

Outline Business Case: 2020

New Velindre Cancer Centre

Economic Case

ECONOMIC CASE

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1 INTRODUCTION

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

- The existing patient environment at the Velindre Cancer Centre is sub-optimal and does not promote patient recovery and well-being;
- There is insufficient patient and family car parking at the existing Velindre Cancer Centre;
- A high proportion of accommodation at the existing Velindre Cancer Centre is non-compliant with statutory requirements and creates challenges in maintaining high levels of patient safety;
- The existing Velindre Cancer Centre, built on a 'like for like' basis and in line with Health Building Notes, would have a footprint of circa 28,000m² compared to the existing building footprint of 17,777m²; and
- There is no expansion space on the existing Velindre Cancer Centre to, for example, install any additional linear accelerators, which limits the Trust's ability to expand its capacity in response to increasing demand for clinical services.

1.2 The purpose of the Economic Case is to identify and appraise the potential options for the delivery of the Project Spending Objectives (PSOs) and to identify the option that provides the best value for money.

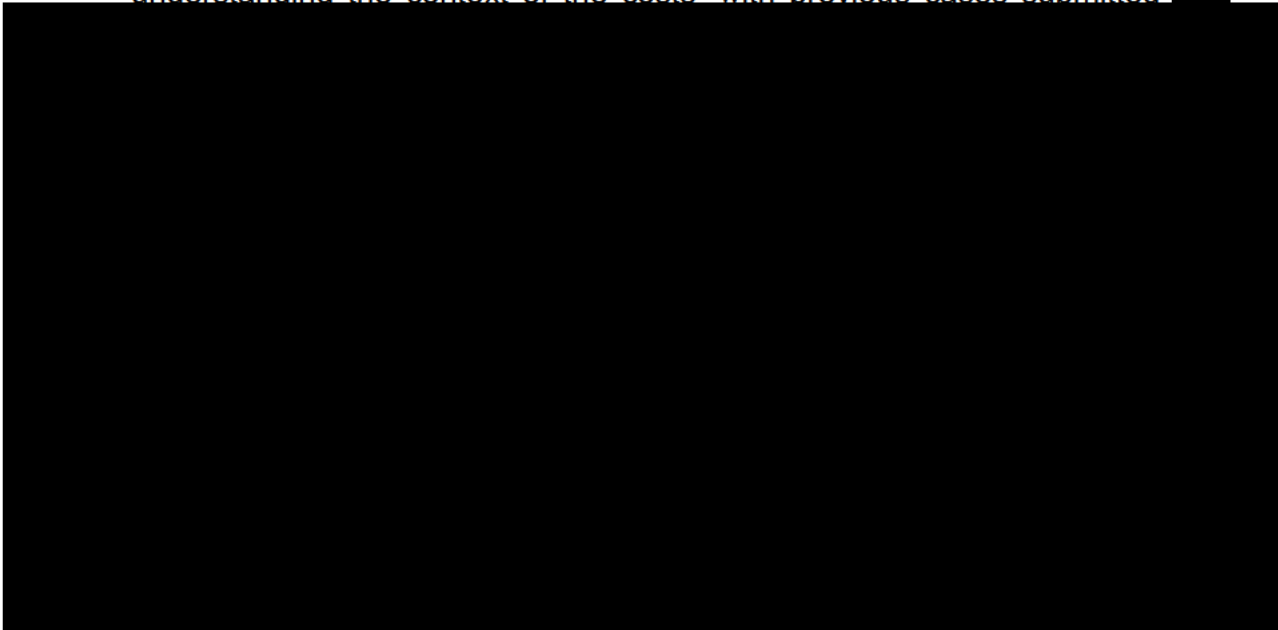
1.3 The Economic Case outlines the option appraisal undertaken to identify the Preferred Option by the following Processes:

- Identification of the Critical Success Factors (CSFs) for the Project;
- Development of a shortlist of options in response to the case for change and the proposed clinical service model;
- Evaluation of the shortlist of options against the CSFs and the PSOs;
- An economic appraisal of the shortlist of the options; and
- 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 is expected to demonstrate that the Project will deliver the benefits required and provide the best value for money.

Project Context

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

- 1.6 The SOP outlines a comprehensive sequence of work over the past five years. In 2010, the Trust submitted a Strategic Outline Case for the development of a new cancer centre [REDACTED]. In 2012, a Strategic Outline Case for a radiotherapy satellite centre was submitted to the Welsh Government [REDACTED]. The work undertaken during this period has provided the foundation for the service model set out within this OBC. The OBC establishes, the benefits of a Specialist Cancer Centre that has been designed to compliment the radiotherapy satellite centre, which is being progressed with Aneurin Bevan University Health Board through a separate OBC. The service model also embraces a systematic approach to providing outreach services within each Local Health. The history of these developments is also helpful in understanding the context of the costs with previous cases submitted [REDACTED]
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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:

Table 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;
 - Potential value;
 - Supplier 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 overleaf.

Table 2-2: Critical Success Factors

Critical success factor	The option will be assessed in relation to how well it:	Alignment to infrastructure investment criteria
Strategic fit	<ul style="list-style-type: none">• Meets agreed Project Spending Objectives, related business needs and service requirements; and• Provides holistic fit and synergy with other strategies, programmes and projects.	<ul style="list-style-type: none">• Health gain
Potential value for money	<ul style="list-style-type: none">• Optimises public value (social, economic, environmental) in terms of potential costs, benefits, and risks.	<ul style="list-style-type: none">• Value for money• Equity
Supplier capacity and capability	<ul style="list-style-type: none">• Matches the ability and capacity of potential suppliers to deliver the required services; and• Is likely to be attractive to potential suppliers.	
Potential affordability	<ul style="list-style-type: none">• Can be funded from available sources of finance; and• Aligns with sourcing constraints.	<ul style="list-style-type: none">• Affordability
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 changes required;• Matches level of available skills required for successful delivery;• Facilitates the continued delivery of services throughout the duration of the project; and• Delivers an operational nVCC in line with the Programme agreed with the Welsh Government.	<ul style="list-style-type: none">• Clinical and skills sustainability

- 2.5 The CSFs are used alongside the PSOs 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.

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 solution, service delivery, implementation 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 service 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.

