route options on the value of Whitchurch Hospital (over which some of the proposed access routes cross) based on the site's potential redevelopment value has been undertaken. The principle adopted is where route options cross areas of land earmarked for development within the masterplan, this will reduce the net developable area of the Whitchurch Hospital site and, therefore, its value. For further details refer to the Property Report outlined in Appendix OBC/EC5.





Assessing the Cost of Risk

- 5.24 A range of risks have been identified for the Project, some of which can be quantified and a financial value determined. Other risks are either qualitative or cannot be attributed to specific aspects of the Project, the impact of which is excluded from this economic appraisal.
- 5.25 For the purposes of assessing the costs of risk for the Project the following capital risks have been calculated including:
- Quantified capital risks: which are included in the capital cost contingencies;
 - Quantified revenue risks: which are included in the revenue costs;
 - Optimism bias: the approach taken by the Project is outlined below.

Optimism Bias

- 5.26 The Trust and their cost advisors have not calculated an adjustment for optimism bias, even though this is a requirement of HM Treasury Guidance, intended to redress the demonstrated and systematic tendency for Project appraisers to be optimistic when estimating costs, benefits and timings.
- 5.27 Optimism bias has been excluded on the basis all uncertainty has been addressed within the quantified capital risks or costed within the capital costs.

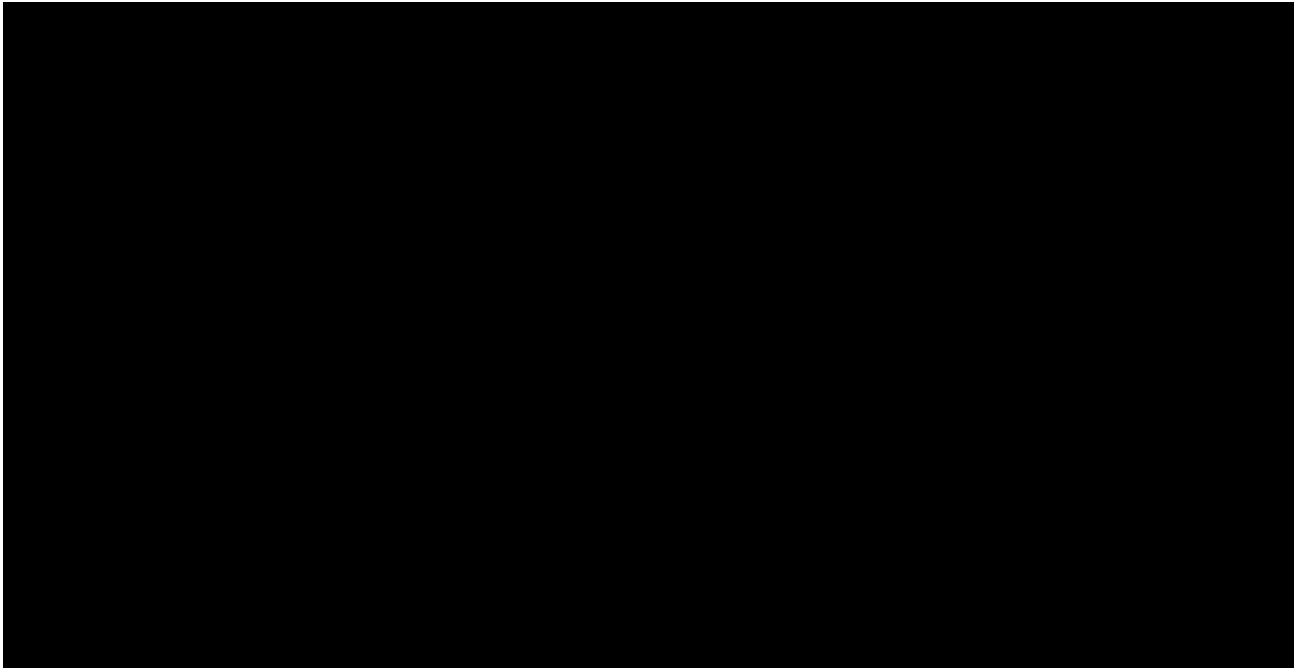
Estimating the Value of Benefits

- 5.28 As outlined in the Strategic Case, the Project delivers benefits in a variety of areas, some of which can be quantified and valued financially.
- 5.29 This includes indirect benefits:
- Reduction in travel time for staff and patients; and

- Wider macro benefits of the employment opportunities related to investment in the local infrastructure.

