



Combined Outline / Full Business Case (OBC/ FBC):

Main Body Document

Development of a dedicated Vascular Hybrid Theatre at Morrison Hospital

Document 2 of 3

Document Control Sheet

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1. Purpose

1.1 Introduction, Structure and Content of the Document

This document has been written to support the investment for the development of a dedicated Vascular Hybrid Theatre at Morriston Hospital, Swansea.

The OBC/FBC is in three volumes:

- Volume 1 – The Executive Summary
- Volume 2 – The OBC/FBC comprising the following components:
 - The Strategic Case section
 - The Economic Case section
 - The Commercial Case section
 - The Financial Case section
 - The Management Case section
- Volume 3 - Appendices

This document has been prepared using 5-case Model guidance:

- HM Treasury - The Green Book: Central Government Guidance on Appraisal and Evaluation (2022)
- Welsh Government – WHC 2018 043 NHS Wales Infrastructure Investment Guidance (2018)

1.2 Progress since Submission of the SOC

A Strategic Outline Case (SOC) to support the development of a dedicated Vascular Hybrid Theatre at Morriston Hospital, Swansea was submitted to Welsh Government (WGov) for approval on the 10th December 2021. This SOC was endorsed by WGov on the 31st May 2022.

Key changes since submission of the SOC are:

- The option appraisal has been reviewed and updated particularly as one of the shortlisted SOC options is now no longer available
- From a clinical service perspective there have been no significant changes since SOC submission

2. Strategic Case

2.1 Introduction

This Outline/ Full Business Case (OBC/FBC) has been prepared through a process of engagement with key stakeholders. Principally, it seeks support from Welsh Government in the form of investment of £10.135m (inclusive of reclaimable VAT & optimism bias) to support the development of a dedicated Vascular Hybrid Theatre at Swansea Bay University Health Board's (SBUHB's) Morriston Hospital, Swansea.

Morriston Hospital is the arterial centre delivering all major vascular interventions for South West Wales Vascular Network, serving a population of circa one million (Ceredigion, Carmarthenshire, Pembrokeshire, Bridgend, Powys and Swansea Bay). It is the only centre able to deliver the requirements of the Vascular Society of Great Britain (The Provision of Services for Patients with Vascular Disease 2021), and Wales Abdominal Aortic Aneurysm Screening Programme (WAAASP) standards.

This investment will further provide the population of South West Wales with access to a state of the art hybrid operating theatre environment for the delivery of vascular surgical services. It will combine theatre functionality, and high-quality advanced radiology imaging devices such as fixed C-Arm imaging system and integrate with teaching and communication facilities. It can also be combined with simulator technology, to enhance training opportunities. It will be utilised by Vascular Surgery and Interventional Radiology and will employ minimally invasive techniques improving patient pathways, reducing length of stay, waiting times and positively impacting on amputation rates.

Integrated health and social care will benefit from a reduction in the number of amputations. Amputation has major health impact, personal financial loss, rehabilitation and additional social care burden. This combined with loss of independence costs the wider health/social care in excess of £200k per major limb amputation.

2.2 Background

Vascular Surgery is a discrete specialty separate from General Surgery and treats patients with peripheral arterial disease (PAD) and venous disease (arteries and veins), with the exception of the blood supply to the heart. Vascular disease is a major cause of stroke, death or limb loss. Arterial disease most frequently causes narrowing or blockage of the arteries; it can also result in swelling or dilatation of the artery known as an aneurysm.

The population of South West Wales has a high incidence and prevalence of peripheral arterial disease, cardiac disease and stroke. This reflects the high social deprivation index, and an elderly population in comparison to that of South East and North Wales. Population studies have found that 20% of people over 60 have some degree of peripheral arterial disease. Incidence is highest in people who smoke and people with diabetes. Patients with diseased coronary arteries (supplying the heart) or carotid arteries (supplying the brain) disease will often have undiagnosed PAD. People with PAD affecting their legs, suffer pain on walking, also known as intermittent claudication, and 1% - 2% will eventually undergo amputation. This risk is increased in people with diabetes considerably to roughly 1 in 20 (about 5%). Of those presenting with intermittent claudication over a 5 year period approx. 10 to 15% will die of cardiovascular event and a further 20% will have a non-fatal cardiovascular event.

The severity of the blockage of the arteries increases over time and between a third to a half of patients will progress to critical limb ischaemia (a severe blockage in the arteries of the lower extremities, which markedly reduces blood-flow) that results in ulceration or gangrene. Patients with critical ischaemia have a very high mortality with nearly 1 in 4 (25%) dying within a year and about a third (33%) requiring a major lower limb amputation within a year.

The most devastating **disabling** effects occur when the arteries to the brain and lower limb are affected resulting in disabling stroke or limb loss.

Dilated blood vessels, commonly known as arterial aneurysms, are a major cause of death or limb loss, due to the vessel wall splitting – known as a ruptured aneurysm, or as a result of blocking causing a sudden failure of blood supply, often resulting in limb loss. Early identification of abdominal aneurysm is currently achieved through the Wales Abdominal Aortic Aneurysm Screening Programme (WAAASP) and allows early treatment that prevents death and/or limb loss. The most common aneurysm is an abdominal aortic aneurysm however aneurysms also affect leg arteries and the main blood vessel in the chest (thoracic aorta). Abdominal and thoracic aneurysms most frequently rupture and are an immediate threat to life with at least 80% mortality.

The treatment of a patient with arterial disease requires traditional open operation, minimally invasive procedures, interventional radiological procedure or a combination of these. Traditional surgery uses incisions to access blood vessels, carried out in an operating theatre.

High level teamworking between Interventional Radiologists and Vascular Surgeons in a suitable hybrid theatre environment enables minimally invasive Endovascular Aortic Aneurysm Repair (EVAR) for abdominal aortic aneurysm and thoracic aortic aneurysm. Although Morriston carries out more than 60 EVARs per annum, this is limited in scope, in poor quality facilities with inadequate space, air change and facilities. This prevents expanding the repertoire of procedures.

Procedures to improve blood supply to the legs are currently done in two stages: interventional radiology procedure, then surgical procedure, or the reverse. If carried out sequentially on the same day, this involves the transfer between clinical treatment areas of a potentially unstable patient. This is often impractical and they are staged, resulting in prolonged admission or an additional admission episode. Less frequently an open operation may be carried out in the Radiology Suite – there are multiple disadvantages, including infection risk due to lower quality of sterility, poor lighting, and displaces interventional radiological procedures, as there are no additional facilities elsewhere.

The technical aspects of open and interventional procedures demand the highest standard of both disciplines to achieve optimal outcomes. Neither of the above situations is satisfactory. The optimal treatment of vascular patients requires access to modern, high quality facilities, i.e. a fully equipped hybrid operating theatre with full imaging facilities.

Wales has three Vascular Networks:

- North Wales Vascular Network serving the population of Betsi Cadwalader UHB - In April 2019 the Health Minister opened North Wales' new £2.6m WGov funded hybrid theatre and vascular ward in Glan Clwyd Hospital. Described as "one of the best in the UK" this "investment into new equipment and technology ... ensured the best possible services (was) in place", this investment "already (had) attracted new staff and (will) provide a solid base to build local delivery and improve patient outcomes. These new arrangements put the needs of the patients first by ensuring excellent services which (will) be sustainable in the longer term"

- South East Wales Vascular Network serves the population of Cardiff and Vale, Cwm Taf Morgannwg and Aneurin Bevan UHBs - In 2020 a vascular hybrid theatre was developed as part of the new Specialist and Critical Care Centre in Cardiff, and a new hybrid theatre development is planned to be operational in 2025 at the University Hospital of Wales (UHW) to support the South East Wales Vascular service plan of vascular centralisation in order to comply with core clinical standards to improve clinical outcomes for vascular surgery
- South West Wales Vascular Network serves the population of Swansea Bay and Hywel Dda UHBs – Morriston Hospital is the designated arterial intervention site for South West Wales and is the most advanced and mature. It is working toward delivering a service that meets the standards of the Vascular Society of Great Britain and Ireland. It is the 18th busiest of over 80 vascular units within the UK but its operation is constrained by the lack of local access to a hybrid theatre facility to support best practice in vascular surgery

If patients do not receive timely, hybrid surgical interventions this will result in continuing loss of limb and life, with the associated major financial burden to the NHS and Community services. Currently, a significant number of patients undergo staged procedures, with the inevitable unnecessary prolonged stays. This adds pressure to the number of bed days consumed and increases the constant pressure for inpatient beds within Morriston Hospital. Access to a hybrid theatre for vascular surgery would reduce risk, improve health outcomes, reduce length of stay and result in significant indirect economic benefits.

Part A: The Strategic Context

2.3 Organisational Overview

2.3.1 Swansea Bay University Health Board (SBUHB)

Swansea Bay University Health Board plans, commissions and delivers healthcare services for the people of Neath Port Talbot and Swansea, and works to improve their health and wellbeing. SBUHB serves a population of 379,765, has a budget of £1.167 billion and employs 13,500 staff.

There are three major hospitals providing a range of services: Morriston and Singleton hospitals in Swansea and Neath Port Talbot Hospital in Baglan, Port Talbot. There is also a community hospital at Gorseinon and primary care resource centres providing clinical and wellbeing services outside the main hospitals.

SBUHB provide more than 70 specialised services to the populations of south-west Wales, south Wales and for certain services, on a Wales-wide and UK basis. This reflects clinical excellence and a diverse range of local and tertiary services for the people of Wales and beyond. Primary care independent contractors play an essential role in the care of the population, and the health board commissions services from 49 GP practices, 31 optometry practices, 72 dental practices and 92 community pharmacies across the region. Mental health and learning disability services are provided in both hospital and community settings for residents within the Swansea Bay region, and a regional service for both learning disability and forensic mental health services is provided.

The board has a clear purpose, ambition, strategic aims, and enabling objectives have been developed to fulfil its civic responsibilities by improving the health of communities, reducing health inequalities and delivering prudent healthcare in which patients and service users feel cared for, confident and safe. These are set out in the SBUHB Recovery and Sustainability Plan.

The following table indicates the SBUHB's actual activity levels for 2022/23:

Acute Care – Unscheduled Care	Activity FYE 22/23
A&E Attendances	125,881
Emergency Admissions	47,134
Acute Care – Planned Care	Activity FYE 22/23
Total Elective Inpatient Admissions	63,054
Total Elective Day Case Admissions	38,245
Total Outpatient Attendances	560,892
Total Follow up Outpatient Attendances	361,108

[source: Recovery & Sustainability Plan]

Table 1: SBUHB Activity Levels 2022/23

2.3.2 Hywel Dda Health Board (HDUHB)

Hywel Dda University Health Board plans and provides healthcare services for people in Carmarthenshire, Ceredigion, Pembrokeshire and its bordering counties. Currently it has a budget of over £1 billion and employs 13,143 members of staff providing primary, community, in-hospital, mental health and learning disabilities authorities and public, private and third sector colleagues, including volunteer services in partnership with three local authorities for approximately 382,518 people across a quarter of the landmass of Wales through¹:

- Four main hospitals: Bronglais General in Aberystwyth, Glangwili General in Carmarthen, Prince Philip in Llanelli and Witybush General in Haverfordwest
- Seven community hospitals: Amman Valley and Llandovery in Carmarthenshire; Tregaron, Aberaeron and Cardigan in Ceredigion; and Tenby and South Pembrokeshire Hospital Health and Social Care Resource Centre in Pembrokeshire
- 48 general practices (four of which are managed practices), 40 dental practices (including three orthodontic), 97 community pharmacies, 44 general ophthalmic practices (44 providing Eye Health Examination Wales and 29 low vision services) and 17 domiciliary only providers and 11 health centres
- Numerous locations providing mental health and learning disabilities services

The following table indicates the HDUHB's actual activity levels for 2022/23:

Acute Care – Unscheduled Care	Activity FYE 22 / 23
A&E Attendances	129,475
Minor Injuries Attendances	53,351
Overall Attendances	182,826
Emergency Admissions (A&E)	24,558
Minor Injuries Admissions (MIU)	1,542
Overall Admissions	26,100
Acute Care – Planned Care	Activity FYE 22 / 23
Elective Inpatients and Daycase Attendances	112,385
New Outpatient Attendances	73,496
Total Follow up Outpatient Attendances	117,263

Table 2: HDUHB Activity 2022/23

¹ Source: HDUHB Annual Report 22/23

2.3.3 Regional Population

The following table provides the population statistics for Wales and SBUHB:

Key Statistics	Wales	HDUHB	SBUHB
Total population	3,105,410	382,518	379,765
Population aged 65 and over	21.43%	25.28%	20.92%

Source: StatsWales.gov

Table 3: Population Base (as at Mid-Year 2021)

The population of Wales is expected to grow to 3,309,154 by 2043 (6.49%), with the growth in Mid and South West Wales to be to 946,815 (5.58%) in the same period. [Source: StatsWales.gov].

2.3.3.1 Health Status

The following table provides the latest health statistics for Wales, Mid and South West Wales and HDUHB's and SBUHB's populations:

Key Statistics	Wales	Mid and South West Wales	HDUHB	SBUHB
Life expectancy at birth – males (years)	78.3 years	78.6 years	78.9 years	77.3 years
Life expectancy at birth – females (years)	82.1 years	82.5 years	82.8 years	81.5 years
Working age adults of health weight	36.7%	37.4%	36.3%	38.9%
Adults who smoke	18.4%	14.3%	14.1%	14.9%
Adults who drink above guidelines	17.9%	17%	16.3%	18.7%

[Source: Public Health Outcomes Framework (2022) data from 2020/21]

Table 4: Morbidity

18.4% of adults in Wales smoke, contributing to peripheral and coronary arterial disease however due to the lack of interventional radiology and hybrid theatre facilities many patients are not considered for interventions to improve leg circulation and improve their mobility, quality of life and maintain cardiovascular fitness. Treating this cohort of patients would result in the legacy of a population with improved mobility, fitness and a lower amputation rate.

2.4 Other Partners/Collaboratives

2.4.1 South West Wales' Arterial Service

Morriston Hospital is the arterial centre delivering all major vascular interventions for Southwest Wales Vascular Network, serving a population of circa one million (Ceredigion, Carmarthenshire, Pembrokeshire, Powys and Swansea Bay). It is the only centre able to deliver the requirements of the Vascular Society of Great Britain (The Provision of Services for Patients with Vascular Disease 2021), and Wales Abdominal Aortic Aneurysm Screening Programme (WAAASP) standards.

2.4.1.1 Theatre Capacity & Utilisation

SBUHB has three acute hospitals providing a range of services; these are Singleton and Morriston Hospitals in Swansea and Neath Port Talbot Hospital in Port Talbot. SBUHB currently has 33 theatres across these hospitals, with plans to establish additional modular theatres at Singleton and NPT Hospitals. They are used for elective and emergency work covering all surgical specialities but there is no hybrid theatre and none of these theatres are dedicated for undertaking vascular procedures.

Pre-COVID, Morriston's vascular surgery service had access to four all-day lists per week and a fortnightly list supported by theatres in the Radiology Department. 80% of these patients were categorised as unscheduled/urgent. Vascular surgery utilised all available theatre capacity available at Morriston Hospital. The standard 42-weeks utilisation of theatres per annum increased to 51-weeks per annum. This is facilitated by the workforce utilising all the available theatre capacity, and by establishing a flexible rota and backfilling all sessions vacated by annual and study leave. Despite these efforts, there is still inadequate theatre capacity to meet the demands on the service. This is being addressed by the plans to establish additional modular theatres.

Despite the Health Board's COVID recovery plan, whereby there is increased provision of emergency operating capacity in Morriston Hospital from 3.6 theatre per day to 6, the allocation of theatres to vascular surgery is still only 2 all day elective lists per week, and in addition, the service is allocated a minimum of 2 all day lists per week for emergencies. These lists are provided consistently 51-weeks of the year, excluding Bank Holidays. This is a significant reduction from 4.5 all day lists per week (weekly lists alternating 5 / 6).

However, the CEPOD theatre is also being utilised every day of the week due to the level of emergency work. The service has planned a critical limb pathway to treat some of the emergency patients as urgent elective patients, but it is not possible to implement this until more elective theatre capacity is available. This pathway would reduce the length of stay and increase limb salvage rates leading to better care, patient experience and outcomes.