Strategic Outline Programme: Transforming Cancer Services (Extract)

- 3.2 The SOP undertook a comprehensive evaluation of options for the new Cancer Centre. A long-list of options was identified. A sub-group of the Programme Board, including representatives with a broad range of service views, used an options framework approach to identify a long-list of options for meeting the investment objectives (IOs) and the critical success factors (CSFs) of the SOP. The options framework is an effective approach for identifying and assessing a broad range of available options. It does so by systematically working through the available choices for what, how, who, when and funding. In completing this process, some options were discounted, others were carried forward, and some provide the recommended approach, which is to provide the preferred way forward. This options evaluation provided the basis for the Reference Project. The long-list of options was developed across a number of different dimensions, namely:
- Service scope
 - Service model
 - Estate solutions
 - Service delivery
 - Implementation strategies
 - Funding methods
- 3.3 In respect of the estates solution, the potential options considered how the estate of an organisation could support the delivery of the Programmes Investment Objectives. The potential options identified were as follows:

Table 3-2: Potential Estate Options in the long-list

Option	Summary	Conclusion
Do Nothing	<ul style="list-style-type: none"> No investment 	Discounted
Do Minimum	<ul style="list-style-type: none"> Major capital assets replaced at end of asset life Increased investment in estate to address backlog maintenance 	Possible
Redevelop Existing Estate	<ul style="list-style-type: none"> Redevelopment of existing Velindre Cancer Centre 	Discounted
New Build (Trust Land)	<ul style="list-style-type: none"> New build on brownfield site 	Preferred
New Build (Greenfield)	<ul style="list-style-type: none"> New build on greenfield/brownfield site 	Discounted
New Build co-located with Acute Site	<ul style="list-style-type: none"> New build on acute site 	Discounted
New Build (NHS, publically)	<ul style="list-style-type: none"> New build on NHS / publicly owned site 	Possible
Split-Site (New Build)	<ul style="list-style-type: none"> New build on Trust brownfield site New build on existing Trust site 	Possible
Split-Site (Part New Build / Part Redevelopment)	<ul style="list-style-type: none"> New build on Trust brownfield site Redevelopment on existing site 	Possible

Discounted Estate Model Options: Justification

- 3.4 **Do Nothing:** This option did not meet the IOs or the CSFs of the SOP. It was determined that it would highly likely result in demand for services outstripping supply; a continuous and sustained reduction in the quality of services and patient experience; the current facility becoming unfit-for-purpose; and worsening of the clinical outcomes and patient experience for cancer patients in South-East Wales.
- 3.5 **New Build (Greenfield/brownfield):** Despite delivering many of the Programme level IOs and CSFs, initial analysis suggested that this option did not provide value for money in comparison to those options that cover developments on land owned by the Trust. This is partly because there are no land purchase costs associated with developing on the existing site. This option was explored at a practical level with a high-level search of available and suitable land conducted by NHS Wales Shared Services Partnership,

Facilities Services. The search concluded that there was unlikely to be land available with a sufficient footprint and / or met the specific requirements of a specialist cancer centre within the required timeframes.

3.6 New Build (co-located with an acute site): The Trust held a number of clinical meetings and discussions before discounting this option. A summary of the main reasons for discounting this option are listed below:

- Qualitative feedback from patients indicates that they value the fact that the current service is provided from a non-acute setting and not part of a very busy acute DGH site. This provides them with a better, more personalised experience in a setting and environment more aligned to cancer care than is potentially available on a multi-purpose acute site.
- The strategic ambitions of Velindre NHS Trust are clearly set out within the 5-year Plan 'Delivering Quality, Care and Excellence' and the 3-year plan 'Delivering Excellence'. There are no strategic aims or objectives within these plans that cannot be delivered within the existing configuration of services.
- Velindre has well established clinical links within each LHB through the provision of outreach outpatient services and Velindre consultants undertaking in-patient clinics. This is considered to work well and provides the benefits of a specialist cancer centre in an environment, which patients value highly, together with a clinical presence and relationship within each respective Local Health Board.
- The acuity of patients receiving services from Velindre Cancer Centre can be managed safely and effectively without co-location on an acute site. The current critical care / transfer system provides the required levels of safety and responsiveness to manage patients. This is further supported by the fact that the specialist cancer centre, under all other options, will be located close to a main DGH.
- The frequency of patients requiring transfer from Velindre Cancer Centre to an acute setting is relatively small. The current arrangements for managing acutely unwell patients are considered to be of high quality at Velindre Cancer Centre and there is no guarantee that these could be enhanced or maintained through co-location.
- The size of DGH sites often means that there can often be little difference in time between a rapid transfer from the tertiary centre to a DGH and that if the tertiary centre was sited within the footprint of the DGH i.e. the tertiary centre could be sited at diametrically opposite ends of a very large and complex site.
- Velindre Cancer Centre is a specialist cancer centre for South East Wales. Therefore, the fact that it sits outside of any of the DGH sites is helpful in identifying it as a specialist centre that serves the regional population and not a single LHB population.
- There is a practical advantage of Velindre Cancer Centre not currently being co-located with an acute site as it reduces the issue of repatriation of patients. For example, if it were located on an acute site there is a high likelihood a number of patients transferred from Velindre Cancer Centre to the acute site would not be from that Local Health Board population. This has a number of disadvantages. First, this would require the patients' family / carers to travel further to visit them when

compared to the existing arrangements as many patients requiring secondary care are transferred to a facility in their own Local Health Board area. Secondly, this reduces the impact of out-of-area patients consuming the capacity of one particular acute site.

- Research and development activities currently are multi-organisational and dispersed across South-East Wales. It is therefore important that a networked approach is continued to ensure a breadth and depth of partnerships are developed in respect of clinical services and research and development activities. The mantra must be about 'relationships and not places'
- Co-locating Velindre Cancer Centre on an acute site would potentially weaken the culture of the organisation, its values and beliefs and what sets it apart as a 'place of excellence'. This could impact on the quality of services provided to patients. Furthermore, it could increase the risk of losing high quality clinical, research and professional staff and reduce the risk of attracting them. It is believed that the strong Velindre brand may be diluted or lost and this has significant value to NHS Wales.
- That culture and ethos i.e. what sets Velindre apart as 'excellent' could be compromised if it is incorporated within a large acute setting.

In addition to the above reasons, and from a more practical perspective, the Trust received confirmation from NHS Wales Shared Services Partnership, Facilities Services that there was currently no land currently available, co-located to an acute site, with a sufficient footprint and / or met the specific requirements of a world-class cancer service within the required timeframes. Therefore, the only way that this option could be pursued, would be to-relocate major services away from an acute site elsewhere. In reality there would be major concerns regarding the deliverability and affordability of such an approach.

- 3.7 As outlined in the Strategic Case, para 3.6, the Nuffield Trust has provided independent advice on the proposals to build the new Velindre Cancer Centre.

New Cancer Centre

- 3.8 The Preferred way forward outlined and approved in the SOP was a new build on Trust land and this was considered in the option appraisal of the OBC.

- 3.9 The process for identifying and assessing options in respect of the new Cancer Centre 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;
- An analysis of each option to assess how well the option meets the PSOs 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.

- 3.10 The outcome of this process determined the longlist of options for the Project. These options were then evaluated and appraised by the nVCC Project Board against the PSOs and CSFs.
- 3.11 The nVCC Project Board used the outputs to identify the Preferred Way Forward for the Project, together with a shortlist of possible options against which the Preferred Way Forward could be appraised.
- 3.12 The detailed exercise of identifying and assessing the longlist of options is outlined in Appendix OBC/EC2.