5.30 For some options there are also disbenefits when compared to the alternative options which include:

- Increased timescales which result in delays to the realisation of benefits associated with the new Velindre Cancer Centre; and
- The curtailment of future access to site.



Mitigation Opportunities

5.32 There is an opportunity to mitigate the risk of the constraints and restrictions of some options.

5.33 Temporary construction access will allow the enabling works construction to haul vehicles and materials to access the site during the construction phase of the enabling works.

5.34 The current planning condition provides for temporary construction accesses. There is an opportunity for the access, subject to planning approval requirements, to be extended to assist the construction works of the nVCC.



6 ECONOMIC APPRAISAL

- 6.1 Economic appraisal is a focus on public value from the perspective of society and take into account social, economic and environmental costs.
- 6.2 The economic appraisal methodology determines the economic costs, benefits and risks for the short-listed options and identifies the preferred way forward: the option most likely to offer the best value for delivery of the Project objectives.
- 6.3 A discounted cash flow for each of the options has been undertaken over 60 years using a discount rate of 3.5% for years 0 to 30 and 3.0% for the remaining period in line with the requirements of HM Treasury.
- 6.4 For the development of the OBC it has been agreed with WG that the baseline (Year 0) will be 2019/20 and Year 1 is 2020/21.
- 6.5 The key assumptions used in this analysis are summarised below:

Figure 6-1: Key Assumptions Used in the Economic Appraisal

- Costs and benefits are calculated over a 60 year appraisal period.
- Year 0 is 2019/20.
- Costs and benefits use real base year prices – all costs are expressed at 2018/19 prices in line with the baseline Trust costs.
- The following costs are excluded from the economic appraisal:
 - Exchequer 'transfer' payments, such as VAT;
 - General inflation;
 - Sunk costs; and
 - Non-cash items such as depreciation and impairments.
- A discount rate of 3.5% is applied to the economic appraisal for years 1-30 and 3.0% for years 31 onwards.
- Quantified risks including Quantified Capital Risk and costing of uncertainty are included based on the approach outlined above.

- 6.6 The economic appraisal has been undertaken to reflect each of the short-listed options before and after the mitigation opportunities that are outlined in Section 5. The aim is to identify the option which best balances the expected costs in relation to the benefits and risks.

