Borders NHS Board

An **Extraordinary** meeting of the **Borders NHS Board** will be held on **Thursday, 16 June 2022** at 9.00am **via MS Teams**.

AGENDA

Time	No		Lead	Paper
9.00	**1**	**ANNOUNCEMENTS & APOLOGIES**	Chair	*Verbal*
9.01	**2**	**DECLARATIONS OF INTEREST**	Chair	*Verbal*
9.05	3.1	Laboratory Management Information System (LIMS) Masterlab Replacement Business Case	Director of Planning & Performance, Medical Director	*Appendix-2022-37*
9.30	3.2	Earlston Medical Practice	Director of Planning & Performance, Director of Finance	*Appendix-2022-38*
9.55	3.3	External Review – Benchmarking & Efficiency	Director of Finance	*Appendix-2022-39*
10.15	**4**	**ANY OTHER BUSINESS**		
10.20	**5**	**DATE AND TIME OF NEXT MEETING**		
		Thursday, 30 June 2022 at 9.00am in person at Tweed Horizons	Chair	*Verbal*

NHS Borders

Meeting:	**Extraordinary Borders NHS Board**
Meeting date:	**16 June 2022**
Title:	**LIMS Masterlab Replacement Business Case**
Responsible Executive/Non-Executive:	**June Smyth, Director of Planning & Performance** **Dr Lynn McCallum, Medical Director** **Gareth Clinkscale, Director of Acute Services**
Report Author:	**Dorothy Corner, Project Manager** **Jackie Stephen, Head of IM&T**

1 Purpose

This is presented to the Board for:

- Decision

This report relates to a:

- Emerging issue
- NHS Board/Integration Joint Board Strategy or Direction

This aligns to the following NHSScotland quality ambition(s):

- Safe
- Effective
- Person Centred

2 Report summary

2.1 Situation

The purpose of this report is to recommend that the NHS Borders Board approves the attached Full Business Case (FBC), which sets out the capital and revenue funding for the proposal to replace the >25-year-old Laboratory Information Management System (LIMS) in use in NHS Borders. The supplier has been approved through a national FBC, and the implications for Borders are considered in this parallel FBC paper.

The proposed replacement system will accommodate modern working practices, improving processes both locally, regionally and at a national level whilst reducing the current risks held on the corporate risk register associated with the current LIMS.

The Outline Business Case (OBC) was approved through national Laboratory Governance routes as well as the eHealth Leads Strategy Group August 2020 and NHS Borders board in December 2020.

The national Full Business Case (to confirm approved bidder for the framework) has been approved through national Laboratory Governance routes and the LIMS Project Board in February 2022. It was presented to the national Directors of Finance meeting in March 2022 where capital costs were agreed to be funded centrally by Scottish Government.

Any member wishing additional information should contact Jackie Stephen, Head of IM&T in advance of the meeting.

2.2 Background

National Full Business Case (FBC)

A consortium of Boards has worked through a business case approach to tender for a national supplier for a LIMS system. The OBC to support the tender process was previously approved by Chief Executives. In parallel with this national process, business cases capturing the estimated NHS Borders capital and revenue implications have been taken through the Board, with the NHS Borders OBC approved by the board in December 2020.

Following this tender process, led by National Procurement, a preferred supplier has been identified and a standstill period entered. The national FBC has been updated to reflect the tender costs, which are significantly less than the OBC estimates.

The national FBC to appoint a supplier is included as Appendix 1. The NHS Borders plan for implementation of this national FBC, including capital and revenue costs, is described in this paper.

Strategic Case

Laboratory services in Scotland employ over 4,000 staff and perform over 84 million tests per year, which play a part in 70 to 80% of all health care decisions affecting diagnosis of disease, treatment, and monitoring response to treatment. IT systems play a key role in enabling the effective management of such testing, yet current LIMS that underpin the function of most Laboratory departments within NHS Scotland Boards are archaic, often over 25 years in use, and are considered end of life. NHS Borders has been notified by the current supplier that our LIMS contract will terminate in March 2023 and the product will be end of life.

The Strategic Case provides an overview of the existing LIMS landscape in Scotland, outlining what solutions are currently used by the different Boards, and the challenges Boards face.

The Strategic Case also outlines the Case for Change, which is based on four key themes:

Strategic Alignment: NHS Scotland’s strategic aim for clinical laboratory services is that the delivery should take the form of a Distributed Service Model (DSM) to ensure

that no matter where health care is delivered, patients will have equitable access to efficient, effective, sustainable and affordable laboratory services. A replacement modern common solution for LIMS based on either a single national, or multiple regional instance(s) in Scotland is a key enabler for the vision of a DSM and the efficiencies associated with standardisation. It provides the baseline to drive service redesign regionally and eventually nationally to be developed in a unified laboratory system without Board boundaries. Furthermore, it would help realise the aims of NHS Scotland's eHealth strategies. Across six priority areas, Scotland's refreshed Digital Health and Care Strategy sets out how organisations will work together to improve the care and wellbeing of people in Scotland by making best use of technologies. The Covid-19 pandemic has highlighted just how important data and technology are in the management of public health and the strategy aims to build on and embed the rapid advances that have been made during the pandemic to provide the "right care in the right place at the right time".

Clinical Value: A modern LIMS is a key enabler to altering care pathways with potential benefits to patient experience and operational efficiencies through performance gains. A modern LIMS will enable multidisciplinary team working, particularly in the production of diagnostic pathways and cascading of tests to support appropriate use of resources. It will support improved productivity and efficiency across laboratories to allow staff to work smarter as well as streamline less efficient processes. This will help to improve turnaround times on referred patient results as well as improving the patient pathways resulting in an enhanced patient experience and enable operational efficiencies. For example, the potential to reduce length of bed stay as faster availability of test results will help enable speedier diagnosis and therefore provides the opportunity to reduce the time to discharge

Sustainability: As was reported in the National Labs Programme DSM business case (2019), the current model of laboratory services delivery across Scotland is not equitable nor is it nationally sustainable considering the challenges they face. Demand across services is increasing, requiring Boards to utilise the same, or even fewer resources to maintain current services. There is significant complexity with each of the Boards' current LIMS which have evolved organically over many years. Due to the poor and limited functionality of existing solutions there is high reliance on bolt-on solutions, many of which are built in-house with varying levels of support, maintenance and ongoing development. This presents a significant business continuity and security risk across NHS in Scotland. Adopting a common LIMS, and standardising associated processes and data sets across NHS Scotland provides a significant opportunity to have a more sustainable and robust solution. Standardisation may also make it easier to replace or rationalise other national solutions in the future (for example SCI Store).

Demand Optimisation: Nationally, for Laboratory Medicine, the vision for Scotland is to deliver the Right Test, in the Right Place, at the Right Time, with the Right Impact. Demand Optimisation is key to this vision. It has been clear for many years that there is considerable variation in the use of diagnostic tests across Scotland. While some of this variation could result from clinical circumstances and demographic differences, there still exists differences in practice by clinicians, including over-requesting and under-requesting. A modern LIMS is a key enabler to reducing unnecessary testing across primary and secondary care. This will free up capacity to address rising demand and deliver testing that positively affects the patient pathway, supports primary care preventative measures, reduces hospital referrals and admissions, and

supports equity of care for citizens and patients regardless of where they are or how they access Laboratory services.

2.3 Assessment

NHS Borders Case
Laboratory Medicine in NHS Borders conducts 1.8M tests per annum by approx 53 WTE laboratory staff (65 staff).

The following key benefits have been identified during the procurement evaluation process:

- Improved integrated reporting
- Opportunities to consolidate ordering and tracking processes
- Significant opportunities for Board collaboration on implementation and standardization across laboratory disciplines
- Histopathology case tracking, and improved general laboratory tracking reducing chances of mismatching, misplacing, or “losing” patient requests
- Increased communication and data sharing opportunities between disciplines, lab sites, and Boards
- Improved flagging and alerting of results requiring action
- Better resilience and reduction in the risk of hardware and software failures using modern technology, and the simplification of technical & clinical architecture
- Standardisation of outputs making integration of systems and services possible, regionally and nationally
- Ability to provide better data and management information
- Optimising the use of resources and increasing efficiency by automating certain aspects of workflow and clinical authorisation

The framework contract will include an optional module for Genetics. NHS Borders does not currently require genetics functionality. On this basis the Genetics optional module is excluded from the NHSB business case and will be considered at a future date if necessary.

2.3.1 Quality/ Patient Care

Clinical Value:

- Improved reporting, including integrated reporting in keeping with NICE guidelines
- Improved functionality allowing modern analytical tests to be reported appropriately
- Histopathology case tracking, and in some cases the introduction of improved general laboratory tracking, reducing chances of mismatching, misplacing or “losing” patient requests
- Increased communication options between disciplines, lab sites and NHS Boards
- Improved flagging of results requiring action

Improved patient outcomes

- improved turnaround times on referred patient results

- improved patient pathways – potential to reduce length of bed stays, faster availability of test results, potential to introduce intelligent result automation (such as iLFTs)14 in a widespread manner to provide decision support for clinicians, and quicker patient treatment and discharge
- improved patient experience - reduced error rates in lab to lab requesting - reduced numbers of repeat patient attendances at clinics because of missing results
- improved equity of care – a common and standardised LIMS enables a consistent approach regardless of patient location
- improved patient safety by reducing transcription errors with reports from provider labs being delivered electronically with commentary

Sustainability

- Reduction in risk of hardware and software failures through the innovative use of technology, the simplification of technical & clinical architecture
- Supports the development of the DSM – or any future work on reconfiguration - for Scotland
- Standardisation of outputs will make it easier to replace connecting solutions in the future (e.g. SCI Store)

2.3.2 Workforce

Reduction in burden for transition of staff and work, through the reduction in re-training of staff & re-booking of results

2.3.3 Financial

The estimated total recurring and non-recurring financial costs are outlined in the table below, based on nationally preferred option 2: individual health board instance with concurrent user licence model, on-premise hosting and support model 1 as detailed in the FBC section 5 and Appendix F. The individual health board instance is the most expensive and therefore worst-case cost estimate – there is an aspiration and commitment in the East region to implement a regional instance which would reduce costs.

The costs are taken directly from the tender costs as part of the national FBC. Board level costs are over a 10-year period. NHS Borders capital costs are significantly reduced due to a national approach to funding of capital by Scottish Government, as set out in Addendum 1 of the FBC.

In addition to the costs identified in the FBC, we have included a £0.05m non-recurring revenue for local NHS Borders requirements for data migration and additional interfaces, and £0.01m recurring revenue cost for ongoing support contingency

Optimism Bias has added 10% onto the total costs (excluding licence fees).

For the purposes of the FBC, vat has been included in the recurring revenue costs. The current LIMS costs (fully managed service) are exempt from VAT and it is expected that this will be the case for the new LIMS. The VAT exemption process with HMRC can commence once the order has been placed.

There is an overall reduction of £5.54m for NHS Borders compared to the Outline Business Case (£6.07m) presented to the Board in December 2020.

Two factors affect the cost difference:

- The OBC calculations were carried out using indicative costs from CliniSys ahead of the procurement exercise. In the pricing for the final bids, CliniSys were significantly more expensive than both InterSystems and Wellbeing Software
- Optimism Bias has been reduced from 30% to 0% for licences and 10% for all other cost elements

Net Present Cost is calculated to be £4.9m over 10 years.

Capital Funding

Funding has been identified as part of the Scottish Government (SG) capital budget and at the Directors of Finance meeting in March 2022 capital costs were agreed to be funded centrally.

The principal benefits identified to support this agreement included;

- Reduction of capital funding requirement for Boards to implement system upgrade, potentially to zero if no local implementation costs are required
- Opportunity for Boards to deliver system upgrade within affordable revenue envelope
- Encourages the coordinated roll out of system across Boards and maximises the opportunity to deliver benefits of standardisation
- Streamlines governance requirements for Boards to progress implementation.
- Provides clear statement of support by Scottish Government for delivery of important upgrade

Scottish Government funding enabled the purchase of the licenses prior to 31st March 2022, immediately following confirmation of framework supplier. The licenses will be held centrally by NSS (National Services Scotland) until Health Boards call off the contract, at which point transfer of licences will take place. It is anticipated that funds will be controlled by the LIMS Implementation Programme Board and allocated when required.

The risk around purchase of licences in advance of approval for implementation has been raised and is understood by the Scottish Government, and is mitigated by

- the significant planning work undertaken by the consortium Boards
- the availability of SG funding for the implementation costs in 22/23
- the risks mitigated and benefits delivered by implementation of the project, supported previously by the Board in December 2020
- the availability of capital funding in 21/22

Table 1a: Capital Cost Implications

Capital Costs	National	NHS Borders
	£m	£m
License Costs	4.57	0.00
Supplier Implementation	1.70	0.00
Design	0.15	0.00
Build and Local Config	0.77	0.00
Interface	0.14	0.00
Data Migration	0.20	0.00
Add. Interfaces build (3rd party suppliers + new)		0.05
Regional Implementation Team	2.83	0.00
Optimism Bias Total	0.47	0.00
Total ex VAT	**10.83**	**0.05**

*It is anticipated that no payments will be required in years 1 & 2 during the implementation process

Revenue

Table 1b identifies a recurring revenue cost of £0.07m per year, a reduction of £0.01m against the current recurring budget. While not calculated in the FBC, as the figure is less than £10k, 10% (£7K) optimism bias should be allowed to cover the potential for additional requirements identified through implementation. The proposed recurring revenue cost assumes the system is fully hosted by the supplier. The opportunity to host in house, saving the hosting fee and further reducing the recurring revenue cost, will be evaluated by the regional project team.

Table 1b: Recurring Revenue Cost Implications

Recurring Revenue Costs	National	NHS Borders
	£m	£m
Annual Support & Hosting Fee (only payable in full from year 3)*	15.60	0.70
Hosted for NHS Borders		tba
3rd party interface support contingency		0.10
Optimism Bias	1.56	0.00
Total ex VAT	**17.16**	**0.80**

Table 1c: Non-Recurring Revenue Cost Implications

Non Recurring Revenue Costs	National	NHS Borders
	£m	£m
Additional Services	3.11	0.26
National Implementation Team	1.77	0.00
Local Implementation costs		0.22
Optimism Bias	0.31	0.05
Total ex VAT	**5.19**	**0.53**

Table 1d: Cost Implications Totals, ex-VAT

TOTAL COSTS ex VAT	National	NHS Borders
	£m	£m
Capital	10.83	0.05
Recurring Revenue	17.16	0.80
Non-recurring Revenue	5.19	0.53
Total ex VAT over 10 years	**33.18**	**1.38**

Table 1e: Cost Implications Totals, inc-VAT & indexed (with OBC comparison)

TOTAL COSTS inc VAT & indexed	National	NHS Borders	Outline Business Case (for NHS Borders)
	£m	£m	£m
Capital	12.82	0.07	1.41
Recurring Revenue	22.59	1.10	4.49
Non-recurring Revenue	6.44	0.65	0.18
Total inc VAT & indexed over 10 years	**41.85**	**1.82**	**6.07**

Local Implementation Costs

The project is expected to take 13 months for NHS Borders to implement locally. We anticipate utilising existing, or FTC resources as recommended for a designated large project with an average time commitment of 2 days/week for the duration of the project.

Local Implementation Costs	Per Year	Project Total
	£	£
Labs Project Manager	58,783	25,473
Labs Tester/Project Officer	48,648	21,081
IM&T Senior Project Manager	58,783	25,473
IM&T Project Officers x2	78,428	33,986
IM&T Facilitators x2	78,428	33,986
IM&T Tester x1 (3 months)	48,648	4,865
IM&T Senior Infrastructure (3 months)	48,648	4,865
Total		**221,753**

2.3.4 Risk Assessment/Management

Supplier Capability/ Capacity: There is a risk that the supplier is unable to deliver the level of support or resourcing to enable Boards to implement according to agreed plan.

Product Capability: There is a risk that the solution supplied is not technically capable of meeting all the requirements of Boards in line with the agreed implementation plan and/or Boards' expectations.

Incomplete Specification: There is a risk that requirements evolve during the contract beyond initial stated specification resulting in need for change controls and increasing the cost of the solution.

Integration/ Technical Complexity: There is a risk that suppliers may struggle to deliver interfaces to the required levels of functionality, performance, reliability, and maintainability. This may lead to increased costs due to extra effort to develop the interfaces and delays to the agreed plan and timescales.

Deliverability of LIMS: There is a risk regarding the feasibility and deliverability of a National standardised and integrated LIMS.

NHS Resource Capacity – Delivery & Support: There is a risk that there will be insufficient NHS resources to deliver and maintain the solution.

LIMS Availability: There is a risk that weakness in national or local infrastructure, or a poorly designed/implemented solution results in multiple and/or sustained periods of unavailability.

Change Management: There is a risk that inadequate change management and/or leadership results in poor adoption of LIMS and or unrealistic expectations meaning that Boards do not realise anticipated benefits.

Divergence of Standards: There is a risk that the governance is not effective, and Boards adopt their own standards and Boards do not realise the anticipated benefits.