The Health Board has recently completed a significant public engagement exercise which gives a clear mandate for implementing the Clinical Services Plan (CSP). There are no plans to change the location of critical care and renal services, which are key dependencies for delivering major vascular interventions for South West Wales.

2.4.2 A Regional Collaboration for Health

A Regional Collaboration for Health (ARCH) is a unique collaboration between three strategic partners: Swansea Bay University Health Board, Hywel Dda University Health Board and Swansea University. It spans the local authority areas of Ceredigion, Pembrokeshire, Carmarthenshire, Neath Port Talbot, and Swansea.

The aim of the ARCH Service Transformation portfolio is to deliver projects to deliver NHS service transformation across the South West Wales region through co-ordinated regional planning.

2.5 Business Strategies

2.5.1 National

This OBC/FBC supports the following national strategies, plans and drivers for change:

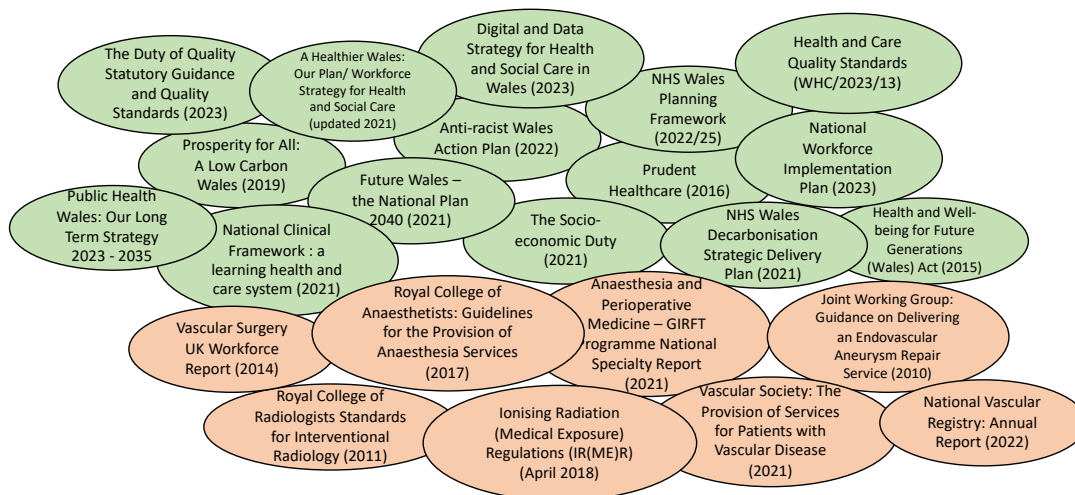


Figure 1: National Guidance (general guidance in green, vascular specific guidance in orange)

This business case supports Public Health Wales revised Long Term Strategy (2023 – 2035) and ‘A Healthier Wales’ (2018, updated 2021), which support the cluster approach to population health and will underpin the plan to reconfigure the roles of the major hospitals and support the effective delivery of timely, high quality hospital based care when it is needed.

Complex surgery will be undertaken in Morriston Hospital. This aligns with the plan for the development of a hybrid theatre in Morriston Hospital.

This project will support the national guidance by:

- The Provision of Vascular Services 2021 clearly states that a hybrid theatre is key to providing modern vascular interventions
- The principals of care, whereby facilities are used most effectively, and prevention/early treatment is beneficial to the patient and prevents waste in the health service has underpinned the NHS in Wales and described more fully in the Welsh Government presentation Securing Health and Well Being For Future Generations
- More recently the Welsh Government has set out the Health and Care Quality Standards 2023 in the Welsh Health Circular WHC/2023/013, replacing the Health and Care Standards 2015. This sets high-level standards that people in Wales can expect when accessing health services and comprise six domains of quality

- The development of the hybrid theatre in the Vascular Hub or the South West Wales Vascular Network, based at Morriston Hospital meets all of these quality standards set out by Welsh Government
- Adopting MMC construction solutions into the design and construction of new buildings supports NHS Wales Decarbonisation Strategic Delivery Plan and Net Zero Carbon (NZC) targets:
 - Standardising the construction approach and thereby minimise construction waste and transportation of construction machinery
 - Championing incorporation of efficient low carbon heating and cooling - this facility will provide a full electric 'green energy' engineering solution with no fossil fuel being utilised
 - Off-site fabrication providing just-in-time delivery to minimise construction-related carbon emissions
 - MMC provides a high-quality product, which incurs less disruption to busy hospital sites than traditional build solutions
 - The new build will be fully compliant with Sustainable Drainage Approval Body (SAB) and Highways requirements

2.5.1.1 Wellbeing of Future Generations (Wales) Act

Appendix 1 includes specific information on how the project meets the 5 ways of working described within the Wellbeing of Future Generations (Wales) Act.

2.5.2 Regional and Local

Some of the key regional and local strategies that have shaped this OBC/ FBC are:

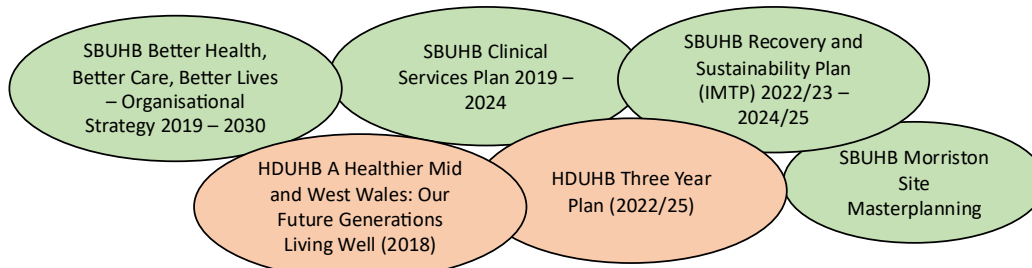


Figure 2: Local Strategies (SBUHB in green, HDUHB in orange)

Both SBUHB and HDUHB support this business case and the project responds to the above regional and local strategies by:

- Delivering treatments more efficiently, with fewer admissions to hospital and shorter hospital stays
- Reducing amputation rates – by using modern techniques at the time they are required
- Saves lives by treating more patients in a timely fashion – providing the 'right treatment, in the right place, at the right time'. Currently a cohort of patients requiring these facilities are referred out of Wales.
- Diagnostic information and imaging from CT scans across the network can be uploaded to the hybrid theatre imaging system, reducing the radiation exposure to patients and staff
- Improving training and research opportunities, with the knock on effect of attracting staffing and trainees, who are likely to remain locally when trained
- This investment 'fits' with A Regional Collaboration for Health (ARCH) programme wherein SBUHB and HDUHB and partners are working to further enhance healthcare service delivery, research, education and innovation in healthcare and life sciences within the region

2.6 Key Interdependent Projects

The following projects are service and clinical projects planned for the Morrision site, this project is not dependent upon any of these:

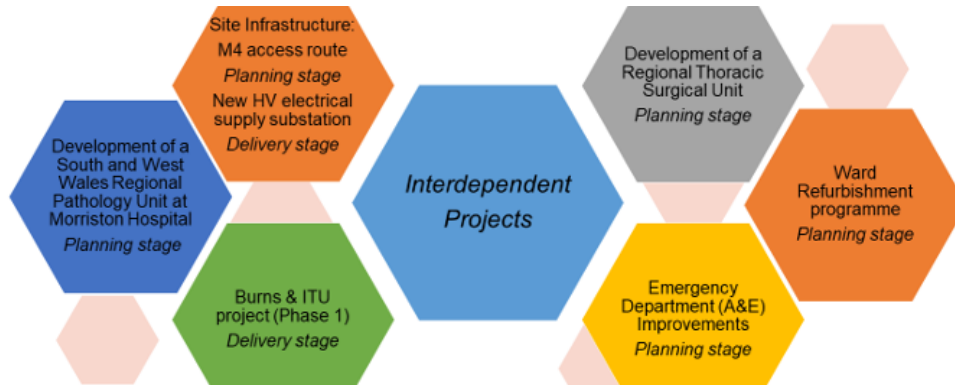


Figure 3: Key Projects for the Morrision Site

Part B: The Case for Change

2.7 Spending Objectives

In accordance with HMT's *The Green Book: Central Government Guidance on Appraisal and Evaluation* (2022), the key spending objectives have been identified in the following table. The spending objectives have been evidenced as SMART – specific, measurable, achievable, relevant and time bound) for this business case and demonstrate alignment with the NHS Infrastructure Investment criteria:

Spending Objective 1: Equity of Access	
Specific	To provide the population of the South West Wales Vascular Network with equitable access, relative to other areas of Wales, to a state of the art specialist theatre with built-in imaging that supports best practice in endovascular procedures
Measurable	Evidenced by: <ul style="list-style-type: none"> ▪ Effective hybrid interventional and surgical capability to treat patients requiring major arterial surgery ▪ Procedures that would traditionally require two separate treatments in different parts of the hospital can be carried out in the same clinical area during the same procedure eliminating clinical and non-clinical duplication ▪ Reduction in length of stay ▪ Improved access to best practice services through appropriate use of imaging technologies ▪ Enable more complex EVARS to be undertaken in a dedicated theatre environment ▪ Earlier repatriation of patients where appropriate
Spending Objective 2: Safe and Sustainable Services	
Specific	To provide the population of South West Wales Vascular Network with access to safe, sustainable and high-quality vascular surgery services for the next 7 – 10 years (current capacity below required level and issues with staff recruitment and retention)

Measurable	<p>Evidenced by:</p> <ul style="list-style-type: none"> ▪ Treating vascular surgery inpatients in suitable, modern, high quality operating suite ▪ Improved safety for patients requiring general anaesthesia (theatre vs IR suite) ▪ Reduced journeys, both in number and duration ▪ Location closer to the ICU, reducing transfer distance, and duration during the most unstable period of their clinical care ▪ Workforce with the right clinical skills and expertise (Medical, Surgical, Interventional Radiology, Radiography, Nursing) ▪ Ensuring all services within the project have sufficient capacity ▪ Reduction in surgical site infections (SSIs) ▪ Less contrast and lower radiation dose for EVAR procedures than non-hybrid environments (as evidenced by: Radiation Dose Reduction During EVAR: Results from a Prospective Multicentre Study (The REVAR Study)) ▪ Improved time to theatre leading to earlier haemorrhage control, fewer early blood transfusions, infection complications, and ventilator days in ruptured abdominal aortic aneurysm patients ▪ Improve clinical effectiveness by see a decrease in open procedures - i.e., Vascular Elective AAA to equal the national average of 59%
Spending Objective 3: Efficient Services	
Specific	To improve the efficiency of South West Wales' surgical services by enhancing vascular surgical services pathways and by providing a high quality workforce with the right clinical skills and expertise, and by improving theatres' space efficiencies
Measurable	<p>Evidenced by:</p> <ul style="list-style-type: none"> ▪ Improved efficiency, eliminating the need to transfer patients between traditional theatre and IR suites ▪ Creates capacity within the radiology intervention suite to allow improved access for patients - improved throughput of 2 – 4 cases per day ▪ Transfer of hybrid cases to an operating theatre prevents unnecessary loss of interventional radiology time ▪ Re-establish vascular operating capacity to a level comparable with pre-covid ▪ Reduced delays in time to surgery and therefore prevent amputation and reduce mortality ▪ A reduction in length of stay

Spending Objective 4: Effective Services	
Specific	To improve the effectiveness of South West Wales' surgical services by providing patients with access to minimally invasive surgical procedures which improve clinical health and patient outcomes
Measurable	Evidenced by: <ul style="list-style-type: none"> ▪ Reduction in early failure as elimination of delays between separate interventions - due to the combination of open surgery and endovascular treatment in a single intervention ▪ Optimising outcomes resulting from the provision of state of the art imaging ▪ A bespoke environment is better for patient outcomes and experience and reduces theatre time, length of stay and SSIs ▪ Procedure length is also reduced with no movement of patient between areas of the hospital ▪ Improved patient outcomes and pain management, including improved postoperative mortality rates of EVAR compared to open repairs for patients with ruptured AAA ▪ Improved patient experience
Spending Objective 5: Value for Money	
Specific	To improve vascular surgical services by providing local access to affordable technologic vascular surgical solutions
Measurable	<ul style="list-style-type: none"> ▪ Services delivered within proposed budgets ▪ Reduced amputation rates which are currently high and costly ▪ Reduced transfers out of the network ▪ Better outcomes lead to earlier return to work/normal living and less reliance on on-going healthcare services ▪ Reductions in length of stay ▪ Reductions in procedure time ▪ Increased throughput in IR suite

Table 5: Spending Objectives**Achievable**

The spending objectives described above are fully achievable through:

- Providing functionally suitable facilities appropriately sized to meet demand with appropriate patient pathways
- By the development of new facilities that meet current guidance and allow the implementation of clinical best practice
- Recruitment of appropriate workforce

Relevant

These spending objectives relate directly to the following five generic drivers for intervention and spend as follows:

- Effectiveness:
 - Improving the quality of services, both in terms of operational outputs and business outcomes (SO 4)
- Efficiency:
 - Improving the throughput of services whilst reducing unit costs (doing more for less) (SO 3)
- Economy:
 - Reducing the costs of the existing service (SO 5)
- Compliance:
 - Meeting statutory and regulatory requirements (SO 2)
- Replacement:
 - To re-provide fit for purpose assets that enable delivery of best practice services (SO 1)

The objective is aligned with the NHS Infrastructure Investment Guidance objectives and criteria as follows:

- **Health gain:** Improving outcomes and providing sufficient capacity to meet future demand (all SOs)
- **Affordability:** Providing efficient services delivered within budget (SO3, SO5)
- **Clinical and Skills Sustainability:** Supporting the delivery of safe, sustainable and accessible services, and facilitating high standards of patient care (SO1, SO2, SO3, SO4)
- **Equity:** Where people received equitable access to services based upon need (SO1)
- **Value for Money:** Promoting the maximum efficient utilisation of assets and improving asset condition and performance (SO3, SO4, SO5)

These spending objectives will enable the Health Board to deliver on the national, regional and local strategies through:

Strategy	SO1	SO2	SO3	SO4	SO5
Digital and Data Strategy for Health and Social Care in Wales (2023)	✓				✓
National Clinical Framework: A Learning Health and Care System (2021)	✓		✓	✓	✓
Health and Care Quality Standards (WHC/2023/13)	✓	✓		✓	
Anti-racist Wales Action Plan (2022)	✓				
A Healthier Wales: Our Plan/Workforce Strategy for Health and Social Care (updated 2021)	✓	✓	✓	✓	✓
The Duty of Quality Statutory Guidance and Quality Standards (2023)		✓		✓	
Public Health Wales: Our Long Term Strategy (2023 - 2025)	✓	✓	✓	✓	✓

Strategy	SO1	SO2	SO3	SO4	SO5
NHS Wales Planning Framework (2022 – 2025)	✓	✓			
National Workforce Implementation Plan (2023)		✓	✓		✓
Health and Wellbeing for Future Generations (Wales) Act (2015)	✓			✓	
Prudent Healthcare (2016)	✓	✓			
NHS Wales Decarbonisation Strategic Delivery Plan (2021)		✓			
The Socio-economic Duty (2021)	✓				
Future Wales – The National Plan 2040 (2021)		✓		✓	
Prosperity for All: A Low Carbon Wales (2019)		✓			
National Vascular Society: The Provision of Services for Patients with Vascular Disease (2021)	✓	✓		✓	
National Vascular Registry: Annual Report (2022)	✓	✓			
Vascular Surgery UK Workforce Report (2014)			✓		
Joint Working Group: Guidance on Delivery an Endovascular Repair Service (2010)		✓		✓	
Anaesthesia and Peri-operative Medicine – GIRFT Programme National Specialty Report (2021)	✓	✓	✓	✓	✓
Royal College of Radiologists Standards for Interventional Radiology (2011)		✓			
Ionising Radiation (Medical Exposure) Regulations (IR(ME)R) (April 2018)		✓			
Royal College of Anaesthetists: Guidelines for the Provision of Anaesthesia Services (2017)		✓		✓	
The SBUHB Better Health, Better Care, Better Lives – Organisational Strategy 2019 - 2030	✓	✓		✓	
SBUHB Clinical Services Plan 2019 – 2024		✓		✓	✓
SBUHB Recovery and Sustainability Plan (IMTP) 2022/23 – 2024/25	✓	✓			
H DUHB 3 Year Plan (2022/25)	✓	✓		✓	
H DUHB A Healthier Mid and West Wales: Our Future Generations Living Well 2018	✓	✓			

Table 6: Delivering National, Regional and Local Strategies

Time-bound

Based on an operational date of March 2025, these objectives will delivered by end of the 1st Quarter 2026 and evidenced by 1st Quarter 2027, subject to funding and planning approvals.

