BUSINESS CASE PRO FORMA FOR MODERATE EXPENDITURE - £100K TO £2M

PROJECT TITLE	**PROCUREMENT OF DA VINCI XI SURGICAL ROBOTIC SYSTEM FOR ROYAL VICTORIA HOSPITAL (RVH), BELFAST HSC TRUST**
PROJECT CONTACT	**KEVIN BRADY**
DIRECTORATE	**ACCTSS & SURGERY**
LOCATION	**RVH, THEATRES, L3**
SENIOR RESPONSIBLE OWNER	
TOTAL CAPITAL COST (NET OF VAT)	**£1,920,000**
TOTAL REVENUE COST (INCLUDING INFLATION WHERE APPLIED)	
CHANGE IN REVENUE COSTS (PER ANNUM)	**£183,600 PA**

	SIGNED	**DATE**
APPROVING OFFICER SIGNATURE		

	SIGNED	**DATE**
DIRECTORATE ACCOUNTANT SIGNATURE		

ASSET CONTROLLER	**NAME: JulieAnne McDonald/Joanne Brimstone**

ESTATES / IT APPROVAL Yes

ESTATES WORKS REQUIRED FOR THIS SCHEME: NO

IT INVOLVEMENT FOR THIS SCHEME: YES

ESTATES/ IT APPROVAL (WHERE REQUIRED):

SIGNED: DATE:

FUNDING

A	**DEPARTMENTAL CONTRIBUTION**	**£**
B	**OTHER CONTRIBUTIONS (EG CHARITABLE)**	**£1,920,000**
	TOTAL PROJECT COST (A+B)	**£**

PROPORTIONATE EFFORT, ADVICE & GUIDANCE

- The business case pro forma is based on HM Treasury Better Business Cases guidance and follows the Five Case Model for preparing business cases.
- This pro forma is designed for general projects with moderate expenditure. Other pro formas, for minor spend or more specific projects, as well as a Business Case template for major expenditure can be found here.
- If your expenditure decision exceeds £50M you must secure DoF approval to a Strategic Outline Case (SOC) before embarking on an OBC. In this case, DoFs Business Case template for major expenditure is likely to be more appropriate at OBC stage. You are advised to check whether your own Department has a lower internal delegated limit for SOC approval.
- Proportionate effort should be used throughout, commensurate with the level of expenditure and how complex, novel, or contentious the proposal is. The level of detail provided should be based on the judgement of the appraiser.
- Text boxes can be expanded depending on the level of detail required.
- For detailed guidance on business cases and expenditure appraisal, consult the Better Business Case NI website or seek advice from relevant professionals within your department.
- It is important to note that workshops are likely to be required to develop the business case, as outlined in guidance. Under the standalone OBC guidance appraisers may wish to consider amalgamating workshops 1 and 2.
- The workshop reports should be saved and made available on request.

BACKGROUND TO THE PROJECT

- Please summarise the background to the project, the purpose of the business case, and the expenditure for which approval is being sought.

Background

The use of robot assisted surgery (RAS) is revolutionising patient treatment and is rapidly becoming the treatment of choice for both surgeon and patient. RAS has become standard practise in much of Europe and North America since it was introduced in 2000. The Royal Marsden was the first NHS hospital to use a surgical robot in 2007. There are now 58 centres across UK with a Da Vinci robot. Northern Ireland was the only region in the UK not to have access to a robot surgical system, forcing patients to travel outside the region for standard of care treatment for prostate cancer. In 2018/19 Belfast Trust was commissioned and funded to deliver a robot-assisted prostatectomy service for Northern Ireland. This recognised the requirement for the region to keep pace with other parts of the UK as well as ensuring the region was able to attract consultant urologists to work in the Trust carrying out a range of urological surgeries using modern techniques.

RAS is now well-established in the Belfast City Hospital. The urology service now over-delivers on the original number of commissioned prostatectomy procedures each year and has gone on to use the existing robot for other urological procedures. It was always the trusts intention that RAS would be expanded following successful delivery of the first system. Other surgical specialties are now in a similar position to urology in 2017, where there is a need and desire to carry out RAS, mainly in gynaecology, colorectal and thoracic surgery.

Across the UK there is now robot drive, millions of patients are predicted to benefit from innovative NHS RAS over the next decade as part of radical plans to cut waiting times. According to NHS England projections Half a million operations will be supported by the trailblazing approach every year by 2035, up from 70,000 in 2023/24, a nearly 700% increase.

9 in 10 of all keyhole surgeries, such as the removal of certain organs affected by cancer, will be delivered with robot assistance within the next 10 years, up from 1 in 5 today with robotic surgery being the default for many operations.

NHS England also expects to see increasing numbers of emergency operations using the space-age tech – which can be more precise than the human hand.

In recent years, the range of operations involving robots has widened – in 2011/12 urological cancer surgery made up 80%, but by 2023/24 this relative proportion dropped to 44% procedures. The number of operations had increased, as there

Background

was significant growth in areas such as colorectal, gynaecology, ear, nose and throat, and orthopaedic procedures.

There is no doubt that there will be a significant role for RAS for several specialties. A considerable number of surgeons within these specialties are now fully trained in robot assisted surgery. Some surgeons have trained at their own expense to be able to use the robot and there is a significant risk that they could leave Northern Ireland if they are not able to practice robotic surgery. It will also be increasingly difficult to attract new staff to the Trust if we do not have an established robotic programme. This is a modern surgical technique, and the Trust is concerned that without access to a robot, those trained surgeons will lose their robot assisted surgical skills.

RAS represents a strategic opportunity for Belfast Health and Social Care Trust to support elective recovery, improve clinical outcomes and enhance long-term workforce sustainability.

Given the benefits of using RAS for the services outlined and others in the future, the Trust therefore plans to develop a clear outline for the strategic implementation of RAS across the Trust (BCH and RVH Sites)

Belfast Health and Social Care Trust propose to procure and install a Da Vinci Xi robotic surgical system at the Royal Victoria Hospital (RVH) to support thoracic surgery initially, with planned phased expansion to Ear, Nose & Throat (ENT), and Cardiac surgery. The Trust currently operates a Da Vinci Xi robotic platform at another site that is heavily used by Urology and therefore not realistically available for RVH-based surgical services.