Funding: There is a risk that Boards require additional funding and/or resource to implement, and the LIMS replacement becomes unaffordable. As with the identified benefits, the above risks were validated and scored by the Evaluation User Group to distinguish between the implementation options. The objective of the scoring exercise was to assess the level of new or additional risk that each option may introduce.

These are fairly generic risks across the consortium.

Specifically for NHS Borders and six other Boards there is a risk that we are unable to move to the new product prior to the current system reaching end of life. This is being managed and is described in section 2.3.6.

A full risk register will be developed as the project progresses.

2.3.5 Equality and Diversity, including health inequalities

An impact assessment has not been completed because there is no policy or practice change which would have a potential impact on people.

2.3.6 Other impacts

The current supplier, Clinisys, has served contractual notice that they intend to retire their Labcentre product from service in March 2023. This appears to remove the ‘right to use’ the software and would potentially leave NHS Borders without a functioning LIMS. This is a critical very high risk to diagnostic services and our ability to provide safe patient care.

Clinisys, who were unsuccessful in the national tender process, have offered the six affected boards the opportunity to move to their newer product as an interim position, though costs and timescale for a move are unclear at this stage.

The six Boards have formed a collaborative partnership to collectively negotiate with the supplier to reach a solution. The preferred option would be a move to the new national product in a timescale that can be supported by Clinisys or prior to the contract termination date. They are being supported by NSS procurement experts and CLO.

Discussion is underway with the new supplier and the national implementation board to assess the feasibility of accelerated implementation for these boards to avoid a move, even in the interim, to a non-national product set, undermining some of the benefits of a once for Scotland approach.

It is possible that a move to the Clinisys Winpath product will be the only viable way to mitigate the removal of the Labcentre product, incurring significant additional expenditure for the Board and effort from labs and digital teams. Should this prove to be the case, a new business case for the option will be presented to the Board.

2.3.7 Communication, involvement, engagement and consultation

A Board Consortium Programme Board was established, jointly chaired by William Edwards NHSGG&C and Mike Gray, Service Manager for Laboratory Medicine, NHS Lothian.

All Boards in the Consortium were represented across all disciplines in the evaluation process.

Updates on the procurement process were provided to eHealth Leads, Corporate Finance Network and Chief Executives Group.

National Directors of Finance Group approved the FBC on 17 March 2022.

The Outline Business Case (OBC) was approved through Laboratory Governance routes as well as the eHealth Leads Strategy Group August 2020 and NHS Borders Board meeting September 2020.

The national Full Business Case (to confirm approved bidder for the framework) has been approved through Laboratory Governance routes. It was presented to the Directors of Finance meeting and approved on 17 March 2022.

2.3.8 Route to the Meeting

This has been previously considered by the following groups as part of its development. The groups have either supported the content, or their feedback has informed the development of the content presented in this report.

- NHSB Labs – Jackie Scott, May 2022
- NHSB Quad, 8 June 2022
- Borders Executive Team, 7 June 2022
- OPG, 6 June 2022

2.4 Recommendation

For awareness:
Note the national Full Business Case enclosed as Appendix 1.

Note SG funding for non-recurring capital and revenue implementation costs.

For decision:
Approve, for inclusion in the Digital Portfolio, Clinical Information Systems Programme, the estimated financial implications in implementing the replacement on laboratory information systems, primarily:

- The estimated capital expenditure of £0.07m including VAT. This includes supplier implementation costs
- The estimate non-recurring revenue expenditure of £0.65m including VAT to cover additional services, NHS Borders portion of National Team costs and NHSB project implementation costs
- Note reduced recurring revenue expenditure of £1.1m including VAT, assuming a fully hosted service. There may be opportunity to further reduce recurring revenue to by hosting in house, with approach on hosting to be agreed with eHealth.

Endorse members of the Labs Consortium Group working on a regional instance of a laboratory information management system for the East Region (Lothian, Fife and Borders) and the resource implications of this strategy. (The Scotland-wide Labs Consortium involves 11 Boards in a procurement and implementation project.) NHS Borders will implement governance which works locally and regionally feeding into the national implementation board.

Endorse the proposed governance and management approach for LIMS implementation as set out in the FBC post contract award.

3 List of appendices

The following appendices are included with this report:

- Appendix 1, Laboratory Information Management System (LIMS) Full Business Case v2.0
- Appendix 2, Laboratory Information Management System (LIMS) Outline Business Case
- Appendix 3, DoFs LIMS paper 17th March 2022 (Commercial in Confidence) Not included

Deloitte.

NHS SCOTLAND

NHS Scotland

Laboratory Information Management System (LIMS)
Full Business Case

May 2022

Change Log

Revision History

Version	Date	Source of Changes	Author(s)
1.0 Final	February 2022	Final FBC issued	Deloitte
1.1 Final	March 2022	Changes to the appendix based on feedback from NHS GGC	Deloitte
2.0 Final	May 2022	Addendum added following NHS Scotland DoF meeting 17 March 2022 and agreement t0 centrally fund Licence Fee and implementation costs for all consortium Health Boards	Deloitte

Contents

Executive Summary

Introduction

This document sets out the Full Business Case (FBC) for implementation of a modern Laboratory Information Management System (LIMS) across 12 NHS Scotland Consortium Boards. It recommends the establishment by NSS National Procurement of a single supplier national framework for LIMS with Wellbeing Software.

It builds upon the National Outline Business Case (OBC) for LIMS, which was approved by the LIMS Project Board in July 2020 and ratified by the individual Consortium Boards by the end of 2020.

The LIMS Project Board was established to provide overall governance to the project and is co-chaired by William Edwards (COO NHS GG&C) and Mike Gray (Service Manager for Laboratory Medicine NHS Lothian).

Strategic Case

The Strategic Case is largely based on the original OBC but has been updated to take account of more recent reports and strategies, the closure of the National Labs Programme, and the impact of Covid-19.

Laboratory services in Scotland employ over 4,000 staff and perform over 84 million tests per year, which play a part in 70 to 80% of all health care decisions affecting diagnosis of disease, treatment, and monitoring response to treatment. IT systems play a key role in enabling the effective management of such testing, yet current LIMS that underpin the function of most Laboratory departments within NHS Scotland Boards are archaic, often over 25 years in use, and are considered end of life. The Strategic Case provides an overview of the existing LIMS landscape in Scotland, outlining what solutions are currently used by the different Boards, and the challenges Boards face.

The Strategic Case also outlines the Case for Change, which is based on four key themes:

Strategic Alignment: NHS Scotland's strategic aim for clinical laboratory services is that the delivery should take the form of a Distributed Service Model (DSM) to ensure that no matter where health care is delivered, patients will have equitable access to efficient, effective, sustainable and affordable laboratory services. A replacement modern common solution for LIMS based on either a single national, or multiple regional instance(s) in Scotland is a key enabler for the vision of a DSM and the efficiencies associated with standardisation. It provides the baseline to drive service redesign regionally and eventually nationally to be developed in a unified laboratory system without Board boundaries. Furthermore, it would help realise the aims of NHS Scotland's eHealth strategies. Across six priority areas, Scotland's refreshed Digital Health and Care Strategy sets out how organisations will work together to improve the care and wellbeing of people in Scotland by making best use of technologies. The Covid-19 pandemic has highlighted just how important data and technology are in the management of public health and the strategy aims to build on and embed the rapid advances that have been made during the pandemic to provide the "*right care in the right place at the right time*".

Clinical Value: A modern LIMS is a key enabler to altering care pathways with potential benefits to patient experience and operational efficiencies through performance gains. A modern LIMS will enable multidisciplinary team working, particularly in the production of diagnostic pathways and cascading of tests to support appropriate use of resources. It will support improved productivity and efficiency across laboratories to allow staff to work smarter as well as streamline less efficient processes. This will help to improve turnaround times on referred patient results as well as improving the patient pathways resulting in an enhanced patient experience and enable operational efficiencies. For example, the potential to reduce length of bed stay as faster availability of test results will help enable speedier diagnosis and therefore provides the opportunity to reduce the time to discharge

Sustainability: As was reported in the National Labs Programme DSM business case (2019), the current model of laboratory services delivery across Scotland is not equitable nor is it nationally sustainable in light of the challenges they face. Demand across services is increasing, requiring Boards to utilise the same, or even fewer resources to maintain current services. There is significant complexity with each of the Boards' current LIMS which have evolved organically over many years. Due to the poor and limited functionality of existing solutions there is high reliance on bolt-on solutions, many of which are built in-house with varying levels of support, maintenance and ongoing development. This presents a significant business continuity and security risk across NHS in Scotland. Adopting a common LIMS, and standardising associated processes and data sets across NHS Scotland provides a significant opportunity to have a more sustainable and robust solution. Standardisation may also make it easier to replace or rationalise other national solutions in the future (for example SCI Store).

Demand Optimisation: Nationally, for Laboratory Medicine, the vision for Scotland is to deliver the Right Test, in the Right Place, at the Right Time, with the Right Impact. Demand Optimisation is key to this vision. It has been clear for many years that there is considerable variation in the use of diagnostic tests across Scotland. While some of this variation could result from clinical circumstances and demographic differences, there still exists differences in practice by clinicians, including over-requesting and under-requesting. A modern LIMS is a key enabler to reducing unnecessary testing across primary and secondary care. This will free up capacity to address rising demand and deliver testing that positively affects the patient pathway, supports primary care preventative measures, reduces hospital referrals and admissions, and supports equity of care for citizens and patients regardless of where they are or how they access Laboratory services.

Economic Case

LIMS Options:

Several options were set out in the National OBC which the LIMS Project Team and Evaluation User Group short-listed. The five options taken forward for further analysis included the option to 'do nothing', as well as four options for replacing LIMS, ranging from replacing Core LIMS only, to replacing Core LIMS, Genetics and Blood Transfusion. All four replacement options involve a unified approach where Boards collaborate to agree a national LIMS specification and select a solution all Consortium Boards could adopt.

In this business case the preferred option identified in the OBC: Unified Consortium with Core LIMS, Genetics and Blood Transfusion is taken forward. In this option, all disciplines are included in the procurement scope including Genetics and Blood Transfusion for Boards that require these capabilities. The business case then considers three implementation approaches (national, regional, individual Boards) to assess the implementation options and identify a recommended approach for Consortium Boards.

Benefits Assessment

The key benefits expected to be realised by a modern LIMS fall into four key areas: clinical value, operational, sustainability and demand optimisation. These benefits outline how replacing the current ageing LIMS system will provide improved clinical value, improved and sustainable operations, and help Laboratory teams effectively manage and optimise demand. While the benefits are described in the context of operational improvements, ultimately, they will contribute to improved patient outcomes.

- **Clinical Value**
  - Improved reporting, including integrated reporting in keeping with NICE guidelines.
  - Improved functionality allowing modern analytical tests to be reported appropriately.
  - Histopathology case tracking, and improved general laboratory tracking reducing chances of mismatching, misplacing, or "losing" patient requests.
  - Increased communication options between disciplines, lab sites, and Boards
  - Improved flagging of results requiring action.
- **Operational**
  - Reduction in burden for transition of staff and work, through the reduction in re-training of staff & re-booking of results.

- **Sustainability**
  - Reduction in the risk of hardware and software failures through the innovative use of technology, and the simplification of technical & clinical architecture.
  - Supporting development of the DSM for Scotland.
  - Standardisation of outputs making it easier to replace connecting solutions in the future (e.g. SCI Store).
- **Demand Optimisation**
  - Optimises diagnostic testing use to maximise appropriate testing.
  - Optimising the use of resources and increasing efficiency by automating certain aspects of workflow and clinical authorisation.

A validation and scoring exercise was undertaken to rank each of the implementation options in terms of their relative non-financial benefit. The purpose of this assessment was to understand any differential between the implementation options in non-monetary terms. The benefits assessment highlighted that implementing LIMS using a single national instance is expected to deliver the highest level of benefit.

Risks Assessment

It is important to recognise that as well as delivering additional benefits, there will be risks associated with implementing a modern LIMS across NHS Scotland as outlined below:

- **Supplier Capability/ Capacity**: There is a risk that the supplier is unable to deliver the level of support or resourcing to enable Boards to implement according to agreed plan.
- **Product Capability**: There is a risk that the solution supplied is not technically capable of meeting all the requirements of Boards in line with the agreed implementation plan and/or Boards' expectations.
- **Incomplete Specification**: There is a risk that requirements evolve during the contract beyond initial stated specification resulting in need for change controls and increasing the cost of the solution.
- **Integration/ Technical Complexity**: There is a risk that suppliers may struggle to deliver interfaces to the required levels of functionality, performance, reliability, and maintainability. This may lead to increased costs due to extra effort to develop the interfaces and delays to the agreed plan and timescales.
- **Deliverability of LIMS**: There is a risk regarding the feasibility and deliverability of a National standardised and integrated LIMS.
- **NHS Resource Capacity – Delivery & Support**: There is a risk that there will be insufficient NHS resources to deliver and maintain the solution.
- **LIMS Availability**: There is a risk that weakness in national or local infrastructure, or a poorly designed/implemented solution results in multiple and/or sustained periods of unavailability.
- **Change Managemen**t: There is a risk that inadequate change management and/or leadership results in poor adoption of LIMS and or unrealistic expectations meaning that Boards do not realise anticipated benefits.
- **Divergence of Standards**: There is a risk that the governance is not effective, and Boards adopt their own standards and Boards do not realise the anticipated benefits.
- **Funding:** There is a risk that Boards require additional funding and/or resource to implement, and the LIMS replacement becomes unaffordable.

As with the identified benefits, the above risks were validated and scored by the Evaluation User Group to distinguish between the implementation options. The objective of the scoring exercise was to assess the level of new or additional risk that each option may introduce.

Total Economic Cost

Following the procurement exercise undertaken by NSS National Procurement on behalf of the Project Board, HSS Well Being were selected as the preferred supplier and their submitted costs used to develop a detailed financial and economic appraisal.

The economic cost of each shortlisted implementation option has been calculated for the full 10-year period for all Consortium Boards and is based on a number of principles and assumptions as found within the main body of the FBC (Section 5.1). They have been calculated for the following scenario:

- Support model: **Support model set out in the call of contract**
- License type: **Concurrent User License**
- Hosting: **On-premises hosting**

Option 2 (Implementing a single national instance) has a total NPC of c£24m over the 10-year period, with Options 3 (Implementing regional instances) and 4 (Implementing individual Health Board instances) being similar in cost at c£37m and c£38m, respectively. Implementing a single national instance represents the most cost-effective solution. Option 1 (Do noting) was considered as the baseline against with the benefits and risks of the other options would be scored.

Option Appraisal and Preferred Option

The table below incorporates the economic cost of each option with the identified weighted benefits and risks.

Table 1: Option Appraisal

Option Appraisal	Option 2: Single national instance	Option 3: Regional instances	Option 4: Individual Health Board instances
Weighted Benefits Points	814	748	507
Weighted Risk Points	867	883	879
Risk Per Benefit Point	1.07	1.18	1.73
Option Rank	1.00	2.00	3.00
NPC Per Option (£k)	24.43	37.01	38.31
Cost Per Benefit Point (£k)	0.03	0.05	0.08
Option Rank	1.00	2.00	3.00

Option 2 (Implementing a single national instance) shows the lowest cost per benefit point, and as such has been identified as the preferred option. However, recognising the potential challenges in adopting a single national solution, a national configuration could provide the starting point which could then be copied and deployed as three regional instances with subsequent Boards being implemented on the appropriate regional instance (Option 3). This standardised approach will greatly facilitate any subsequent migration to a national deployment and further support the service transformation goals identified.

Economic Costs for Each Consortium Board

Individual Boards will need to develop their local business cases. Recognising that a regional approach has not yet been fully agreed by all Consortium Boards and given that costing of the regional and individual instance implementation approaches are very similar for Wellbeing Software, we have profiled the financial costs over a 10-year period for each Consortium Board using the individual instance implementation approach. The below costs also assume on-premises hosting, the concurrent license fee model and the use of support model 1. Further detail can be found in the main body of the FBC (Section 5) and Appendix F.