4 THE SHORTLISTED OPTIONS

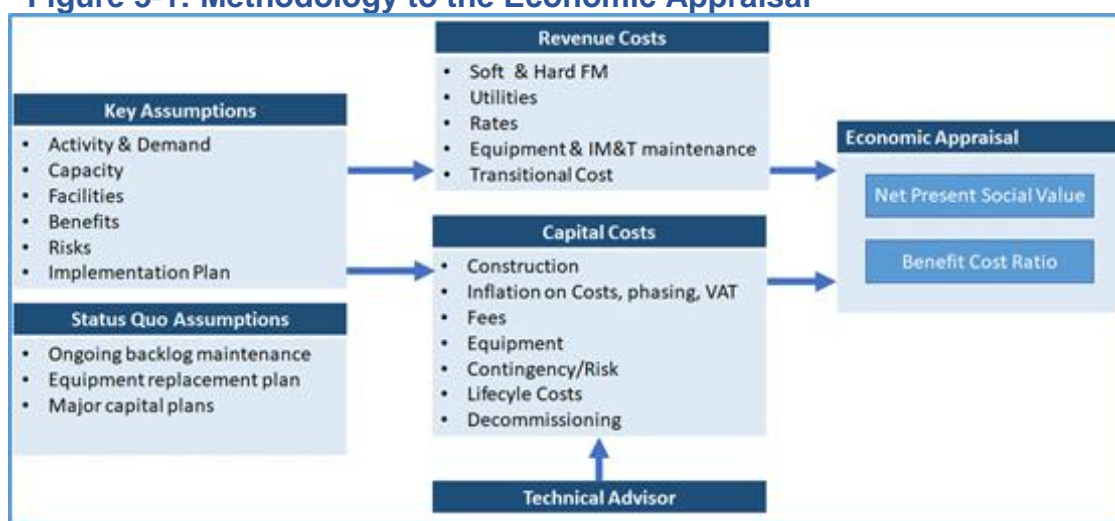
- 4.1 As outlined in the previous section, the nVCC Project Board determined the shortlist of possible options that would be appraised.
- 4.2 The nVCC Project Board reviewed the shortlist of options by testing the following:
- Was the option likely to deliver the spending objectives and CSFs?
 - Was 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 this review, the shortlist of options were approved by the Velindre University NHS Trust Board.
- 4.4 The final shortlist of **four** options are presented below:
- **The Status Quo Option:** This option provides a benchmark for assessing the value for money of all options. It attempts to optimise existing arrangements as far as possible in order to improve the organisation's capability to meet current and some future demand for core services. It requires investment in backlog maintenance for the existing Cancer Centre through a phased implementation plan, which will be funded through traditional public capital.
 - **The Do Minimum Option:** This option offers a realistic way forward to meet future demand for core services through the development of a purpose built nVCC, including an expansion zone for the future introduction of additional specialist services. This option requires a phased implementation, which will be funded through a mix of private and public agreements.
 - **Do Minimum Plus Option (Preferred Way Forward):** This option requires the development of a purpose built nVCC with increased learning, technology and innovation facilities, a service development bunker and space provision to support PET CT research service at Velindre. This option requires a phased implementation, which will be funded through a mix of private and public agreements.
 - **The More Ambitious Option:** This option offers the same solution as the Do Minimum Plus Option with the added feature of incorporating additional specialist services, including a Proton Beam service. This option requires a phased implementation, which will be funded through a mix of private and public agreements.
- 4.5 The appraisal, in financial and non-financial terms, of the shortlisted options is presented in Sections 5 to 8.

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 required 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 the Economic Appraisal



Capital Costs

- 5.4 The Trust and its Technical Advisors, in partnership with NHS Wales Shared Services (Shared 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 Schedules of Accommodation (see Appendix OBC/EC3) with appropriate adjustments to reflect the costs of delivering the options at the time when the new facilities become operational. The capital requirements differ for each of the four shortlisted options and include:
- **Status Quo Option:**
 - Investment in existing facilities at the Velindre Cancer Centre to address backlog maintenance;
 - Essential capital Projects that are required to maintain core service delivery at the Velindre Cancer Centre; and
 - Replacement of existing equipment at Velindre Cancer Centre.

- **Do Minimum Option:**
 - Construction of a nVCC to replace the existing Velindre Cancer Centre;
 - nVCC designed and sized in line with current service scope and in line with relevant Health Building Notes; and
 - Expansion zones identified through the design of the nVCC to facilitate the potential future introduction of new services.
- **Do Minimum Plus Option (The Preferred Way Forward):**
 - Construction of a nVCC to replace the existing Velindre Cancer Centre;
 - nVCC designed and sized in line with enhanced service scope and in line with relevant Health Building Notes; and
 - Expansion zones identified through the design of the nVCC to facilitate the potential future introduction of new services.
- **More Ambitious Option:**
 - Construction of a nVCC to replace the Velindre Cancer Centre; and
 - nVCC designed and sized in line with enhanced service scope and in line with relevant Health Building Notes.

5.6 An overview of the capital requirements of the four options is provided in the following table:

Table 5-1: Capital Requirements

		Status Quo	Do Minimum	Do Minimum Plus	More ambitious
Existing Velindre Cancer Centre	<ul style="list-style-type: none"> • Backlog maintenance • Essential capital projects • Replacement of existing equipment 	✓			
	<ul style="list-style-type: none"> • Enabling works • Site demolition and disposal 		✓	✓	✓
New Velindre Cancer Centre (nVCC)	• New build VCC		✓	✓	✓
	• Research and Development Service Bunker			✓	✓
	• Collaborative Centre for Learning, Technology and Innovation (CCfLTI)			✓	✓
	• PET CT space			✓	✓
	• Advanced Technology space				✓

Estimating the Value of Benefits

5.36 As outlined in the Strategic Case, the Project delivers benefits in a variety of areas some of which can be quantified and valued financially.

5.37 This includes direct benefits to the Trust including:

- Direct financial benefits including productivity improvements associated with better facilities, cost savings associated with improved recruitment and retention, and income generated by the Collaborative Centre for Learning, Technology and Innovation.
- Contribution to delivery of non-building related Programme benefits such as clinical service model, improved survival rates, increased employment.
- Environmental benefits associated with a modern more energy efficient building.

Direct financial benefits

5.38 The direct benefits of delivering the nVCC that are quantifiable in monetary terms including:

- Improved productivity related to more efficient ways of working;
- Improved staff recruitment and retention; and
- Benefits of incorporating the Centre for Learning and Innovation.

5.39 These benefits were valued as part of estimating the requirements and recurring revenue costs of each option, based on the extensive modelling and benchmarking undertaken by the programme team and its advisors as outlined in Appendix EC7(c). The monetary value was calculated by measuring existing performance against target improvements in line with the findings of benchmarking activities.