A second system based at RVH will modernise regional minimally invasive surgery (MIS) capacity, improve patient outcomes, reduce length of stay, and create a regional hub for robotic training and research across multiple regional surgical specialties.

Approval is sought for £1.9 million capital to purchase the robotic platform, with associated training and maintenance arrangements via City Deals funding. Recurring costs will be managed through service budgets, and it is projected these costs offset by efficiency gains from shorter hospital stays, fewer complications, and increased planned surgical throughput.

This business case should be viewed primarily as a service transformation and quality investment rather than a cost-reduction proposal. While opportunities exist for efficiency gains through reduced length of stay and improved theatre productivity, these are secondary benefits. The principal drivers are improved patient outcomes, surgical innovation, elective recovery, workforce sustainability, and maintenance of regional and national standards of care.

Background

STRATEGIC CASE

Please refer to Pages 17-26 of the HMT Better Business Cases Guidance for Projects when completing this section.

Ascertain the Strategic Fit and Agree the Strategic Context

Please provide details on:

- The nature and work of the organisation within which this project is taking place if not central Government.
- How the project links to existing policies / strategies including the Programme for Government, New Decade New Approach, the Climate Change Act, and draft Carbon Budget requirements.
- Any notable changes since SOC (if applicable).

Strategic Fit /Strategic Context
The Royal Victoria Hospital delivers regional thoracic, cardiac, and ENT services. Demand for minimally invasive, high-precision surgery continues to rise, driven by lung cancer, HPV-related head & neck cancers, and complex cardiac disease. Robotic-assisted surgery (RAS) enhances dexterity, vision, and surgeon ergonomics versus standard laparoscopy/VATS, enabling complex dissections with potentially lower conversion and complication rates and shorter recovery times. Evidence from thoracic, head & neck, and cardiac surgical literature supports the safety and effectiveness of RAS. The proposal supports the Northern Ireland Programme for Government (PfG) Outcomes 4 (We enjoy long, healthy, active lives), 5 (We are an innovative, creative society), and 6 (We have more people working in better jobs) through improved clinical outcomes, technological innovation, and attraction/retention of highly skilled surgical staff. It aligns with elective recovery objectives and regional ambitions to standardise access to advanced MIS modalities. Access to robotic-assisted surgery supports compliance with contemporary UK standards of care, contributing to clinical risk mitigation and enhanced recruitment and retention. This proposal is in line with ECF, an updated ECF was published in May 2024 outlining the strategic direction for the development and implementation of changes necessary for effective sustainable elective care services within the Northern Ireland Health and Social Care (HSC) system over the next 5-year period. This proposal will increase surgical efficiency within the health care system

Strategic Fit /Strategic Context

and enable the Belfast Trust to attract and retain surgeons and therefore future proofing the system and helping deal with the recruiting and retention issues with NI.

Workshop 1 – Case for Change

Please refer to page 26 of the HMT Better Business Case Guidance for Projects.

Case for Change

Existing arrangements and Business Needs

- Describe the existing arrangements that are in place (i.e., business as usual/ what is currently provided). This may include, but not be limited to throughput and turnover, existing costs, asset availability / utilisation, and condition.
- Describe deficiencies associated with the current provision and the implications if the project does not proceed.
- Include suitable quantification of the nature and level of future needs/demands – future projections should be supported by evidence of historical demand over the past 3-5 years.
- Provide details around the service gap (i.e., the difference between current provision and where the business wants to be in line with the spending objectives of this proposal).

Existing Arrangements and Business Needs

Since 2018 the Belfast trust have had a Da Vinci X (RAS) system based at BCH, The Urology service have now fully established a RAS programme on the BCH site.

The usage of the Robotic system based in the city hospital has now been expanded to other services including Gynae, General Surgery (both services have elective theatre list on BCH site) This has allowed the training of other specialty consultants and theatre teams in use of RAS. The Thoracic surgery service has also used the robot based on BCH site on an Ad-hoc basis. Unfortunately, the robot on the city site is not a long-term solution for the Thoracic service given all their service provision and elective lists are based on RVH site.

Financial Year	Urology	Colorectal Surgery	Gynaecology	Thoracic Surgery	Grand Total
18/19	13				13
19/20	43				43
20/21	15				15
21/22	63				63
22/23	114				114
23/24	194				194

Existing Arrangements and Business Needs

24/25	219		6	2	227
25/26	135	17	1	2	155
Grand Total	**796**	**17**	**7**	**4**	**824**

Future access to robotic platforms is limited because the Trust's existing robotic system is now fully used for Urology, Gynae and General Surgery and occasional weekend cross-specialty use, restricting routine access for RVH-based teams.

Thoracic, ENT, and cardiac surgery at RVH currently rely on open or conventional minimally invasive approaches (e.g., LAP/VATS)

Without a dedicated RVH system, patients who might benefit from robotic procedures are often managed by alternative modalities, potentially impacting access, operative precision, conversion rates, and recovery time.

Regional surgical demand continues to rise with lung cancer resection demand remaining high; HPV-related oropharyngeal cancers are increasing; and complex valve and minimally invasive cardiac workloads are expanding. Providing sustainable access to RAS is necessary to maintain quality, meet waiting-list pressures, and support training pipelines.

Based on costing assumptions for Thoracic Surgery theatre G&S costs should eventually reduce with RAS

	Procedure	**Goods and Services cost per Lap or open case**	**Goods and Services cost for robotic case**	**Variance per case**	**Projected Procedures**	
Thoracic	Pneumonectomy	£2,527	£2,086	-£441	11	-£4,851
	Lobectomy	£2,527	£2,086	-£441	117	-£51,597
	Thoracic Surgery-Wedge/Segment	£2,527	£2,086	-£441	20	-£8,820
	Thymectomy	£1,052	£1,067	£15	7	£105
		£8,633	£7,325	-£1,308	155	-£202,740

Decontamination costs

Existing Arrangements and Business Needs

Pay costs:

Da Vinci total processing time per 2 lists	Lap / VATS processing time per 2 lists	Staff cost difference per 2 lists
X4 Endowrist X4 Endoscope = 14 hours 20 minutes staff time	Lap / VATS + associated instruments = 9 hours 20 minutes staff time	5 hours + 24% = 6.2 hours at B4 Cost centre = A1D620

Non-pay costs:

Da Vinci total processing costs	Lap / VATS processing costs	Non-pay difference per 2 lists
X4 Endowrist (steam sterilisation) X4 Endoscope (VH202 sterilisation) = £261	£111.52	£149.48 Cost centre = A1D620

While the transition from LAP/VATS to robotic-assisted surgery (RAS) may incur a slight increase in revenue costs often driven by higher decontamination requirements for complex robotic-specific instruments and initial capital outlays these are increasingly offset by superior clinical and operational efficiencies. Studies indicate that RAS can significantly reduce length of stay (LOS) and lower postoperative complication rates, which are major drivers of hospital costs. By minimising high-cost adverse events such as surgical site infections and readmissions, the overall cost per case often becomes comparable or even favourable over time, particularly as we move past the initial learning curve and increase procedural volume. Ultimately, the enhanced precision and reduced patient recovery times provide a compelling value proposition that justifies the modest marginal increase in upfront processing.