Table 2: Economic Costs per Consortium Boards (individual instance implementation)

	NHS Borders	NHS D&G	NHS Fife	NHS Forth Valley	NHS Golden Jubilee	NHS Grampian	NHS GGC	NHS Lothian	NHS Orkney	NHS Shetland	NHS Tayside	NHS Western Isles
License Costs (NRC)	0.02	0.22	0.28	0.30	0.05	0.60	1.86	0.81	0.02	0.02	0.37	0.02
Annual Support & Hosting Fee (RR)	0.07	0.75	0.91	0.94	0.15	2.01	6.63	2.79	0.06	0.07	1.17	0.06

Supplier Implementation (NRC)	0.02	0.07	0.08	0.09	0.04	0.17	0.82	0.25	0.02	0.02	0.12	0.02
Design (NRC)	0.00	0.01	0.01	0.01	0.00	0.02	0.05	0.03	0.00	0.00	0.01	0.00
Build and Local Config (NRC)	0.01	0.04	0.05	0.05	0.02	0.11	0.25	0.13	0.01	0.01	0.06	0.01
Interface (NRC)	0.00	0.01	0.01	0.01	0.00	0.02	0.05	0.02	0.00	0.00	0.01	0.00
Data Migration (NRC)	0.00	0.01	0.01	0.01	0.00	0.02	0.10	0.03	0.00	0.00	0.01	0.00
Additional Services (NRR)	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26
Regional Implementation Team (NRC)	0.08	0.09	0.25	0.16	0.04	0.51	0.66	0.54	0.03	0.03	0.41	0.04
National Implementation Team (NRR)	0.05	0.07	0.16	0.13	0.04	0.23	0.52	0.35	0.01	0.01	0.18	0.02
Optimism Bias	0.05	0.13	0.17	0.17	0.06	0.33	0.93	0.44	0.04	0.04	0.22	0.04
Total with Optimism Bias	**0.56**	**1.65**	**2.19**	**2.13**	**0.66**	**4.28**	**12.12**	**5.65**	**0.46**	**0.47**	**2.84**	**0.47**
Non Recurring Capital (NRC)	0.15	0.46	0.73	0.66	0.17	1.54	3.97	1.91	0.09	0.09	1.06	0.10
Non Recurring Revenue (NRR)	0.34	0.36	0.46	0.43	0.32	0.54	0.86	0.67	0.30	0.30	0.49	0.30
Recurring Revenue (RR)	0.07	0.82	1.00	1.04	0.16	2.21	7.29	3.07	0.07	0.08	1.29	0.07
Total with Optimism Bias over 10 years	**0.56**	**1.65**	**2.19**	**2.13**	**0.66**	**4.28**	**12.12**	**5.65**	**0.46**	**0.47**	**2.84**	**0.47**
NPC over 10 years	**0.49**	**1.42**	**1.90**	**1.83**	**0.57**	**3.74**	**10.66**	**4.96**	**0.39**	**0.40**	**2.46**	**0.40**

*Due to rounding, '0.00' costs are less than £10k

The table above shows the total NPC for each Consortium Board. NHS GGC and NHS Lothian have the highest cost (c£11m and £5m respectively over 10 years), both previously defined as Very Large Boards in the OBC, while the smaller Boards including NHS Orkney and NHS Shetland have a similar total cost of c.£0.4m.

Optimism Bias has added **10% onto the total costs** (excluding license fees), equating to an additional c£0.04m to £0.93m depending on Board size.

Financial Case

A financial appraisal based on a number of assumptions has been undertaken to illustrate the estimated cost over the 10-year period.

Table 3: Total Financial Cost per Consortium Board (individual instance implementation)

	NHS Borders	NHS D&G	NHS Fife	NHS Forth Valley	NHS Golden Jubilee	NHS Grampian	NHS GGC	NHS Lothian	NHS Orkney	NHS Shetland	NHS Tayside	NHS Western Isles
Consolidated Financial Considerations												
NRC (Incl. VAT & Indexation)	0.17	0.55	0.84	0.78	0.21	1.78	4.69	2.23	0.11	0.11	1.22	0.12
NRR (Incl. VAT & Indexation)	0.43	0.45	0.55	0.52	0.41	0.63	0.95	0.76	0.38	0.38	0.58	0.39
RR (Incl. VAT & Indexation)	0.10	1.08	1.32	1.37	0.22	2.91	9.56	4.04	0.09	0.10	1.71	0.09
Total Financial Cost (Incl. VAT & Indexation)	**0.69**	**2.08**	**2.72**	**2.68**	**0.83**	**5.32**	**15.21**	**7.03**	**0.59**	**0.60**	**3.51**	**0.60**
Capital Depreciation	0.15	0.48	0.75	0.69	0.18	1.59	4.04	1.97	0.10	0.10	1.10	0.11
Existing Local BAU Resources	0.07	0.08	0.19	0.14	0.01	0.27	0.79	0.43	0.01	0.01	0.26	0.01
Existing License + Hardware Fee	0.41	0.94	1.53	0.98	0.61	1.12	5.43	3.78	0.27	0.31	1.06	0.27

*Due to rounding, '0.00' costs are less than £10k

The table illustrates that VAT and Indexation considerations increase the total Financial Cost to each Board over the 10-year period. Each Board has a minimum VAT cost of c£80k, and Indexation of c£40k over the 10-year period, with the larger Boards having higher costs as expected. Further breakdown of financial considerations by Board is shown in the below tables with yearly costs included in the Appendix.

Commercial Case

The Commercial Case documents the procurement process that has been undertaken to put in place the Single Supplier Framework for LIMS. A formal procurement process commenced in April 2019 when a Prior Information Notice (PIN) was issued to the market followed by the contract notice and European Single Procurement Document (ESPD) in November 2020. Eleven suppliers responded to the ESPD, and an Invitation to Tender (ITT) was issued in January 2021 to eight suppliers, including the following solutions: Cirdan Imaging Limited, CliniSys Solutions Limited, CGM Lab Belgium S.A., CSC Computer Sciences Limited, Healthcare Software Solutions Ltd, InterSystems Corporation, SCC Softcomputer and Technidata SAS. Seven responses were received, and all seven bids were evaluated by the LIMS Project Team together with an evaluation panel that included representatives from all Consortium Boards through a written submission and a demonstration of the solution.

Following on from the initial bids, three suppliers (CliniSys, Healthcare Software and InterSystems) were invited to move to the negotiation phase in November 2021. After extensive discussions with all suppliers across a four-week period, the suppliers were invited to submit interim bids for information only in December 2021. The invitation to submit final bids was issued on January 14th, 2022 to all three bidders with a deadline of January 28th, 2022.

Based on the final written bid submissions and scoreable demonstrations, Healthcare Software Solutions Ltd, part of the Wellbeing Software Limited received the highest overall score. This business case recommends that NSS National Procurement establish a national Framework for LIMS provision, accessible by all NHS Scotland Boards and that Wellbeing Software be appointed as the single supplier on that Framework.

Management Case

It is recommended that the Consortium Boards progressively develop and agree national standards and approaches for laboratory medicine that can then be applied locally by Boards and Regions, with a collaborative, staged approach to implementation.

Oversight during the implementation phase will be provided by the National LIMS Operational Group (NLOG), a collaborative group made up of members from Boards across Scotland, that will report directly to Boards and the Laboratories Executive Board (LEB), which reports to the Diagnostics in Scotland Strategy Group (DiSSG), and ultimately the Chief Executives. This governance structure leverages existing governing bodies and enables Consortium Boards to work collaboratively to implement LIMS.

After establishment of the framework, the current LIMS Project Board will be stood down and replaced by an operational governance model to coordinate and oversee the implementation, operation, and development of LIMS across Consortium Boards. Key to this will be the NLOG, who will support drive for consistency and commonality of approach during the implementation, coordinating development and adoption of standards and reviewing how those standards are applied locally. The NLOG will oversee the long-term governance, operation and development of any new LIMS implemented in NHS Scotland. It will be the national coordination group enabling standardisation and harmonisation of working practices across consortium board laboratories.

During the period where Boards are implementing LIMS there will be a specific National LIMS Implementation Programme Board established, to operate alongside the NLOG, to provide specific oversight and management of implementation activities. This programme board should then be stepped down once all Consortium Boards have completed implementation. The programme board will be comprised of senior

stakeholders from across the Consortium Boards, with authority to make decisions within either their individual Board or the region they represent.

The NLOG will eventually act as the Design Authority for LIMS across Scotland to ensure that any changes Consortium Boards request locally are in line with the nationally agreed approach and standards. There will be a new project team set up to support the NLOG. It is suggested that this team would be divided into smaller groups, comprising a LIMS National Implementation Team, LIMS Clinical Operations Group, LIMS Technical Operations Group and a LIMS Standardisation Group.

The eHealth Strategy Leads, and Local Board Executive Management Teams will be kept informed however will not provide approval / sign-off.

Introduction

Background

This document sets out the Full Business Case (FBC) for investment in a modern Laboratory Information Management System (LIMS) across the following NHS Scotland Consortium Boards:

- NHS Borders
- NHS Dumfries & Galloway
- NHS Fife
- NHS Forth Valley
- NHS Golden Jubilee / NHS National Waiting Times Centre
- NHS Grampian
- NHS Greater Glasgow & Clyde
- NHS Lothian
- NHS Orkney
- NHS Shetland
- NHS Tayside
- NHS Western Isles

Note that NHS Ayrshire and Arran, NHS Highland, and NHS Lanarkshire are not currently actively involved. Should they require estimated costs these can be calculated by using calculations for similarly sized boards.

This FBC describes the procurement process undertaken to put in place a Single Supplier Framework Agreement for LIMS in Scotland as well as the benefits, risks and economic implications of implementing the preferred option. It builds upon the Outline Business Case (OBC) For LIMS, which was approved by the LIMS Project Board in July 2020. The document has been prepared in accordance with HM Treasury Green Book guidance and is structured into six main sections as set out below with further information provided in appendices:

- the **Strategic Case** considers the case for change nationally, as well as a summary of the national OBC;
- the **LIMS Options** section sets out the base case option for the implementation of LIMS building on the preferred option identified in the OBC;
- the **Benefits and Risks** section documents the associated benefits and risks of the chosen option;
- the **Commercial Case** provides an overview of the procurement process and governance structure. It also describes the procurement process undertaken, the results of the procurement exercise to date and supplier prices;
- the **Economic and Financial Case** section outlines the economic cost of implementing LIMS across NHS Scotland as well as the funding implications for NHS Scotland; and
- the **Management Case** describes the governance structure and management arrangements for the implementation of the LIMS project.

1. Strategic Case

1.1. Introduction

In this section the background to the project is set out alongside the current LIMS landscape and case for change. The Strategic Case is largely based on the original OBC but has been updated to take account of more recent reports and strategies, as well as considering the impact of Covid-19. This section also provides a summary of key findings of the OBC, highlighting the preferred option.

1.2. Background

Laboratory Medicine provides laboratory services to primary and secondary care centres across Scotland. Laboratories across Consortium Boards perform over 84 million tests per year and employ over 4,000 staff. Laboratories provide a 24/7 clinical and medical laboratory service and a comprehensive range of investigations including decentralised testing sites. Laboratory tests play a part in 70 – 80% of all health care decisions affecting diagnosis of disease, treatment, and monitoring response to treatment.

LIMS is crucial to the function of Laboratory Medicine as it is used to result and report all primary, secondary and tertiary laboratory requests received by Laboratory Medicine (with the exception of Genetics). It also provides capability to create automation of workflows, integration of instruments, and management of samples and their associated information. LIMS systems interface with several key local and national healthcare systems, for example:

- Patient Administration Systems
- Electronic Patient Records
- Analytical Middleware
- Electronic Order Communication Systems
- Regional and National Systems

Current LIMS that underpin the function of the majority of departments within Laboratories within NHS Scotland Boards are archaic, often over 25 years in use, and are considered end of life. For most Boards, rolling support contracts are not offering value for money, while in others, the LIMS in use are nearing end of support.

Differences in LIMS systems, versions, local service configurations and processes also lead to variation and complexity. Current disparity between laboratory software and data means that meaningful cross border (i.e. between different Boards) analysis is not currently possible and does not enable optimal use of resources on a national basis. Most suppliers now have a LIMS available that offers functionality and automation that far exceeds systems currently in use by Boards, for example:

- multidisciplinary team working; in particular the production of diagnostic pathways and cascading of tests to support appropriate use of resources;
- integrated reporting and multidisciplinary meetings capability; and
- real time access to information on performance, quality, and cost.

There are strong drivers, as set out in the remainder of this section, for Boards in Scotland to replace their existing solutions with a modern LIMS.

1.2.1. National Collaborative LIMS Project

In 2018, a Prior Information Notice (PIN) was published by NHS Greater Glasgow and Clyde (NHS GGC) to gather information on what LIMS were available in the market and indicative costs. Eight vendors responded and attended a Q&A day. After the PIN process was completed, NHS GGC were approached by three Boards

from the East of Scotland region (undertaking work as part of the National Laboratories Programme in the East), to investigate the position of working collaboratively, as they were in the same position with an urgent need to replace their LIMS. Since then, 12 Boards in total from across NHS Scotland have expressed an interest to join a national LIMS procurement (NHS Borders, NHS Dumfries & Galloway, NHS Fife, NHS Forth Valley, NHS Golden Jubilee/ NHS National Waiting Times Centre, NHS Grampian, NHS GGC, NHS Lothian, NHS Orkney, NHS Shetland, NHS Tayside, and NHS Wester Isles). The vision is for a single supplier framework which Boards can call off to procure a new LIMS.

It is expected that working together as a consortium will bring a number of benefits including:

1. shared specification to promote standardisation across large parts of Scotland
2. the ability to use economies of scale to drive down costs; and
3. an opportunity to share project costs between multiple Boards.

The LIMS Project Board (see Appendix A Table 9) commissioned the development of this FBC via NHS GGC in October 2021. Deloitte was engaged to support this work. The project will report into the National LIMS Project Board who is responsible for approving the business case.

This business case will enable establishment of a single supplier framework supporting Boards (either individually or as a consortium) to make investment decisions around the potential acquisition and deployment of a modern LIMS. It will not replace the need for local business cases within Boards as the LIMS implementation may require fundamental changes to established ways of working as well as significant local investment of resources and effort.

A Project Team was formed and met regularly during the development of the FBC to review key outputs and provide overall assurance of the process. The Project Team membership is set out in Appendix A Table 10.

The LIMS Evaluation User Group (Clinical Technical User Group) was formed to support the development of the OBC, comprising of a number of cross-discipline technical and clinical stakeholders from various sub-groups across the Consortium Boards including eHealth and clinical representatives. This User Group then continued to meet and was responsible for the quality review of supplier bids during the procurement process and provided insight on benefit and risk validation during development of the FBC. The LIMS Evaluation User Group membership is set out in Appendix A Table 34.

1.3. LIMS Landscape & Challenges

1.3.1. LIMS Landscape

Current IT infrastructures and architectures across NHS Boards are highly complex and have evolved over many years. Historically, each hospital site and discipline may have had its own instance of a LIMS or LIMS module respectively. Boards thought this approach appropriate for the working practices of the time but it has resulted in a high degree of variation and challenges around working as part of a multidisciplinary team, which current practices require. Table 4 provides an overview of current LIMS in use across NHS Scotland.

Table 4: Current LIMS landscape

LIMS	Version	NHS Board
Clinisys / WinPath	1.1	Ayrshire & Arran*
Medpath	1.12	Western Isles
Technidata	-	Lanarkshire*
Clinisys / LabCentre	1.1	Shetland
		Orkney
	1.11	Borders

		Golden Jubilee / National Waiting Times Centre
	1.12	Tayside
	1.13	Fife
DXC/Telepath	1.9	Greater Glasgow & Clyde
CIRDAN Ultra	-	Highland*
DXC/iLab	5.8	Forth Valley
	5.8.10022.3b3	Dumfries & Galloway
	6.1b6	Lothian
	6	Grampian

*not currently part of the identified Consortium Boards

Suppliers are now directing development effort towards the production of new LIMS offerings. This has resulted in markedly reduced product support for some Board solutions, with very significant timelines for problem resolution, even for issues considered as business critical. There is significant risk that suppliers will completely remove support from existing products as they bring new versions and solutions to market. Lack of support also poses a significant security risk as new vulnerabilities may either not be caught or remain unpatched. The lack of development and old database architecture is also significantly impacting on the operational effectiveness of laboratory medicine and is preventing the streamlining of diagnostic workflows and demand optimisation pathways.

1.3.2. Board Challenges

The common challenges associated with current LIMS raised by the Consortiums are summarised below:

- Current LIMS do not meet the needs current and future needs of the service; modern collaborative working practices, streamlining of workflows and mainstreaming of new technology cannot be implemented. For example, the introduction of SNOMED-CT and other required standards to deliver against Scotland's refreshed Digital Health and Care Strategy cannot be met.
- The continued use of disparate LIMS with local coding, requesting and reporting practices do not meet the Digital Health and Care Strategy's agenda around standardisation, reduction in IT variation and facilitating cross Board working to improve the availability and accessibility of health and care information and services, and the ability to feed into other National IT infrastructure projects.
- Current disparity between both laboratory software and data across Boards means that meaningful cross border information sharing, and analysis is challenging.
- Where common solutions are in place, differences in service configurations and processes lead to variation and complexity in LIMS configurations. Together, these introduce barriers to cross border working of laboratory professionals (e.g. cross border reporting and results validations) and aggregation of data.
- Multimodality/integrated reporting is not supported by current solutions to enable the production of comprehensive and consolidated diagnostics reports. This leads to significant inefficiencies in working practice and, since many vital pieces of patient information are still held on paper, this frequently makes them unavailable when needed and could be considered a risk to patient safety. This challenge has been highlighted during the current Covid-19 pandemic.
- There is limited or no support for modern communication methods (email, SMS, new HL7 standards e.g. FHIR). For example, in some Boards the Genetics and Cytogenetics LIMS do not interface with the Patient Administration Systems and their results do not get filed within the Electronic Patient Record.