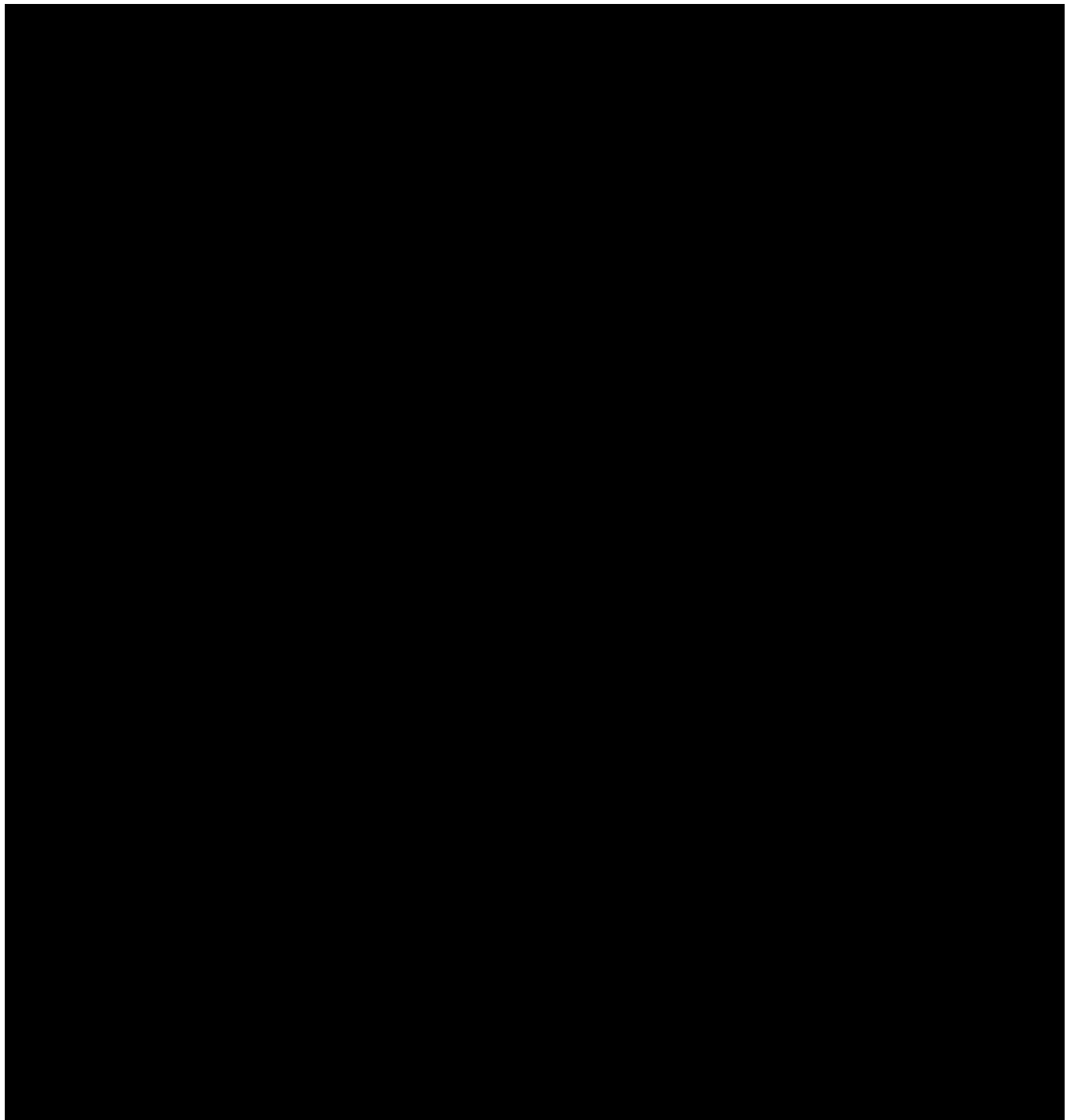
7 SENSITIVITY OF THE PREFERRED WAY FORWARD



Decision Analysis

- 7.1 The results show that when comparing the relative costs and benefits of the alternative solutions, **Option 3 (Asda 1)**, is the preferred way forward. It offers the best value for money of the shortlisted options over a 60 year period on a discounted benefits cost ratio analysis.

Sensitivity analysis and switching

- 7.2 The results of the economic appraisal above have been subject to a sensitivity analysis to examine the impact of movements in capital and revenue costs.



- 
- 7.7 This analysis demonstrates that the ranking of options in terms of BCR is less sensitive, so **Option 3 (Asda 1)** can be considered to offer best value for money in terms of the relationship between benefits and costs.
- 7.8 The results of the economic appraisal (**including** the temporary construction access mitigation) are analysed below:
- 

- 7.9 The results of the economic appraisal allow selection of the preferred way forward. The Preferred Way Forward, **Option 3 (Asda 1)** is considered to offer the best value for money and, is confirmed as the **Preferred Option**.

8 THE PREFERRED OPTION

- 8.1 The preferred option for delivering the Enabling Works project is **Option 3 (Asda 1)** and contains the following features to deliver a wide range of benefits to patients, staff and other stakeholders.

Figure 8-1: Summary of the preferred option

- Primary access from the North via a new bridge at South of Asda car park.
- Emergency access via a new bridge at the Hollybush Estate.
- Extended temporary construction access will allow the enabling works construction to haul vehicles and materials to access the site during the periods of construction for both the Enabling Works and new Velindre Cancer Centre Projects.
- Reduced risk to Project timescales enabling delivery of the new Velindre Cancer Centre and its associated benefits.

9 CONCLUSION

- 9.1 Following a robust option appraisal process involving a wide range of stakeholders, the Trust has identified its Preferred Option for developing primary and emergency access to the new Velindre Cancer Centre as **Option 3 (Asda 1)**.
- 9.2 **Option 3 (Asda 1)**, the Preferred Option, delivers a wide range of subsidiary benefits which are in addition to the primary benefit of facilitation of the nVCC Project.
- 9.3 Subsequent sections of the OBC will consider the procurement route in further detail for the Project. The financial implications, as well as the management of its successful delivery, are considered in the subsequent OBC cases.