In agreeing these objectives, the team has also identified measurable benefits which will be derived by patients, staff, the Health Board and the wider health economy. These are detailed in Sections 2.11, 0 and 6.8.

2.8 Existing Arrangements

This section provides an overview of the current service delivery arrangements.

2.8.1 South West Wales Vascular Network Service

The South West Wales Vascular Network serves the population of SBUHB, HDUHB CTUHB and PTUHB. Morriston Hospital is the designated arterial intervention site for South West Wales and is the most advanced and mature as the designated arterial intervention site. Ranked as the 18th busiest of over 80 vascular units within the UK. Currently, Morriston carries out 40 Endovascular aneurysm repair (EVARs) procedures. The number of combined peripheral procedures incorporating imaging and open surgery (emergency and elective) lower limb procedures equated to between 90-105 cases per year for imaging alone. The current EVAR rate is 50% compared to a typical level of 75% in other vascular surgery centres and procedures are carried out either within the theatre estate in generic theatres or in a DSA suite, neither of which are designed or purpose built to undertake these types of procedures.

Current facilities are either focused around the adaption of angiography suites to allow open access surgery or the uses of mobile imaging in a conventional theatre. Its operation is constrained by the lack of local access to a hybrid theatre facility to support best practice in vascular surgery. This means that complex EVARs that requires branches to maintain supply to kidney and other main branches of the aorta that supply blood to the gut. Consequently, complex cases are referred out of area for treatment to centres with hybrid theatre facilities and relevant expertise.

2.8.2 Mobile Imaging

Currently, should imaging be required for the procedure within a generic theatre a mobile imaging system can be brought into the theatre. There are a number of limitations in using mobile systems:

- “The first limitation of mobile systems “is the obvious inferiority of the images they generate in terms of quality in comparison with fixed x-ray systems. Despite improvements, mobile imagers are less powerful at usually less than 25kW compared to fixed systems that operate at 80-100kW. Imaging an obese patient, particularly at lateral angle, could therefore produce an unsatisfactory image”
- Moving the equipment between the site of storage and the operating room, setting up the equipment and network connections consumes time, slows down the intervention, creates a space issue within the theatre and creates an inefficiency
- Mobile imaging does not have the facility to overlay (incorporate) existing CT images, with relevant mark up and planning measurements. This leads to additional radiation potentially unnecessary X ray exposure to the patient and staff. This goes against the ALARA (As Low as Reasonably Achievable) principal and is a health risk for staff

2.8.3 Radiology Suites

The importance of intra operative sterility is critical with positive pressure, air change cycling ability and environmental control of an operating theatre. There is an increasing body of evidence supporting the use of laminar air flow when implanting foreign bodies into patients:

- The current radiology suite has a footprint of 40m². This is sufficient for standard interventional procedures. It is significantly smaller than the minimum recommended footprint for a hybrid theatre of 70m².
- An operating theatre is purpose built to allow rapid de-contamination and cleaning to maintain the sterile environment
- Radiology suites are not designed to accommodate anaesthetic machines and the additional staff required for a general anaesthetic procedure. There are also the issues with adequate light and suction facilities if an open conversion is required
- “Although EVAR complications requiring immediate open conversion are rare (3.8%), it is possible that, with the increasing volume of endovascular cases, complexity and the possibility of endovascular repair of ruptured aneurysms, the need for conversion may increase”
- More complex endovascular aneurysm treatments combine open arterial bypass procedures, to ensure that an adequate area of the blood vessel to be covered to create a satisfactory sealing zone. An example is transferring the blood supply to the brain from one carotid artery in the neck, to the other carotid artery, to create a sealing zone in the thoracic aorta. This procedure requires an open bypass using a cloth (Dacron) graft. If this were to become infected the result would be life threatening

2.9 Business Needs

2.9.1 Hybrid Theatre

The definition of a hybrid procedure in the literature varies widely. Nollert et al (2012) state that “a strict definition of a hybrid procedure is a major procedure that combines a conventional surgical part including a skin incision with an interventional part using some sort of catheter-based procedure guided by fluoroscopic or MRI imaging in a hybrid room without interruption”. Traditionally, in certain specialty areas patients have been treated via open procedures. However, over the last 10-15 years advances in X-Ray, CT Scanning and other medical imaging technology has made it possible to diagnose and treat patients for a range of diseases through minimally invasive surgical (MIS) techniques. As a result, surgeons have now been trained in interventional radiology procedures and angioplasty and stenting. This means that surgeons have developed a whole new discipline which isn't one thing or another – in other words a ‘hybrid’ operating process. To undertake this work a hybrid theatre is required. The hybrid theatre allows the surgeon in combination with an Interventional Radiologist, or in certain circumstances the surgeon alone is able to perform both minimally invasive, image guided procedures, as well as traditional open surgery. In some cases both types of surgery will be required on the patient and with a hybrid theatre this can now be done in one operating session, under a single anaesthetic, rather than several stages in different theatre facilities within the hospital.

2.9.2 Problems with Status Quo

Inequality of access for South & West Wales' Vascular patients

South and West Wales Vascular Network does not have a dedicated theatre for undertaking vascular procedures or a hybrid operating theatre, so, unlike the other two Welsh Vascular Networks, the South West Wales Network's patients cannot access first class and optimal vascular treatment or open/combined endovascular surgical procedures with full imaging facilities in a local and fully equipped facility unless this investment is supported.

Safety issues with utilising existing Mobile Imaging

Currently within SBUHB, should imaging be required for a procedure within a generic theatre, a mobile imaging system can be brought into the theatre. However, there are a number of limitations in using mobile systems, including: inferior images in terms of quality compared with fixed X-ray systems; the propensity of portable imaging systems to overheat during an operation; safe-storage issues (mobile equipment requires electrical charge when not in use) and logistical challenges transferring equipment between storage site and the operating room, which can lead to clinical inefficiencies. Also, mobile imaging does not have the facility to overlay (incorporate) existing CT images, with relevant mark up and planning measurements, which leads to additional radiation from potentially unnecessary X-ray exposure to the patient and staff (this contravenes 'As Low As Reasonably Achievable' (ALARA) principals and is a health risk for staff.

Environmental issues with utilising existing Radiology Suites

Occasionally an open operation may be carried out in the Radiology Suite but these facilities are not designed to accommodate anaesthetic machines and the additional staff required for a general anaesthetic procedure. Compared with operating theatres, these suites lack essential positive pressure, lighting is poor, and suction facilities, air change cycling ability and environmental controls (including laminar air flows).

Failure to achieve full compliance with Vascular Society Recommendations & MHRA Guidance

To achieve full compliance with MHRA Guidance SBUHB needs investment in at least one endovascular theatre or theatre specification endovascular suite, preferably with high quality imaging and advanced applications. A dedicated theatre table is also required to deliver the Vascular Society's recommendation that be provided to ensure full compliance with best practice.

2.9.3 Vascular Service Model

2.9.3.1 UK Service Model

There is well-established clinical guidance about how to deliver a high quality vascular service. Most recently this has been articulated in The Provision of Services for Patients with Vascular Disease (2021), published by the Vascular Society of Great Britain and Ireland. The paper states the following: "The current Vascular Society advice, based on sound clinical evidence, is that high quality vascular care in the UK is best delivered with the establishment of integrated vascular networks. Such networks should decide upon a single hospital which will provide arterial surgery and complex endovascular interventions. The other hospitals in the network need to continue to provide the following clinical support: - vascular clinics; diagnostics; interventions such as renal access procedures; review of in-patient vascular referrals; and rehabilitation. This provides the patient with direct local access to the vascular service."

In terms of the benefits of this approach the above paper advises: “Concentrating arterial surgery and more complex endovascular interventions in one arterial centre has a number of benefits. Evidence shows that clinical outcomes are improved with increasing volumes of procedures. Sustainable on-call rotas can be achieved, and effective multi-professional training is facilitated. Lack of exposure to sufficient numbers of training opportunities is the biggest problem facing current trainees. Finally there are significant economic benefits to be gained by avoiding the replication of expensive technology and staff in hospitals throughout the network”.

2.9.3.2 *The Vascular Society*

The Vascular Society defines the following resources and facilities that should be in place to support delivery of high volume arterial hospital for a network:

- A 24/7 consultant on-call rota for vascular emergencies of 1:6 or greater, covered by a combination of vascular surgeons and interventional radiologists to ensure adequate care
- A 24/7 critical care facility with ability to undertake mechanical ventilation and renal support and with 24/7 on-site anaesthetic cover
- Wards for dedicated vascular patients
- At least one endovascular theatre or theatre specification endovascular suite is required, preferably with high quality imaging, advanced applications and a dedicated theatre table ((in accordance with Medicines and Healthcare products Regulatory Agency (MHRA) guidance))
- A minimum number of 60 Abdominal Aortic Aneurysm (AAA) and 40 carotid procedures (elective and emergency) are undertaken p.a.
- The population covered by the network should be sufficient to generate the required volume of procedures at the arterial centre (a minimum of 800,000 is usually required for this)
- An on-site vascular laboratory should be available
- Hospitals, vascular surgeons and interventional radiologists should submit cases to the National Vascular Registry (NVR) and publish their outcomes in line with the National HQIP programme. Actions should be taken to ensure all outcomes are satisfactory, and
- Vascular surgeons should undertake regular review of their practice and outcomes (morbidity and mortality/governance meetings)

2.9.3.3 *The Getting it Right First time (GIRFT) Programme National Specialty Report into Vascular Surgery*

Professor Michael Horrocks, in the foreword to The Getting it Right First Time (GIRFT) Programme National Specialty Report into Vascular Surgery published in March 2018, stated that “the most pivotal recommendation being made was that delivery of arterial surgery should be reconfigured so that all patients can be treated on an urgent basis”, by establishing hub and spoke networks, where the hubs have the capacity and flexibility to offer a seven-day service. This model is already supported by the Vascular Society and NHS England; where it has been adopted and embedded well, major improvements in wait times and other patient outcomes have been seen. Where well-embedded, this network model typically leads to improved perioperative care, by facilitating closer working with other medical specialties who are also treating these often very frail patients. That in turn could also help reduce length of stay and readmissions. These benefits underline the importance of ensuring that all vascular networks are established as required by the existing national service specification. The report recommends that a network model becomes the norm, with all providers’ part of a network and work clearly and consistently distributed between the hubs and spokes. The report goes on to describe the

case for networks and how they can allow pooling of resources to invest in facilities such as CT scanners and hybrid theatres.

2.9.4 External Advisory Organisations

2.9.4.1 NICE

The National Institute of healthcare and Clinical Excellence (NICE) recommend the treatment of infrarenal abdominal aortic aneurysm by Endovascular Aneurysm Repair (EVAR). The MHRA recommend that EVAR be carried out in a Hybrid Operating Theatre and specify minimum standards for these facilities. The treatment of patients presenting with ruptured AAA, is recommended as part of clinical trials. Current evidence supports this approach for certain subsets, however as more data is acquired the indications will become clearer. 'Gold standard' assessment of vascular interventions includes post reconstruction imaging, with angiography. Other modalities are often used in combination. We do not currently utilise this modality.

2.9.4.2 Medicine & Healthcare products Regulatory Agency (MHRA)

MHRA is an Executive Agency of the Department of Health responsible for the regulation of medical devices and pharmaceutical products. In 2010 the MHRA became aware of number of adverse incidents of interventional procedures in relation to the placement of stent grafts, many of which were associated with inadequate imaging facilities for fluoroscopy. As a result guidance was then issued on the delivery of Endovascular Aneurysm Repair (EVAR) based on the recommendation of group of nominated experts. The MHRA Report (2010) outlined two essential elements for a dedicated EVAR facility as follows:

- High quality imaging equipment is crucial for the accurate positioning and deployment of the stent graft to avoid covering important branch vessels and compromising blood flow to essential organs such as the brain, upper limb or kidney
- Theatre specification setting to provide a safe, appropriate environment to allow for induction of anaesthesia, surgical cut-down, post-operative recovery and conversion to open repair, should the need arise

2.9.4.3 IRMER Guidance

Ionising Radiation (Medical Exposure) Regulation (IR(ME)R 2017) is legislation intended to protect the patient from hazards associated with ionising radiation. They are designed to ensure patient safety and are enforced as if made under Section 15 of the Health and Safety at Work etc. Act 1974. Within SBUHB the lack of an integrated imaging facility means that patients may require repeat imaging rather than an image transfer. This results in the patient having additional radiation exposure, which is contrary to IRMER guidelines.

2.9.5 Education, Training and Recruitment

SBUHB aims to be able to train both vascular surgical trainees and interventional radiology trainees in both environments, i.e. Radiology Suite and Hybrid Theatre. This will require mentorship and proctoring. A Training & Development Plan will be developed to ensure health outcomes and patient benefits are realised as planned. This will potentially be taken forward as a South Wales plan with links to the Vascular Steering Group across Wales to enable mentoring across various disciplines and across all Health Boards. Staffing training and development will be critical to maintaining a vascular service in South West Wales.

2.9.5.1 *University Initiatives*

The University of Swansea Medical School was established in 2001 and aims to be an internationally-recognised Centre of Excellence in research and medical education. It works closely with the Health Board to achieve excellence in teaching, research and clinical service. The establishment of a hybrid theatre with the facility to feed live procedures into a lecture theatre will enhance excellent teaching.

2.9.5.2 *Supporting Deanery Training Posts & Recruitment*

The strategic aim of the Wales Deanery is to commission, quality assure and support the education and training of trainees, hospital doctors, GPs, dentists and DCPs in Wales. This includes the development of innovative models of education and training delivery, building training capacity and leading on postgraduate medical and educational research. The development of a dedicated hybrid theatre in SBUHB will support this goal for ongoing training within the Health Board and Wales. It will also allow live procedures to be transmitted to the training facilities.

2.9.6 Summary of Business Needs

The development of a hybrid theatre for more complex cases allows patients in South West Wales to be treated closer to home and would support clinical efficiencies and significant indirect economic benefits.

The population needs access to a dedicated and appropriately equipped hybrid theatre to allow vascular surgeons to combine conventional surgical techniques involving a skin incision with interventional techniques using some sort of catheter-based procedure guided by fluoroscopic or MRI imaging in a hybrid room without interruption. Local access to a hybrid theatre will allow Morriston's Vascular Surgeons to perform both minimally invasive, image guided procedures, as well as traditional open surgery. In some cases both types of surgery will be required on the patient and with a hybrid theatre, to be done in one operating session under a single anaesthetic, rather than in several stages in different theatre facilities within the hospital.