- There is a lack of integrated business intelligence tools making it difficult and time consuming to extract information from LIMS to provide timely management information including cost, audit information and demand management control.
- There is no nationally agreed data set or definitions for laboratories in Scotland and therefore an inability to meaningfully collate data for strategic planning or service improvement. There is an inability to share test information between NHS Boards with disparate and disjointed approaches to data collection, analysis, and storage.

1.4. Case for Change

1.4.1. Strategic Landscape

NHS Scotland's strategic aim for clinical laboratory services is that the delivery should take the form of a Distributed Service Model (DSM) with services developed incrementally following the National Blueprint published in the National Strategy and Business Case[1]. The aim is to ensure that no matter where health care is delivered in Scotland, patients will have equitable access to efficient, effective, sustainable and affordable laboratory services. Whilst the National Laboratories Programme was initially set up to lead a joined-up approach to laboratories management, this has since been closed down. Changing priorities during the Covid-19 pandemic highlighted that some of the Programme's intended outputs were already being naturally delivered through collaborative working. Further enhancement of the DSM can be effectively achieved through increasing collaborative working across the Boards to develop nationally agreed standards and common approaches which can then be locally applied.

A replacement modern common solution for LIMS based on a single or multiple (likely three regional[2]) instances in Scotland is a key enabler for the vision of a DSM and the efficiencies associated with standardisation. It provides the baseline to drive service redesign regionally and eventually nationally to be developed in a unified laboratory system without Board boundaries. However, it is also acknowledged that delivery of common LIMS for Scotland requires convergence of laboratory and other processes, use of shared protocols, common coding systems and taxonomies. An initial approach where a national approach and standards are regionally applied is most likely to result in the successful implementation of the new solution.

Implementation of a common and modern LIMS would help realise the aims of NHS Scotland's eHealth Strategies. Across six priority areas Scotland's refreshed "Digital Health and Care Strategy"[3] sets out how we will work together to improve the care and wellbeing of people in Scotland by making best use of technologies. The Covid-19 pandemic has highlighted just how important data and technology are in the management of public health, not only to run our health organisations, but also to build awareness, and maintain public confidence in the organisations and progress they are making. The strategy aims to build on and embed the rapid advances that have been made during the pandemic to provide the "*right care in the right place at the right time*", and it will be accompanied by a rolling three-year delivery plan, updated each year from April 2022.

The refreshed strategy also provides the framework for the development of Scotland's first Data Strategy for Health and Social Care, which is due to be published in September 2022. In order to develop the Data strategy user group feedback is being collated by Nesta with a full formal consultation scheduled for May

[1]https://www.thebiomedicalscientist.net/science/blueprint-future
[2]https://www.researchgate.net/publication/342751621_Transforming_NHSScotland's_lab_services_a_blueprint_for_the_future
[3]https://www.gov.scot/publications/scotlands-digital-health-care-strategy/

2022. Jonathan Cameron, lead of Digital Health and Care for the Scottish Government, has outlined the importance of having health and care services that are integrated and built on people-centred, safe, secure and ethical digital foundations. He says that "*the strategy will include details of what is required to deliver secure systems across health and care as an agreed approach to data standards will help direct and assure how data is coded, stored and flows across the system*."[4] Implementing a common and modern LIMS system that can enable meaningful ways to collate and analyse data and provide insights for strategic planning would strategically align with the refreshed strategy.

Research undertaken by the Royal College of Pathologists[5] in January 2017 examined how integrated reporting across Histopathology and Genetics could be achieved. The report identifies current LIMS as a key barrier given that reporting interfaces do not uniformly provide functionality to integrate data from a variety of sources into a single definitive report. Moving to a common modern LIMS is a key enabler to achieving the recommendations within this report.

The case for change has been further strengthened by the Covid-19 pandemic, as highlighted in the Royal College of Pathologists' RCPath 2021 manifesto[6], which outlines learnings from the pandemic and key priorities for moving forward. It highlights the importance of having well-connected and collaborative networks for delivering laboratory services. One of the key priorities for the College is investment in IT and infrastructure for better patient care, and it specifically calls for significant capital investment to support the implementation of the LIMS roll out. This will help ensure "*reliable, efficient and safe systems and ensure software systems are fit for the future and consistent across the country*".

Dr Bernie Croal, Chair of the Scotland Regional Council (RCPath), said: "*The Covid-19 pandemic has once again highlighted the importance of laboratory tests and laboratory professionals within the healthcare landscape. As we emerge from the pandemic it is vital that such services are reinforced and supported to optimise healthcare recovery both for Covid-19 related illness and for the inevitable huge healthcare backlog created as a result of the pandemic. Ensuring we have appropriate staff, equipment and IT support to underpin laboratory services is vital*."

Within the Scottish Public Sector there continues to be a focus on regional working and shared services. Testing volumes vary by discipline however overall anecdotal evidence provided to the project team estimates that there is approximately a 2-3% increase in testing each year. The increasing demand on services will have to be met within the resources to sustain current services - financial and human - that NHS Scotland has at its disposal. Adoption of a common LIMS implemented by Boards based on a nationally agreed approach and standards will support the breaking down of geographic and organisational barriers in the delivery of support services and functions.

1.4.2. Clinical Value

Alongside the evolving DSM, adoption of a common modern LIMS by Boards will be a key enabler to altering care pathways with potential benefits to patient experience and operational efficiencies through performance gains. LIMS will enable multidisciplinary team working, in particular the production of diagnostic pathways and cascading of tests to support appropriate use of resources. LIMS can support improved productivity and efficiency across laboratories to allow staff to work smarter as well as streamline less efficient processes. This will help to improve turnaround times on referred patient results as well as improving the patient

[4]https://blogs.gov.scot/health-social-care/2021/11/16/data-strategy-for-health-and-social-care/
[5] https://www.rcpath.org/asset/442FCDC1-AF22-401F-8FCD1B4B65603810/
[6]https://www.rcpath.org/uploads/assets/97efe4ad-c9fe-486b-9b52e0363b56d9d9/7682c7b4-1f5a-4239-ad07bee24a9b1551/RCPath-Scotland-Manifesto-2021final.pdf

pathways resulting in an enhanced patient experience and enable operational efficiencies. For example, the potential to reduce length of bed stay as faster availability of test results and coherent multi-disciplinary reports will help enable speedier diagnosis and therefore provides the opportunity to reduce the time to discharge.

LIMS will also provide capability for advanced reporting across multiple disciplines. Currently, older LIMS do not have the functionality to generate integrated report for genetics haematology and pathology - this capability would help clinicians identify appropriate treatments and follow up tests potentially leading to improved patient safety and outcomes.

1.4.3. Sustainability

As previously reported in the DSM business case[7], the current model of laboratory services delivery across Scotland is not equitable nor is it nationally sustainable in light of the challenges they face. Demand across services is increasing, requiring Boards to utilise the same, or even fewer, resources to maintain current services.

There is significant complexity with each of the Boards current LIMS which has evolved organically over many years. Due to the poor and limited functionality of existing solutions there is a high reliance on bolt-on solutions, many of which are built in-house and not properly supported. This presents a significant business continuity and security risk. Adopting a common LIMS and standardising associated processes and data sets across NHS Scotland provides a significant opportunity to have a more sustainable and robust solution. Adoption of a common LIMS by Boards based on nationally agreed standards and approaches may also make it easier to replace or rationalise other national solutions in the future (for example SCI Store).

1.4.4. Demand Optimisation

Nationally, for Laboratory Medicine, the vision for Scotland is to deliver "*the Right Test, in the Right Place, at the Right Time, with the Right Impact*"[8]. Demand Optimisation is key to this vision. Demand Optimisation is defined as the process by which diagnostic test use is optimised to maximise appropriate testing, which in turn optimises clinical care and drives more efficient use of a scarce resource.

It has been recognised for many years that there is considerable variation in the use of diagnostic tests across NHS Scotland. While some of this variation can be explained by clinical circumstances and demographic differences, there still exists considerable levels of inappropriate requesting by clinicians, practises of over-requesting and under-requesting etc. In addition, lack of availability of certain tests across the NHS Boards may also limit their optimal universal utility.

Adoption of a common modern LIMS by Boards is a key enabler to reducing unnecessary testing across primary and secondary care. This will free up capacity to address rising demand and deliver testing that positively affects the patient pathway, supports primary care preventative measures, reduces hospital referrals and admissions, and supports equity of care for patients regardless of where they are or where they access Laboratory services.

[7]https://www.smvn.scot.nhs.uk/wp-content/uploads/2018/11/BBartlett.pdf
[8]https://www.npex.nhs.uk/Content/Downloads/News/181008/3_Bill_Bartletts_NPEx_prestentation.pdf

1.5. Summary of the OBC

The final OBC was developed in July 2020 and it provided an overview of the strategic rationale for investment in a modern LIMS, presenting a national picture of the benefits, costs and risks associated with investing in LIMS. A brief summary of the findings and conclusions of the OBC is set out below.

1.5.1. OBC Options

Multiple options were set out for the implementation of LIMS. A short-listing exercise was undertaken to determine the options to take forward for further analysis within the OBC. This exercise was completed by the Project Team and LIMS Evaluation User Group, and the below options were shortlisted for further analysis:

Option 1: Do Nothing - all 'core'[9] laboratory services including blood sciences, microbiology, and histopathology[10] will be delivered from existing LIMS. For NHS Boards that have molecular genetics and blood transfusion, these will continue to reside on their own separate LIMS. There will be no change to cross Board / Region working practices or standards.

Option 3: Unified Consortium - Boards collaborate to agree a national LIMS specification and select a common solution to be made available for Boards to adopt. The implementation approach, roll out strategy, and hosting approach will be informed as part of the procurement process. However, it is anticipated that some Boards would work together to implement and utilise a common LIMS instance.

- Option A: Core LIMS, Genetics and Blood Transfusion - all disciplines are included in the procurement scope including Genetics and Blood Transfusion for Boards that require these capabilities.
- Option B: Core LIMS and Genetics - Core LIMS disciplines and Genetics, for Boards that require this capability, are in scope. Blood Transfusion is not included in the procurement scope.
- Option C: Core LIMS and Blood Transfusion - Core LIMS disciplines and Blood Transfusion for Boards that require this capability, are included in the procurement scope. Genetics is not included in scope.
- Option D: Core LIMS only - Core LIMS disciplines are only included in the procurement scope. Genetics and Blood Transfusion are not included in scope.

1.5.2. Economic Case

The key benefits and risks from implementing a common modern LIMS system were identified by the Evaluation User Group.

The benefits outline how replacing the current different, ageing LIMS systems will provide improved clinical value, improved and sustainable operations and help Laboratory teams effectively manage and optimise demand. While the benefits are primarily described in the context of operational improvements, ultimately, they will contribute to improved patient outcomes. At this stage it was not anticipated that the move to a common LIMS would enable significant monetary benefits, and quantitative/ monetary savings were not

[9] 'Core' Lab services did not include Genetics & Blood Transfusion for the purposes of the OBC.
[10] For OBC purposes, Blood Sciences covered disciplines including biochemistry, haematology and immunology, and Microbiology covers disciplines including bacteriology and virology.

included in the economic or financial appraisal elements of the OBC. It was highlighted that quantitative savings will likely be as a result of a combination of initiatives involving modernising LIMS, further development of a DSM and wider standardisation activity across NHS Scotland. A weighting and scoring exercise was undertaken to rank each of the shortlisted options in terms of their relative non-financial benefit. The purpose of this assessment was to understand any differential between shortlisted options in non-monetary terms.

A risk workshop focused on identifying the implementation risks and weighting each risk by level of concern. A follow-up exercise was completed by the workshop participants to assign a risk score for each option. Risks related to the supplier, NHS resource capacity, specifications, technical complexity, LIMS availability, change management, funding, and governance were scored by the Evaluation User Group to distinguish between the shortlisted options. The objective of the scoring exercise was to assess the level of new or additional risk that each option may introduce.

It should be noted that the status quo option was not scored against either benefit or risk. The key factor to consider was whether any of the options introduced additional or new risks in comparison to risk that already exist under existing arrangements. As such, the status quo option would have been judged to score zero across all risk categories.

A key point of discussion by the Evaluation User Group was the weighting % applied to the NHS Resource Capacity risk which reflects this was the highest area of concern amongst the Evaluation User Group. Given the complexity of the implementation it was highlighted that investment in NHS capacity would be critical to the success of the project to enable NHS staff to be backfilled to provide dedicated input into the project.

The OBC concluded that based on the analysis undertaken, Option 3a (Core LIMS, Genetics and Blood Transfusion), which showed the lowest cost per benefit point, is the preferred option for Consortium Boards. Option 3b (Core LIMS and Genetics) was shown to have a relatively similar cost per benefit point evidencing the importance of Genetics inclusion in LIMS Replacement. Option 3a attracted the highest benefit score reflecting that increasing the scope of the LIMS will deliver the greatest opportunity for maximising benefits against each of the benefit categories. Option 3a also however attracted the highest risk score indicating that increasing scope will be more complex for Boards to implement whereas 3d (Core LIMS only) scored the lowest given the scope of the replacement is more closely aligned to current solutions in place by Boards.

The table below incorporates the economic cost of each option with the identified weighted benefits and risks.

Table 5: OBC Option Appraisal

Option Appraisal	Option 3a: Core LIMS, Genetics and Blood Transfusion	Option 3b: Core LIMS and Genetics	Option 3c: Core LIMS and Blood Transfusion	Option 3d: Core LIMS only
Weighted Benefits Points	931	805	673	558
Weighted Risk Points	1578	1406	1236	1167
Risk Per Benefit Point	1.69	1.74	1.84	2.09
Option Rank	1.00	2.00	3.00	4.00
NPC Per Option (£k)	82,060	80,610	80,020	78,130
Cost Per Benefit Point (£k)	88	100	119	140
Option Rank	1.00	2.00	3.00	4.00

1.5.3. Financial Case

A financial appraisal based on a number of assumptions was undertaken to illustrate the estimated affordability of the Preferred Option.

The VAT and Depreciation considerations increase the total Financial Cost to each Board over the 10-year period. Each Board has a minimum VAT cost of c£800k, and indexation of c£300k over the 10-year period, with the larger Boards having higher costs as expected.

It was assumed that the majority of funding, other than shared resources, for LIMS will come from individual Consortium Board budgets. The OBC highlighted that further discussions would be required to agree the most appropriate funding model.

1.5.4. Commercial and Management Cases

The OBC established that the Competitive Procedure with Negotiation (CPN) was the preferred procurement procedure for NHS Scotland in this case. Whilst it is a relatively new procedure it has previously been used by NHS Scotland including for the GP IT and CHI procurements. It provides flexibility to reduce the number of suppliers to be invited to negotiate and provides the opportunity to negotiate to help ensure the optimum solution is procured, while providing flexibility around what element to negotiate on. CPN is also generally quicker than the Competitive Dialogue process. NHS Scotland are seeking to establish a single supplier National Framework to secure the services required to provide LIMS. This will provide flexibility in dealing with uncertainty over deployment phasing and timing and commitment of funding whilst also delivering a route to a common solution. As each Board becomes ready, it can call off its deployment.

To realise the benefits of a common solution, the LIMS project highlights the need for strong governance that supports a common approach, for example to agree national standards, sharing of resources and managing suppliers as a consortium to drive positive supplier behaviour. The OBC set out governance arrangements to manage this process, including a Project Board, the eHealth Leads Strategy Group, the Project Team, LIMS Evaluation User Group, as well as the Laboratories Executive Board and Local Board Executive Management Teams with the following responsibilities:

- The Project Board is responsible for approving the procurement strategy, shortlisting of vendors and selection of the preferred solution.
- The eHealth leads Strategy Group is responsible for approving the FBC (note that this responsibility is now with the LIMS Project Board).
- The Project Team will be supported by a LIMS Evaluation User Group comprising of Subject Matter Experts (SMEs) and consortium board representatives. The Project Team may seek additional advice and support from the Regional Laboratory Medicine Delivery Boards as required however no formal reporting into these boards will be put in place.
- The National Laboratories Executive Board (LEB) and Local Board Executive Management Teams will be kept informed however will not provide approval / sign-off of any of the procurement artefacts.

2. LIMS Options

During development of the OBC a long-list and short list of options for implementing a LIMS solution were identified. The following section outlines the impact of proceeding with the 'do nothing' option, as well as the implementation options for the preferred option identified in the OBC. In the preferred option, Option 3A (Unified Consortium with Core LIMS, Genetics and Blood Transfusion), Boards collaborate to agree a national approach and national standards and adopt the same LIMS solution. All disciplines are included in the procurement scope including Genetics and Blood Transfusion for Boards that require these capabilities.

It is recommended that the Consortium Boards work together to implement and utilise a common LIMS solution with deployment of a single national instance or regional instances representing the most beneficial options. By initially implementing a national configuration as a National LIMS Reference Platform, NHS Scotland will realise several advantages as the country strives towards a unified National Pathology Service. Key is the ability to reduce unwarranted variation in the delivery of healthcare.