In addition, it is recognised that the implementation of RAS will result in an initial increase in both capital and revenue costs. These costs are directly linked to procurement, implementation, training, and the ongoing running expenses required to embed the system safely and effectively. While this represents an upfront financial pressure, it is a planned and understood investment that supports the transition to a more resilient and future-focused model of care.

Importantly, these initial costs should be considered in the context of wider, longer-term efficiencies across the hospital system. Evidence from comparable

implementations demonstrates that RAS can contribute to reductions in post-operative complications, shorter lengths of stay, and improved recovery times for patients. These factors translate into reduced downstream costs associated with extended admissions, unplanned readmissions, and the management of avoidable complications, thereby releasing capacity across inpatient and support services.

The financial appraisal demonstrates that while modest cost avoidance may be realised over time through reduced length of stay and capacity release, these benefits are not presented as cash-releasing savings. The affordability assessment therefore focuses on sustainability of revenue funding and value for money in terms of service quality, resilience, and patient outcomes rather than direct financial return.

Furthermore, the introduction of RAS supports workforce sustainability by improving job satisfaction and aiding the recruitment and retention of highly skilled clinical staff, in particular operating surgeons and trainees. Access to modern technology and innovative models of care enhances clinical practice, reduces burnout, and strengthens expertise within the Trust. Taken together, these benefits are expected to outweigh the initial financial investment, delivering a net positive impact for both the wider health economy and, most critically, the patient population through safer, more efficient, and higher-quality care.

The introduction of robotic-assisted surgery is not expected to reduce surgical workforce numbers. Instead, it represents a change in surgical delivery model, enhancing surgeon capability, reducing physical strain, and supporting longer-term workforce sustainability. No reduction in surgical posts or adverse impact on training opportunities is anticipated.

Phased Implementation Plan

A phased implementation approach will be adopted to ensure safe, effective, and sustainable delivery of robotic-assisted surgery (RAS) at RVH. The initial implementation will focus on thoracic surgery, using an already fully trained consultant to deliver two robotic theatre lists per week (equivalent to two sessions) over 42 weeks. This will provide baseline activity from go-live.

After six months, once a second thoracic consultant has completed robotic training, weekly activity will be increased to three lists (six sessions), maintaining delivery over 42 weeks. This increase will apply to the latter two quarters of the first operational year.

Further incremental expansion will be undertaken as additional specialties such as ENT and other specialties develop a trained robotic workforce. This approach provides predictable ramp-up, ensuring theatre utilisation is aligned to workforce readiness and avoids underutilisation during the early phase.

Activity Assumptions (Phased Plan)

Phase	Activity Assumption	Duration
Phase 1 – Initial Go-Live	2 robotic lists/week (2 sessions), 1 consultant	42 weeks/year
Phase 2 – Post-6 Month Scale-Up	3 robotic lists/week (6 sessions), 2 consultants	Q3–Q4
Phase 3 – Specialty Expansion	Incremental increase with ENT, Cardiac, etc.	Year 2 onward

This phased implementation plan for the **April 2026 – March 2027** financial year outlines the transition from an initial training period to a high-volume robotic service.

Phase	Timeframe	Schedule	Cases per Week	Total Cases	Operational Focus
Phase 1: Induction	Apr '26 – Sept '26 (21 Weeks)	2 Cases x 2 Sessions	4	84	Safety & Training: Establishing SOPs and completing proctored cases.
Phase 2: Expansion	Oct '26 – Mar '27 (21 Weeks)	2 Cases x 4 Sessions	8	168	Throughput: Maximising theatre utilization and reducing turnaround times between cases.
Year 1 Totals	42 Working Weeks	—	—	252	Result: Comfortably exceeds the 150 cases

To establish a modern Robotic-Assisted Surgery (RAS) service, the trust must move beyond the initial capital investment and focus on integrated infrastructure. This requires a dedicated multidisciplinary team (MDT) trained, including specialized sterile processing for robotic instruments, as well as a high-utilization scheduling model to ensure the robot does not sit idle. By committing to a structured learning program, the trust can transition from an induction phase to a high-volume service that effectively repays fixed costs and optimizes theatre throughput.

Existing Arrangements and Business Needs

For the local population, the benefits are transformative. Patients undergoing Thoracic or ENT robotic procedures experience significantly less surgical trauma, resulting in reduced postoperative pain and a lower incidence of surgical site infections. This precision leads to a shorter Length of Stay (LOS), allowing individuals to return to their daily lives and work much faster than traditional open or even some standard MIS techniques would permit.

The business need for a dedicated robotic-assisted surgery (RAS) platform at the Royal Victoria Hospital is driven primarily by the opportunity to deliver demonstrably improved patient outcomes across multiple regional surgical specialties. Robotic surgery enables greater surgical precision, tremor filtration micro-movements through articulated instruments and enhanced 3D visualization., which together support reduced tissue trauma, more accurate resections, and improved margin clearance in complex procedures. For multiple surgical specialties patients, this translates into lower complication rates, reduced postoperative pain, earlier mobilisation and improved functional recovery when compared with open or conventional minimally invasive techniques.

A key operational benefit of RAS is the consistent reduction in length of stay (LOS), which remains a critical pressure point across elective services. Reduced LOS not only improves patient experience by enabling faster recovery at home, but also releases inpatient bed capacity, supporting elective flow and reducing cancellations due to bed shortages. Earlier discharge is particularly significant for high-complexity regional services, where bed availability is often the limiting factor rather than theatre time itself. The introduction of a dedicated RVH robotic system therefore directly supports elective recovery by improving throughput and enabling more predictable surgical pathways.