Overall, this investment will support the following:

- Delivery of a new service model and patient pathways in compliance with UK vascular surgery best practice
- Delivery of efficiency improvements in the overall vascular surgical pathway
- An opportunity to modernise the outdated, inadequate post-operative recovery area within the main theatre department and improve patient flows at Morriston Hospital
- Essential limb and life-saving interventions efficiently
- Prevents multiple or extended admissions for complex procedures
- Allows a timely revascularisation of limbs as a combined radiological and surgical procedure

- Increases the rate of minimally invasive procedures
- Improve patient pathways, reduce length of stay, waiting times and positively impact on amputation rates
- Reduce the requirement for external referral / commissioning for complex procedures
- Local access, eliminating significant travelling for patients and carers
- Improves the quality of care, provide fit for purpose, dedicated and networked Hybrid surgical services to the population of South & West Wales
- Improves patient safety
- Improves the patient experience and survival rates against UK standards - reducing infection risk - prosthetics, wounds
- Reduces radiation exposure to patients and staff in compliance with Ionising Radiation (Medical Exposure) Regulation ((IR(ME)R) Guidance 2017 legislation, currently within SBUHB the lack of an integrated imaging facility means that patients may require repeat imaging rather than an image transfer. This currently results in the patient having additional radiation exposure, which is contrary to IRMER guidelines
- Meets Vascular Society and MHRA recommendations for delivering treatments in an appropriate environment
- Makes SBUHB a competitive and attractive organisation within the recruitment market for Vascular Surgeons, Interventional Radiologists and Allied Health Professional staff
- Aligns Morriston Hospital vascular surgery theatre infrastructure with the majority of other vascular hub hospitals in the UK, where 59% of hub hospitals have access to at least one hybrid theatre on site (National Vascular Registry Annual Report 2018), an increase from 43% in 2015
- Complies with National Institute of healthcare and Clinical Excellence (NICE) recommend the treatment of infrarenal AAA by EVAR
- Complies with The Medicine & Healthcare products Regulatory Agency (MHRA) recommendation that EVAR be carried out in a Hybrid operating theatre and specify minimum standards for these facilities. The treatment of patients presenting with ruptured AAA, is recommended as part of clinical trials. Current evidence supports this approach for certain subsets, however as more data is acquired the indications will become clearer. 'Gold standard' assessment of vascular interventions includes post reconstruction imaging, with angiography. Other modalities are often used in combination. SBUHB currently does not utilise this modality

2.9.6.1 *Forecast Activity*

A hybrid theatre primarily designed for vascular surgery with advanced medical imaging devices has the potential to be used to centralise the open/endovascular surgery. EVAR procedures should run at a minimum of 100-110 cases per annum. Combined peripheral procedures incorporating imaging and open surgery (emergency and elective) lower limb procedures equate to between 90-105 cases per annum for imaging alone. This does not account for the expected uplift in combined endovascular interventions in addition to open procedures.

Appendix 2 contains full information regarding the activity and capacity planning but in summary:

	Current	Increase in elective Work	Decrease in Emergency Work	Increase in Angio-plasty	Decrease in Re-admission Rates	Reduction in Follow Up Procedures	Demographic Growth	Future
	2024	150%	65%	65%	50%	3%	17%	2034
Cases								
Elective	205	307	-	75	(72)	(3)	85	596
Emergency	537	-	(349)	-	(15)	(1)	29	201
Total	742	307	(349)	75	(87)	(4)	114	797
Theatre Minutes								
Elective	39,664	59,496	-	4,960	(6,969)	(229)	16,186	113,107
Emergency	60,759	-	(39,493)	-	(664)	(40)	3,434	23,996
Total	100,422	59,496	(39,493)	4,960	(7,633)	(269)	19,620	137,103
Out of Hour Sessions	30,379	-	(19,747)	-	(332)	(20)	1,717	11,998
In Hour Sessions	70,043	59,496	(19,747)	4,960	(7,301)	(249)	17,903	125,105
Hybrid Theatre Sessions	321	273	(91)	23	(33)	(1)	82	574
Emergency Sessions	139	-	(91)	-	(2)	(0)	8	55
Theatres Requirement								
Hybrid Theatre	0.6	0.5	(0.2)	0.0	(0.1)	(0.0)	0.2	1.1
Emergency Theatre	0.3	-	(0.2)	-	(0.0)	(0.0)	0.0	0.1
Total	0.9	0.5	(0.4)	0.0	(0.1)	(0.0)	0.2	1.2

Table 7: Summary of Activity and Capacity Requirements

These activity and capacity projections are based on the following assumptions:

- The demographic extrapolation is based on ONS 2018-based projections (the latest available) for the over 50's population within the catchment area (Swansea Bay and Hywel Dda Health Boards)
- Besides demographic pressures and an ageing population, the various other clinical change factors are driven by:
 - provision of procedures that are not currently carried out as we are currently only dealing with threatened limbs, i.e. gangrene and tissue loss
 - many other interventions should be carried out than is currently possible due to limitations due to peripheral arterial disease
- Theatre throughput assumptions:
 - 51 weeks per year
 - 10 sessions per week
 - 270 mins per session (4.5 hours) 8:30-6pm
 - 85% in-session utilisation
 - 95% of scheduled sessions used
- Theatre time and anaesthetic time for each procedure is based on data from actual utilisation statistics from the theatre dashboard

2.10 Potential Scope & Key Service Requirements

This section describes the potential scope for the project in relation to the above business needs in terms of modalities and service drivers. The potential scope has been assessed against a continuum of need ranging from:

- **A Do Minimum** – essential or core requirements/ outputs.
- **An Intermediate** – with essential and desirable delivery requirements/ outputs to a greater and lesser extent.
- **A Do Maximum** – with essential, desirable and optional requirements/outputs.

	Core	Desirable	Optional
Potential Scope	The population of South and West Wales have access to a local high quality dedicated hybrid theatre service	The population of South and West Wales have access to a local high quality hybrid theatre service and improved staff changing and additional storage provision	The population of South and West Wales have access to a local high quality hybrid theatre service and improved theatre patient pathways/ recovery areas
Key Service Requirements	Facilities that meet minimum statutory requirements regarding environmental standards and agreed quality standards. Sized to meet future projected demand	Facilities that meet minimum statutory requirements regarding environmental standards and agreed quality standards. Sized to meet future projected demand	Facilities that meet minimum statutory requirements regarding environmental standards and agreed quality standards. Sized to meet future projected demand

Table 8: Potential Scope and Key Service Requirements

2.10.1 Service Interdependencies

The following service interdependencies must be integrated or co-located with a hybrid theatre development:

- Theatre & Recovery services, Anaesthetic and Nursing Teams & Advanced Nurse Practitioners services
- Respiratory Medicine (this is the prime referring speciality for most conditions requiring Hybrid surgery. Respiratory physicians are core members of lung cancer and emphysema MDTs)
- Outpatient clinic space, including facilities for pre-op assessment and pre-admission
- Intensive Care

2.11 Main Outcomes and Benefits

The main outcomes and benefits to patients, the Health Board and the wider health community are classified in terms of cash releasing benefits (CRBs), non-cash releasing benefits (NCRBs), quantifiable benefits (QBs), and non-quantifiable benefits (Non QBs) as follows:

Spending Objective	Stakeholder Group	Benefits	Type of Benefit
Spending Objective 1: Equity of Access	Patients	<ul style="list-style-type: none"> ▪ Provide patients with access to more minimally invasive, innovative, and modern techniques and developments 	QB
		<ul style="list-style-type: none"> ▪ The ability to move increasingly towards endovascular procedures from open surgery is associated with improved clinical outcomes 	QB
		<ul style="list-style-type: none"> ▪ Provide more appropriate, safer, and more sustainable levels of surgical services via modern 'state-of-the-art' surgical technology delivering a high quality surgical service to the patients of South West Wales 	Non QB
	Health Board/Staff	<ul style="list-style-type: none"> ▪ Provide co-location with ICU from main theatres to provide a safer transfer for complex and unstable patients, particularly those requiring endovascular interventions 	QB
	Wider Community	<ul style="list-style-type: none"> ▪ Provide the population of SW Wales with access to hybrid theatre services to support best practice for the treatment of aneurysmal disease and occlusive peripheral arterial disease (PAD) 	QB
	Spending Objective 2: Safe and Sustainable Services	Patients	<ul style="list-style-type: none"> ▪ Improved mortality rates through immediate intervention of life-threatening vascular emergencies - abdominal aortic aneurysms
<ul style="list-style-type: none"> ▪ Promote patient benefits from accessing 'time is tissue' faster to one-stage modern treatments, which reduce the risk of amputation, and improves patients' outcomes, patient experience, and patient recovery 			QB

Spending Objective	Stakeholder Group	Benefits	Type of Benefit
		<ul style="list-style-type: none"> Improve patient safety, e.g. by allowing the immediate conversion within the right environment of a minimally invasive procedure into an open procedure if this is required 	Non QB
		<ul style="list-style-type: none"> Reduction in patient exposure to ionizing radiation 	Non QB
		<ul style="list-style-type: none"> Reduction in surgical site infections (SSI's) 	QB
	Health Board/Staff	<ul style="list-style-type: none"> Provide a fully compliant environment for surgeons to perform open, hybrid and interventional radiology procedures / operations in an environment that is fully compliant with WHBN/WHTM standards 	QB
		<ul style="list-style-type: none"> Supports recruitment and retention of staff 	QB
	Wider Community	<ul style="list-style-type: none"> Provide safe endovascular aneurysm repair in accordance with specific guidance on appropriate facilities issued by the MHRA 	QB
		<ul style="list-style-type: none"> Supports the development of mentoring and innovative ways to train the medical staff of the future 	Non QB
Spending Objective 3: Efficient Services	Patients	<ul style="list-style-type: none"> Eliminate the need to transfer patients between Radiology and Theatres 	QB
		<ul style="list-style-type: none"> Enable patients to experience faster more integrated treatment and improvements in relation to overall care 	QB
	Health Board/Staff	<ul style="list-style-type: none"> Availability of hybrid theatre capabilities to specialties other than vascular 	Non QB
		<ul style="list-style-type: none"> Co-location of procedures and earlier intervention provides opportunities to reduce clinical and non-clinical duplication 	Non QB
	Wider Community	<ul style="list-style-type: none"> Progress towards meeting the vascular service standards for a vascular network 	QB
Spending Objective 4: Effective Services	Patients	<ul style="list-style-type: none"> Provides minimally invasive vascular surgical procedures for a larger percentage of patients, especially those with multiple medical comorbidities 	QB
		<ul style="list-style-type: none"> Provides high quality digital images that allow the use of the most advanced endovascular devices 	Non QB
	Health Board/Staff	<ul style="list-style-type: none"> Provides vascular surgeons with access to both traditional open surgery and modern endovascular surgery training opportunities 	QB
		<ul style="list-style-type: none"> Improve staff wellbeing and satisfaction 	Non QB
	Wider Community	<ul style="list-style-type: none"> Allows delivery on a level platform with other large regional providers of complex Cardiovascular services 	QB

Spending Objective	Stakeholder Group	Benefits	Type of Benefit
Spending Objective 5: Value for Money	Patients	<ul style="list-style-type: none"> Reduced LOS in hospital 	QB
	Health Board/Staff	<ul style="list-style-type: none"> Operational economies, e.g. from improved utilisation of theatres 	QB
		<ul style="list-style-type: none"> Maximises the opportunity costs associated with maintenance, reactive repairs and under-utilised theatre resources 	CRB
		<ul style="list-style-type: none"> Reduces the opportunity costs e.g. breakdown of equipment, equipment not readily available within the theatre 	CRB
	Wider Community	<ul style="list-style-type: none"> Supports achievement of NHS Net Zero Carbon targets (i.e. to reduce emissions by 78% by 2035 and achieve net zero by 2050) 	QB
		<ul style="list-style-type: none"> Maximises opportunities in relation to post project evaluation via provision of a centre of excellence and any lessons learned outcomes for Pathology services across the NHS 	Non QB

Table 9: Main Benefits

2.12 Main Risks

The main business and service risks and mitigations are as follows:

Risk Description	Mitigating Actions
Risk that the crane access route could incur health and safety/operational issues	Liaise with Module Co and Morrision management
Risk of failing to recruit and retain IR consultants in future	Deliver the project as soon as is possible; Health Board to develop strategic plan. Business Continuity Plan in place & Options Appraisal document developed.
Risk that planning conditions (Highways & Suds) will be onerous	Continued liaison with local planners; Coordinate with other Morrision developments
Risk that (updated) full planning / SUDs approvals for signed off design solution will not be approved when required	Continued liaison with local planners; Undertake ecological surveys; Confirm footfall impact on site within context of overall site activity
Risk the case's revenue affordability will be unaffordable for the Health Board	Report on an ongoing basis to project board
Risk the case's capital affordability will not be approved by WGov	Continued regular liaison with WGov
Risk the overall service model could change during design development and delivery stage	Involve Control of Infection in design process
Risk there is insufficient revenue funding to fully utilise the hybrid theatre	Explore efficiencies and cost savings; Capture equipment maintenance contracts & estates maintenance implications, etc. (sign off with FM service leads)

Risk Description	Mitigating Actions
Workforce risk (including theatre staff / radiology)	Establish a Workforce Group to develop and workforce plan

Table 10: Main Risks and Mitigations

Please refer to Outline Arrangements for Risk Management within the Management section of this business case for information relating the project risk register.

2.13 Constraints

The scheme is subject to the following constraints:

- The new service model must demonstrate measurable health outcomes for patients requiring complex vascular surgery
- Ability of SBUHB to recruit and retain sufficient qualified and non-professionally qualified staff
- The solution must be located on the existing Morriston Hospital site, adjacent to the main theatre nucleus and support services (NB. all the general theatres on the Morriston Hospital site are too small to accommodate a hybrid theatre development - 'standard' theatres are 50m² and 'hybrid' theatres require approx. 100m² to accommodate mobile imaging equipment and procedures)
- The solution must be affordable in capital and revenue terms and be delivered within project budget

2.14 Dependencies

The success of this scheme is subject to the following dependencies:

- The availability of capital funding from the Welsh Government
- Buildability of the technical solution, strategic 'fit' with the SDCP and planning permissions

3. The Economic Case

3.1 Introduction

In accordance with the Capital Investment Manual and requirements of HM Treasury's Green Book (*A Guide to Investment Appraisal in the Public Sector*), this section of the business case demonstrates the wide range of options that have been considered in response to the potential scope identified in this OBC/ FBC.

This section of the business case has been reviewed and refreshed since the development of the SOC primarily due to one of the original service/technical solutions no longer being available – ie the refurbishment of existing facilities and the desire to limit the scope to the do minimum option.

3.2 Critical Success Factors

The Critical Success Factors (CSFs) that were used in the SOC have been updated during development of this OBC/FBC to re-evaluate the potential options. These are shown below:

CSF	Description
CSF 1 Business needs	How well the option satisfies the existing and future needs of the organisation
CSF 2 Strategic fit	How well the option provides holistic 'fit' and synergy with other key elements of the national, regional and local strategies, i.e. supporting SBUHB's strategic objectives.
CSF 3 Potential value for money	How well the option optimises the potential return on expenditure e.g. outcomes and benefits
CSF 4 Potential achievability	The organisations' ability to innovate, adapt, introduce, support and manage the required level of change, including the management of associated risks, and; the need for supporting skills (capacity & capability)
CSF 5 Supply side capacity and capability	The ability of the marketplace and the potential suppliers to deliver the required services and deliverables.
CSF 6 Potential affordability	The organisation's ability to fund the required level of expenditure, viz, the capital and revenue consequences associated with the proposed investment.

Table 11: Critical Success Factors

3.3 The Long Listed Options

3.3.1 Long Listing Methodology

The long list of options was generated in accordance with best practice contained in the Infrastructure Investment Guidance. The evaluation was undertaken in accordance with how well each option met the spending objectives and CSFs.

This process resulted in options either being discounted or carried forward for further consideration in the short list.

The long list of options for this investment was generated within the following key categories of choice:

Scoping options – choices in terms of coverage (the what)

The choices for potential scope are driven by business needs and the strategic objectives at both national and local levels. In practice, these may range from business functionality to geographical, customer and organisational coverage. Key considerations at this stage are ‘what’s in?’ ‘what’s out?’ and service needs.

Service/Technical solution options – choices in terms of solution (the how)

The choices for potential solution are driven by new technologies, new services and new approaches and new ways of working, including business process re-engineering. In practice, these will range from services to how the estate of an organisation might be configured. Key considerations range from ‘what ways are there to do it?’ to ‘what processes could we use?’

Service delivery options – choices in terms of delivery (the who)

The choices for service delivery are driven by the availability of service providers. In practice, these will range from within the organisation (in-house), to outsourcing, to use of the public sector as opposed to the private sector, or some combination of each category. The use of some form of public private sector partnership (PPP) may be relevant here.

Implementation options – choices in terms of the delivery timescale

The choices for implementation are driven by the ability of the supply side to produce the required products and services, VFM, affordability and service need. In practice, these will range from the phasing of the solution over time, to the modular, incremental introduction of services.

Funding options – choices in terms of financing and funding

The choices for financing the scheme (public versus private) and funding (central versus local) will be driven by the availability of capital and revenue, potential VFM, and the effectiveness or relevance/ appropriateness of funding sources.