To fully meet the defined requirements and the longer-term goal of a fully integrated Laboratory Medicine service across Scotland, all short-listed suppliers have recommended the implementation of a solution with as few instances as possible, which includes a single national instance or (three) regional instances. This would require the coordinated input from all Consortium Boards to form a set of nationally agreed standards and approaches that individual Boards can then locally apply as required i.e., a national configuration and build.

Recognising the potential challenges in adopting a single national solution, this national configuration could provide the starting point to be copied and deployed as three regional instances with subsequent Boards being implemented on the appropriate regional instance. This standardised approach will greatly facilitate any subsequent migration to a national deployment and further support the service transformation goals identified. Alternatively, a "master build" could be developed separately for each region or even for each Health Board.

It is important to note that while transfer of orders and results, and full traceability are possible for options 2.2 to 2.4, board resource requirements and costs are expected to increase as more instances are deployed.

2.1. 'Do nothing'

All 'core'[8] laboratory services including blood sciences, microbiology, and histopathology[9] will be delivered from existing LIMS. For NHS Boards that have molecular genetics and blood transfusion, these will continue to reside on their own separate LIMS. There will be no change to cross Board / Region working practices or standards.

The 'do nothing' option would offer no improvement to the current situation and none of the associated benefits would be realised. Individual Boards would then have to go ahead with procuring their own solution to update or replace their existing LIMS. This would result in continued disparity between both laboratory software and data across Boards, impeding meaningful cross border information sharing and analysis. Boards across Scotland would also not be able to benefit from using economies of scale to drive down costs. Overall, it is felt that this option would not support the move to a DSM for Scotland.

2.2. Single national instance

For this option a unified LIMS solution would be provided to all Consortium Boards through a single national instance. This would require upfront investment for national configuration and the go-live of the first board. Subsequent implementations would follow with reduced cost and effort.

A single national instance would provide a number of key advantages, including:

- A high degree of national configuration resulting in increased standardisation and reduced IT variation;
- Fully integrated national working and a full national pathology record to support improvement in patient outcomes;
- The most cost-effective solution from a technology and application perspective;
- Efficient use of shared skills and training materials;
- Shared national benefits realisation and associated effort;
- Shared national testing plans, scripts and testing effort;
- Analytics capabilities enhanced as a result of access to data from all lab sites; and
- Enhanced service resilience and enabling cross border distributed working to maximise workforce capabilities and capacity.

Engagement by the Project Team with stakeholders have highlighted that some disciplines are currently more aligned than others. For example, there are a lot of communalities in Cellular Pathology across Scotland, and the community is keen to implement a single national instance. They will be publishing the Cellular Pathology Target Operating Model (TOM), which is being developed in line with the concept of DSM, over the next few months. They are looking for "*a robust nationally interoperable Laboratory Information Management System (LIMS) for all cellular pathology services across Scotland, without inequalities in the support of cross-board workflows and information transfer, ensuring interoperability with relevant partners (genetics for molecular pathology)*." Similarly, there are only four genetics departments across Scotland (Aberdeen, Dundee, Edinburgh and Glasgow), and therefore it would make sense for these to be standardised nationally.

Implementing a single national instance also brings some challenges. Having all Consortium Boards move to the same system configuration may not immediately be feasible depending on local requirements. It is important to note that the vendors have highlighted that even in the case of a single instance, they can allow for variations within regions and individual boards. It will be important to establish what level of variation is feasible.

Specific opportunities for local variation will depend on the selected vendor solution, however, for illustration Intersystems have provided the below table, which provides an example for what could be configured locally:

Table 6: Intersystems Standard vs Local Configuration

	Example – Haematology FBC	Setup
Core System Tables	• Requestors and Requesting Locations etc	Standard
Test Set	• FBC – Full Blood Count	Standard
Test Item	• Hb (g/L)	Standard
Specimens and attributes	• Blood - 4ml EDTA Container	Standard
Operational Reports and Labels	• Primary Specimen Labels, Material Labels	Standard
Reference Ranges	• Hb - 115 – 165	Local Variation
Protocols (Lab SOPs)	• Making a Blood Film	Local Variation
Worksheets	• N/A	Local Variation
Instruments (and QC)	• Channel Maps / Flags • Auto Authorisation Rules	Local Variation
Lab Transfers	• Send from Site A to Site B	Local Variation
Verification Workflow (Queue)	• Technical and Clinical Verification	Local Variation

	• Phone Queues	
Decision Support	• Demand Management, Reflex Tests, Add Comments, Queue Movement	Local Variation
Storage Management	• Storage Locations and Container	Local Variation
Report Publication	• Electronic Report and Printed Dr Reports	Local Variation

*__Standard__: Setup once on the instance (Single Board, Regional or National); **Local Variation**: Setup can be different per lab site

Wellbeing Software have stated that their solution, Evolution vLab, supports a National Reference Platform and allows for variation across Boards and/ or variations across disciplines. As variations become less needed, they can be removed at the discipline, Health Board or regional level and move closer to the National LIMS Reference Platform. The basic concept is that once the National LIMS Reference Platform has been agreed and implemented with Evolution vLab, each Health Board would review this and adopt as much of this as they can, and then add local or regional variations where the National LIMS Reference Platform does not meet there need. The objective is to minimise the variation across disciplines and Boards. The result is a National database of results that is viewable by any Health Board, the highest level of consistency in reports for clinicians, and access to a full patient history regardless of where testing was performed. In the above example, there would not be a need for separate independent databases. According to Wellbeing Software this reduces the need to purchase and support additional hardware, pay for separate projects, and have separate support contracts with each independent Health Board or Regions of Boards. The supplier has stated that if NHS Scotland were to require separate independent databases, this is possible, and these could be run as independent projects and run parallel to the National System.

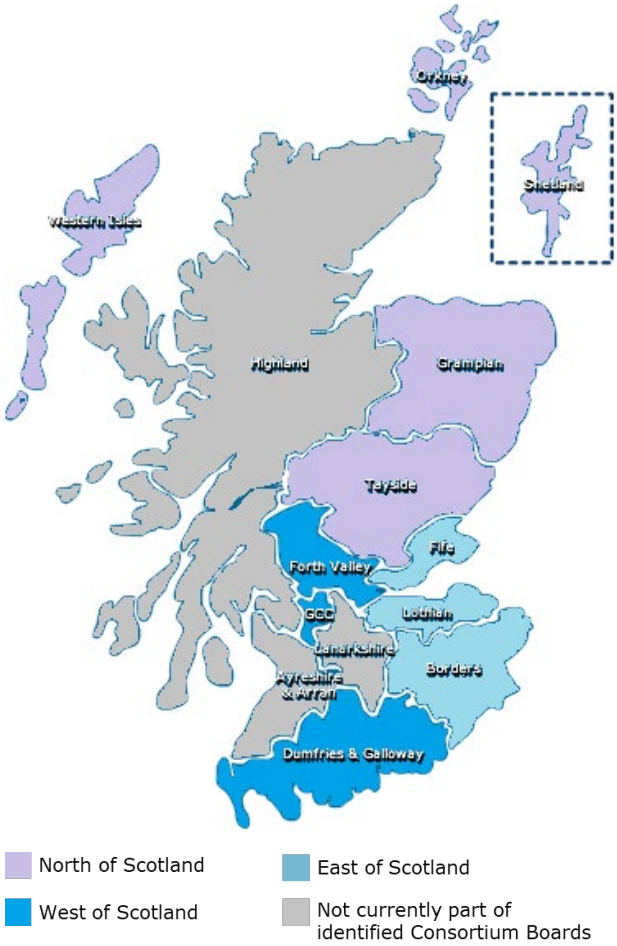
Whilst a single national instance is the most cost efficient in terms of implementation cost, there is a cost to standardisation. For example, Boards currently have their Primary and Secondary Order Communication Systems configured for their own local set up. Depending on the configuration required by a new LIMS solution, Boards may have to rework their downstream systems as part of implementation, which would require significant effort. In the best-case scenario, some level of local configuration can be retained, and the integration engine can then handle standardisation of any national level reporting.

Moving to a national instance would also require strong governance, where any changes proposed by one Health Board would have to be agreed by everyone. This could lead to slower processes, which in turn may impact on the ability to implement efficiently.

2.3. Regional instances

For this option a unified LIMS solution would be provided to all Consortium Boards through multiple, regional instances. The recommendation is to have three regional instances: East of Scotland (NHS Fife, NHS Lothian and NHS Borders), West of Scotland (NHS GGC, NHS Dumfries & Galloway, NHS Forth Valley, NHS Golden Jubilee National Hospital) and North of Scotland (NHS Tayside, NHS Grampian, NHS Orkney, NHS Shetland, NHS Western Isles)[11].

Figure 1: Health Boards by region



There are two options for implementing regional instances.

- A national configuration or "master build" could be agreed by all Consortium Boards for the first region go-live and this could then be applied to the other regions.
- A "master build" could be defined separately for each region.

It is important to note that for the first region the initial Health Board will have the highest implementation costs, as they would carry the cost of developing the initial "master build" configuration, which could then be deployed for subsequent Boards/ copied across regions. Consortium Boards could agree to share this upfront cost.

[11]https://www.researchgate.net/publication/342751621_Transforming_NHSScotland's_lab_services_a_blueprint_for_the_future

This approach continues to provide several of the advantages outlined for a single national instance:

- Consistency across regions and as such reduced IT variation and improved standardisation;
- Enables Consortium Boards within a region to easily share information and support meaningful cross-border working;
- Supports the ability for a user to move across all sites within that region;
- Efficient use of shared skills and training materials across the regions;
- Reduced timelines for subsequent implementations in the same region;
- Reduced cost compared to individual instances;
- Shared benefit realisation and associated effort; and
- Shared testing plans, scripts and testing effort;
- Opportunity to apply some local workflow configuration on a per Health Board basis that would be incorporated within the configuration for the regional solution;

However, there are also a number of disadvantages when compared to the single national instance:

- There is the potential for workflow variation from other regions to impact seamless cross border distributed working:
- Analytics capabilities and pathology records could be constrained regionally;
- Consortium Boards within a region would still require a consistent approach; and
- Multiple instances will result in higher support costs than a single instance as the cost depends on the number of instances and degree of common configuration.

Wellbeing Software have stated that if regional or local implementations are physically separate, then each instance would be priced for support and hosting services and they expect that in aggregate this would be more than the support for a national instance.

Similarly, InterSystems and CliniSys expect the cost to increase with the number of instances, with all suppliers indicating in their pricing model that a regional approach would save money when compared to the cost of implementing individual instances (see Section 5: Economic and Financial Case for cost comparison).

2.4. Individual Health Board instances

In this option, Consortium Boards agree national standards and a national approach but implement LIMS using individual instances.

This option provides the highest flexibility for individual Consortium Boards in terms of implementing the solution as configuration would be Board specific and determined during the Discovery stage for each board. Boards would call off the solution as required and this would likely involve several independent projects, which could result in shorter implementation time for individual boards.

However, this option introduces several disadvantages:

- Highest potential for variation, which would impact standardisation and cross-border working;
- Creates more complexity and likely that meaningful cross border information sharing, and analysis would remain challenging;
- Expected to be the most expensive solution;
- Local training materials; and
- Local testing plans, scripts and testing effort

Currently, where there are common solutions in place (for example CliniSys / Lab Centre in NHS Shetland, Orkney, Borders Golden Jubilee/ National Waiting Times Centre, Tayside and Fife), differences in service configurations and processes lead to variation and complexity in LIMS configuration. Together, these introduce barriers to cross border working of laboratory professionals (e.g., cross border reporting and results validations) and aggregation of data. This indicates that similar issues could remain should individual instances be implemented.

3. Benefits & Risks

This section outlines a summary of the benefits and risks associated with implementing a modern LIMS solution. These draw on those identified in the National OBC and have been discussed and validated during a Benefits & Risks workshop with the LIMS Evaluation User Group.

3.1. Introduction

Laboratory services in Scotland play a vital role in the prevention, diagnosis and treatment of illness, helping us understand what is making a patient unwell. Laboratory professionals undertake research, advancing medicine and devising new treatments, and have been crucial in the response to the Covid-19 pandemic.[12]

Laboratory services depend heavily on modern IT systems for sample tracking, analysis and reporting results. However, as outlined in the strategic case, current LIMS in Scotland are often over 25 years old and not fit for purpose. A lack of interoperability between Boards means results cannot be electronically shared or transferred, and no meaningful analysis for business intelligence can be carried out.

The collection, management, sharing and interpretation of pathology information digitally will improve patient care, and support the pathology workforce by making the diagnosis and monitoring of disease much more efficient.[13] A modern, unified LIMS will also enable Boards in Scotland to work together to address long-term challenges, such as issues with capacity to respond to increasing demand on services.

The LIMS Evaluation User Group assessed the benefits and risks identified during the OBC in an interactive workshop in January 2022. 22 participants attended the workshop with representatives from Consortium Boards across Scotland (NHS Borders, NHS Fife, NHS Forth Valley, NHS GGC, NHS Grampian, NHS Lothian, NHS Tayside, NHS Shetland), NHS Education for Scotland and Public Health Scotland. Specific input was also received from several disciplines, including Cellular Pathology, Blood Sciences and Genetics.

3.2. LIMS Benefits

The key benefits identified by the LIMS Evaluation User Group during the OBC that are expected to be realised by a modern LIMS are described in Table 7 below. These benefits and their weightings were validated by the LIMS Evaluation User Group during the Benefits & Risks Workshop.

The benefits outline how replacing the current ageing LIMS system will provide improved clinical value, improved and sustainable operations and help Laboratory teams effectively manage and optimise demand. While the benefits are primarily described in the context of operational improvements, ultimately, they will contribute to improved patient outcomes, for example:

- improved turnaround times on referred patient results;

[12]https://www.rcpath.org/uploads/assets/97efe4ad-c9fe-486b-9b52e0363b56d9d9/7682c7b4-1f5a-4239-ad07bee24a9b1551/RCPath-Scotland-Manifesto-2021final.pdf
[13]https://www.rcpath.org/uploads/assets/97efe4ad-c9fe-486b-9b52e0363b56d9d9/7682c7b4-1f5a-4239-ad07bee24a9b1551/RCPath-Scotland-Manifesto-2021final.pdf

- improved patient pathways – potential to reduce length of bed stays, faster availability of test results, potential to introduce intelligent result automation (such as iLFTs)[14] in a widespread manner to provide decision support for clinicians, and ultimately quicker patient treatment and discharge;
- improved patient experience - reduced error rates in lab to lab requesting - reduced numbers of repeat patient attendances at clinics as a consequence of missing results;
- improved equity of care – a common and standardised LIMS enables a consistent approach regardless of patient location; and
- improved patient safety by reducing transcription errors with reports from provider labs being delivered electronically with commentary.

At this stage, it is not anticipated the move to a national LIMS will enable significant monetary benefits therefore, quantitative/monetary savings have not been included in the economic or financial appraisal elements of this business case. However, it is expected that savings can be expected depending on the implementation approach with fewer instances leading to a reduction in cost.

Additional quantitative savings will likely be a result of a combination of initiatives involving modernising LIMS, implementation of a DSM, demand optimisation, business analysis (cost per test) and wider standardisation and reduction in waste activity across NHS Scotland. Together these initiatives could achieve efficiencies to support future cost reduction initiatives, e.g. reduction in administrative activities, reduced hosting costs through collaboration, increased clinical capacity through more efficient processes etc.

Table 7: LIMS Benefits

Category	**Benefit Description**
Clinical Value	Improved reporting, including integrated reporting in keeping with NICE guidelines
	Improved functionality allowing modern analytical tests to be reported appropriately
	Histopathology case tracking, and in some cases the introduction of improved general laboratory tracking, reducing chances of mismatching, misplacing or "losing" patient requests
	Increased communication options between disciplines, lab sites and NHS Boards
	Improved flagging of results requiring action
Operational	Reduction in burden for transition of staff and work, through the reduction in re-training of staff & re-booking of results
Sustainability	Reduction in risk of hardware and software failures through the innovative use of technology, the simplification of technical & clinical architecture
	Supports the development of the DSM – or any future work on reconfiguration - for Scotland
	Standardisation of outputs will make it easier to replace connecting solutions in the future (e.g. SCI Store)

[14]https://www.nhsx.nhs.uk/key-tools-and-info/digital-playbooks/gastroenterology-digital-playbook/using-an-algorithm-to-improve-interpretation-of-liver-function-tests/

Category	Benefit Description
Demand Optimisation	Optimises diagnostic testing use to maximise appropriate testing
	Optimises the use of resource while reducing turnaround times by streamlining processes related to clinical authorisation

A weighting and scoring exercise was undertaken to rank each of the implementation options in terms of their relative non-financial benefit. The purpose of this assessment was to understand any differential between the three implementation options in non-monetary terms.

The same weightings determined during the OBC was applied, as the Evaluation User Group deemed them as appropriate.

During the workshop, participants scored each implementation option in terms of their relative benefit on a scale from one to ten according to the degree to which the option contributes to the realisation of the benefit. The scorings across each benefit represent an average score provided by the Evaluation User Group participants. A worked example of this is presented below.