From a workforce perspective, access to modern surgical technology is now an essential requirement for recruitment, retention, and skills sustainability within surgical, anaesthetic and theatre teams. Robotic-assisted surgery is increasingly becoming standard practice across the UK and Ireland. Without access at RVH, there is a growing risk of skill attrition among trained surgeons, reliance on outdated techniques, and increased difficulty attracting high-calibre consultants and senior trainees to posts. The proposed investment supports workforce stability by enabling staff to maintain and develop advanced competencies, improving job satisfaction while strengthening succession planning and long-term service resilience.

The regional impact of this proposal is particularly significant. RVH delivers a wide range of regional surgical specialty services for Northern Ireland, meaning that access to RAS at this site directly benefits patients from all Trusts rather than a single local population. Locating robotic capacity at RVH avoids hospital transfers, ensures equitable access to advanced surgical care, and supports standardisation

Existing Arrangements and Business Needs
of care regardless of patient's trust of residence. Over time, this investment will underpin the development of RVH as a regional hub for robotic surgery, training and innovation, supporting collaboration, multi-specialty learning and participation in regional and national quality improvement and research programmes. These benefits align directly with the Elective Care Framework, which prioritises productivity, reduced unwarranted variation, workforce sustainability, and the adoption of innovation to deliver safe and sustainable elective services. The proposal also supports the direction of the emerging regional RAS strategy, which emphasises high-utilisation hubs, multi-specialty platforms, workforce development, and equitable regional access. By addressing clinical outcomes, LOS, workforce challenges and regional equity in a single, integrated solution, this investment represents a proportionate and strategic response to current and future surgical demand.

Determine potential business scope and key service requirements

Identify potential service improvements. When doing this, it is useful to classify needs / requirements based on the following hierarchy:

- The 'Essential' requirements without which the project would not be judged to be a success.
- The 'Desirable' requirements which the project may justify extra expenditure on a value for money basis.
- The 'Optional' requirements, which the project may justify on a marginal low cost and affordability basis.

Range	Essential	Desirable	Optional
Potential scope	Robotic platform on-site at RVH	High-availability robotic platform; multi-specialty booking mode	
Key service requirements	Training for thoracic/ENT/cardiac anaesthetic and theatre teams		

Spending objectives for the project

- Specify spending objectives for the project that focus on the rationale and drivers for further intervention and the key outcomes and benefits we are seeking to achieve in support of the organisation's business strategy. See page 21 of HMTs guidance.
- This can be linked to Outcomes Based Accountability (OBA) - PfG and Outcomes based working guidance

#	Objective	Linked Targets
1.	Introduce robotic thoracic surgery at RVH	≥100 thoracic RAS cases Y1; LoS ↓ by 1–2 days
2.	Enable ENT access to robotic transoral resections	≥50 ENT RAS cases Y2; +10% margin clearance
3.	Establish RVH robotic training & audit hub	staff trained Y1; quarterly utilisation reports >80%
4.		

Determine constraints and dependencies

Constraints

- Specify any constraints that have been placed on the project. Constraints are the external conditions over which the project has little or no control. This may include, but not be limited to affordability; spatial; legislative; timing; legal, technological constraints etc.

Constraints

The primary constraint is the availability of capital funding (£1.9 million) in the current or next financial year. This must be approved through formal Trust capital prioritisation processes and Department of Health oversight. A further constraint is physical capacity at RVH, where integration into existing theatre schedules or conversion of a space for dedicated robotic use must be achieved without disrupting other critical services.

Another key constraint is workforce readiness: surgeons, anaesthetists, nurses, and ODPs must all be trained and credentialed in robotic-assisted surgery techniques before go-live. Additionally, maintenance contracts and consumables (estimated at £180k per annum) must be built into the revenue budget from year 1 onwards. The implementation must also comply with clinical governance standards, including audit, infection control, and national guidance from NICE and the Royal College of Surgeons.

Constraint	Summary
Capital funding availability	£1.9m investment required upfront – must be approved and allocated within the financial year.
Theatre space at RVH	Requires integration into existing theatre schedule or conversion of an existing theatre to accommodate the robot.
Trained workforce	Surgeons, nurses, ODPs must be trained and credentialed before go-live.
Installation timeline	Procurement, delivery, installation, and validation must align with project milestones (Q1–Q2 2026).
Ongoing maintenance & servicing	Revenue budget must support annual servicing (~£180k/year) and consumables costs.
Clinical governance	Procedures must be aligned with Trust policies, surgical audit pathways, and NICE / RCS guidance.

Dependencies

- Identify any dependencies outside the scope of the project upon which the ultimate success of the project is dependent, including inter-dependencies between other programmes and projects and external dependencies outside the project environment.

Dependencies

This project is dependent on the successful rollout of robotic training across the involved specialties, aligned with the Trust's approved RAS training pathway. It also depends on elective care flow stability, as throughput assumptions rely on available beds, anaesthetic staffing, and recovery facilities. A third dependency is integration into surgical scheduling infrastructure, such as Epic or ORMIS, to capture robotic-specific theatre lists and timings.

Installation relies on support from estates, with appropriate coordination with the supplier. Continued alignment with NICE evidence generation and GIRFT recommendations will be essential to demonstrate benefit.

Finally, procurement success depends on NHS Supply Chain lead-in timelines.

Dependency	Summary
RAS training programme	Clinical teams (thoracic, ENT, cardiac) must complete structured training including simulation, dry lab, and case proctoring.
Elective care recovery pathways	Throughput assumptions rely on stable elective case access and bed capacity.
Surgical scheduling infrastructure	Scheduling tools (e.g., Epic) must be configured to support robotic cases.
Medical engineering & estates	Installation and maintenance depend on internal departments
NICE / GIRFT guidance	Compliance with evolving guidance and evidence review is essential to justify use across specialties.
Procurement lead-in time	NHS Supply Chain timelines for ordering, customisation, and shipment must align with project plan.

Environmental Screening Process

See the Supplementary BC Guidance on Incorporating Environmental and Climate Considerations into Business Cases

Consider the potential environmental impact of the project by answering the screening questions below.