Table 5-15 Direct benefits resulting from the nVCC

Benefit category	Specific benefits
Improved productivity	<ul style="list-style-type: none">• Improved adjacencies• More flexible facilities• Greater ability to comply with standards
Improved recruitment and retention	<ul style="list-style-type: none">• Improved staff recruitment and retention resulting in reduced reliance on overtime, bank and agency
Centre for Learning and Innovation	<ul style="list-style-type: none">• Additional income from Centre for Learning and Innovation

Improved productivity

5.40 There are various productivity benefits that will emerge as a direct result of improved functionality and suitability of the premises. The background to these improvements is provided in Appendix EC7(c). The resulting benefits include:

- Improved adjacencies within the new building will result in better productivity and more efficient ways of working specifically for clinical, portering, catering and domestic staff. It is anticipated that this will lead to a reduction in associated pay costs of 0.1% to 1.0%. A most likely figure of 0.5% was used.
- More flexible facilities within the new building will result in better productivity and more efficient ways of working specifically for clinical, portering, catering and domestic staff. It is anticipated that this will lead to a reduction in associated pay costs of 0.1% to 1.0%. A most likely figure of 0.5% was used.
- Greater ability to comply with standards will result in better productivity and more efficient ways of working specifically for clinical, portering, catering and domestic staff. It is anticipated that this will lead to a reduction in associated pay costs of 0.1% to 1.0%. A most likely figure of 0.5% was used.

Table 5-16 Assumptions for improved productivity benefits

Expenditure heading	Worst case	Most likely (used in NPV calculation)	Best case
Improved adjacencies	0.1% productivity saving	0.5% productivity saving	1.0% productivity saving
More flexible facilities	0.1% productivity saving	0.5% productivity saving	1.0% productivity saving
Better compliance with standards	0.1% productivity saving	0.5% productivity saving	1.0% productivity saving

5.41 These benefits apply to all options equally.

Improved recruitment and retention

5.42 The new clinical model will enable more efficient ways of working and improve VCC's ability to recruit to vacancies. This will result in a reduced need for bank, agency, and overtime usage, as well as lower travel expenses. It is anticipated that this will result in a 10% to 50% reduction in current variable pay costs associated with bank, agency and overtime. A most likely figure 25% was used.

Table 5-17 Assumptions for improved recruitment and retention benefits

Expenditure heading	Worst case	Most likely (used in NPV calculation)	Best case
Reduction in bank, agency, overtime and travel costs	10% cost reduction	25% cost reduction	50% cost reduction

- 5.43 It is anticipated that the scale of benefits will increase with the scope of the project as follows.

Table 5-18 Allocation of benefit to options

	Business as Usual	Do Minimum	Do Minimum +	More Ambitious
Proportion of benefits delivered	-	100%	114%	129%

Centre for Learning and Innovation

- 5.45 This benefit only applies to options that include the Centre for Learning and Innovation i.e. Do Minimum + and the More Ambitious options.

Table 5-20 Allocation of benefit to options

	Status Quo	Do Minimum	Do Minimum +	More Ambitious
Centre for Learning and Innovation in scope	No	No	Yes	Yes
Proportion of benefits delivered	-	-	100%	100%

Contribution to Programme benefits

- 5.46 The nVCC is critical to delivery of the TCS Programme benefits. This includes delivering benefits that are directly attributable to the nVCC project as well as contributing to the broader benefits of implementing a new clinical model. In particular, the development of nVCC will contribute to the delivering the following:
- Direct benefits of introducing the new clinical model;
 - Economic benefits of improved survival rates; and
 - Economic benefits of increased employment.

Approach to quantifying programme benefits

- 5.47 The approach to quantifying each of these programme benefits in monetary terms is outlined in the subsequent paragraphs below.

Table 5-21 Programme benefits the nVCC will contribute to delivering

Benefit category	Specific benefits
Direct benefits of the new clinical model	<ul style="list-style-type: none">• Reduced length of stay• Reduced admissions• Improved utilisation• Less value of reinvestment in capacity to meet demand
Improved survival rates	<ul style="list-style-type: none">• Economic benefit of survivors re-entering employment• Economic benefit of survivors providing childcare
Increased employment	<ul style="list-style-type: none">• Economic benefit of new employees working at nVCC

Approach to attributing programme benefits to the project

- 5.48 The programme benefits will be realised as a result of transforming the clinical pathway. The creation of nVCC contributes to this by providing a modern fit for purpose environment that allows effective ways of working and ensures there is enough capacity to meet demand at the latter stages of the pathway, thereby ensuring patients can access the right care at the right time.
- 5.49 Given that the greatest impact, and therefore majority of benefits, will be realised as a result of transforming the front end of the pathway - for instance interventions associated with earlier diagnosis – and only a modest proportion of the overall programme benefits are likely to be associated with the physical infrastructure of the nVCC, it was concluded that it is reasonable to assume that 5% of overall programme benefits could be claimed as a result of the Do Minimum option (which relates to the nVCC building).
- 5.50 However, it was also recognised that the ability to realise programme benefits would be greatly enhanced by the additional elements included within the Do Minimum + option including:
- **Collaborative Centre for Learning, Technology and Innovation (CCfLTI):** The CCfLTI will significantly contribute to the transformation of the way in which care is planned, organised and delivered across South East Wales by bringing together a range of partners. This will support a range of healthcare benefits beyond the current role of Velindre Cancer Centre, supporting healthy lifestyle promotion, cancer prevention and early diagnosis, giving an opportunity to reduce the impact of cancer on the people of Wales for future generations.
 - **Radiotherapy Service Development Bunker:** A service development bunker is required to house a 'leading edge' treatment delivery unit which will significantly advance Velindre's ambitions to become a recognised Centre of Excellence in Radiotherapy. It will also help fulfil the transformative aspects of the clinical service model.

- 5.51 It was therefore concluded that given the significant enhancements these elements, in particular the CCfLTI and the Development Bunker, contribute to the overall programme over and above the physical infrastructure, it is reasonable to assume a further 2.5% of overall benefits could be claimed for this option.
- 5.52 Since the More Ambitious option includes additional space to incorporate future technologies and so is focused on additional opportunities rather than directly related benefits, it was concluded that it is reasonable to assume that no additional overall benefits can be claimed for this option at this stage.

Table 5-22 Allocation of benefit to options

	Status Quo	Do Minimum	Do Minimum +	More Ambitious
	No impact	Improved capacity and productivity related to new building	+ 50% due to significant enhancements associated with CCfLTI and Development Bunker	No quantifiable impact as relates to space to expand into advanced technologies in the future
Proportion of programme benefits delivered	-	5.0%	7.5%	7.5%

Direct benefits of clinical model

- 5.53 The financial benefits of introducing the new service model that is central to the TCS programme include reduced length of stay, reduced admissions and improved utilisation.
- 5.54 Investment in additional capacity and new ways of working is anticipated to deliver several key benefits. Based on the results of the benchmarking and modelling exercises outlined in Appendix EC7(c), it was estimated that the TCS programme will deliver the following:
- Inpatient length of stay is anticipated to reduce by 0.5% to 5.0%. 1.5% is considered to be a realistic target within this range, based on local knowledge.
 - Inpatient admissions are expected to reduce by 5.0% to 20.0%. A most likely figure of 10.0% was used to value the financial impact of the benefit.
 - Radiotherapy utilisation is expected to increase from 77% to between 80% and 87%. It was agreed that 84% is a realistic target within this range.

- 5.55 A summary of the assumptions used to calculate the value of direct cash releasing programme benefits is provided in the table below. A range of scenarios was considered from worst case to best case and including the most likely.