It should be noted that the status quo option was not scored against either benefit or risk. The key factor to consider was whether any of the options introduced additional benefits in comparison to benefits that are already delivered under existing arrangements. As such, the status quo option would be judged to score zero across all benefit categories.

The scoring of the implementation options using the benefits evaluation criteria is presented in Table 8.

The option of implementing a single national instance attracted the highest benefit score reflecting that standardising LIMS as much as possible across the country will deliver the greatest opportunity for maximising benefits against each of the benefit categories. Conversely the lowest scoring option was implementing individual Health Board instances, which scored significantly lower than both the national and regional implementation options. This reflects that if Boards implement the solution on individual instances, there is a high chance of variation, which would negatively impact any benefits related to increased standardisation and interoperability.

Worked Benefit Example:

- Benefit: Improved reporting, including integrated reporting in keeping with NICE guidelines
- Option: Single national instance
- Benefit Weighting (calculated during OBC):
    - 6 People Ranked it 5/5 = 30
    - 4 People Ranked it 4/5 = 16
    - 1 Person Ranked it 3/5 = 3
    - Total Ranking / Total People = 49 / 11 People = 4.4
    - Relative score of 4.4 (specific weighted benefit score) / total of 44 points (total of weighted benefits scores) = **10%**
- Option Ability to Realise Benefit:
    - 7 People Ranked it 10/10 = 70
    - 4 People Ranked it 9/10 = 36
    - 3 People Ranked it 8/10 = 24
    - 2 People Ranked It 7/10 = 14
    - 3 People Ranked it 5/10 = 15
    - 1 Person Ranked it 3/10 = 3
    - Total Rank / Total People = 162 / 20 People = **8.1**

Table 8: Scores from benefit assessment of implementation options

			Single national instance	Regional instances	Individual Health Board instances
Category	**Benefit Description**	**Weighting**	**Average Score**	**Average Score**	**Average Score**
Clinical Value	Improved reporting, including integrated reporting in keeping with NICE guidelines	10%	8.1	7.3	4.6
	Improved functionality allowing modern analytical tests to be reported appropriately	10%	8.5	8.2	6.4
	Histopathology case tracking, and improved general laboratory tracking reducing chances of mismatching patient requests	9%	7.7	6.9	4.5
	Increased communication options between disciplines, lab sites and NHS Boards	9%	9.1	7.7	3.9
	Improved flagging of results requiring action	8%	8.1	8.3	7.0
Operational	Reduction in burden for transition of staff and work, through the reduction in re-training of staff & re-booking of results	8%	7.8	7.1	4.3
Sustainability	Reduction in risk of hardware & software failures through the innovative use of technology, the simplification of technical & clinical architecture	9%	6.6	7.2	5.6
	Supports the development of the DSM for Scotland	10%	8.8	7.4	4.3
	Standardisation of outputs will make it easier to replace connecting solutions in the future (e.g. SCI Store)	10%	8.9	7.6	4.5
Demand Optimisation	Optimising diagnostic test use to maximise appropriate testing	9%	8.2	7.4	5.2
	Optimises the use of resource while reducing turnaround times by automating current clinical authorisation	8%	7.7	7.4	5.9
	Total Weighted Benefit Scores	100%	**814**	**748**	**507**
	Overall Benefit Ranking		1	2	3

3.3. LIMS Risks

It is important to recognise that as well as delivering additional benefits, there will also be risks associated with implementing LIMS across Boards in Scotland. The risks identified during the OBC were assessed during the Benefits & Risks workshop with the User Evaluation Group. During the workshop, it was determined that an additional risk relating to Product Capability should be added, and the descriptions of several of the risks were updated. The weighting of the risks was also reassessed.

The table below sets out the updated risks and associated mitigation strategies.

Table 9: LIMS Implementation Risks

Risk	Category	Description	Mitigations
Supplier Capability / Capacity	Business & Reputational	There is a risk that the supplier is unable to deliver the level of support or resourcing to enable Boards to implement according to the agreed plan.	• Suppliers were asked to provide detailed implementation plans, which include resource requirements for both the supplier and NHS resources. • Suppliers were asked for evidence that they have completed similar work successfully in the past. • Suppliers were asked to provide references from other sites. • The potential need for the selected supplier to hire staff was discussed with the vendors during procurement.
Product Capability	Clinical & Business	There is a risk that the solution supplied is not technically capable of meeting all the requirements of Boards in line with the agreed implementation plan and/or Boards' expectations.	• Detailed specification for the technical requirements were set out during the procurement process, which were reviewed by clinical staff. • All Consortium Boards were involved throughout the procurement process.
Incomplete Specification	Business	There is a risk that requirements evolve during the contract beyond initial stated specification resulting in need for change controls and increasing the cost of the solution.	• Strong governance arrangements were implemented to QA the specification and score it appropriately. • The business requirements were identified by importance with the mandatory requirements being limited to the absolute essential ones. • A process for change management has been submitted by the suppliers as part of the implementation plan.
Integration / Technical Complexity	Business & Clinical	There is a risk that suppliers may struggle to deliver interfaces to the required levels of functionality, performance, reliability, and maintainability. This may lead to increased costs due to extra effort to develop the interfaces and delays to the agreed plan and timescales.	• Ensure that the full complexity of requirements is identified and understood before interfaces are developed, and by maintaining close dialogue between Boards and suppliers throughout procurement.
Deliverability of LIMS	Business	There is a risk regarding the feasibility and deliverability of a National standardised and integrated LIMS.	• A national approach with national standards that are applied locally provides the flexibility required by local Boards to adopt standardised configurations. • Strong governance mechanisms will be implemented that leverage existing structures to ensure appropriate oversight can be provided during implementation and maintenance (this includes setting up a National LIMS Implementation Programme Board and an operational group (NLOG)).

Risk	Category	Description	Mitigations
NHS Resource Capacity – Delivery	Business & Staff	There is a risk that there will be insufficient NHS resources to deliver the solution.	• Regional and national working exploits economies of scale and shared learning. • Suppliers were asked to provide a plan of NHS Resource requirements for the implementation phase. • Deployment strategy to be phased according to capacity.
NHS Resource Capacity – Support	Business & Staff	There is a risk that there will be insufficient NHS resources to maintain the solution.	• Regional and national working exploits economies of scale and shared learning. • Deployment strategy to be phased according to capacity.
LIMS Availability	Clinical	There is a risk that weakness in national or local infrastructure, or a poorly designed/implemented solution results in multiple and/or sustained periods of unavailability of the solution.	• Rigorous performance testing to provide confidence the availability requirements are satisfied. • Motivate suppliers through appropriate service levels/credit regime in the contract. • Ensure Boards are made aware of the relevant network and infrastructure requirements of the solution provider so that costs of upgrades are incorporated into local business cases.
Change Management	Business	There is a risk that inadequate change management and/or leadership results in poor adoption of LIMS and or unrealistic expectations meaning that Boards do not realise anticipated benefits.	• It is essential that existing and future processes are examined and understood. This will help the implementation team support operational staff in the transition to the new LIMS. • Strong clinical leadership is an essential part of successfully achieving this change to working practice, and in particular in ensuring that the new system and way of working is widely adopted. • Implementation team to include appropriate levels of business change and readiness resource.
Divergence of Standards	Business & Clinical	There is a risk that the governance is not effective, and Boards adopt their own standards and Boards do not realise the anticipated benefits.	• Strong governance mechanisms will be implemented (including NLOG) to ensure standards are set and controlled alongside appropriate change control processes. • Clear expectations of the role and responsibilities of the Consortium Boards will be defined and communicated including commitment to standardisation.
Funding	Business	There is a risk that Boards require additional funding and/or resource to implement, and the LIMS replacement becomes unaffordable	• Strong governance mechanisms will be implemented to ensure costs are closely managed and monitored. • Project management will be based on good practice to ensure costs are closely managed and monitored. • A procurement process is set out to ensure best value can be achieved with pricing being a significant evaluation criterion at 30%.

During the workshop, representatives highlighted the importance of including a risk related to product capability, as they felt that it is likely that suppliers suggest functionality is available in their specification

when there is still significant development work and/ or configuration required. This was highlighted as a particular risk for Cell Path.

It was felt that the risk related to integration/ technical complexity was significantly mitigated during procurement. However, it still remained a risk, its likelihood and impact dependent on the selected supplier.

There was also extensive discussion around the risk of LIMS Availability. Some representatives felt that there could be an increased risk to availability with a single national LIMS solution, while others argued this would not be the case. They highlighted that to a patient there is no perceived difference in whether a local or national instance experience downtime and argued that availability is mostly impacted by how frequently a system experiences unexpected downtime. In the case of a national instance, it was considered that perhaps more support/ resource would be available to deal with any potential issues. It was also noted that there are contractual requirements with regards to unscheduled downtime for the LIMS solution.

Finally, representatives highlighted that strong governance would be key to enabling the success of this programme.

Following the discussion, the above risks were scored by the Evaluation User Group to assess any differences between the implementation options. The objective of the scoring exercise was to assess the level of risk that each option may introduce. Each option was considered against each risk in turn and assigned a score in a range of 1 – 5 for the two key factors associated with risk - likelihood and impact:

Likelihood

- 0: The option will not introduce any additional or new risk in this area.
- 1: The option will introduce a marginal level of additional or new risk in this area.
- 2: The option will introduce a small level of additional or new risk in this area.
- 3: The option will introduce a moderate level of additional or new risk in this area.
- 4: The option will introduce a high level of additional or new risk in this area.
- 5: The option will introduce a very high level of additional or new risk in this area.

Impact

- 0: The risk will have no negative impact on the Board if it occurs.
- 1: The risk will have minimal negative impact on the Board if it occurs.
- 2: The risk will have some negative impact on the Board if it occurs.
- 3: The risk will have moderate negative impact on the Board if it occurs.
- 4: The risk will have a high negative impact on the Board if it occurs.
- 5: The risk will have a very high negative impact on the Board if it occurs.

The total risk score was calculated by multiplying the 'likelihood' score by the 'impact' score - once the weighting of the risk was applied, the total score was then presented as an overall ranking to align with the benefit scoring presentation. The weighting for risk categories indicates the area of risk judged to be of most concern and that Boards will have the least control over. A worked example of this is presented beneath in Table 10.

It should be noted that the status quo option was not scored against either benefit or risk. The key factor to consider was whether any of the options introduced additional or new risks in comparison to risk that already exist under existing arrangements. As such, the status quo option would be judged to score zero across all risk categories.

The scoring of the implementation options using the risk evaluation criteria is presented in Table 10.

Table 10: Scores from risk assessment of implementation options

		Weighted Score		
Risk	**Weighting**	**Single national instance**	**Regional instances**	**Individual Health Board instances**
Supplier Capability / Capacity	9%	72	85	114
Product Capability	9%	82	76	63
Incomplete Specification	8%	61	56	57
Integration / Technical Complexity	6%	59	55	45
Deliverability of LIMS	9%	92	75	80
NHS Resource Capacity	10%	121	130	121
NHS Resource Capacity - Support	10%	92	96	100
LIMS Availability	10%	75	67	57
Change Management	9%	78	73	48
Divergence of Standards	9%	40	70	95
Funding	11%	96	100	98
Total Weighted Risk Score	100%	**867**	**883**	**879**
Overall Risk Ranking		1	3	2

Worked Risk Example:

- Risk: Supplier Capability / Capacity
- Option: National Instance
- Risk Weighting:
    - 3 People Ranked it 5/5 = 15
    - 2 People Ranked it 4/5 = 8
    - 2 People Ranked it 3/5 = 6
    - 1 Person Ranked it 2/5 = 2
    - Total Ranking / Total People = 31 / 8 People = 3.9
    - Relative score of 3.9 (specific weighted risk score) / total of 43.9 points (total weighted risk scores) = 8.9%
- Likelihood & Impact of Risk based on Option:
    - Likelihood:
        - 3 People Ranked it 5/5 = 15
        - 1 Person Ranked it 4/5 = 4
        - 8 People Ranked it 3/5 = 24
        - 2 People Ranked it 2/5 = 4
        - 3 People Ranked it 1/5 = 3
        - Average Likelihood Score = 50/17 = 2.9
    - Impact:
        - 3 People Ranked it 5/5 = 15
        - 8 People Ranked it 3/5 = 24
        - 2 People Ranked it 2/5 = 4
        - 4 People Ranked it 1/5 = 4
        - Average Likelihood Score = 47/17 = 2.8

- Total Average Risk = 2.9 * 2.8 = 8.1
- Total Weighted Option Risk
    - Average Option Risk (8.1) * Risk Weighting (9%) * 100 = **72** (seen in Table 6 above)

The risk scores for all three implementation options were relatively close, indicating that there are similar levels of risk associated with a new LIMS regardless of the implementation approach.

However, implementing a single national instance did receive the lowest risk score since the risks of diverging standards and supplier capacity are expected to be significantly lower when employing this approach. Implementing regional instances attracted the highest risk score, highlighting the expected difficulty of taking such an approach with regards to funding and NHS Resource Capacity to implement the solution.

4. Commercial Case

The Commercial Case documents the procurement process that has been undertaken to put in place a Single Supplier Framework for LIMS and describes the next steps Boards will have to take to call off against the framework.

4.1. Single Supplier Framework

4.1.1. Governance

NHS National Services Scotland (NSS) was commissioned by NHS GGC to support establishment a single supplier framework on behalf of all NHS Boards in Scotland for the replacement of their LIMS.

The procurement process was overseen by the National Collaborative LIMS Project Board and the LIMS Project Team. Scott Douglas (eHealth Programme Manager for the NHS Scotland LIMS procurement programme), and Jim Binnie (Procurement Lead) led the Day-to-Day management and support of the procurement process.

All Consortium Boards were heavily involved in the functional and technical evaluation process as they helped develop the national LIMS operating requirements specification.

4.1.2. Contract Structure

The aim of the procurement was to put in place a Single Supplier Framework on behalf of all NHS Boards in Scotland for the replacement of their LIMS. The contract notice outlined that the framework agreement will provide LIMS services to the specification of a consortium of 11 NHS Boards and will provide a window of 5 years for all NHS Boards to replace their current LIMS services. Note that since this was issued, NHS Western Isles have joined the consortium of Boards, increasing the number of Consortium Boards to 12.

The intention of each NHS Board is to enter into a ten-year call-off contract pursuant to which LIMS and related services will be delivered.

The Framework and Call-Off Contract were drafted in line with CLO and received extensive input from members of the Project Board.

A draft payment structure is set out in the Call-off contract, which outlines that license fee and implementation charges will be paid in line with the achievement of four milestones:

- Milestone 1: 10% of licence fee & implementation charges
- Milestone 2: 20% of licence fee & implementation charges
- Milestone 3: 20% of licence fee & implementation charges
- Milestone 4: 50% of licence fee & implementation charges

4.1.3. Procurement Process and Timeline

A formal procurement process (Competitive Procedure with Negotiation as outlined in the OBC) commenced in April 2019 when a Prior Information Notice (PIN) was issued to the market followed by the contract notice and European Single Procurement Document (ESPD) in November 2020. The procurement timeline deviated from the original timeline set out in the OBC as shown in Table 11.

Table 11: Procurement Phases

Milestone	OBC Estimated Timeline	Actual Timeline
Contract Notice Publication & ESPD Issued	September 2020	November 2020
ESPD Deadline	October 2020	December 2020
Issue Instructions to Bidders	November 2020	January 2021
Initial Bid Submission Deadline	December 2020	May 2021
Initial Bid evaluation	January 2021	June 2021
Initial Negotiation	April 2021	November 2021
Negotiation Phase (Optional)	June 2021	*Not required*
Invitation to Submit Final Bids	July 2021	January 2022
Return of Final Bids	July 2021	January 2022
Successful Bidders Announcement	August 2021	February 2022
Framework Agreement Award	August 2021	March 2022

During the procurement process a number of commercial models were considered, including on premise hosted and supplier hosted solutions, as well as various implementation options, including a national, regional, multi-board and individual local approach.

Stage 1: European Single Procurement Document (ESPD) Supplier Selection

Once the contract notice closed, all interested suppliers had the opportunity to provide a response to the ESPD that was issued in November 2020. Eleven suppliers responded to the ESPD and were scored across five sections:

- Exclusion Grounds (Pass/ Fail);
- Economic and Financial Standing (Pass/ Fail);
- References (60%);
- Quality Control/ ISO (30%); and
- Qualifications (10%)

Based on the scores a short-list of eight suppliers was selected:

- Cirdan Imaging Limited
- CliniSys Solutions Limited
- CGM LAB Belgium S.A.
- CSC Computer Sciences Limited (later taken over by the Dedalus Group)
- Healthcare Software Solutions Ltd
- Intersystems Corporation
- SCC Softcomputer
- Technidata SAS

Stage 2: Initial bid stage

The contract framework and specification documents for the bid were sent to the eight selected bidders in January 2021 with a deadline to submit the initial bid by May 2021. Out of the eight suppliers, seven submitted a bid response. Dedalus Group, who had just taken over CSC Computer Sciences Limited, chose

to withdraw from the process before submitting an initial bid as they felt that they could not commit to the procurement.