Environmental Consideration	Impact	Monetisable	Quantifiable	Qualitative	Risk in need of mitigation
Use or management of land?	N/A				
The atmosphere/ climate?	N/A				
Inland, coastal or marine water body?	N/A				
Biodiversity?	N/A				
The supply of raw materials from natural sources?	N/A				
Outdoor recreation?	N/A				
Where relevant, provide more info within these sections of the BC		**Economic Appraisal**	**Non-monetary analysis**	**Non-monetary analysis**	**Risk Appraisal**

If you have answered yes to one or more of the questions above, you should consider page 11 of the Supplementary Guidance and action appropriately.

THE STRATEGIC CASE SECTION OF THE OBC HAS BEEN COMPLETED AND MUST BE KEPT UNDER REVIEW

CONOMIC CASE

Please refer to Pages 27-61 of the HMT Better Business Cases Guidance for Projects when completing this section.

Workshop 2 – Identifying and Assessing the Options

Please refer to page 39 of the HMT Better Business Case Guidance for Projects.

Agree Critical Success Factors (CSFs)

- Identify and agree the CSFs for the project - These are the attributes essential for successful delivery of the project.
- The critical success factors for the project must be crucial, not merely desirable, and not set at a level that could exclude important options at an early stage of identification and appraisal.
- Five basic CSFs which should be considered for all proposals are: strategic fit and business needs; potential VFM; supplier capacity and capability; potential affordability and potential achievability.
- In some cases, one or two more may be added, but if a proposal's objectives, constraints, and dependencies are correctly understood this is rarely the case. At most the number should not exceed seven.

Critical Success Factors

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Critical Success Factor	Summary
Strategic alignment	Supports Programme for Government outcomes, Elective Care Framework, NICE/GIRFT recommendations, and Belfast Trust's innovation strategy.
Affordability	Initial capital investment (£1.9m) and recurring costs (£183k/year) must be met within Trust financial envelope. Funding secured via City deals funding
Deliverability	Requires theatre readiness, trained staff, and timely procurement through NHS Supply Chain.
Clinical outcomes	Demonstrates improved outcomes, lower LoS, reduced morbidity, and enhanced MIS access across thoracic, ENT, and cardiac surgery.
Workforce readiness	Availability of trained robotic surgeons, ODPs, and scrub staff to deliver safe services from go-live.
Collaborative working	Success depends on multi-specialty coordination, training partnerships, and integration with wider theatre and service delivery teams.

Determine the long list of options

- Identify a wide range of possible options for achieving the project's business needs, potential scope, and service requirements, and undertake an assessment of how well each option meets the spending objectives and critical success factors agreed for the project.
- Use the Options Framework template on the Better Business Cases NI website to identify the long-list of options – key dimensions include Scope (What?), Service Solution (How?), Service Delivery (Who?), Service Implementation (When?) and Funding. It is important that these key dimensions are considered in sequence, as this prevents the long-list becoming unmanageable with a large combination of options which is not necessary.
- The long list must include the Business as Usual and a realistic Do Minimum
- **Pages 29-35 of the HMT Better Business Case Guide will provide further information on the options framework.**

Recommend a preferred way forward

- Use the completed options framework template from above to arrive at an options shortlist.
- There must be at least 4 short-listed options – BAU, Do Minimum, the recommended preferred way forward and one or two other options which would be more or less ambitious than the recommended option.
- Note the preferred way forward at this stage will not necessarily be the preferred option, which is identified later from appraisal of shortlisted options (in terms of costs, benefits, risks).

Shortlisting Options
Long-List of Options (Summary) • Business As Usual (BAU) – continue open/VATS/other approaches, no new robot. • Do Minimum – ad hoc access to existing Trust robot (capacity constrained). • Lease Da Vinci Xi for RVH. • Purchase refurbished robotic platform. • Purchase new Da Vinci Xi robotic system for RVH (multi-specialty). Shortlisting & Preferred Way Forward BAU and Do Minimum fail to address demand and strategic targets. Lease and refurbished routes offer lower initial capital but deliver poorer lifecycle value and may limit warranty/support. The **New Da Vinci Xi for RVH** option fully meets scope, training, and utilisation objectives and is therefore the preferred way forward at this stage. It is essential, however, that the existing Da Vinci Xi robot at BCH is also fully utilised. While the preferred option focuses on capacity expansion at RVH, the

Shortlisting Options
Trust must ensure full weekday allocation of BCH's existing system, support multi-specialty use, monitor productivity, and integrate training alongside clinical activity. This ensures that any further investment is underpinned by a commitment to maximising the value and throughput of current assets.

Workshop 3 – Assessing the Short-listed Options

Please refer to pages 60-61 of the HMT Better Business Case Guidance for Projects.

Note: Given the nature of the workshop and stakeholders involved, it may also be useful to include discussions around the financial model and appraisals as part of this workshop.

Prepare the economic appraisals for shortlisted options

It is good practice to do the following when calculating the monetary costs and benefits for the short-listed options:

- Include all monetary costs/benefits arising from the project (inclusive of public, private and third sectors)
- Include tables that show a detailed breakdown of total monetary costs/benefits by individual cost/benefit line.
- Provide a clear explanation of assumptions. For example, what calculations did you make for each cost/benefit line and why? What evidence did you use to come up with these assumptions?
- Calculate the Net Present Social Value/Cost (NPSV/NPSC) (an excel template for this can be found here). Formula should be used to show the derivation of the cost estimates, and these should be easily reconciled with the assumptions summary tab. Excel sheets should accompany this pro forma.
- Optimism Bias (OB) should be included where appropriate in NPSV/NPSC calculations. Use OB calculators if required and follow guidance.
- The effects of general inflation must be excluded from the NPSVs/NPSCs i.e., prices should be in real terms.
- The appraisal period must be based on the useful life of the asset or the duration of the level of service to be provided.

Monetary Impacts Summary Table				
Option	**Total Capital Cost**	**Total Operating Cost**	**Total Monetary Benefits**	**NPSV/NPSC**
Option 1: BAU	£0	£0		
Option 2: BCH 2nd Robot Only				
Option 3: RVH Robot (Preferred)	£1,920,000			
Option 4: RVH Robot (Lease)	£3,118,080			

Undertake non-monetary impacts appraisal

- Undertake an appraisal of the quantifiable and qualitative impacts and explain why these are important enough to affect the decision for the ranking of the options. A template for this can be found on the Better Business Cases website.
- Where possible, avoid defining impacts that cannot be measured, assessed, or evaluated in any realistic way because there is no established evidence base. Both the quantifiable and qualitative impacts must be recorded in the Benefits Realisation Plan.