3.3.2 Scoping Options

In accordance with the Treasury Green Book and Infrastructure Investment Guidance, the business as usual option has been considered as a benchmark for potential VFM.

An infinite number of options and permutations are possible; however, within the broad scope outlined in the strategic case, the following main options have been considered:

Option 1.0 Business As Usual (status quo)	Option 1.1 Core	Option 1.2 Desirable	Option 1.3 Optional
Population of South West Wales does not have access to a local high quality dedicated hybrid theatre service	The population of South and West Wales have access to a local high quality dedicated hybrid theatre service	Core services plus: <ul style="list-style-type: none"> ■ improved staff changing facilities ■ additional storage areas 	Core and Desirable services plus: <ul style="list-style-type: none"> ■ improved theatre patient pathways ■ improved recovery areas

Table 12: Potential Scope

The table below summarises the assessment of each option against the spending objectives and CSFs:

Option:	1.0	1.1	1.2	1.3
Spending Objectives				
SO 1. Equity of access	X	✓✓	✓✓	✓✓
SO 2. Safe and sustainable services	X	✓✓	✓✓	✓✓
SO 3. Efficient services	X	✓✓	✓✓	✓✓
SO 4. Effective services	X	✓✓	✓✓	✓✓
SO 5. Value for money	X	✓✓	✓	X
Critical Success Factors				
CSF 1: Business needs	X	✓✓	✓✓	X
CSF 2: Strategic fit	X	✓✓	✓✓	✓
CSF 3: Potential value for money / benefits optimisation	X	✓✓	✓	✓
CSF 4: Potential achievability	X	✓✓	✓✓	X
CSF 5: Supplier capacity and capability	X	✓✓	✓✓	✓
CSF 6: Potentially affordability	X	✓✓	✓	✓
Summary	Discounted	Preferred Way Forward	Carried Forward	Discounted

Table 13: Summary Assessment of Scoping Options

Key: ✓✓ - fully achieves ✓ - partially achieves X - does not achieve

3.3.2.1 Option 1.0: Business as Usual

Description

The business as usual option includes providing no access to a dedicated hybrid theatre service for the population of South West Wales.

Advantages

- Maintains current service delivery (i.e. no hybrid theatre capacity)

Disadvantages

- Does not deliver the SOs and CSFs

3.3.2.2 Option 1.1: The 'Core' Scope

Description

The core scope includes providing access to the population of South and West Wales to a local high quality dedicated hybrid theatre service.

Advantages

- Delivers all the SOs and CSFs
- Provides population with local high quality dedicated hybrid theatre service with imaging capability
- Reduces travel time for treatment
- Is a more acceptable solution for patients and clinicians
- Improves clinical outcomes

Disadvantages

- Does not improve staff changing facilities or provide additional storage space
- Does not improve patient flows in the adjacent theatre area

3.3.2.3 *Option 1.2: The 'Core and Desirable' Scope*

Description

The services included are the core scope plus:

- Improved staff changing facilities
- Additional storage areas

Advantages

- Delivers elements of all the SOs and CSFs
- Provides population with local high quality dedicated hybrid theatre service with imaging capability
- Reduces travel time for treatment
- Improves clinical outcomes
- Improves staff changing area and additional storage space

Disadvantages

- Higher capital investment with possibly only minimal additional benefits

3.3.2.4 *Option 1.3: The 'Core, Desirable and Optional' Scope*

Description

The services included are the core and desirable scope plus:

- Improved theatre patient pathways
- Improved recovery areas

Advantages

- Optimises delivery of all the SOs and CSFs
- Provides local population with a local high quality dedicated hybrid theatre service with imaging capability
- Reduces travel time for treatment
- Improves clinical outcomes
- Improves patient flows in the adjacent theatre support areas
- Optimally improves theatre efficiencies and effectiveness, and facilitates the most effective locations for (WGov approved) automated stock management cabinets in the anaesthetic and theatre area at Morriston Hospital
- Improves recovery facilities

Disadvantages

- Significant capital investment
- Longer delivery programme than other options and may not be deliverable

3.3.2.5 Overall conclusion: scoping options

Option 1.0: business as usual is unsustainable and fails to deliver the project spending objectives and critical success factors. This solution was discounted from further detailed analysis but was retained as a baseline comparator moving forward. Options 1.1 and 1.2 will be carried forward as they both meet the required spending objectives and critical success factors with Option 1.1 being carried forward as preferred choice for assessment within the next category.

3.3.3 Service/Technical Solution Options

The range of options that have been considered are:

Option 2.0 Do Minimum	Option 2.1 Intermediate	Option 2.2 Intermediate Plus	Option 2.3 Maximum
Remodel two existing theatres to provide dedicated hybrid capabilities	New build extension adjacent to main theatres to provide dedicated hybrid capabilities	New build extension adjacent to main theatres to provide dedicated hybrid capabilities with additional space as shell and core only	New build extension adjacent to main theatres to provide dedicated hybrid capabilities with additional space for staff changing/storage

Table 14: Service/ Technical Solution Options

NB: There is no service/technical solution to deliver BAU as the service does not currently exist. A new build stand-alone option was discounted at SOC due to the requirement for additional support, pre and post recovery facilities making it less acceptable clinically than an integrated facility or a facility with complementary clinical adjacencies.

The table below summarises the assessment of each option against the spending objectives and CSFs:

Option:	2.0	2.1	2.2	2.3
Spending Objectives				
SO 1. Equity of access	✓✓	✓✓	✓✓	✓✓
SO 2. Safe and sustainable services	✓✓	✓✓	✓✓	✓✓
SO 3. Efficient services	✓✓	✓✓	✓✓	✓✓
SO 4. Effective services	✓✓	✓✓	✓✓	✓✓
SO 5. Value for money	✓✓	✓✓	✓	✓
Critical Success Factors				
CSF 1: Business needs	✓✓	✓✓	✓✓	✓✓
CSF 2: Strategic fit	✓✓	✓✓	✓✓	✓✓
CSF 3: Potential value for money/benefits optimisation	✓✓	✓✓	✓	✓
CSF 4: Potential achievability	X	✓✓	✓✓	✓✓
CSF 5: Supplier capacity and capability	X	✓✓	✓✓	✓✓
CSF 6: Potentially affordability	✓	✓✓	✓	✓
Summary	Discounted	Preferred Way Forward	Carried Forward	Carried Forward

Table 15: Summary Assessment of Service/ Technical Solution Options

Key: ✓✓ - fully achieves ✓ - partially achieves X - does not achieve

3.3.3.1 *Option 2.0: Do Minimum*

Description

Remodel two existing theatres to provide dedicated hybrid capabilities. This solution would involve merging two theatres to provide a developable footprint and strengthening of floor/ceilings, subject to the choice of machine.

Advantages

- Does not delivers all the SOs and CSFs
- The Health Board has identified two existing theatre in Theatres 1-7 (Theatres 2 & 3) which could be freed-up for other clinical developments as part of the wider transformation/response to Covid planning
- Theatres 2 & 3 would provide the necessary space and optimum clinical location for a hybrid theatre
- Solution does not increase current estate footprint
- This solution is clinically supported
- Solution does not require planning permissions

Disadvantages

- Refurbishment of two existing theatres would disrupt delivery of adjacent theatres north and south of the works area due to noise, vibration, service works)
- Construction & operational risks need to be managed
- This solution could disrupt the ward sited below whilst floors and/or ceilings works are undertaken
- This theatre area was constructed c.1980s and its 'waffle' floors and ceilings will not take the weight of a hybrid's theatre equipment without structural steel work frame / M&E)
- There is a central column which may need moving however structural feasibility stage inspections have been undertaken

3.3.3.2 *Option 2.1: Intermediate*

Description

This solution includes a new build extension adjacent to main theatres to provide dedicated hybrid capabilities

Advantages

- Delivers all of the SOs and most of the CSFs
- A development area has been identified within a courtyard in Theatres 1-7 and this site already has planning permission in place

Disadvantages

- Utilisation of internal courtyards is needed to ensure adjacency with existing theatre support services and other general theatres but this loses access to natural light
- This would involve a significant capital investment.

3.3.3.3 *Option 2.2: Intermediate Plus*

Description

This solution includes a new build extension adjacent to main theatres to provide dedicated hybrid capabilities with shell and core space

Advantages

- Delivers all of the SOs and most of the CSFs
- A development area has been identified within a courtyard in Theatres 1-7 and this site already has planning permission in place
- This solution would provide a shell and core ground floor developable area

Disadvantages

- Capital and revenue implications are higher than option 2.1
- Utilisation of internal courtyards is needed to ensure adjacency with existing theatre support services and other general theatres but this loses access to natural light

3.3.3.4 *Option 2.3: Maximum*

Description

This solution includes a new build extension adjacent to main theatres to provide dedicated hybrid capabilities with additional space for storage and staff changing

Advantages

- Delivers all of the SOs and most of the CSFs
- A development area has been identified within a courtyard in Theatres 1-7 and this site already has planning permission in place
- This solution would provide alternative staff changing facilities, allowing areas within the Theatres area to be converted into storage

Disadvantages

- Capital and revenue implications are higher than option 2.1 and 2.3
- Utilisation of internal courtyards is needed to ensure adjacency with existing theatre support services and other general theatres but this loses access to natural light

3.3.3.5 *Overall conclusion: service/technical solutions options*

Options 2.0 has been discounted as it does not meet all of the spending objectives or critical success factors and retains the current clinically unsafe service delivery.

Options 2.2 and 2.3 have been carried forward for consideration moving forward.

Option 2.1 has been carried forward as the preferred choice for assessment within the next category.

3.3.4 Service Delivery Options

This range of options considers the options for service delivery in relation to the preferred scope and potential solution. The ranges of options that have been examined are:

Option 3.1	Option 3.2	Option 3.3
In-house	Strategic Partnership	Outsource

Table 16: Service Delivery Options

The table below summarises the assessment of each option against the spending objectives and CSFs:

Option:	3.1	3.2	3.3
Spending Objectives			
SO 1. Equity of access	✓✓	✓	X
SO 2. Safe and sustainable services	✓✓	✓	X
SO 3. Efficient services	✓✓	✓	X
SO 4. Effective services	✓✓	✓	X
SO 5. Value for money	✓✓	✓	X
Critical Success Factors			
CSF 1: Business needs	✓✓	X	X
CSF 2: Strategic fit	✓✓	X	X
CSF 3: Potential value for money / benefits optimisation	✓✓	X	X
CSF 4: Potential achievability	✓✓	X	X
CSF 5: Supplier capacity and capability	✓✓	X	X
CSF 6: Potentially affordability	✓✓	✓	X
Summary	Preferred Way Forward	Discounted	Discounted

Table 17: Summary Assessment of Service Delivery Options

Key: ✓✓ - fully achieves ✓ - partially achieves X - does not achieve

3.3.4.1 Option 3.1: In-house

Description

In-house delivery of proposed services and facilities by the Health Board.

Advantages

- Retains the income stream for this work
- Retains control over the quality of the service
- Maintains clinical skills and experience across the Health Board
- Maintains flexibility to accommodate required changes in service delivery

Disadvantages

- Risk remains with the Health Board
- Requirement to provide a suitable, fit for purpose environment
- Capital investment required

3.3.4.2 *Option 3.2: Strategic Partnership*

Description

This option describes the provision of services through a strategic partnership, including collaboration with another Health Board.

Advantages

- Retains some control over the quality of services

Disadvantages

- Finding a suitable partner who can provide the required services and capacity
- Unlikely to provide a service locally
- Potential increase in revenue cost
- Some loss of the income stream for this work
- Some loss of control over the quality of the service
- Potential loss of clinical skills within the Health Board
- Capital investment required as service is not available elsewhere locally

3.3.4.3 *Option 3.3: Outsource*

Description

Outsource delivery of proposed services and facilities to another provider.

Advantages

- No capital investment required

Disadvantages

- Finding a suitable provider who can provide the required capacity
- Reduced flexibility to accommodate required changes in service delivery and facilities
- Potential loss of clinical skills within the Health Board

3.3.4.4 *Overall conclusion: service delivery options*

Given this service is an essential NHS service the only practicable and acceptable service delivery option available is a wholly in-house NHS staffed solution, as it delivers all of the spending objectives and critical success factors. Therefore Option 3.1 has been carried forward as the preferred way forward.

3.3.5 Implementation Options

This range of options considers the choices for implementation in relation to the preferred scope, service/technical solution and method of service delivery.

The following section relates to the new build hub accommodation. The phasing and timing of the local refurbishments will be subject to local procurement arrangements.

Option 4.1	Option 4.2
Phased	Big Bang - Single Phase

Table 18: Implementation Options

The table below summarises the assessment of each option against the spending objectives and CSFs:

Option:	4.1	4.2
Spending Objectives		
SO 1. Equity of access	✓✓	✓✓
SO 2. Safe and sustainable services	✓✓	✓✓
SO 3. Efficient services	✓✓	✓✓
SO 4. Effective services	✓✓	✓✓
SO 5. Value for money	X	✓✓
Critical Success Factors		
CSF 1: Business needs	X	✓✓
CSF 2: Strategic fit	✓✓	✓✓
CSF 3: Potential value for money / benefits optimisation	✓	✓✓
CSF 4: Potential achievability	✓	✓✓
CSF 5: Supplier capacity and capability	✓	✓✓
CSF 6: Potentially affordability	X	✓✓
Summary	Discounted	Preferred Forward Way

Table 19: Summary Assessment of Implementation Options

Key: ✓✓ - fully achieves ✓ - partially achieves X - does not achieve

3.3.5.1 Option 4.1: Phased

Description

This option assumes that the implementation of the required services would be phased on an incremental basis.

Advantages

A phased solution has few, if any, advantages above a non-phased solution

Disadvantages

- Potentially higher costs and longer delivery programme
- Could disrupt current services for longer

3.3.5.2 *Option 4.2: 'Big Bang'*

Description

This option assumes that all the required services could be delivered within one phase.

Advantages

- Optimises benefits sooner
- Shorter timescales
- Most cost efficient from estates/ construction perspective

Disadvantages

There are no disadvantages.

3.3.5.3 *Overall conclusion: implementation options*

Due to the preferred service/technical solution option, a single phase implementation has been carried forward as the preferred choice for assessment as there are no disadvantages.

3.3.6 Funding Options

This range of options considers the choices for funding and financing in relation to the preferred scope, solution, method of service delivery and implementation. The options are as follows:

Option 5.1	Option 5.2
Public Funding	Private Funding

Table 20: Funding Options

3.3.6.1 *Option 5.1: Public Funding*

Description

The options for public funding are essentially to secure funding from WGov through the capital programme.

Advantages

- The Health Board can manage its assets and ongoing plans for estate rationalisation and development as part of a long-term financial model;
- The Health Board can assure greater control of expenditure and cost through direct management of development activities;
- The Health Board can retain existing assets for disposal when market conditions are more favourable.

Disadvantages

- The Health Board needs to secure funding from WGov.

3.3.6.2 *Option 5.2: Private Funding*

Description

Under this option, the required services and facilities might be provided on a PPP basis from a single service provider or consortium made up of potential service providers on the private sector side.

The assets underpinning the provision of services would be an integral part of the service and indistinguishable within the resultant service charge. All elements of the service would be within the potential scope of the deal.

Advantages

- Any commercial transaction can be tailored to reduce the Health Board's risk exposure
- The Health Board is not dependent upon securing monies from the WGov Capital Programme
- The disposal of any existing assets could be factored into a commercial deal
- Ongoing maintenance and part-operation of the new facilities could be factored into the commercial deal

Disadvantages

- Public Private Partnerships are becoming a rarer option
- There are significant timescales, costs and resources required to establish a commercial settlement
- The accounting treatment for a PPP is not as simple as it might seem
- The recurrent costs of PPP are much greater than a traditionally-procured solution, as measured by the Unitary Payment
- The size and scope of the Project is unlikely to be attractive to private sector partners in the current macro-economic environment

3.3.6.3 *Overall Conclusion: Funding*

Private funding is impracticable and unaffordable, with no potential sole funder(s) having been identified for this strategically important service.