The LIMS Project Team managed the detailed scoring process, which started in May 2021. All suppliers were scored across three criteria:

- Functional requirements (60%);
- Non-Functional requirements (10%); and
- Price (30%)

For Functional and Non-Functional requirements each element was scored on a scale from 0 to 5: 0 (very poor), 1 (poor), 3 (good), or 5 (very good). A detailed breakdown of the scoring approach is set out in the ITN documentation "Volume 6: Evaluation & Scoring Methodologies".

The evaluation panel involved 209 representatives from the 11 original Consortium Boards and all disciplines, including Blood Transfusion, Microbiology/ Virology, Genetics and Cellular Pathology. Scoring groups were set up and asked to score each section of the bid locally. They then nominated a representative to attend a national consensus meeting, where an agreement was reached on what the scores for each element should be.

All suppliers received a score of 30 points (out of 30 possible points) on the pricing section, as a financial threshold was set, which determined that any solution with a total cost less than £150 million would receive full marks. The bidders with the highest scores were therefore determined based on their responses to the functional and non-functional elements and were invited to the negotiation phase.

Suppliers were also asked for demonstrations of their product. These were not scored separately but used to validate the initial bid scoring.

Stage 3: Initial negotiation phase

Based on the initial bids, three suppliers were selected as they received the highest scores: CliniSys Solutions Limited (CliniSys), Intersystems Corporation (Intersystems) and Healthcare Software Solutions (Wellbeing Software).

During the negotiation phase, there were ongoing discussions with the three bidders, which involved 30 discussion sessions over a 4-week period (15th November 2021 until 10th December 2021) with all suppliers. Each supplier was given the same amount of time (10 sessions per supplier). The negotiation sessions covered the following items:

- Initial bid review
- Genetics
- Blood transfusion
- Instances (regional, local)
- Software and system upgrades
- Development
- Implementation
- NHS Responsibilities
- Hosting
- Data migration
- Support models
- Pricing
- Cellular Pathology

Stage 4: Interim Bid stage

Following the negotiation phase all three suppliers were invited to submit interim bids via email on December 2nd 2021 to ensure that the final bids would meet all requirements set out and discussed during

the negotiation phase. Suppliers were informed that these submissions would not be scored but used as a fact-finding step to help clarify understanding moving towards submission of a final bid. The deadline for interim bid submission was December 20th 2021.

The suggested solutions provided by all three suppliers are functionally very similar. CliniSys have the advantage of providing a system with particularly rich functionality and are well known in Scotland and the wider UK. They have also recently won work in Northern Ireland. Intersystem provide TrakCare and have experience in Scotland, however, they currently have no sites in Scotland. Similarly, Wellbeing Software appear clinically rich and have recently won the LIMS work in Wales. They also have a wide spread of work across Australia; however, they remain a relatively unknown provider in the UK with no local experience.

Stage 5: Final Bid stage

On January 14th, 2022, suppliers were invited to submit their final bids with a deadline of January 24th, 2022. The project team then granted an extension to January 28th, 2022. During the final bid stage, the evaluation team scored responses across four criteria:

- Functional Requirements (55%);
- Solution Demonstration (5%);
- Non-Functional Requirements (10%); and
- Price (30%)

For Functional and Non-Functional requirements each element was scored against four possible scores: 0 (very poor), 1 (poor), 3 (good), or 5 (very good).

Scoreable demonstrations were introduced to allow bidders to demonstrate how their solution meets the functionality detailed in specific scenarios outlined in the Supplier Demonstrations Scenarios document. NSS has reserved the right to revisit the scoring of written responses based on the demonstrations. Each scenario demonstration was scored across the following scale: 0 (unacceptable), 1 (poor demonstration), 3 (good demonstration), and 5 (excellent demonstration).

The bidder's price submission was evaluated on the basis of whole life cost over 16 years. Pricing for both individual Boards and a regional implementation approach was scored, while pricing for a national implementation approach was used for reference only. The lowest priced tender received a score of 30. A detailed breakdown of the scoring methodology is provided in the ITSFB document "Volume 6: Evaluation and Scoring Methodologies".

In addition to the written bid submissions and scoreable demoes, all suppliers were asked to provide references for existing sites. Due to restricted capacity from existing sites, it was not possible to arrange virtual site visits. Therefore, questionnaires were sent to all reference sites. These were not formally evaluated and used for reference only.

Based on the final bid submissions Wellbeing Software received the highest score and was selected as the preferred supplier. Table 12 below shows the total scores across all categories for the three suppliers. The suppliers were informed about the outcome on 14th February 2022, and a standstill letter was issued on 14th February 2022.

Table 12: Supplier Final Bid Scores

		Agreed marking (%)			Weighted Score (%)		
Level 2 Category	**Weighting %**	**CliniSys**	**InterSystems**	**Wellbeing Software**	**CliniSys**	**InterSystems**	**Wellbeing Software**
Functional Requirements	55	64.93	55.31	58.96	35.71	30.42	32.43
Non-Functional Requirements	10	56.84	60.09	52.70	5.68	6.01	5.27
Scored Demonstrations	5	-	-	-	2.96	2.40	2.11
Price	30	-	-	-	0.00	18.00	30.00
Total	100			**Total**	**44.35**	**56.83**	**69.81**
				Ranking	**3**	**2**	**1**

4.2. Contracting Process

Boards in Scotland have the option of using the preferred supplier on the single supplier framework, which negates the need for a mini competition. However, individual Boards will need to prepare local business cases to call off work with the preferred supplier under the framework. Based on the business case, the supplier will provide specific pricing.

The framework will be available to call off against for a period of 5 years.

Boards will have the option through the framework to select the relevant implementation approach (individual vs regional vs national).

5. Economic and Financial Case

The Economic and Financial Case outlines the costs associated with implementing a modern LIMS solution across the Consortium Boards of NHS Scotland. It documents the assumptions underpinning the development of the cost model, as well as the estimated economic and financial cost over a 10-year period for the preferred supplier, Wellbeing Software.

Boards will have to develop their own business cases based on this national FBC. To enable Boards to raise their local business cases to call off against the framework in their own time, this FBC provides the economic and financial cost breakdown based on an individual instance implementation approach for each Board. This represents the highest cost option, and thus provides Boards with the greatest flexibility. Based on the findings from the Strategic and Economic cases, it is recommended that the Boards collectively establish national and regional implementation teams to enable the effective move towards establishment of three regional instances.

5.1. Assumptions

The assumptions that underpin the cost model are outlined below.

5.1.1. Economic Appraisal Principles

Costs have been presented over a 10-year period, starting with mobilisation of the first Board, and uses the Treasury recommended discount rate of 3.5%.

5.1.2. Implementation Timeline

The implementation timeline for Boards has been developed by the LIMS Project Team and is based on the timelines submitted by the suppliers during the interim and final bid phases. It assumes a phased, regional approach to implementation, starting in April 2022 with NHS GGC and the formation of a West region instance.

Full details for the implementation plan, including the full implementation timeline, are available in Section 6.3.

5.1.3. LIMS Supplier Costs

Licence Costs: License costs were provided by Wellbeing Software. Wellbeing Software provided the same license costs for all three implementation approaches for the Concurrent License Fee, which is their Enterprise License model. Concurrent License Fees are calculated for each Health Board based on the number of LIMS users provided in the pricing model. License costs for Genetics and Blood Transfusion are added separately.

For the national implementation approach, Wellbeing Software have also provided the cost for an annual revenue (Software as a Service style) approach to licensing.

The financial model assumes that license costs will be paid in line with the milestones set out in the call-off contract, aligned to the implementation timeline as outlined in the table below.

Table 13: License Fee by milestone

Milestone	Requirement(s)	% of License fee payment due	Month in Implementation Timeline
Milestone 1	Completion of Purchase Order	10	M1 of Pre-Project Set up phase
Milestone 2	Finalise Data Migration/ Training plan	20	M1 System Validation
Milestone 3	System Go Live	20	M1 of Go Live phase

Milestone 4	Final Acceptance/ Completion of UAT followed by 30 days live	50	End of Go Live phase

Annual Support, Maintenance and Hosting Fee: The annual support, maintenance and hosting fee includes any hardware costs, the supplier support costs (including those for genetics and blood transfusion where required), and hosting costs.

These costs have been calculated based on the information set out in the pricing model by Wellbeing Software with only the hosting element being charged in Year 1. It is then assumed that the full annual support and maintenance costs will start with the beginning of the Go Live period for each Board.

It is important to note that Wellbeing Software have confirmed that they will provide a warranty for 12 months post operational go-live, which means that only hosting fees would be charged during that initial operational period. This would result in reduced costs post operational go-live. When producing local business cases, Boards should develop more detailed implementation timelines, in which they can reflect this discount.

For the purposes of the financial and economic appraisal, Genetics and Blood Transfusion support costs are included for relevant Boards. It is important to note that these are optional modules, and Boards may choose to exclude these in their local business cases. Detail of the support costs for Genetics and Blood Transfusion are provided separately for information at the individual Board level.

Wellbeing Software have provided costings for three support models:

- The support model as defined in the contract (call-off contract schedule Part 3. Support Services and Services Levels)
- Alternate Support 1: All Priority levels - 08:00-18:00 Monday – Friday only
- Alternate Support 2: All Priority levels - 08:00-18:00 Monday – Friday only and Priority 1 and 2 calls 24/7

Wellbeing Software have provided costing information for on-premises hosting, and for supplier hosted options for both the individual and regional instance implementation approaches. For the national instance implementation approach, they have only provided costing for a supplier hosted solution. For the on-premises hosting at a regional level, the costs of the individual Boards have been added up. For supplier hosting, cost savings have been applied for the regional and national implementation approaches.

For NHS GGC an additional £150k in Year 1 has been added to the Supplier Implementation cost line for hardware contingency in the event that barcode scanners and other such devices need to be replaced.

Supplier Implementation: This cost line adds up the costs provided by Wellbeing Software for Project Management, Implementation Support, Training, 3rd party software and other licence fees, Hardware, Other testing, Other charges, Genetics Implementation and Blood Transfusion implementation. Costs are incurred based on the implementation timeline as follows:

- Project Management: Whole implementation period
- Implementation support: Validation > End of Go Live
- Training: UAT > Go Live
- 3rd Party software and other license fees: Build & Config
- Hardware: Project Setup/ Discovery
- Other testing: UAT
- Other charges: Setup > Discovery

- Genetics Implementation: Discovery > Go Live
- Blood Transfusion Implementation: Discovery > Go Live

Wellbeing Software have provided consistent supplier implementation costs across the implementation approaches (individual vs regional vs national). For example, the project management costs for the single national instance approach are the sum of the costs of the individual Boards. The exception is for Genetics and Blood Transfusion implementation costs, which have been discounted in the national approach.

Genetics and Blood Transfusion implementation costs have been included for all relevant Boards. It is important to note that these are optional modules, and Boards may choose to exclude these in their local business cases.

Design: This cost line corresponds to the costs provided by Wellbeing Software for Customisation/ Software development. It is assumed that these costs will be incurred across the following phases: Build & Config > System Validation.

For the national and regional approaches, Wellbeing Software have simply aggregated the cost of the relevant individual Boards so the costs remain the same across different implementation models.

Build and Local Config: This cost line corresponds the costs provided by Wellbeing Software for Service localisation and configuration. The assumption taken is that these costs will be incurred across the following phases: Discovery > System Validation.

For the national and regional approaches, Wellbeing Software have simply aggregate the cost of the relevant individual Boards. Therefore, the costs remain the same across different implementation models.

Interface: This cost line corresponds the costs provided by Wellbeing Software for Integration and Interfacing to other systems. The assumption taken is that these costs will be incurred across the Build & Config phase.

For the national and regional approaches, Wellbeing Software have simply aggregate the cost of the relevant individual Boards. Therefore, the costs remain the same across different implementation models.

Data Migration: This cost line corresponds the costs provided by Wellbeing Software for Data Migration. The assumption taken is that these costs will be incurred across the following phases: Build & Config > Go Live.

For the national and regional approaches, Wellbeing Software have simply aggregate the cost of the relevant individual Boards. Therefore, the costs remain the same across different implementation models.

The assumption taken is that NHS GGC will pay an extra £50k for the data migration costs (double of what Wellbeing Software suggested in their pricing model) to account for the migration of the pathology data held in a legacy APEX system.

Additional Services: The assumption taken is that additional services will be required by the Boards on an annual basis. These include the following:

- Trainer - 4 days;
- Project manager - 20 days;
- Senior Developer/ Senior Tester - 5 days;
- Development Architect/ Designer - 5 days;
- Developer / Tester - 20 days.

Wellbeing Software have listed a day rate of £480 for each role, resulting in a total annual cost of £25,920.00. In the regional and national implementation approaches, these costs are split across Boards using a regional cost apportionment approach and adjusted national NRAC figures, respectively.

Existing License + Hardware Fee: Once the new LIMS solution goes live, Boards will be able to stop the use of their existing LIMS solution. To reflect this cost in the financial model, all Consortium Boards were asked to provide costs for the year 2020/21 for their current LIMS solution. Where no hardware costs were provided, this cost line reflects only the existing net license and support cost.

Table 14: Existing LIMS solution costs

Board	Supplier	Net	Hardware	Note
NHS Borders	CliniSys	£51,809.77	N/A	Hardware cost not provided
NHS Dumfries and Galloway	DXC	£105,987.83	£11,000.00	
NHS Fife	CliniSys	£191,677.00	N/A	Hardware cost not provided
NHS Forth Valley	DXC	£110,000.00	£13,000.00	
NHS Golden Jubilee NH	CliniSys	£76,000.00	N/A	Hardware cost not provided, 2019/2020 costs used
NHS Grampian	DXC	£120,000.00	£20,000.00	
NHS Greater Glasgow and Clyde	DXC	£604,881.12	£74,210.00	
NHS Lothian	DXC	£453,279.31	£20,000.00	
NHS Orkney	CliniSys	£38,904.87	N/A	Hardware cost not provided
NHS Shetland	CliniSys	£38,904.87	N/A	Hardware cost not provided
NHS Tayside	CliniSys	£132,807.59	N/A	Hardware cost not provided
NHS Western Isles	Medpath	N/A	N/A	Costs not provided – assumed same as NHS Shetland and NHS Orkney as similar Board size

5.1.4. NHS Resourcing

NHS resources will be required to support the implementation and maintenance of a modern LIMS solution.

NHS Staff Costs

All costs are calculated using the top of band, inclusive NHS salary costs for 2020/2021 provided by the LIMS Project Team as outlined in the table below.

Table 15: NHS Staff Cost figures

Grade	Annual Cost to NHS	Monthly Cost to NHS
5	£43,116	£3,593
6	£53,652	£4,471
7	£63,229	£5,269
8a	£72,168	£6,014
8b	£86,843	£7,236
8c	£104,454	£8,704
8d	£120,726	£10,060
9	£144,323	£12,026

NRAC

Cost apportionment has been calculated based on NRAC figures adjusted to account for only Consortium Boards and using the assumption that across the Consortium Boards, NHS Golden Jubilee National Hospital (GJNH) should be assigned 2%, based on its activity levels. See table below for proposed apportionment values for Regional and National (Consortium Boards).

Table 16: Cost apportionment figures

Region	Health Board	National Allocation (%)	Regional Allocation (%)
West Region	Greater Glasgow & Clyde	29.51	69.08
	Dumfries & Galloway	3.97	9.30
	Forth Valley	7.23	16.93
	GJNH	2.00	4.68
East Region	Lothian	19.89	62.61
	Fife	9.05	28.49
	Borders	2.82	8.89
North Region	Grampian	12.94	50.70
	Tayside	10.38	40.67
	Shetland	0.65	2.54
	Orkney	0.67	2.61
	Western Isles	0.89	3.48

The above figures were used to allocate the cost of the national and regional implementation team among the Boards.

Implementation Team

The supplier implementation team will be supported by NHS resources. These will consist of a national implementation programme team, as well as regional implementation teams to support a standardised approach across Scotland.

National Implementation Team

The breakdown of the national implementation team is provided below. The following assumptions were made:

- Each Board will pay a percentage of the costs for this national team based on the adjusted national apportionment figures. Alternatively, it is possible that Boards reassign existing staff to fill the required roles.
- These costs will be paid during each Board's implementation period. For example, NHS GGC will pay 29.5% of the total national implementation team costs, paying their contribution over the 24 months of their local implementation project, starting in April 2022.
- These costs are considered as non-recurring revenue.