Non-Monetary Impact Appraisal

This non-monetary impact appraisal compares four strategic options for robotic-assisted surgery (RAS) investment. The preferred option – procuring a new system for RVH – scores highest across nearly all domains including clinical benefit, equity, workforce development, innovation, and service resilience. It enables robotic access for thoracic, ENT, and cardiac surgery at their point of care and helps establish the Trust as a centre of excellence.

By contrast, options 1 and 2 (BAU / Do Minimum) delivers limited non-monetary benefit and risk perpetuating inequities and capacity shortfalls. While a second robot at BCH would alleviate local constraints, it does not support regional access or cross-specialty innovation to the same extent. Option 3 clearly emerges as the most advantageous solution from a non-financial impact perspective.

Impact Domain	Description of Impact	Option 1: BAU	Option 2: BCH 2nd Robot Only	Option 3: RVH Robot (Preferred)	Option 3: RVH Robot (Lease)
Clinical Outcomes /	Quality of care, recovery,	Low	Medium / High	High	High

Non-Monetary Impact Appraisal					
Patient Experience	pain, complications, access to MIS				
Access & Equity	Geographic and specialty access to robotic surgery	Low	Medium	High	High
Workforce Development	Training, retention, skills, career pathways	Low	Medium / High	High	High
Innovation & Reputation	Trust / regional standing, ability to attract research and partnerships	Low	Medium	High	High
Service Resilience / Future-proofing	Ability to adapt to demand, handle growth, maintain capacity under stress	Low	Medium	High	Medium
Operational / Workflow Impact	Scheduling flexibility, theatre utilisation, co-ordination costs	Low	Medium	High	High
Environmental / Sustainability	Energy use, footprint, materials, waste	Low	Low / Medium	Medium	Medium

Undertake risk appraisal

- Identify and quantify the risks and mitigations associated with the short-listed options. The probability of each risk occurring and its likely impact should be assessed, along with an overall risk rating. A template for this can be found on the Better Business Cases website.
- Project managers should ensure a risk register is developed from the beginning of the project, this should be updated and reviewed on a regular basis.

Risk Appraisal

A range of moderate-level risks are associated with the implementation of a new robotic system, particularly around workforce readiness, theatre preparation, and sustainable funding. These are common to surgical innovation projects and can be managed through active mitigation. There are no high-rated risks currently identified that would render the preferred option undeliverable. A range of moderate-level risks around workforce readiness, theatre preparation, and sustainable funding. These are common to surgical innovation projects and can be managed through active mitigation.

Risk Description	Mitigation Strategy	Risk Rating (High/Medium/Low)
Under-utilisation of new robot	Ensure surgeon training, scheduling governance, and case pipeline in place.	Medium
Workforce capacity shortfall	Secure RAS training slots, protect clinical time, and embed in job planning.	Medium
Revenue budget pressures	Secure funding for maintenance/consumables as part of business case.	Medium

Undertake sensitivity analysis

Sensitivity Analysis

- Sensitivity analysis is used to test the vulnerability of options to future uncertainties. It involves testing the ranking of the options by changing some of the key assumptions, for example switching values/scenarios for costs and the delivery of benefits.
- Sensitivity analysis may not change the preferred option. However, if small changes in the assumptions alter the ranking, it is an indication that the investment process should proceed cautiously, because it has non-robust elements in it.
- This analysis should be undertaken in two stages, switching values and then scenario analysis looking at best and worst possible outcomes. See HMT

guidance, (pages 58-59) for information on both and an explanation about interpreting results.

Sensitivity Analysis

Sensitivity Analysis of Activity Assumptions

The following sensitivity analysis explores variations in activity delivery across different scenarios. The base case assumes a phased delivery with initial thoracic focus increasing from 84 sessions in Year 1 (42 weeks × 2 sessions) to 126 sessions in Year 2 (42 weeks × 3 sessions). Assuming 1.5 patients per session, patient throughput varies depending on pace of training, availability of surgical workforce, and service readiness.

Scenario	Annual Sessions	Patients (assuming 1.5 per session)	Narrative
Base Case – Phased Growth	84 (Yr1), 126 (Yr2)	126 (Yr1), 189 (Yr2)	Initial thoracic only → 2 to 3 lists/week
High Case – Accelerated Expansion	168+	252+	Multi-specialty implementation faster than expected
Low Case – Training Delays	42	63	Delayed training or staffing pressures restrict session growth

Identifying the preferred option

- Conclusions should be drawn on each of the different options, considered in terms of cost, benefit, risk and its ability to meet the spending objectives – a summary table like the one below may be useful.
- Preferred option should be identified and justified.

	Option 1	Option 2	Option 3	Option 4
Description	BAU	BCH 2nd System Only	Purchase RVH System **Preferred**	Lease RVH Robot
Net Present Social Cost/Net Present Social Value				
Monetised Benefit-Cost Ratio[1] (if applicable)				
NPSC/NPSV Options Rank				
Non-Monetary Impacts Score				
Non-Monetary Impacts Options Rank				
Risks Score	1	2	4	3
Risk Assessment Options Rank				
Overall Rank/Conclusion	4	3	1	2

Identifying the Preferred Option
The preferred option is to procure a new Da Vinci Xi robotic surgical system for the Royal Victoria Hospital (RVH) to enable service transformation across thoracic surgery initially, followed by ENT and cardiac specialties. This option directly supports key regional objectives around surgical innovation, elective care recovery, and multi-specialty workforce training. Strategically, this model decentralises robotic capacity from a single site (BCH) and expands it to regional surgical centres based at RVH, where many regional surgical services are delivered. It aligns with Programme for Government (PfG)

[1] A BCR should only be calculated for monetised costs and benefits (I.e., it is not appropriate to include non-monetary impacts in this calculation).

Identifying the Preferred Option
priorities, NICE conditional guidance on robotic surgery (HTE21), GIRFT implementation principles, and Royal College of Surgeons (RCS) training standards. Clinically, RVH houses the regional surgical specialties many of the very specialties seeking to expand RAS access. Locating the system at RVH avoids the inefficiencies and risks of transferring high-acuity patients across sites for robotic access. Furthermore, it supports the Trust's aspiration to become a RAS training hub, aligned with emerging national credentialing frameworks.