Table 5-23 Assumptions for clinical model benefits

Benefit	Worst case	Most likely	Best case
Reduced length of stay	0.5% reduction	1.5% reduction	5% reduction
Reduced admissions	5% reduction in unscheduled admissions	10% reduction in unscheduled admissions	20% reduction in unscheduled admissions
Improved utilisation	From 77% to 80% RT utilisation	From 77% to 84% RT utilisation	From 77% to 87% RT utilisation

- 5.56 The resulting financial benefits based on the most likely scenario are provided in the table below with further details behind the original calculation provided in Appendix EC7(c).

Table 5-24 Impact of clinical model benefits (£'000)

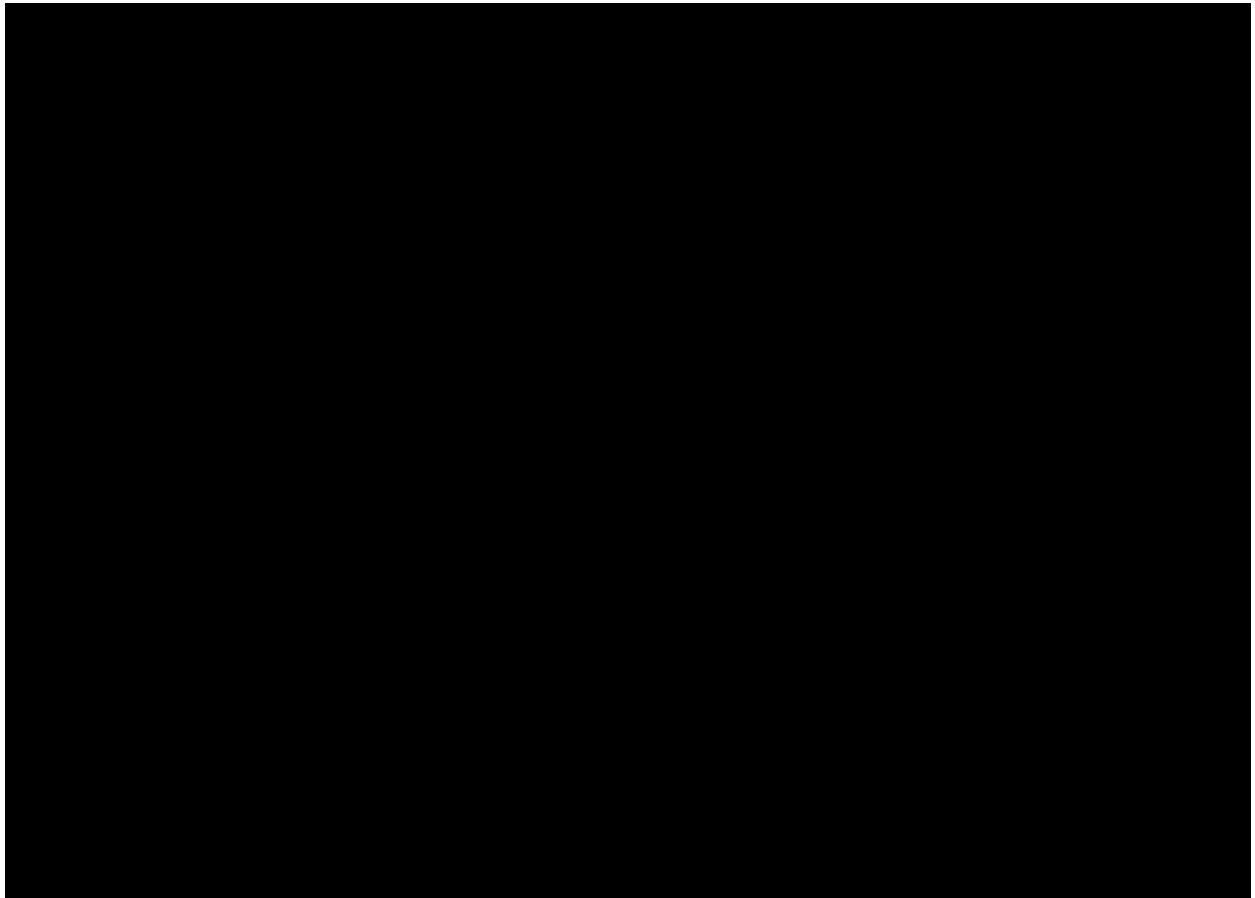
Expenditure heading	Annual impact Year 1 of operating	Annual impact by Year 11 of operating
Reduced length of stay	(332)	(406)
Reduced admissions	(229)	(280)
Improved utilisation	(207)	(252)
Less value of reinvestment in capacity to meet demand	299	365
Clinical service model benefits	(469)	(573)

Economic benefits of improved survival rates

- 5.57 In addition to the direct benefits of the programme, such as improvements in efficiency and better access, there will be wider macroeconomic benefits that arise from improved mortality and survival rates. It is clearly very difficult to put a value on additional years of life and we have not attempted to do this. However, we can attribute market values to some of the activities that cancer survivors would be able to participate.
- 5.58 The economic benefits of improved survival rates were calculated in relation to
- Increased employment years of survivors, based on a review of similar business cases and wider assessments of cancer services, for which we have attributed market values to some of the activities that cancer survivors would be able to participate in; and
 - The increased numbers of survivors of retirement age who can provide care of grandchildren for working parents allowing them to take up employment or increase hours worked.

5.59 The economic benefits associated with these groups are two-fold including:

- Direct earnings for individuals; and
- The 'multiplier' effect of spending those earnings in the wider economy.