Therefore the public funding option has been considered the most practicable and appropriate for this strategically important NHS service.

3.4 The Long List: Options Framework

The framework options long list options findings are summarised below as per business case guidance:

Framework Options	Business As Usual	Do Minimum	Intermediate	Do Maximum
Potential Service Scope Options – as outlined in the strategic case	1.0 - Population of South West Wales does not have access to a local high quality dedicated hybrid theatre service	1.1 - Core services: The population of South and West Wales have access to a local high quality dedicated hybrid theatre service	1.2 - Core services plus: <ul style="list-style-type: none"> improved staff changing facilities additional storage areas 	1.3 - Core and Desirable services plus: <ul style="list-style-type: none"> improved theatre patient pathways improved recovery areas
	Discounted	Preferred Way Forward	Carried Forward	Discounted
Potential Service/Technical Solution Options – in relation to the preferred scope	2.0 - Remodel two existing theatres to provide dedicated hybrid capabilities	2.1 - New build extension adjacent to main theatres to provide dedicated hybrid capabilities	2.2 - New build extension adjacent to main theatres to provide dedicated hybrid capabilities with additional space as shell and core only	2.3 - New build extension adjacent to main theatres to provide dedicated hybrid capabilities with additional space for staff changing/storage
	Discounted	Preferred Way Forward	Carried Forward	Carried Forward
Potential Service Delivery Options - in relation to preferred scope & solution	3.1 In-house		3.2 Strategic Partnership	3.3 Outsource
	Preferred Way Forward		Discounted	Discounted
Potential Implementation Options – in relation to preferred scope, solution & method of service delivery		4.1 Phased		4.2 Big Bang (single phase)
		Discounted		Preferred Way Forward
Potential Funding Options – in relation to preferred scope, solution, method of service delivery & implementation		5.1 Public Funding		5.2 Private Funding
		Preferred Way Forward		Discounted

Table 21: Long List Options Framework Summary

3.5 Shortlisted Options

The preferred and possible solutions identified have been carried forward into the short list for further appraisal and evaluation. All the options that were 'discounted' as impracticable have been excluded at this stage. Business As Usual was excluded from further detailed analysis but has been retained as the baseline comparator. Based on this hi-level non-financial analysis, the recommended short list for further appraisal as per business case guidance is as follows:

Framework Options	Option 0	Option 1	Option 2	Option 3
	Business As Usual	Do Minimum/ Less Ambitions/ Preferred Way Forward	More Ambitious	Most Ambitious
Service Scope	1.0 - Population of South West Wales does not have access to a local high quality dedicated hybrid theatre service	1.1 - Core services: The population of South and West Wales have access to a local high quality dedicated hybrid theatre service	1.1 - Core services: The population of South and West Wales have access to a local high quality dedicated hybrid theatre service	1.2 - Core services plus: <ul style="list-style-type: none"> ■ improved staff changing facilities ■ additional storage areas
Service Solution	N/A	2.1 - New build extension adjacent to main theatres to provide dedicated hybrid capabilities	2.2 - New build extension adjacent to main theatres to provide dedicated hybrid capabilities with additional space as shell and core only	2.3 - New build extension adjacent to main theatres to provide dedicated hybrid capabilities with additional space for staff changing/storage
Service Delivery	3.1 In-house			
Implementation	4.2 Big bang			
Funding	5.1 Public Funding			

Table 22: Short List of Options

3.5.1 Summary Assessment of Short Listed Options

Based on the table above the initial short list is:

- Option 0 – Business As Usual: taken forward as a baseline comparator only
- Option 1 – New build extension to provide the do minimum scope
- Option 2 – New build extension to provide the do minimum scope with shell and core space for future expansion (intermediate service solution scope)
- Option 3 - New build extension to provide the do minimum scope with fitted-out staff changing/storage space (do maximum service solution scope)

The short listed options, including any sub-options have been further analysed against the spending objectives and critical success factors. The table below shows the outcome of this analysis:

Option:	0	1	2	3
Spending Objectives				
SO 1. Equity of access	X	✓✓	✓✓	✓✓
SO 2. Safe and sustainable services	X	✓✓	✓✓	✓✓
SO 3. Efficient services	X	✓✓	✓✓	✓✓
SO 4. Effective services	X	✓✓	✓✓	✓✓
SO 5. Value for money	X	✓✓	✓	✓
Critical Success Factors				
CSF 1: Business needs	X	✓✓	✓	✓
CSF 2: Strategic fit	X	✓✓	✓✓	✓✓
CSF 3: Potential value for money / benefits optimisation	X	✓✓	✓	✓
CSF 4: Potential achievability	X	✓✓	✓✓	✓✓
CSF 5: Supplier capacity and capability	X	✓✓	✓✓	✓✓
CSF 6: Potentially affordability	X	✓✓	✓	✓
Summary	Discounted but Carried Forward as Baseline Comparator	Preferred Way Forward	Carried Forward	Carried Forward

Table 23: Short Listed Option Analysis

Key: ✓✓ - fully achieves ✓ - partially achieves X - does not achieve

3.5.1.1 Overall Conclusion: Shortlist

On the basis of this analysis above, the recommended short list for further appraisal within the OBC/FBC is as follows:

- Option 0 – Business As Usual: taken forward as a baseline comparator only
- Option 1 – New build extension to provide the do minimum scope
- Option 2 – New build extension to provide the do minimum scope with shell and core space for future expansion (intermediate service solution scope)
- Option 3 - New build extension to provide the do minimum scope with fitted-out staff changing/storage space (do maximum service solution scope)

3.6 Economic Appraisal

3.6.1.1 Introduction

The following economic appraisal evaluates the costs, benefits and risks of the shortlisted options and identifies the option that is most likely to offer the best VfM in accordance with HM Treasury Green Book and WGov business case guidance.

3.6.1.2 Overview

An economic appraisal has been undertaken with the following assumptions

- Across all options over a 65-year period and a Comprehensive Investment Appraisal Model completed to calculate a relative benefits cost ratio for the proposed options.
- Discount rate has been applied of 3.5% for 40 years followed by 3.0% for the remainder of the period and QALYS at 1.5%.
- Sensitivity analysis has then been undertaken to stress test the outcomes.
- Planning contingency has been applied to risk, optimism bias within costs in line with Green Book guidance.

3.6.1.3 Capital Costs

The project's Cost Advisor, AECOM, has prepared capital costs in respect of the shortlist options. An allowance has been made for inflation. Planning contingency was estimated at 4.99% of works, non-works, equipment and fees. The summary of the capital costs for each shortlisted option are as follows:

	Option 0 Business Usual £000	as	Option 1 Do Minimum (preferred) £000	Option 2 Intermediate £000	Option 3 Do Maximum £000
Works	0		5,170	6190	7108
Fees	0		610	730	838
Non Works Costs	0		213	213	213
Equipment Costs	0		2,050	2050	2050
Contingency	0		401	458	509
Forecast Project Outturn	0		8,444	9,641	10,718

Table 24: Capital Requirements (£000 excluding VAT & Optimism Bias)

	Option 0 Business Usual	as	Option 1 Do Minimum (preferred)	Option 2 Intermediate	Option 3 Do Maximum
Capital Outturn	0		8,444	9,641	10,718
OB Adjustment	0		147	175	239
Total	0		8,590	9,816	10,957

Table 25: Capital Requirements (£000 excluding VAT & including Optimism Bias)

See Appendix 3 for the capital cost forms.

The key planning assumptions are as follows:

- Capital Costs include a breakdown of new build works based on £10,256.70/sqm² based on BCIS PUBSEC Firm Price Index for 1st Q 2024 (309) and abnormals elements
- The Location Factor is 0.97
- VAT has been excluded from this section of the case
- Planning contingencies of 4.99% has been allowed to the shortlisted options, as appropriate
- The Business as Usual option (Option 0) was retained as the baseline comparator

3.6.1.4 Revenue Costs

The baseline and indicative future recurring revenue cost for each shortlisted option are as follows:

	Option 0 Business as Usual	Option 1 Do Minimum (preferred)	Option 2 Intermediate	Option 3 Do Maximum
Pay				
Medical	2,567	2,900	2,900	2,900
Nursing	663	1,189	1,189	1,189
Other Clinical	288	624	624	624
Administration	276	276	276	276
Sub Total Pay	3,794	4,989	4,989	4,989
Non-Pay				
Consumables	640	1,425	1,425	1,425
Other	0	385	385	385
Theatre running cost	640	1,810	1,810	1,810
Overheads				
Equip & Maintenance		190	190	190
FM	83	167	178	212
Total overheads	83	357	36	393
Total Cost	4,517	7,156	7,167	7,192
Additional Costs	0	2,639	2,650	2,675

Table 26: Revenue Costs (£000 above baseline excluding VAT)

All options have a consistent direct cost with the only difference being the running costs of the additional space in options 2 and 3.

3.6.1.5 Wider Economic and Social Benefits

An assessment has been undertaken of the benefits register to see which benefits can be quantified and built into the economic appraisal. Four key benefits were identified:

- Benefits register A1; improved mortality rates for 25 patients per year for an average of 2 years based on a move to elective proactive treatment as opposed to reactive emergency treatment (£3.5m per annum)
- Benefits register A2: Improved economic benefit of patients return to work of 50 patients per year for 3 months due to earlier intervention and reduced recovery time plus reduced waiting lists (£0.4m per annum)
- Benefits Register A3: Reduction in the number of amputations and earlier and more successful complex limb revascularisation leading to reduced social care costs (£4.2m per annum)
- Benefits register A4: reduction on length of stay of 4,000 bed days a year due to earlier intervention and a reduced number of emergencies with long length of stay (£2.3m per annum)

All benefits have been assumed to take 4 years to incrementally build up to maximum impact for the purposes of the economic model. All benefits are the same in each option.

3.6.1.6 Outputs of the Economic Appraisal

The relevant assumptions have been run through the CIA model and the findings are detailed below:

£000's	Option 0 BAU	Option 1 Do Minimum (preferred)	Option 2 Intermediate	Option 3 Do Maximum
Incremental Costs		(82.8)	(84.7)	(86.8)
Incremental Benefits		297.4	297.4	297.4
NPSV		214.5	212.6	210.6
Benefit/Cost Ratio		3.59	3.51	3.43
Ranking		1	2	3

Table 27: CIA model findings

The table shows that option 1 is the economically preferred option as it provides the most cost-effective capital solution and reduced running costs over the life of the asset. The difference, however, is relatively small as the direct cost of services are the same for all options and the benefits and risk are the same.

£000's	Option 0 BAU	Option 1 Do Minimum (preferred)	Option 2 Intermediate	Option 3 Do Maximum
BCR		3.59	3.51	3.43
BCR Below Preferred			(0.08)	(0.16)
BCR Switch Value		(0.08)	0.08	0.16

Table 28: Benefit Cost Ratio

The tables are summarised in Appendix 4 and the CIA model has been submitted with the Business Case.

3.6.1.7 Economic Sensitivity Testing

A sensitivity analysis has been undertaken to test the outputs of the economic analysis. The table below shows the relative change required to switch the preferred option based upon the benefits cost ratio.

£000's	Option 0 BAU	Option 1 Do Minimum (preferred)	Option 2 Intermediate	Option 3 Do Maximum
Base Incremental Costs				
Incremental cost increase - capital (inc.		11.5%	(10.5%)	(20.3%)
Incremental cost increase - revenue		2.9%	(2.9%)	(5.9%)
Incremental cost increase - risks		>100%	>(100%)	>(100%)
Total Incremental Cost Change needed		(1,903)	1,903	3,970
Base Incremental Benefits				
Incremental cost reduction - net contribution		N/A	N/A	N/A
Incremental benefit - cash releasing		N/A	N/A	N/A
Incremental benefit - non-cash releasing		(4.4%)	4.5%	9.4%
Incremental benefit - societal		(4.6%)	4.7%	9.8%
Total Incremental Benefit change needed		(6,681)	6,835	14,275

Table 29: Relative changes in cost benefit ratio

3.6.1.8 Summary of Overall Economic Analysis Results

In summary option 1 is the preferred option with a BCR of 3.59 (0.08 BCR over Option 2 at 3.51) due to the differential capital and site running costs with all other revenue and benefits being the same across all options. It is also the more affordable in capital terms at a capital cost including VAT and OB of £10.1m compared to option 2 of £11.6m. Given the nature of the case with capital building being the main driver of difference sensitivity analysis highlighted no significant issues.

3.6.1.9 Option Appraisal Conclusion

Based on the above analysis the preferred option is confirmed as Option 1 – Do Minimum:

Service Scope Option	Core services: The population of South and West Wales have access to a local high quality dedicated hybrid theatre service
Service/Technical Option	New build extension adjacent to main theatres to provide dedicated hybrid capabilities
Delivery Option	In-house
Implementation Option	Big bang
Funding Option	Public funding

Table 30: Option Appraisal Conclusion

3.7 The Preferred Option

The preferred option has been confirmed as Option 1: the development of a hybrid theatre at Morrision Hospital.



Figure 4: Example Hybrid Theatre

The Hybrid Theatre service at Morrision Hospital will be staffed by ten vascular surgeons providing scheduled and 24/7 emergency cover. Design of practices and services will comply with MHRA guidance and best practice Vascular Society recommendations and an evidence-based approach for optimising service delivery to patients and maximising survival rates. Access to minimally invasive procedures will result in a significant reduction in operative stress to the patient, reduce the need for critical care beds and shorten patient stays.

The volume of interventional procedures undertaken is increasing and the development of the hybrid theatre will complement this new radiology facility and will move some of the work currently done in the radiology department, into the hybrid operating theatre. This work will, for the most part, be undertaken in partnership with Radiology, however it is envisaged that appropriately trained endovascular surgeons will also carry out some procedures independently in the hybrid operating theatre, as is the current practice in the radiological imaging suite. As more complex procedures are developed it is essential that the high degree of team working between radiology and vascular surgery continues.

Space released in Morrision's main theatres could be utilised by other surgical services that require more intensive support, which have been limited in the past. Space released by re-providing, e.g. staff support facilities in the new build, could be utilised for essential equipment storage, improving pathways and efficiencies in the theatre area.

Design and Method of Construction: The proposed method of construction is a Modern Methods of Construction (MMC) solution.



Figure 5: Example of MMC

The theatre will be constructed off-site by a specialist modular supplier and added adjacent to the existing theatres 1 - 7, by constructing an elevated development, linked directly to the first floor of the hospital. Enabling works will be provided by the specialist modular supplier. This method of construction has the benefit of enabling the Health Board to increase capacity for the duration indicated by the modelling work without material disruption to activity delivered by the existing theatres at Singleton Hospital.

The Design Strategy The new theatre will be designed to the latest WHBN/WHTM specification with patients at the heart of the design to ensure an improved patient experience. The new facilities will be fully compliant with no derogations.

The new theatre will include best practice infection prevention measures health-care facilities. This will involve access to adjacent isolation facilities for infection prevention and control towards curbing the spread of Covid-19; Separation of clean and dirty areas and access routes within the existing theatre complex will comply with infection control requirements. Design within the storage and changing rooms in the new build will, within fire regulations constraints, enhance natural ventilation to maximise the movement of air within a space, and enhance daylight or sunlight to support good fenestrations and daylight in structures can sway the spread of airborne pathogens.