THE ECONOMIC CASE SECTION OF THE OBC HAS BEEN COMPLETED AND MUST BE KEPT UNDER REVIEW.

COMMERCIAL CASE

Please refer to Pages 61-69 of the HMT Better Business Cases Guidance for Projects when completing this section.

Workshop 4 – Developing the Deals

For further details on the purpose, objectives, key participants and outputs of workshop 4, please refer to pages 68-69 of the HMT Better Business Case Guidance for Projects.

Determine procurement strategy

- Determine the procurement strategy and possible procurement routes for the project's key outputs and activities.
- Key considerations are the choice of procurement method and the degree to which early consultation with the supply side is required; and the extent to which the organisation should be acting as a single procurement entity or procuring more collaboratively with other public bodies.
- Please outline or append the procurement strategy.
- Note, there is no need to complete if no procurement exercise is required.

Procurement Strategy
Procurement via NHS Supply Chain Framework, and access to established vendor support. Early market engagement confirms Da Vinci Xi as the appropriate platform for multi-specialty thoracic/ENT/cardiac deployment.

Determine service streams and required outputs

Identify and summarise the project's required services and outputs and the potential implementation timescales required. The project plan for the procurement of its key outputs and activities should be outlined and/or attached to the Project Business Case.vice streams and required outputs

Project Outputs, Services, and Implementation Timeline

Key Services and Outputs

Service / Output	Description
Procurement of Da Vinci Xi System	Capital purchase of one surgical robot including training console, instruments, and service agreement.
Infrastructure Readiness	Theatre space preparation, including cabling, lighting, and integration with digital systems at RVH.
Staff Training & Credentialing	RAS training pathway for surgeons, nurses, and support staff in line with RCS and Intuitive guidelines.
RAS Governance Framework	Set-up of multi-specialty oversight group, development of SOPs, booking protocol, reporting, and clinical governance.
Operational Launch	Initial go-live for thoracic and ENT cases, with phased expansion to cardiac and additional specialties.

Indicative Implementation Timeline

Milestone / Activity	Target Date	Notes / Dependencies
Business Case Approval	April 2026	Subject to Trust and DoH business case approval processes.
Capital Procurement Initiated	April 2026	Using existing procurement frameworks (NHSSC)
Site Preparation Works	April 2026	Estates-led enabling works at RVH theatre site.
Robot Delivery and Commissioning	Q1 26/27	Logistics coordination and system testing.
Staff Training Commencement	Q1 26/27	Dependent on Intuitive availability and training capacity.
Operational Go-Live (Thoracic initially & then multi specialism)	Q1 26/27	Initial implementation with subsequent phased expansion.

The project aims to implement a fully operational robotic-assisted surgery service based at RVH, initially supporting Cardiothoracic and ENT surgery with future potential to expand into other complex surgical specialties. Key project outputs include acquisition and installation of a Da Vinci Xi robot, clinical and operational readiness through training and infrastructure upgrades, and robust governance structures to ensure safe and efficient multi-specialty use. Implementation is

Identify and summarise the project's required services and outputs and the potential implementation timescales required. The project plan for the procurement of its key outputs and activities should be outlined and/or attached to the Project Business Case.vice streams and required outputs
targeted for Q1 2027, contingent on approvals, supplier timelines, and training readiness.

Outline potential risk apportionment

- Identify how the service risks in the Design, Build, Funding and Operational (DBFO) phases of the project may be apportioned between the public and private sectors.
- The intention is to optimise the allocation and sharing of risk. Specific risks should be allocated to the party best able to manage it.

Risk Apportionment
Management and oversight of risks will be managed by project contact and SRO. Any risk will be apportioned as dictated by the standard NHS supplier contract entered into by Trust.

Outline potential payment mechanisms

- Identify how the project intends to make payment for its key services and outputs over the expected lifespan of the contract(s).
- Payment mechanisms should incentivise the service provider to provide Value for Money over the lifespan of the project.
- **Payment mechanisms for the: pre-delivery phase; operational phase; and extension phase are discussed in more detail on pages 64-66 of the HMT Better Business Cases Guide.**

Payment Mechanisms
Single capital purchase and annual maintenance fees as detailed on quote from City Deals funding allocation. All payments will be according to agreed supplier terms upon satisfactory delivery and install of equipment. PALS will manage procurement. Via NHSSC

Ascertain contractual issues and accountancy treatment

- Outline the contractual arrangements for the project, including the use of a particular contract, the key contractual issues for the Deal and its accountancy treatment and personnel implications.

Contractual issues and accountancy treatment
The new equipment will be placed on a maintenance contract procured via the NHSSC. The replacement equipment will be accounted for as a normal fixed asset with the respective asset rules regarding life and depreciation linked to asset type while also adhering to Trust procedures on asset reporting. The asset will be recorded on the asset register for the trust.

THE COMMERCIAL CASE SECTION OF THE OBC HAS BEEN COMPLETED AND MUST BE KEPT UNDER REVIEW.

FINANCIAL CASE

Please refer to Pages 69-76 of the HMT Better Business Cases Guidance for Projects when completing this section.

Workshop

Please note that there is no specific requirement for a further workshop to take place under the financial case. Nevertheless, given the nature and stakeholders involved in Workshop 3, discussions around the financial model and appraisals could take place at that stage.

Prepare financial model and financial appraisals

- Ascertain the affordability and funding requirements of the preferred option and demonstrate that the recommended project is affordable.
- The financial appraisals focus on the affordability and fundability of the project. The costs and benefits appraised in the financial case reflect an accountancy-based perspective.
- A Budget statement; Cash flow statement; and Funding statement should be included as part of this appraisal.
- The financial appraisal should result in a clear understanding of:
    - the capital and revenue implications of the project;
    - any financial contingencies (for example, for inflation) on top of any adjustments made in the Economic Case; the impact on the income and expenditure account and the organisation's charges for services (if applicable);
    - the impact on the budget, other sources of available funding and any shortfalls;
    - the impact of the project on the organisation's balance sheet; and
    - evidence of commissioner and stakeholder support (if required).
- An affordability template is available on the BBC NI website.