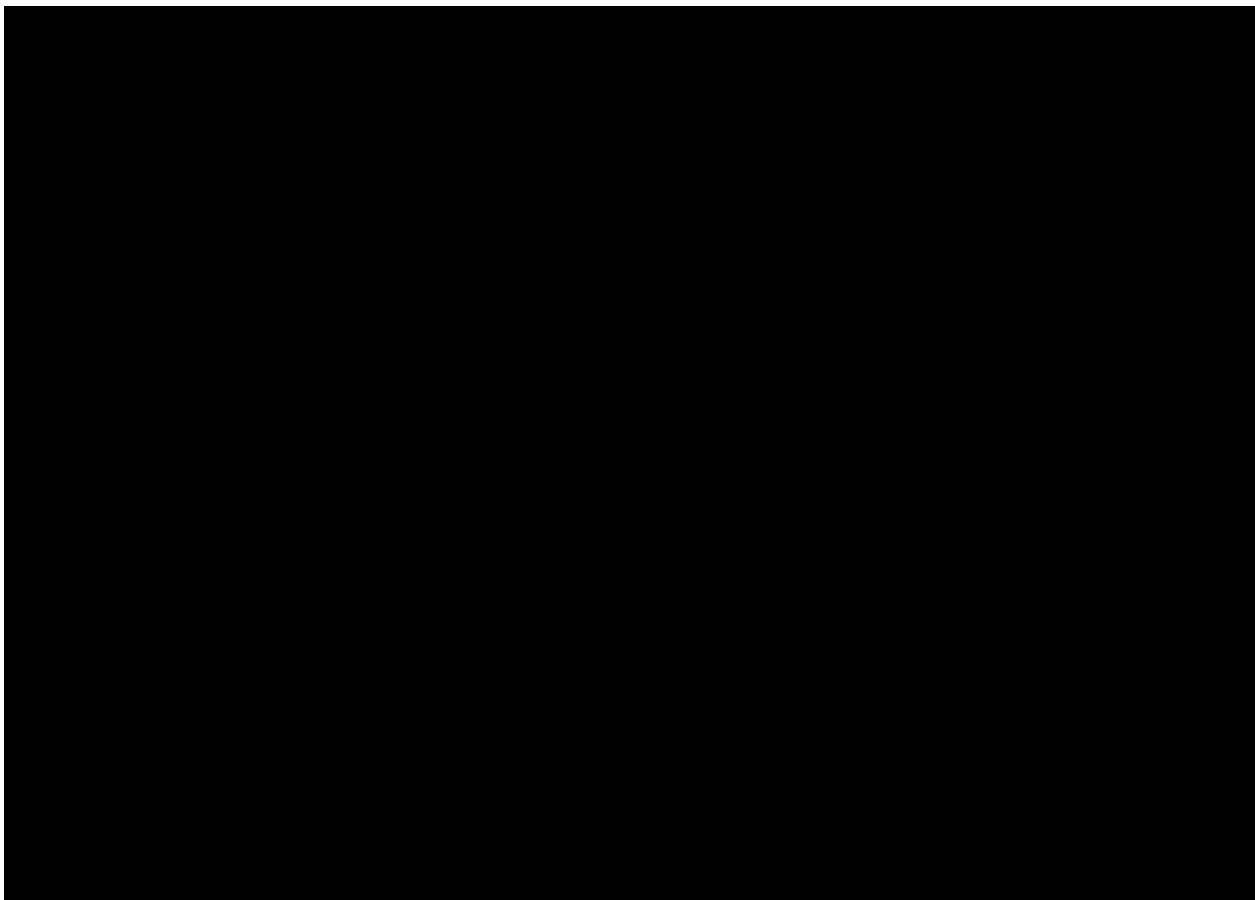
Social benefits of improved survival rates (QALYs)

5.61 As part of identifying and quantifying the programme benefits, an assessment was made of the social benefits. This was undertaken by Welsh Government on 17 August 2017 and their report is included in Appendix EC7(c) along with the overall monetary value that was applied to the programme.

5.62 However, there was some concern as to whether including both the economic and social benefits of improved survival rates would result in a duplication of benefits. Therefore, given that the economic benefits equate to a lower value than the social value in monetary terms, it was concluded that it is prudent to use the economic benefits only.

Environmental benefits

- 5.63 Overall energy usage is expected to increase because the nVCC will have a greater floor area than the existing VCC. However, given the design of more modern energy efficient facilities, the nVCC will enable a change in fuel type, shifting from a combination of electricity and gas usage to all energy being generated from Standard Grid (Green Electricity). This will result in a reduction in energy usage per m2.
- 5.64 The changes in energy usage have been valued using the toolkit from the Green Book supplementary guidance: valuation of energy use and greenhouse gas emissions for appraisal. (Source: [IAG spreadsheet toolkit for valuing changes in greenhouse gas emissions](#)).
- 5.65 This calculation is provided in Appendix EC7(d). It shows that the improved energy efficiency results in a reduction in greenhouse gases overall which creates a net economic benefit since:
- CO2 emissions reduce due to a shift to greener energy types.
 - This is offset because of negative changes in air quality due to increased energy usage.
- 5.66 It should be noted that although the toolkit also includes a calculation for changes in energy costs this has been excluded as it has already been accounted for in the recurring revenue costs calculation in section 5.



6 ECONOMIC APPRAISAL

- 6.1 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. The key assumptions used in this analysis are summarised below:

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

- Costs and benefits are calculated over a 60-year appraisal period.
- Baseline (Year 0) will be 2020-21.
- Costs and benefits use real base year prices – all costs are expressed at 2020-21 prices in line with the baseline Trust costs using PUBSEC indices.
- 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.
- No financial benefits are incorporated.
- Quantified risks including Quantified Capital Risk and Optimism Bias are included based on the approach outlined above.



- 6.5 Therefore, the Do Minimum Plus Option is therefore identified as the Preferred Option for the Project since it offers the best balance of benefits to costs as a result of the additional benefits realised from incorporating:
- Research and Development service bunker
 - Collaborative Centre for Learning, Technology and Innovation (CCfLTI)
 - PET CT space
- 6.6 The detailed analysis of the Generic Economic Model (GEM) is provided in Appendix OBC/EC8.