The new facility will be as follows:

- 248sqm theatre suite footprint and 96sqm rooftop plant room containing WHTM03-01 compliant (therefore, Building Research Establishment Environmental Assessment Method environmental and built environment sustainability requirements does not apply)
- AHU serving the new facility
- Rooftop plant deck including DX cooling units
- Code 3 lead lining to the operating room walls and floors
- 2N electrical infrastructure and IPS/UPS systems & UCV canopy installation

Net Zero and Sustainability: Adopting MMC construction solutions into the design and construction of new buildings supports NHS Wales Decarbonisation Strategic Delivery Plan and Net Zero Carbon (NZC) targets:

- Standardising the construction approach and thereby minimise construction waste and transportation of construction machinery
- Championing incorporation of efficient low carbon heating and cooling - this facility will provide a full electric 'green energy' engineering solution with no fossil fuel being utilised
- Off-site fabrication providing just-in-time delivery to minimise construction-related carbon emissions
- MMC provides a high-quality product, which incurs less disruption to busy hospital sites than traditional build solutions

3.7.1 Benefits

3.7.1.1 *Clinical Benefits*

A hybrid theatre environment delivers utmost patient safety as it allows the immediate conversion within the right environment of a minimally invasive procedure into an open procedure if this is required

Access to high quality digital images would allow the use of the most advanced endovascular devices, and simultaneous multiple vascular access from different areas of the body (groin, upper limb, foot, chest abdomen)

The integration of the open and endovascular techniques in the same setting for the treatment of different vascular surgery pathologies, has driven the need for an adequate environment where the surgeons could perform such interventions to the highest standard of care possible. The hybrid theatre is a facility where the interventional facilities are fully integrated into a standard open theatre to ensure adequate sterility and lighting are met to perform open operations

The need for hybrid theatre capability is not restricted to vascular surgeons: cardiac surgeons and neurosurgeons have already developed hybrid procedures necessitating angiography systems in the theatre, trauma surgeons, orthopaedics and urologist regularly use angiography equipment for their operations. Imaging needs and room set-ups requirements will vary between specialties

3.7.1.2 *Benefits for the South West Wales Region (Swansea Bay and Hywel Dda University Health Boards)*

The establishment of a South West Wales Vascular Network has ensured that a high volume centre has been created in Morriston Hospital, to allow the delivery of improved outcomes for the patient population of South West Wales. The development of a hybrid facility will ensure that SBUHB competes on a level platform with other large regional providers of complex cardiovascular services, in which the Health Board currently has a significant tertiary referral base. Hybrid facilities are recognised as the gold standard facility and are widely available throughout the UK. The proposed initiative will ensure that the South West Wales Vascular Network provide patients with access to facilities which enable clinicians to provide the best possible quality of clinical care for the patient population. This will be especially relevant to patients experiencing life threatening vascular emergencies, which require immediate intervention and are characterised by high levels of mortality

3.7.1.3 *Benefits for Operational efficiency and productivity*

Patients undergoing an endovascular procedure experience consistently shorter post-operative inpatient stays compared to those undergoing open surgery. For all new patients who have endovascular rather than open surgery, there will be a saving of 5 bed days per patient. The mean open aortic aneurysm stay in critical care was 2 days compared with 0 days for endovascular aortic aneurysm procedures. The overall inpatient stay was 9 days for open, 2 days for endovascular

There is an opportunity to concentrate endovascular activity within the new facility, which has the potential to increase utilisation compared to the existing arrangement. Currently there can be delays in complex revascularisation where a patient may need to wait until an operating list and a radiology list are both available. This would not be the case should a combined case be planned in a hybrid suite

The ability to perform combined procedures in a hybrid suite would mean that instead of a dedicated radiology suite and operating theatre being on hold or standby when efforts are made for combined cases could be used efficiently for standard endovascular or open cases. Currently two suites are being used for one case with staffing for both sat idle whilst one section is being carried out.

3.7.1.4 *Benefits to the Patients*

There will be the additional benefits to patient experience, as a result of more timely access to treatment access and improvements in the facilities and support services available.

- Co-location with main theatres will provide a safer operating environment for complex and unstable patients, particularly those requiring endovascular interventions
- Patients requiring both open and endovascular interventions will experience faster more integrated treatment without the need to transfer between Radiology and open theatres
- The ability to move increasingly towards endovascular procedures from open surgery is associated with improved patient outcomes. The approximate mortality rate for elective endovascular activity is 1.5% compared with approximately 4-5% for open surgery, although these figures are not risk adjusted

Prompt revascularisation by means of complex procedures i.e. a combination of open and endovascular techniques currently takes significant logistical manoeuvring and this often results in significant delay in getting a definitive revascularisation carried out. By carrying out a combined procedure in a hybrid operating suite this delay will not happen and as a result a patient will have a limb revascularisation carried out sooner and hence reduce the risk of limb loss due to ischaemia.

3.7.1.5 *Benefits in Teaching & Learning Opportunities for SBUHB and Wales*

In the future SBUHB will be an experienced clinical site for Hybrid technology and has the potential to offer short clinical fellowships. The clinical fellow could be assigned to an experienced team for 3-5 days. During the fellowship the fellow will experience the typical workflow in a Hybrid Theatre, including treatment decisions and surgery guided by an accomplished trainer.

Develop internships within the Health Board - the idea being that a department designates a 'Super User'. They will spend 1 week training with the Hybrid team to gain experience. This has been particularly useful to staff within radiology, cardiology and vascular services. Both of the opportunities above could be offered not just for SBUHB staff, but for staff across Wales. Tele-medicine has multiple benefits from collaboration, sharing information, second opinions and tele-mentoring all of which are improving surgical practice, education, treatment and post-operative care. Sharing of medical expertise will only improve patient outcomes and in the long run, greatly reduce costs.

3.7.2 **Digital Technology**

The new service will also need access to modern digital technology to support the following:

- Teaching and training, which allows the development of surgical skills without interruptions to the performing surgeon's field of view. This will enable visualisation of the open surgical field on surrounding monitors and reduce risks associated with overcrowding in and around the sterile field
- Tele-medicine, which has multiple benefits from collaboration, sharing information, second opinions and tele-mentoring all of which are improving surgical practice, education, treatment and post-operative care. Sharing of medical expertise will only improve patient outcomes and in the long run, greatly reduce costs
- The provision of live-feed technology between the new theatre and lecture theatres, would support education, training and research in partnership with University of Swansea Medical School initiatives, and support Deanery Training Posts and recruitment

3.7.3 **Achieving Excellence Design Evaluation Toolkit (AEDET)**

Given the nature and location of this development within the main theatre block 1-7 the Health Board has confirmed with NWSSP-SES representatives, this project does not require an AEDET assessment.

3.7.4 Planning Permission

Full planning permission was granted on the 14th February 2017 (ref. 2016/3702/FUL). Permissions were extended by the City and County Of Swansea on the 16th September 2021 (ref. 2021/2402/S73) and Ecological Enhancement Measures conditions were advised.

4. The Commercial Case

4.1 Introduction

This section of the OBC/FBC details the proposed 'deal' as outlined in the Economic Case and is seeking to secure public funding from Welsh Government's 'All Wales Capital Programme'.

4.2 Required Services

The required services include enabling works at Morriston Hospital as required, including the supply of essential infrastructure services, development of a compliant Hybrid Surgery Centre, and technical commissioning.

The Hybrid Surgical Theatre will be in compliance with the appropriate Welsh Health Building Notes (WHBN) & Welsh Health Technical Memorandum (WHTM), primarily NHS design guidance: WHBN 26: Facilities for Surgical Procedures.

A full description, including drawings are provided within the Estates Annex.

4.2.1 Confirmation of Stakeholder Support

This project includes a wide range of stakeholders and collaboration and integration are key enablers. Excellent communication links have been established and engagement with all project stakeholders has been extensive. Therefore to demonstrate this, letters of support for the project has been received from WAASP and the SW Vascular Network (includes Swansea Bay, Hywel Dda, Cwm Taf and Powys Health Boards). These are included within Appendix 5 that accompanies this OBC/FBC.

4.3 Procurement Strategy

The procurement strategy was in line with the procedures and practices as laid down in the NHS Building for Wales framework with the following appointments made:

- Specialist Modular Supplier (construction and design team services) - ModuleCo
- Health Board Cost Advisor - AECOM

Supervisor and other technical services are to be provided by the Health Board.

4.4 Agreed Risk Transfer and Management

Following agreement of the target cost the final allocation of risk between the Health Boards and the SCP/Main Contractor will be agreed.

4.5 Personnel Implications (Including TUPE)

TUPE (Transfer of Undertaking and Protection of Employee) will not apply to this investment.

4.6 Equipment Procurement and Strategy

The financial implications of this assessment have been included within the cost forms for the preferred option. See Appendix 3 for the capital cost forms.

An assessment has been carried out of the required equipment within groups 2 & 3 based upon signed off Room Data Sheets (RDS). A further assessment will be made regarding the items of equipment which are suitable for transfer if applicable.

4.7 Agreed Charging Mechanisms

A collaborative working model is to be adopted. All charging mechanisms will be covered within the framework agreement. Under this arrangement ModuleCo will be appointed by the Health Board from an approved Framework.

AECOM, the Health Board's appointed Cost Advisor, confirms the scheme will be Based on a final Guaranteed Maximum Price (GMP). The GMP submitted by ModuleCo includes the physical construction costs, main contractor management, supervision and preliminaries, design fees and survey costs, design development and construction risks, and overheads and profit. AECOM evaluated the GMP submission which does not include for other professional fees (i.e., Health Board direct appointments for commissioning, etc.), IM&T support, and equipment costs, art, and other direct Health Board costs (e.g., cleaning) and VAT.

The Modular Supplier will invoice SBUHB in accordance with the Payment Mechanism. The agreed Payment Mechanism is 4 weekly assessments by the Health Board Cost Advisor with payment due within 14 days of the Assessment Date.

4.8 Agreed Contract Length

The contract will cover approximately 7 months offsite construction through to fit out and commissioning although the start date for this is dependent on the approvals process and securing support for the investments. Appendix 9 includes the indicative project programme..

4.9 Key Contractual Clauses

Contractual arrangements have been entered into with all parties using the NEC4 contract as prescribed under the Framework. For the Project Manager and Cost Advisor, the NEC4 Professional Services Contract (PSC) has been used, and for the SCP, the NEC4 Option C (gain share) contract has been used.

Payments to the externally appointed team will be as prescribed in the individual NEC contracts and in line with the framework practices and procedures. There are no key contractual clauses over and above the standard framework clauses.

4.10 FRS5 – Accountancy Treatment

It is assumed public funding will be allocated for this project and therefore capital will be included on the balance sheet. Full details are included in the Financial Case.

4.11 Community Benefits and Procurement

The Welsh Government actively seeks to derive benefits for the local community from procurement activity through the application of the Community Benefits policy approach.

This approach ensures delivery of social, economic and environmental benefits through effective application of the policy and is integral to any consideration in procurement.

The Health Board are therefore working with the Specialist Modular Supplier as part of the Considerate Construction Strategy to measure the identified benefits extended from this scheme.

5. The Financial Case

5.1 Introduction

The purpose of this section is to set out the financial implications of the investment (as set out in the Economic Case) and proposed Deal (as described in the Commercial Case).

5.2 Capital

The fully tendered capital cost assessment was undertaken by AECOM, Cost Advisors. These are as summarised in the following tables. See Appendix 3 for the capital cost forms for detail:

	Option 1: Preferred
	£000
Works	6,204
Fees	732
Non Works Costs	255
Equipment Costs	2,460
Contingency	482
Forecast Project Outturn (pre VAT recovery)	10,133
Recoverable VAT	-174
Forecast Project Outturn	9,959
OB Adjustment	175
Total	10,135

Table 31: Capital Requirements

See Appendix 6 for VAT reclaim advice.

The following table shows the total capital funding profile for the preferred option:

	Capital Funding Received		Capital Funding	Total
	Prior Years	2024/25	Required	
	£000	£000	2024/25	£000
Capital Costs	287	96	9,752	10,135
Capital Funding	287	96	9,752	10,135

Table 32: Preferred Option – Capital Expenditure £000's (including of non-recoverable VAT)

5.2.1 Capital Assumptions

The key assumptions underlying the development of the capital costs are:

- Capital Cost includes works, non-works, abnormal allowances, equipment costs and risk contingency, which is assessed at 4.99%
- The indices at this stage are based on BCIS PUBSEC Firm Price Index for 1st Q 2024 (309). The Business Case Reporting Index will be the standard one for Wales of 0.97
- VAT is at 20% except for the professional fee and other recoverable elements

5.3 Revenue

The revenue analysis is outlined in the table below:

	WTE	Option 1: Preferred Option £'000
Medical	3.20	333
Nursing	11.30	526
Other Clinical	5.40	336
Indirect Pay (portering/cleaning)	3.00	84
Sub Total Pay	22.90	1,279
Non-Pay		
Consumables – activity related		785
Equipment maintenance		190
Theatre running cost		385
Sub Total Non-Pay		1,360
Total	22.90	2,639

Table 33: Revenue Impact £000's above baseline

The above costs include the impact of long-term activity projections, including demographic growth of 17%. The table below outlines the uplift in consumables required as a result of these activity projections.

Elective Procedure	Current (2024)	Future (2034)	% Increase	Cost per Procedure (£)	Total Cost of Uplift (£)
Angioplasty	130	167	28.46%	1,547	57,223
Angiography		~200		1,282	256,434
Aortic Aneurysm (Endovascular grafts)	30	76	152.00%	8,181	373,035
Emergency Procedure	Current (2024)	Future (2034)	% Increase	Cost per Procedure (£)	Total Cost of Uplift (£)
Aortic Aneurysm (Endovascular grafts)	3	15	400.00%	8,181	98,167
Total					784,859

Table 34: Consumables Uplift

Included within the Pay costs are the Theatre and Anaesthetic support to ensure the new facility is fully resourced.

The key revenue assumptions are as follows:

- Costed at 2023/24 prices
- No change to dedicated vascular CEPOD lists
- No change to bed base – continue to utilise the existing beds on short stay surgical ward, ward R (acute dedicated vascular ward), Pembroke and CITU for Vascular patients
- The costs include restoration of activity to pre-Covid levels
- No anticipated change to volume of patients – treated electively rather than via emergency route through the same bed base
- Theatre operational time will be Monday - Friday, 8:30am – 6pm
- All staffing costed at substantive rates with no allowance for any premium rates
- Patient retrieval service is not included, but assumed to be in place ahead of the new capacity opening
- 1 x 28 bed ward will provide sufficient bed coverage for the activity delivered through the new theatres (as per activity model)
- Equipment maintenance costs are based on 10% of the net equipment costs within the cost form

See Appendix 7 for the workforce planning tracker.

5.4 Impact on the Balance Sheet and Impairment

This scheme would result in an estimated AME Impairment of £6.140m on the initial valuation of the works. This will need to be taken through the Health Board's OCS, which the Health Board would require to be funded by the Welsh Government and this updated estimate will be included in the AME impairment funding submission to the Welsh Government.

The District Valuer will value the part new engineering elements on completion and the final value attributed to the buildings will be on the Balance Sheet of the Health Board.

A process of external audit for the project has already begun and will continue throughout the redevelopment and construction process.

000's	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30
Depreciation (DEL)		543	543	543	543	543
Impairment (AME) Initial Valuation	6,140					

Table 35: Revenue Expenditure £000's above baseline

The Health Board will engage the services of the District Valuer to provide a valuation of the scheme following completion. This scheme would result in an estimated AME Impairment of £6,140k on the initial valuation of the unit and this will need to be taken through the Health Board's SOCNE in 2024/25. The Health Board would require funding from WGov and this will be included in the AME impairment funding submission to WGov in 2024/25.

The Health Board will require additional recurring depreciation of £543k from 2025/26.

5.5 Overall Affordability

The revenue requirement includes an increase in activity, with an additional cost of £785k per year, based on a 10-year projection. The initial revenue investment is £1.854m. The Health Board will address the recurring revenue investment via the well-established annual financial planning process. The development will also allow a full consideration of the opportunities, identified within the case as non-cash releasing benefits, when the new theatre is fully operationalised.

The project requests capital investment 'not to exceed' £10.135m (including VAT) to be allocated by the WGov.

The Health Board requests AME Impairment funding of £6,140k in 2024/25 and funding to support recurrent depreciation costs of £543k from 2025/26.

6. The Management Case

6.1 Introduction

The section of the OBC/FBC addresses the achievability of the project and identifies how the project will be managed from its initiation to completion. Its purpose is to describe the arrangements that will be required to effectively govern and successfully manage the project and deliver it in accordance with best practice.

This section has been drafted based upon the lessons learnt from previous projects, incorporating proven arrangements, structures and processes to ensure the successful delivery of the project

6.2 Project Management Arrangements

To ensure successful project delivery a robust project management reporting structure has been established. The structure is based on the Prince2 principles, with key members of the project team trained in Prince2 methodology.