Financial Model and Appraisal

	Year 1	Year 2	Year 3	Year 4	Year 5
XI Capital	£1,909,200.00				
Xi Service		£183,600.00	£183,600.00	£183,600.00	£183,600.00

Financial Model and Appraisal

Hub Implementation	£10,800.00				

Royal Victoria Belfast.pdf

Lease	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
XI Capital	£445,440	£445,440	£445,440	£445,440	£445,440	£445,440	£445,440
Xi Service							
Hub Implementation	£10,800.00						

THE FINANCIAL CASE SECTION OF THE OBC HAS BEEN COMPLETED AND MUST BE KEPT UNDER REVIEW.

MANAGEMENT CASE

Please refer to Pages 76-85 of the HMT Better Business Cases Guidance for Projects when completing this section.

Workshop 5 – Successful Delivery Arrangements

For further details on the purpose, objectives, key participants and outputs of this workshop, please refer to page 84 of the HMT Better Business Case Guidance for Projects.

Plan project management

- Put in place the strategy, framework, and plans for successful project delivery through the development of the Project Framework and Project Plan.
- The appointment of the Senior Responsible Owner as well as the use of any specialist advisers should also be discussed.

Project Management

Who will manage the implementation and how?	Asset Controller will oversee delivery and safe installation
Who will monitor and evaluate the outcomes?	Efficiency and effectiveness will be measured by SRO and service leads
When will this take place?	Throughout the project, and on completion
What factors will be monitored / evaluated?	• Compliance with key policies, standards, and guidelines • Assurance of continuity of service delivery • Contingency arrangements in place • Recommendations / Lessons Learned
Nominated Asset Controller	Julieanne McDonald Theatres SM

Plan change management

- Put in place the strategy, framework and plans required for managing change.
- This should include a change management strategy (linked to benefits realisation), a change management framework (to manage anticipated and unexpected change), and a change management plan (to explain what will be delivered by whom and when in terms of underlying activities).

Managing Change

The team will be responsible for developing implementation plans, contingency plans, and managing and mitigating risks and will continue to monitor progress, ensuring agreed timeframes are being met, and challenging these when not met.

A clear outline for the strategic implementation of RAS across the Trust has been outlined the enabling actions required to ensure safe, effective, and sustainable delivery, including governance and assurance arrangements, planning structures, procurement, infrastructure readiness, and workforce development.

The Trust will continue to engage with the Regional Robotic Surgery Group and with SPPG to ensure coordinated, sustainable service development.

Structured onboarding: simulation, bedside assist, proctored cases, independent practice. Stakeholder engagement with nursing, anaesthetics, scheduling teams. Communications to patients & referrers

PPE will be carried out six months after scheme for any lessons learned.

Plan benefits realisation.

- Put in place the management arrangements required to ensure that the project delivers its anticipated benefits, including Benefits realisation strategy; Benefits realisation framework; and Benefits register/Benefits Realisation Plan (BRP).
- All the benefits identified in the strategic case and economic case sections of the OBC must be accounted for within the benefits register/BRP.
- The benefits register should be updated and reviewed continuously throughout the course of the project.
- A benefit profile template can be found on the Better Business Cases NI website.

Benefits Realisation

The Benefit Realisation Plan outlines how the proposed investment in robotic surgery at RVH will deliver measurable clinical, operational, and strategic benefits. Each benefit is linked to defined outcomes and has a responsible owner to ensure delivery is monitored and aligned to wider Trust and regional goals.

Benefit	Measure / KPI	Responsible Owner	Timescale

Benefits Realisation			
Improved patient outcomes	Reduced LoS, conversion, and complication rates	Clinical Leads – Thoracic, ENT, Cardiac	Within 6–12 months of implementation
Increased elective surgical capacity	Additional cases per annum vs baseline	Service Managers & Theatre Scheduling	Monitored monthly from go-live
Upskilled multidisciplinary workforce	Number of trained robotic surgeons & staff	RAS Training Lead	Within 12 months of go-live
Regional innovation leadership	Recognition in regional/national reviews	Surgical Directorate	Within 2 years
Improved training infrastructure	Cases logged for training & proctoring	RAS Clinical Education Lead	Ongoing from implementation
Recruitment/Retention	Workforce	HR/ Medical Workforce	Immediate

Plan risk management

- Put in place arrangements for managing and mitigating risks during the key phases of the project.
- A risk management framework should be established, within which risks are identified, mitigated, and managed.
- All the risks identified in the strategic case and economic case sections of the OBC must be accounted for within the risk register/log.
- The risk register/log should be updated and reviewed continuously throughout the course of the project.
- A risk register/log template can be found on the DoF website.

Risk Management
Programme risk register maintained; reviewed monthly by Project Board. Principal risks: utilisation, training delays, cost variance, device downtime. Mitigations: multi-specialty scheduling, vendor SLA, protected training time, backup instrumentation The Risk Register summarises key implementation risks using the NI Department of Finance standard format. Each risk is scored based on likelihood and impact, and mitigation plans are assigned with clear ownership. No extreme risks are currently identified; most fall within the moderate range and are considered manageable.

Risk Management					
Risk Description	Likelihood (1-5)	Impact (1-5)	Risk Score (L x I)	Mitigation	Owner
Under-utilisation of robot	3	4	12	Embed use in job planning and list allocation; training pipeline secured	Service Manager
Workforce delays in training	3	4	12	Early identification of trainees; use of regional RAS training framework	RAS Lead
Delayed theatre readiness	2	4	8	Advance coordination with estates and vendors	Theatre Estates
Revenue shortfall for maintenance	3	3	9	Inclusion in business case recurring funding bid	Finance Lead
Resistance from existing clinical teams	2	3	6	Early engagement, training, and sharing clinical evidence	Surgical Lead

Plan Post-Project Evaluation

- Put in place the necessary arrangements for Project Assurance (for example Gateway Reviews), Monitoring and Evaluation.
- To ensure an independent and objective approach, evaluations should be led by individuals or teams who have had no responsibility for or involvement in the management or implementation of the proposal under consideration.

Project Assurance and Evaluation Arrangements
Delivery, installation, and 12 Months Standard Warranty included in price. DEC oversees delivery and safe installation. Efficiency and effectiveness will be measured by patients' clinical outcomes. Post project evaluation will be carried out within 6 months post implementation of project. Responsible staff • Theatres SM Julieann McDonald

THE MANAGEMENT CASE SECTION OF THE OBC HAS BEEN COMPLETED AND MUST BE KEPT UNDER REVIEW.