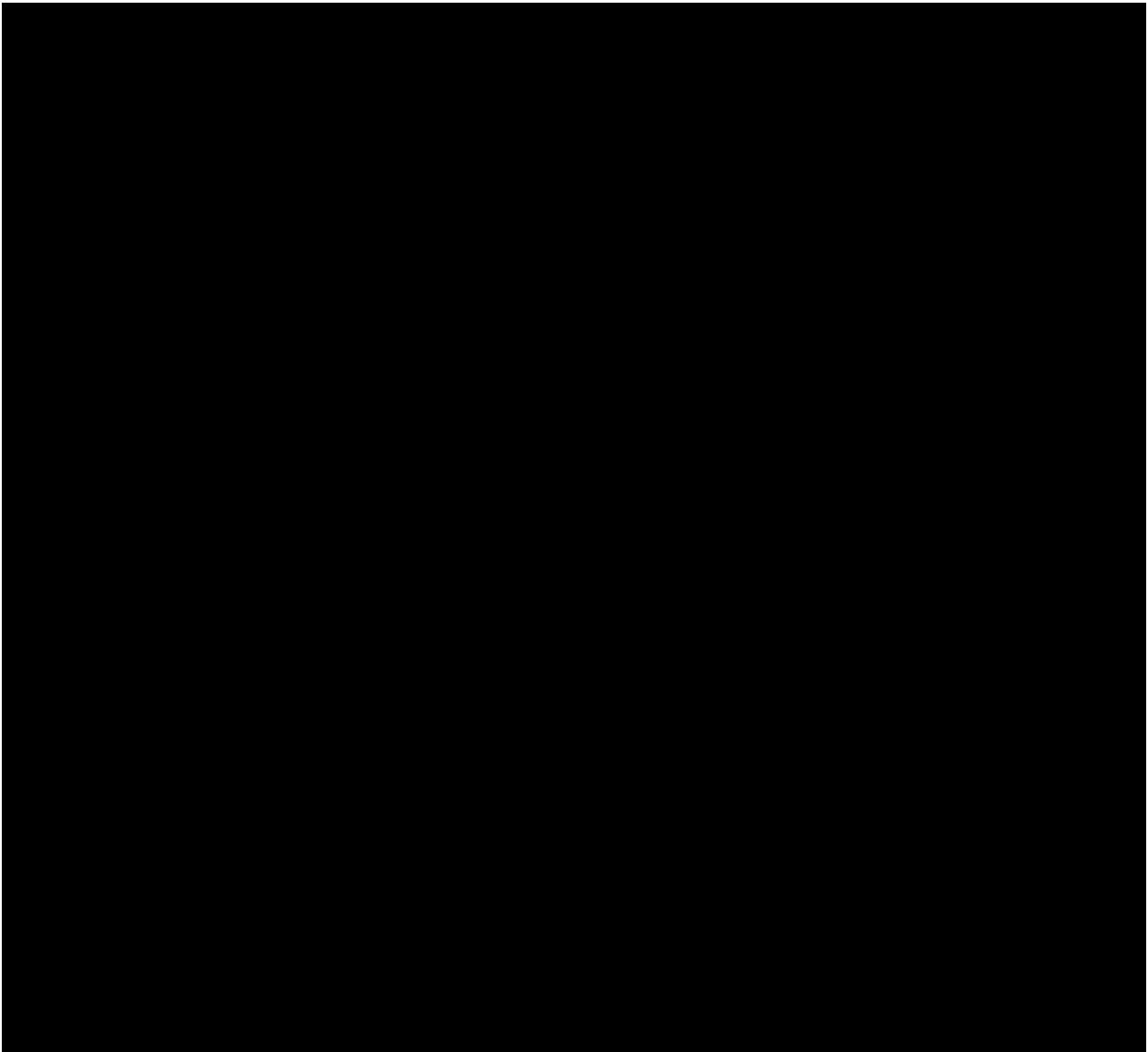
7 SENSITIVITY ANALYSIS OF PREFERRED OPTION

Decision Analysis

- 7.1 The Economic Appraisal demonstrates that the Preferred Option has the best Benefit Cost Ratio, indicating this option delivers the best value for money of the shortlisted options.

Sensitivity analysis and switching

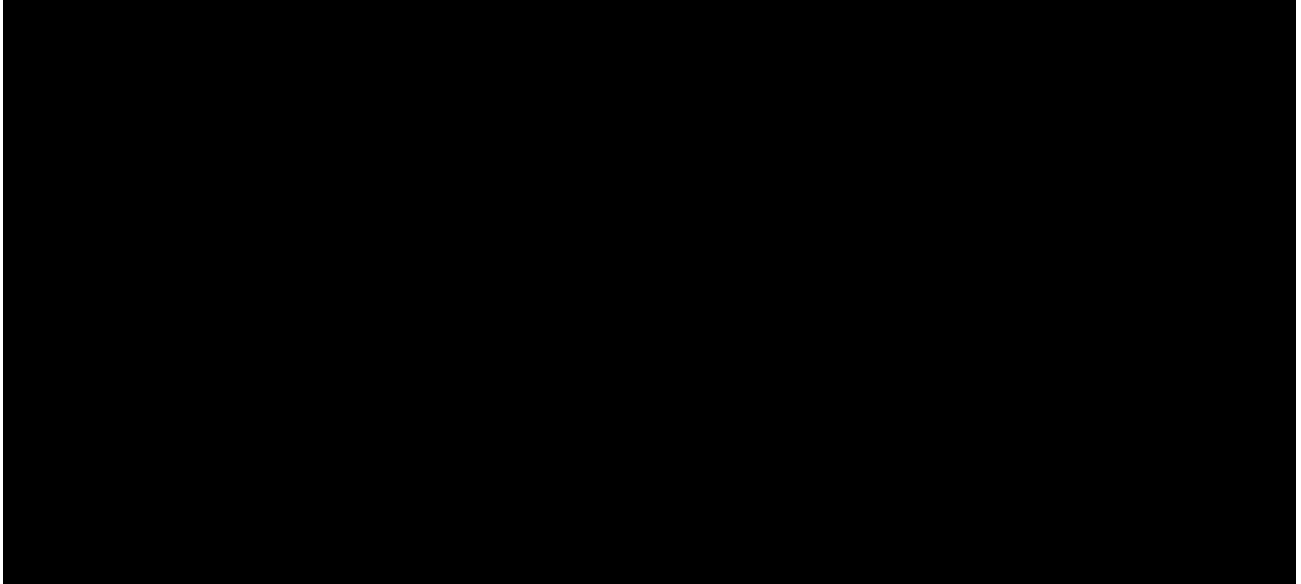
- 7.2 The results of the Economic Appraisal above have been subject to a sensitivity analysis to examine the impact of movements in capital and revenue costs.



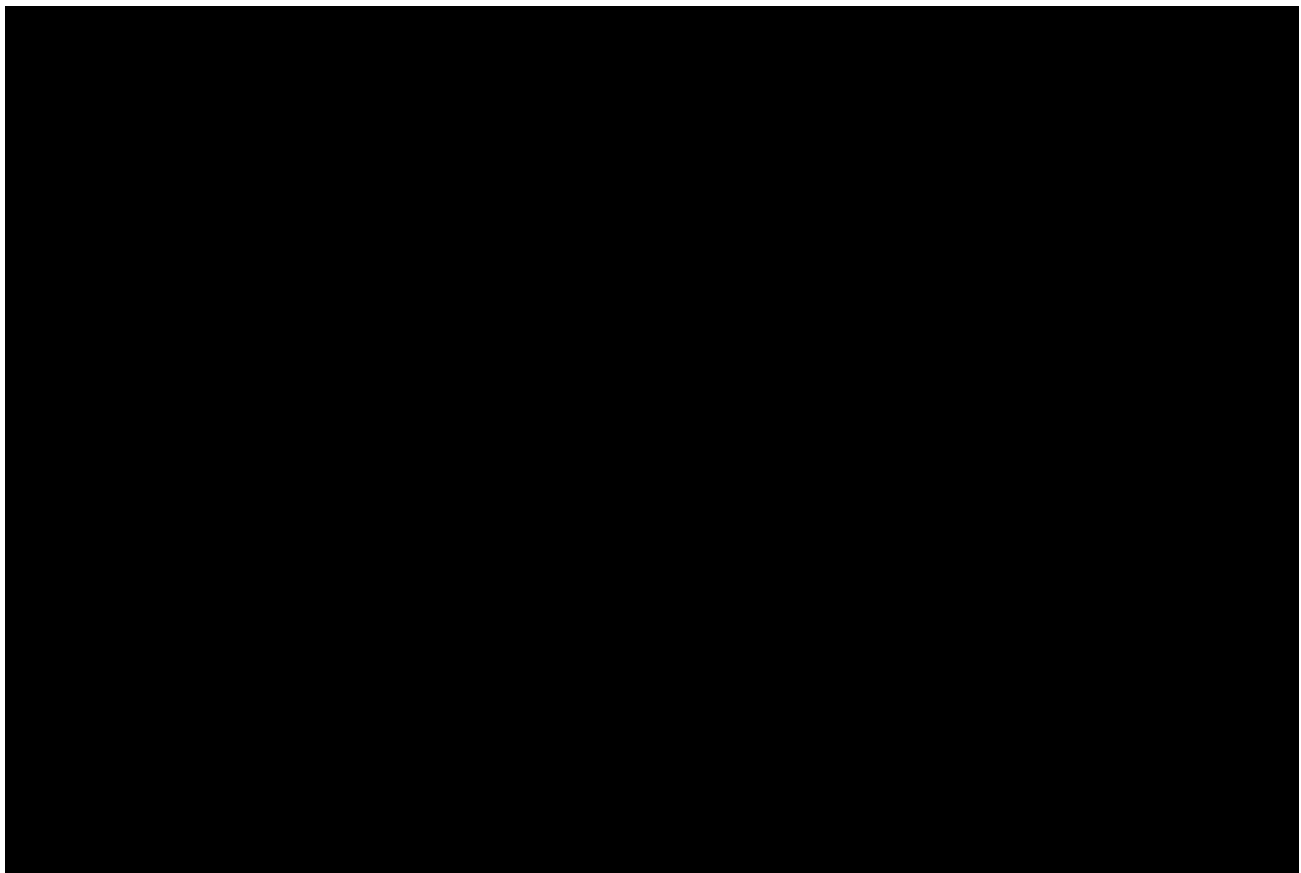
- 7.7 In addition to the switching analysis, alternative scenarios have been used to consider how options may be impacted by future uncertainty and provide an assessment of risk in the ranking of options including:

1. Optimism bias within capital costs reduced from current assumption of 25% to a typical factor of 10%.

2. Optimism bias within capital costs increased to upper bound limit of 51%.
3. Benefits are reduced by 50%.
4. Infrastructure running costs increase by 25%.



7.9 This analysis demonstrates that while each of these scenarios change the BCR, none of them have any impact on the ranking of options and therefore this analysis supports the identification of the Preferred Option.





- 7.11 This analysis confirms the selection of the Do Minimum Plus Option as the Preferred Option.

8 THE PREFERRED OPTION

- 8.1 The Preferred Option delivers a nVCC, to be built in Whitchurch, Cardiff. The ambition is to deliver a world-class facility that will provide unrivalled care for cancer patients from across the region. The nVCC will provide a range of core Cancer Services for patients across South East Wales. In addition, the nVCC will aim to make Velindre an international focal point for research, learning, technology and innovation. A summary of the key requirements and features of the Preferred Option is provided below.

Footprint

- 8.2 The proposed 'footprint' of the new Preferred Option is summarised in Table 8-1. It is important to highlight that a significant proportion of the increased footprint, compared to the existing Velindre Cancer Centre, is directly attributable to the need to comply with Health Building Notes and statutory compliance requirements.

Table 8-1: Footprint of the Preferred Option

Functional Area	m ²
Radiotherapy	8,839
Inpatients	3,534
SACT & Ambulatory Care	2,066
Outpatients & Therapies	2,034
Imaging and Nuclear Medicine	2,516
Pharmacy	1,518
Hospital Clinical / Non-Clinical Administration and Support Services	4,693
Hospital Education, Training and associated Support Services	635
Collaborative Centre for Learning, Technology and Innovation	604
IM&T	484
SPR & On Call	84
Staff Facilities	1,041
Mortuary	171
Catering & Restaurant	1,019
Hospital Main Entrance	1,855
Central FM Areas	1,300
Total Gross	32,393

- 8.3 The Trust has worked closely with NHS Wales Shared Services Partnership (NWSSP) and Welsh Government Officers in the development of the footprint and have received assurance that the nVCC is appropriately sized.

Flexibility for Future Expansion

- 8.4 The Outline Planning Application for the nVCC was approved by Cardiff County Council on 13th December 2017. The Outline Planning application was based upon a potential hospital footprint of 38,732m² against a proposed current footprint for the Preferred Option of 32,393m². There is therefore approximately 6,500m² of space, compared to the Outline Planning Application, to facilitate the future expansion of service if required.

Major Medical Equipment Requirements

- 8.5 The delivery of non-surgical Cancer Services is dependent upon having access to Major Medical equipment. This is essential to support the safe and effective delivery of patient treatments. The Major Medical equipment requirements, with a unit value of [REDACTED], are summarised in Table 8-2. It is important to note that additional equipment requirements have been minimised, and the majority of Major Medical equipment would still be required if the Trust was to remain on the existing estate as part of the routine replacement Programme.

Table 8-2: Major Medical Equipment Requirements for the Preferred Option

Department	Equipment	Number Required in nVCC (2025)
Radiotherapy	Linear Accelerator	8
Radiotherapy	CT Simulator	2
Radiotherapy	Papillon System	1
Radiotherapy	Brachytherapy System	1
Radiology	MRI Scanner	2
Radiology	CT Scanner	2
Radiology	Imaging System (Fluoroscopy / General X-Ray)	1
Radiology	Computed Radiography System (General X-Ray)	1
Nuclear Medicine	Gamma Camera	1
Pharmacy	Robotic Dispensing System	1

Functional Content

- 8.6 The functional content of the Preferred Option is summarised in Table 8-3. The clinical accommodation identified within the Preferred Option will support the Trust in continuing to delivery high quality and safe service over the long-term.

Table 8-3: Functional Content Requirements for Core Services within the New Velindre Cancer Centre

Department	nVCC (2025)
Radiotherapy Linear Accelerators	8
Outpatient Consultation Rooms	28
SACT Chairs	16
Inpatient Beds	50

Operational Delivery Model

8.7 The Preferred operational delivery model for meeting forecast activity within the nVCC is summarised below:

- Radiotherapy service - 5 days a week, 9.5 hours a day;
 - 7-day Radiotherapy service for category 1 emergency patients and for urgent palliative patients;
- Outpatient service – 5 days a week, 2 sessions a day;
- SACT service – 5 days a week, 12 hours a day; and
- Inpatient service – 7 days a week, 24 hours a day.

Conclusion

- 8.8 The Preferred Option provides the opportunity to deliver a world-class Centre for cancer patients from across the region. The nVCC will provide a range of core cancer services for patients across South East Wales. In addition, the nVCC will aim to make Velindre an international focal point for research, learning, technology and innovation.
- 8.9 The proposed current 'footprint' of the Preferred Option has been sized in line with Health Building Notes, best practice guidance and statutory compliance requirements. In addition, the nVCC will be able to accommodate forecast activity projections.
- 8.10 Importantly, the Preferred Option also provides flexibility for future service expansion if required.

10 CONCLUSION

10.1 Following a robust Option Appraisal process involving a wide range of stakeholders, the Trust has identified its Preferred Option for developing a new Velindre Cancer Centre.

10.2 The Preferred Option delivers a wide range of benefits which are complementary with local and national priorities as well as the delivery of a range of short and long term objectives to support the improvement of specialist non-surgical cancer service delivery across South East Wales.

10.3 In terms of infrastructure the Preferred Option provides:

- A new purpose-built Velindre Cancer Centre;
[REDACTED]
[REDACTED]
[REDACTED]
- Opportunity for a Development Bunker to support Research and Development (please see appendix OBC/EC11 for a detailed description and justification in relation to the Development Bunker); and
- Development of a Collaborative Centre for Learning, Technology and Innovation (CCfLTI) at Velindre Cancer Centre (please see appendix OBC/EC12 for a detailed description and justification in relation to the Collaborative Centre for Learning, Technology and Innovation).