The Health Board’s experience of developing and delivering complex projects in a Prince2 environment ensures diligent management and thorough clinical involvement throughout all parts of the development:

- The Senior Responsible Owner (SRO) is Sue Moore, Morriston Service Group Director, SBUHB
- The Project Director, Mollie Kearns, Interim Divisional Manager Integrated Surgical Services, has the authority and responsibility to manage delivery of the project on behalf of the key stakeholders. The Project Director reports via the Project Board to the SRO
- The Project Manager, (Meinir Morgan) will support the Project Director

6.2.1 Reporting Structure

The reporting structure is shown below:

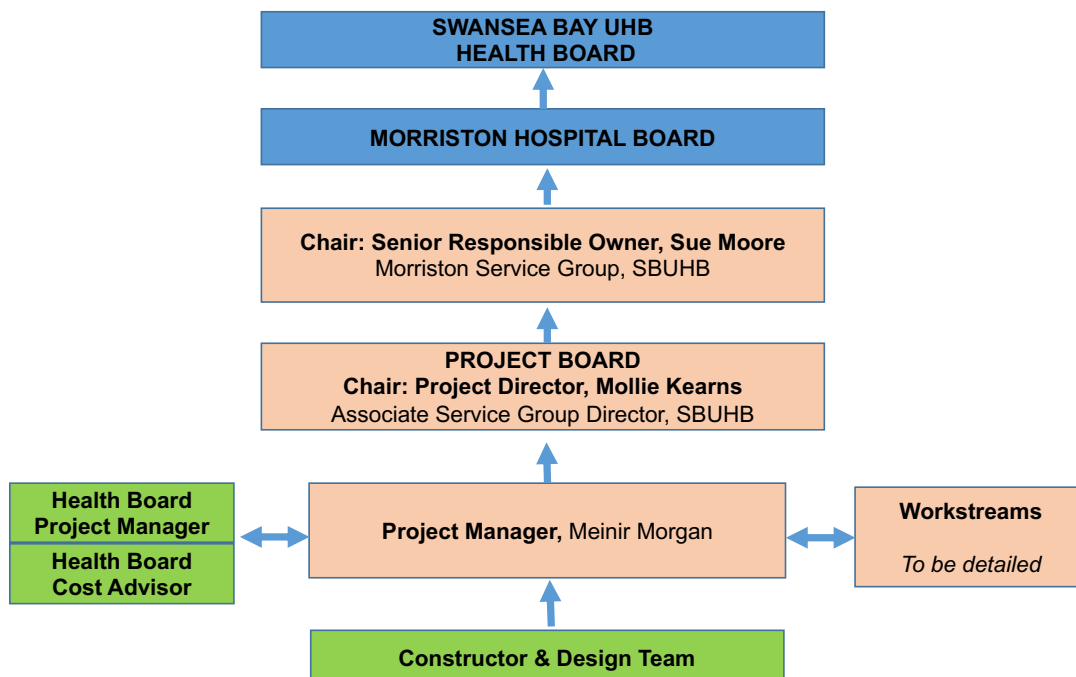


Figure 6: Reporting Structure

Please refer to Appendix 8 – Hybrid Surgical Project Board Membership - Terms of Reference.

6.2.2 Project Roles and Responsibilities

The Project Director takes lead responsibility for the overall success of the project, and the services which support the change; Agrees and directs the activity of the project; Takes the lead responsibility for risk relating to the project and for the realisation of associated benefits; Agrees and directs the activity of the project; Instructs and manages external consultants; Ensures the brief set by the Project Board is adhered to, and; Provides the key contact in respect of high level decisions required in order to progress work.

The Project Manager provides effective liaison with the wider clinical team; provides highlight reports and exception reports to the Project Board on all aspects of project performance; Ensures the project team (which will include technical and capital planning, construction and service planning leads) is effectively directed and managed during this OBC/FBC stage; Supports effective liaison with the wider team; Ensures effective monitoring of all project activities is undertaken regarding time, quality and cost, and; Develops the Post Project Evaluation plan.

6.3 Project Plan

The indicative milestones are set out below:

Activity	Due Date
Submit OBC/FBC to Welsh Government for approval	May 2024
Welsh Government approval of OBC/FBC	July 2024
Enter contract with Modular Supplier (subject to funding approval)	August 2024
Enabling works and off site construction	December 2024
Completed (subject to contractor's programme)	February 2025
Handover	March 2025
Equipment installation	March 2025
Technical and clinical commissioning	March 2025
New build operational	April 2025
Technical Project Evaluation (approx. 3 months post new build handover)	August 2025

Table 36: Key indicative Milestones

Appendix 9 includes the indicative project programme.

6.4 Use of Special Advisors

Specialist advisors have been used in a timely and cost-effective manner in accordance with the Treasury Guidance: Use of Special Advisors. The following special advisors have been appointed:

Role	Appointment
Specialist Modular Supplier	ModuleCo
VAT Advisor	Ernst & Young
Cost Advisor	AECOM
Healthcare Planner	Adcuris Consulting

Table 37: Specialist Advisors

6.5 Arrangements for Communication and Engagement

Stakeholder engagement shall be managed in accordance with the Organisational Change Policy for the NHS in Wales (commonly known as OCP).

Based on the range of preferred options the staff directly affected includes the following (list is not exhaustive):

- Consultant Surgeons, Consultant Anaesthetists, Radiology, Nursing and Theatre staff
- Radiation Protection staff
- Administration & Support staff

This project engages with the wide range of stakeholders and organisations including the following:

- Swansea Bay University Health Board
- Hywel Dda University Health Board
- Cwm Taf Morgannwg University Health Board
- Powys Teaching Health Board
- Wales Abdominal Aortic Aneurysm Screening Programme (WAAASP)

The following partners and key stakeholders shall be consulted with via the following collaborative and consultative forums (list is not exhaustive):

- Morriston Hospital Management Board
- SBU - Urgent & Emergency Care Board
- South Wales Vascular Network Group

6.6 Workforce Planning

Services have developed workforce plans that respond to demand profiles and the local/national recommendations regarding exposure to ionising radiation. Where possible, benchmarks have been utilised to inform the model.

The following assumptions were made with regards to workforce planning to resource the new model:

- No change to dedicated vascular CEPOD lists
- No change to bed base – continue to utilise the existing beds on short stay surgical ward, ward R (acute dedicated vascular ward), Pembroke and CITU for Vascular patients
- No anticipated change to volume of patients – patients treated electively rather than via emergency route through the same bed base
- Theatre operational time will be Mon-Fri, 8:30am – 6pm
- Costs include restoration of activity to pre-Covid levels
- All staffing costed at substantive rates with no allowance for any premium rates

The workforce requirements have been signed off by the Hybrid Theatres Project Board and have been subjected to rigorous scrutiny sessions by the senior team.

The following table shows a summary of the workforce planning tracker:

Service	Appraisal	Uplift Required WTE	Total Cost (£)
Vascular Surgery	SCP uplift to support patients pre and post operatively and to assist in theatre. SCF uplift to support 1:6 middle grade rota.	Surgical Care Practitioner - Band 8a - 2.0 WTE Senior Clinical Fellow - 2.0 WTE	318,924
Radiology	Enable use of the least invasive techniques and technology to diagnose and treat patients in order to minimize the risk of a procedure while reducing pain and recovery time.	Band 6 Radiographer - 2.3 WTE Band 7 Radiographer - 0.8 WTE Band 6 Radiology Nurse - 3.3 WTE	355,977
Radiation Physics	To ensure safe, effective, and legal use of the associated interventional X-ray system.	Band 7 Clinical Scientist - 0.1 WTE	6,412
Theatres	Vascular surgery theatre staffing workforce for both unscheduled and scheduled care pathway.	Band 6 - 1.6 WTE Band 5 - 4.8 WTE Band 3 - 1.6 WTE	346,666
Anaesthetists	Vascular surgery anaesthetic workforce for both unscheduled and scheduled care pathway.	Consultant Anaesthetist - 1.2 WTE	160,940
Pharmacy	ATO staff top up theatre once weekly and pharmacy technicians support controlled drug management.	Band 3 ATO - 0.2 WTE	6,106
			1,195,025

Table 38: Summary of Workforce Planning Tracker

- Costed at 2023/24 prices
- No change to dedicated vascular CEPOD lists
- No change to bed base – continue to utilise the existing beds on short stay surgical ward, ward R (acute dedicated vascular ward), Pembroke and CITU for Vascular patients
- The costs include restoration of activity to pre-Covid levels
- No anticipated change to volume of patients – treated electively rather than via emergency route through the same bed base
- Theatre operational time will be Monday - Friday, 8:30am – 6pm
- All staffing costed at substantive rates with no allowance for any premium rates
- Patient retrieval service is not included, but assumed to be in place ahead of the new capacity opening
- 1 x 28 bed ward will provide sufficient bed coverage for the activity delivered through the new theatres (as per activity model)
- Equipment maintenance costs are based on 10% of the net equipment costs within the cost form

See Appendix 7 for the workforce planning tracker.

6.7 Equality and Health Impact Assessment (EHIA)

In line with the Health Board's values and commitment to equality, an Equality and Health Impact Assessment (EHIA) of the development has been completed during key stages of the business case process to ensure that the proposals promote equality and positive health outcomes for all. The EHIA document is a live document for identification of impact, mitigation and action for the duration of the project / programme of works. The findings will be updated on an ongoing basis as the development moves through the business case process and fully considered within the design of facilities as they progress.

A copy of the current EHIA is attached in Appendix 10.

6.8 Arrangements for Benefits Realisation

Benefits realisation is the definition, planning, structuring and actual realisation of the benefits of a business change or digital implementation project. Projects are often considered finished when their deliverables are complete. However, the benefits of a project are typically realised over time. For benefits realisation to work it is crucial to identify clear benefits early in the change life cycle and to assign ownership to those responsible for planning and managing their achievement.

A Benefits Register has therefore been developed during this OBC/FBC which will provide a working document throughout the life of the project. This is in order that a meaningful assessment can be made of the benefits yielded by the project and to benchmark the assessment criteria themselves so that lessons learned can be fed back into future projects.

The latest copy of the Benefits Register is attached in Appendix 11.

6.9 Arrangements for Risk Management

A risk framework has been established which outlines the process for managing risk associated with developing this project, including a structure for identifying and mitigating operational and construction related risks.

A risk register has been compiled and costed relative to risks that apply over the whole of the project lifecycle at this stage. The risk register will be developed by the Health Board Project Liaison Manager in consultation with the Health Board's Cost Advisor during the development and construction phases of the project, through to hand over and operational commissioning. It is planned to review the risk register, which will be regularly reviewed and updated accordingly, to maintain tight financial cost control relative to the risks noted in the register.

The current project risk register for the preferred option is attached at Appendix 12 - Risk Register.

6.10 Arrangements for Post Evaluation Arrangements

All projects are subject to evaluation, as appropriate the investment, in accordance with best practice and NHS guidance.

The project will be reviewed 3 months following physical and financial completion to assess performance against anticipated construction related benefits and again 12 months following completion of the works to assess performance against time and cost targets.

The evaluation process will be driven primarily by the project's Spending Objectives, Benefit Criteria, and Benefit Realisation Plan and will seek to verify the extent to which each has been achieved.

Lessons learned from this process will be of benefit to the Health Boards (for future projects), other key stakeholders (to inform their approach to future projects), and the NHS more widely (to test whether the policies and procedures have been effective).

The above approach will be managed by the Project Team and has been endorsed by the Project Board.

6.11 NHS Wales Gateway Review

A Risk Potential Assessments (RPA) has been carried out for this project. A copy is included in Appendix 13. A Gateway review could be arranged WGov would carry out post submission of this business case in accordance with WGov Investment Guidance as proportionate to this investment. Further Gateways would be completed according to Office of Government Commerce (OGC) guidelines following further evaluation.

6.12 Audit and Assurance

In accordance with the NHS Wales Infrastructure Investment Guidance (2018), the University Health Board has sought input from the NWSSP Audit and Assurance Services (Specialist Services Unit) to “assess the risk profile of the scheme and provide appropriate levels of review”. A fully resourced and costed audit plan has been developed and provision included within this business case.

As agreed with NWSSP:A&A (SSu), the audit coverage will be further risk assessed prior to the progression of the individual audit assignments and considered alongside the wider project assurance provisions. A copy of the audit and assurance plans is attached as Appendix 14.

6.13 Contingency Plans

The Health Board can identify two major category of project failure: failure to achieve business case approval to deliver the project; failure of the specialist modular supplier to deliver the new build to time.

The contingency plan for the project in the event of failure to achieve business case approval is for the Health Board to continue to revise its plans, working with WGov to develop a Hybrid Surgical solution for the population of South West Wales that is acceptable.

In the event of specialist modular supplier, SBUHB would seek recompense in line with the agreed contractual arrangements and other contractor to complete the project.

6.14 Recommendation

This OBC/FBC presents a compelling case for change for the development of a regional Hybrid Vascular Theatre and the Health Board therefore recommends on this basis that WGov approve this project.

Signed:

Date:

Mrs Sue Moore
Morriston Service Group Director, SBUHB

Abbreviations

A&E	Accident and Emergency	ICU	Intensive Care Unit
AAA	Abdominal Aortic Aneurysm	IM&T	Information Management and Technology
AEDET	Achieving Excellence Design Evaluation Toolkit	IPS	Iron Pipe Size
ALARA	As Low as Reasonably Achievable	IR	Interventional Radiology
AME	Annually managed expenditure	IR(MER)R	Ionising Radiation (Medical Exposure) Regulations
ARCH	A Regional Collaboration for Health	LOS	Length of Stay
BAU	Business as Usual	M&E	Mechanical and Electrical
BIS	Business Innovation and Skills	MDT	Multi-Disciplinary Team
PUBSEC	(Firm Price Index) Tender Price Index of Public Sector Building Non-Housing	MHRA	Medicines and Healthcare products Regulatory Agency
CEPOD	Confidential Enquiry into Perioperative Deaths	MIS	Minimally Invasive Surgical
CIA	Comprehensive Investment Appraisal	MIU	Minor Injuries Unit
CRBs	Cash Releasing Benefits	MMC	Modern Methods of Construction
		NCRB	Non Cash Releasing Benefit
		NEC	New Engineering Contract
CSF	Critical Success Factor	NICE	The National Institute for Health and Care Excellence
CSP	(SBUHB's) Clinical Service Plan	Non QB	Non Quantifiable Benefit
		NPT	Neath Port Talbot
CT	Computed Tomography	NVR	National Vascular Registry
DCP	Dental Care Professionals	NZC	Net Zero Carbon
DEL	Depreciation	OBC	Outline Business Case
DSA	Digital Subtraction Angiography	OCP	Organisational Change Policy
DX	Direct Expansion	OGC	Office of Government Commerce
		ONS	Office for National Statistics
EHIA	Equality and Health Impact Assessment	PAD	Peripheral Arterial Disease
EVAR	Endovascular Aortic Aneurysm Repair	PPP	Public Private Partnership
		PSC	Professional Services Contract
FBC	Full Business Case	QB	Quantifiable Benefit
FYE	Full Year Equivalent	RDS	Room Data Sheet
GIRFT	Getting it Right First Time	REVAR	Radiation Dose Reduction During EVAR: Results from a Prospective Multicentre
GMP	Guaranteed Maximum Price		
GP	General Practitioner	RPA	Risk Potential Assessment
HDUHB	Hywel Dda University Health Board	SAB	Sustainable Drainage Approval Body
HMT	His Majesty's Treasury		
HQIP	Healthcare Quality Improvement Partnership	SBUHB	Swansea Bay University Health Board

SCP	Supply Chain Partner	UPS	Uninterruptible Power Supply
SDCP	Site Development Control Plan	VAT	Value Added Tax
SO	Spending Objective	VfM	Value for Money
SOC	Strategic Outline Business Case	WAAASP	Wales Abdominal Aortic Aneurysm Screening Programme
SOCNE	Statement of Comprehensive Net Expenditure	WGov	Welsh Government
SRO	Senior Responsible Officer	WHBN	Welsh Health Building Note
SSI	Surgical Site Infection	WHTM	Welsh Health Technical Memorandum
SUDs	Sustainable drainage systems		
TUPE	Transfer of Undertaking and Protection of Employee	WTE	Whole Time Equivalent
UCV	Ultra Clean Ventilation		
UHB	University Health Board		
UHW	University Hospital Wales		