Table 17: National Implementation Team

Role	Grade	WTE	Period	Equivalent months in post	Total Central Programme Cost	Description
Senior Programme Manager	8c	1	43	43	£374,293.50	1 person full-time for duration of implementation
Programme Manager	8a	1	43	43	£258,602.00	1 person full time for duration of implementation
Lab lead	8b	1	43	43	£311,187.42	1 senior (nominated) representative from each domain (5), 1 days per week for duration of implementation
Lab Admin	7	1	43	43	£226,570.58	1 Admin from each domain (5), 1 days per week for duration of implementation
PMO	5	1	43	43	£154,499.00	1 person full time for duration of implementation
Change & Comms Lead	8a	0.5	43	21.5	£129,301.00	1 person half-time for duration of implementation
eHealth Lead / Architect	8a	0.5	43	21.5	£129,301.00	1 person half-time for duration of implementation
IG Lead	7	0.2	43	8.6	£45,314.12	Nominated representation from IG Leads group, equivalent of 1 day per week for duration of implementation
Test Manager	7	0.6	43	25.8	£135,942.35	1 person near full time during the first 18 months and then reduce to approximately 1 day per week for second 18 months
Total cost for (Central) Programme Team					**£1,765,010.97**	

Regional Implementation Teams

Regional implementation teams will provide local support to Boards within that region. The roles included in the regional implementation teams are illustrated below. Full cost profiles for each region are provided in Appendix B. The following assumptions have been used:

- The regional implementation teams will be required during the full implementation period for each region (34 months for the West Region, 31 months for the East Region and 36 months for the North Region).
- Each Board within the region will pay a percentage of the costs for the relevant regional implementation team based on the region apportionment figures. Alternatively, it is possible that Boards reassign existing staff to fill the required roles.
- These costs are considered as non-recurring capital.

Table 18: Roles in regional implementation teams

	Grade	WTE	Description
Project Manager	8a	1	1 person full time for duration of Regional implementation
Domain Expert	8a	2	Local representatives of each of the Domains (5) to assist with specific elements of design, configuration, build and test. Equivalent to 2 day per week per domain for duration of regional implementation.
Integration specialist	7	0.2	Activity to fluctuate during period with near full time during design, config, build and then test, reverting to minimal input at other times.
Comms & Change	6	0.4	Activity to fluctuate during period with near full time in the run up to operational go-live of each domain in each Board, reverting to minimal input at other times.
Test facilitator	6	0.2	Activity to fluctuate during period with near full time in run up to, and management of key test stages, reverting to minimal input at other times.
Analyst	7	0.2	Activity to fluctuate during period with near full time during design, config & build stages, reverting to minimal input at other times.
Training Facilitator	5	0.2	Activity to fluctuate during period with near full time in run up to, and management of training stages, reverting to minimal input at other times.
Business Reporting	6	0.2	Activity to fluctuate during period with near full time during design, config and then test, reverting to minimal input at other times.
PMO	5	1	1 person full time for duration of Regional implementation

Existing NHS Resources

The existing NHS resource costs for each Consortium Boards are based on the costs calculated in the OBC except for Western Isles as they were not included in the OBC. It has been assumed that NHS Western Isles would have similar costs to other small Boards. It is not expected that the BAU costs at individual Boards will increase significantly and therefore, these figures were used for the financial model.

Table 19: Existing NHS Resource Costs

Board	Board Size	Existing NHS Resource Costs Estimate
NHS Golden Jubilee	Small	£1,045
NHS Borders	Small	£6,924
NHS Dumfries & Galloway	Small	£7,877
NHS Fife	Medium	£18,742
NHS Forth Valley	Medium	£13,695
NHS Grampian	Large	£27,388
NHS Greater Glasgow & Clyde	Very Large	£79,124
NHS Lothian	Very Large	£43,447
NHS Orkney	Small	£1,045
NHS Shetland	Small	£1,063
NHS Tayside	Large	£25,605
NHS Western Isles	Small	£1,050

It is recognised that a national BAU team, as described by NLOG and set out in Section 6.1.2, will be needed following the completion of the national implementation. This is required to maintain the drive towards standardisation of approach and data across Consortium Boards, to act as a National Design Authority for LIMS, and to support the move towards a single national LIMS instance. Costs for the national BAU team have not be included in this business case.

5.1.5. Optimism Bias and Contingency

The Treasury Green Book published in 2003 introduced a requirement for an adjustment to be made for optimism bias in all business cases. This refers to the known tendency for the costs of projects to be underestimated, particularly in the early stages of developing and costing projects. The adjustment for optimism bias and contingency is a requirement to make explicit, upward adjustments to the costs to counteract this known tendency.

In this business case contingency adjustments have been applied across all cost lines, including licensing costs, annual support, maintenance and hosting fees, implementation and BAU costs.

For the purposes of this FBC,

- An **optimism bias figure of 0%** has been applied to licence costs as these are specifically set out in the final bid submission from Wellbeing Software for the duration of the framework
- A single **optimism bias figure of 10%** has been applied to all other cost items including supplier costs and internal NHS costs.

This equates to an additional c£0.04m to £0.93m over the 10-year period depending on Board size. The optimism bias calculator recommended in the Scottish Capital Investment Manual (SCIM) was used to define the values used. The level of optimism bias applied has been influenced by a number of factors, including:

- The contract structure being defined.
- Due diligence being well progressed at FBC stage.
- Project management team requirements and structure identified and defined.
- Development of detailed requirements for the LIMS solution by knowledgeable stakeholders from Consortium Boards.

The applied optimism bias has been reduced significantly from the level of optimism bias (30%) that was applied at the OBC stage, as there is more certainty regarding specifications, supplier capability and capacity, and a contract structure has been defined.

Further detail behind the optimism bias calculation can be found in Appendix E: Optimism Bias Calculation.

5.2. Total Economic Cost

The estimated economic cost of each implementation option has been calculated based on the assumptions outlined in the previous section. These are the full costs for all Consortium Boards for a 10-year period starting with the first Board implementation project commencement.

The table below shows the total Economic Costs for the following scenario:

- Implementation approach: **Individual Health Board instances**
- Support model: **Support model set out in the call of contract**
- License type: **Concurrent User License**
- Hosting: **On-premises hosting**

The table illustrates that the ten-year Net Present Cost for NHS Scotland will be £29.22m excluding the costs for existing local NHS resources. Upfront licence costs account for just under £5m, with the annual support, maintenance and hosting fee being the largest cost at £15.60m. Recurring revenue costs will be in the region of £2.02m per annum once all Boards are fully implemented, mainly for the support costs.

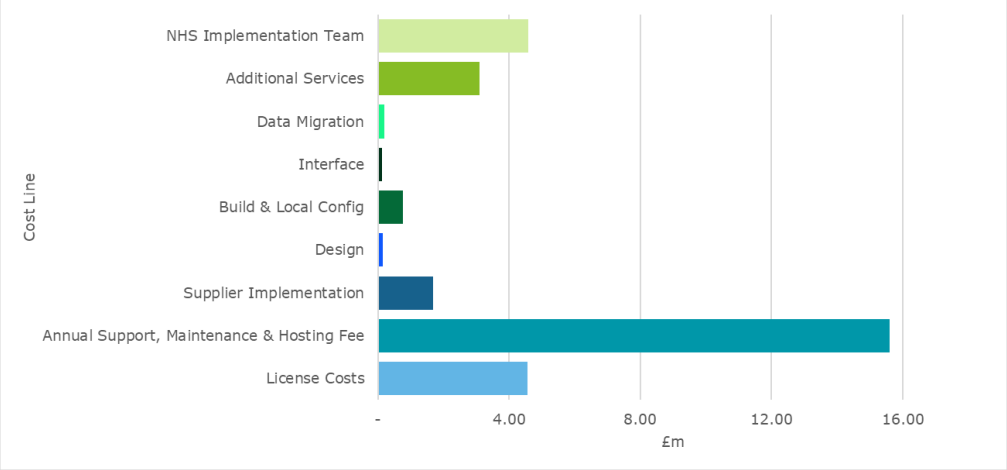
Table 20: NHS Scotland Consortium Boards Total Economic Costs

Cost line	Year	

	1	2	3	4	5	6	7	8	9	10	Total
License Costs	0.33	2.18	2.03	0.04	-	-	-	-	-	-	4.57
Annual Support, Maintenance & Hosting Fee	0.38	0.69	1.67	1.84	1.84	1.84	1.84	1.84	1.84	1.84	15.60
Supplier Implementation	0.49	0.77	0.41	0.02	-	-	-	-	-	-	1.70
Design	0.02	0.10	0.03	0.00	-	-	-	-	-	-	0.15
Build and Local Config	0.21	0.42	0.13	0.01	-	-	-	-	-	-	0.77
Interface	0.03	0.08	0.02	0.00	-	-	-	-	-	-	0.14
Data Migration	0.03	0.12	0.05	0.00	-	-	-	-	-	-	0.20
Additional Services	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	3.11
Regional Implementation Team	0.63	1.36	0.81	0.03	-	-	-	-	-	-	2.83
National Implementation Team	0.43	0.86	0.45	0.01	-	-	-	-	-	-	1.77
Optimism Bias Total	0.25	0.47	0.39	0.22	0.21	0.21	0.21	0.21	0.21	0.21	2.63
Total with Contingency	**3.12**	**7.36**	**6.31**	**2.49**	**2.36**	**2.36**	**2.36**	**2.36**	**2.36**	**2.36**	**33.47**
Total NRC	1.89	5.31	3.63	0.12	-	-	-	-	-	-	10.94
Total NRR	0.82	1.29	0.84	0.36	0.34	0.34	0.34	0.34	0.34	0.34	5.36
Total RR	0.42	0.76	1.84	2.02	2.02	2.02	2.02	2.02	2.02	2.02	17.16
Total	**3.12**	**7.36**	**6.31**	**2.49**	**2.36**	**2.36**	**2.36**	**2.36**	**2.36**	**2.36**	**33.47**
Discount Factor	*0.98*	*0.95*	*0.92*	*0.89*	*0.86*	*0.83*	*0.80*	*0.77*	*0.75*	*0.72*	-
Net Present Cost	**3.07**	**6.99**	**5.79**	**2.21**	**2.02**	**1.96**	**1.89**	**1.83**	**1.76**	**1.70**	**29.22**
Existing Local NHS Resources	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	2.27
Net Present Cost	***3.30***	***7.22***	***6.01***	***2.44***	***2.25***	***2.18***	***2.12***	***2.05***	***1.99***	***1.93***	**31.49**

The figure below illustrates the total cost breakdown for the 10-year period.

Figure 2: Cost Breakdown per Cost Category



5.3. Financial Assumptions

A number of additional financial assumptions have been included in the business case as outlined below.

Accounting Treatment. It has been assumed that the initial purchase of software licences, the supplier implementation costs, as well as the Boards' contribution for the regional implementation teams will be a capital expenditure. Additional services provided by the supplier, as well as the annual support, maintenance and hosting fees and costs for the national implementation team have been treated as revenue expenditure.

VAT Position. It has been assumed in the cost model that VAT will be payable at the standard rate of 20% on all supplier costs (licence costs, supplier implementation support, and ongoing support) and that VAT is not recoverable. It is possible that VAT could be recovered on the ongoing service provision, although this is subject to the service being considered a fully managed service by HMRC, and a decision will need to be sought by individual Boards to determine whether VAT can be recovered.

Indexation. Per Office of Budget Responsibility (OBR), inflation is set to rise in the short term before returning to target levels from 2025. Assuming a modelling term beginning in 2022 (base year), we have used the OBR's estimate of inflation for 2023 and 2024 and the Bank of England target rate of 2% from 2025 onwards. Since the period begins in April 2022, we have used a blended rate for each annual period modelled after the Year 1 base year, i.e. (OBR forecasts 2.6% CPI inflation in 2023 and 2.1% in 2024).

Capital Depreciation. Capital expenditure has been depreciated using the straight-line method over ten years. Depreciation will start in the year of purchase, depreciating the full Capital costs until being fully written down at the end of year ten, which is the anticipated useful life of the LIMS solution. This is accounted for as Non-Core costs to Boards, and as such is shown as a separate line item below the Total Financial Cost.

It is recommended that these issues are considered further as part of the development of subsequent local business cases.

5.4. Total Financial Cost

All financial costs have been calculated based on the following scenario:

- Implementation approach: **Individual Health Board instances**
- Support model: **Support model set out in the call-off contract**
- License type: **Concurrent User License**

- Hosting: **On-premises hosting**

The regional and national implementation approaches are more cost effective, but they require Boards to agree on a regional or national instance approach respectively. Therefore, for Boards developing their local business cases, we have represented the implementation approach for individual instances, which represents the lowest risk option. Alternative scenarios are shown in Section 5.6 for the Sensitivity Analysis.

5.4.1. Total Consortium

The table below illustrates that the total financial cost to NHS Scotland, when allowing for costs associated with VAT, capital charges and CPI indexation. These bring the total estimated cost to £41.85m over a 10-year period, starting with the first Board implementation project commencement.

Table 21: Financial Costs Total Consortium

Cost line	Year										
	1	2	3	4	5	6	7	8	9	10	Total
Total with Contingency	**3.12**	**7.36**	**6.31**	**2.49**	**2.36**	**2.36**	**2.36**	**2.36**	**2.36**	**2.36**	**33.47**
Discount Factor	*0.98*	*0.95*	*0.92*	*0.89*	*0.86*	*0.83*	*0.80*	*0.77*	*0.75*	*0.72*	-
Net Present Cost	**3.07**	**6.99**	**5.79**	**2.21**	**2.02**	**1.96**	**1.89**	**1.83**	**1.76**	**1.70**	**29.22**
NRC VAT	0.24	0.76	0.55	0.02	-	-	-	-	-	-	1.57
NRR VAT	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.68
RR VAT	0.08	0.15	0.37	0.40	0.40	0.40	0.40	0.40	0.40	0.40	3.43
Total VAT	**0.39**	**0.98**	**0.98**	**0.49**	**0.47**	**0.47**	**0.47**	**0.47**	**0.47**	**0.47**	**5.68**
Total Indexation	**-**	**0.19**	**0.29**	**0.17**	**0.21**	**0.26**	**0.31**	**0.37**	**0.42**	**0.48**	**2.70**
NRC (Incl. VAT & indexation)	2.13	6.21	4.35	0.14	-	-	-	-	-	-	12.82
NRR (Incl. VAT & indexation)	0.89	1.39	0.95	0.45	0.44	0.45	0.46	0.46	0.47	0.48	6.44
RR (Incl. VAT & indexation)	0.50	0.93	2.29	2.56	2.61	2.65	2.69	2.74	2.79	2.83	22.59
Total (Incl. VAT & indexation)	**3.51**	**8.53**	**7.58**	**3.15**	**3.05**	**3.10**	**3.15**	**3.20**	**3.26**	**3.31**	**41.85**
Annual Depreciation	0.19	0.79	1.27	1.29	1.29	1.29	1.29	1.29	1.29	1.29	11.25
Existing Local BAU Resources	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	2.27
Existing License + Hardware Fee	-	-	2.02	2.10	2.10	2.10	2.10	2.10	2.10	2.10	16.73

5.4.2. Individual Consortium Boards

The financial appraisal illustrates the total financial cost of LIMS by Consortium Board over the ten-year period, starting with the first Board implementation project commencement and following the implementation timeline proposed by the LIMS Project Team. As with costs outlined in the Economic Case, the costs in the table below are estimates based on the key assumptions within this FBC. Consortium Boards may further refine these costs in their local business cases including adjustment of 10-year period from their own implementation project commencement.

Table 22: Total 10-year Financial Cost by Consortium Board

	NHS Borders	NHS D&G	NHS Fife	NHS Forth Valley	NHS Golden Jubilee	NHS Grampian	NHS GGC	NHS Lothian	NHS Orkney	NHS Shetland	NHS Tayside	NHS Western Isles
Consolidated Financial Considerations												
NRC (Incl. VAT & Indexation)	0.17	0.55	0.84	0.78	0.21	1.78	4.69	2.23	0.11	0.11	1.22	0.12
NRR (Incl. VAT & Indexation)	0.43	0.45	0.55	0.52	0.41	0.63	0.95	0.76	0.38	0.38	0.58	0.39
RR (Incl. VAT & Indexation)	0.10	1.08	1.32	1.37	0.22	2.91	9.56	4.04	0.09	0.10	1.71	0.09
Total Financial Cost (Incl. VAT & Indexation)	**0.69**	**2.08**	**2.72**	**2.68**	**0.83**	**5.32**	**15.21**	**7.03**	**0.59**	**0.60**	**3.51**	**0.60**
Capital Depreciation	0.15	0.48	0.75	0.69	0.18	1.59	4.04	1.97	0.10	0.10	1.10	0.11
Existing Local BAU Resources	0.07	0.08	0.19	0.14	0.01	0.27	0.79	0.43	0.01	0.01	0.26	0.01
Existing License + Hardware Fee	0.41	0.94	1.53	0.98	0.61	1.12	5.43	3.78	0.27	0.31	1.06	0.27

*Due to rounding, '0.00' costs are less than £10k

Table 22 illustrates that VAT and Indexation considerations increase the total Financial Cost for each Board over the 10-year period. Each Board has a minimum VAT cost of c£80k, and Indexation of x£40k over the 10-year period, with the larger Boards having higher costs as expected. Further breakdown of financial considerations by Board is shown in the below tables with yearly costs included in Appendix F.

Table 23: 10-year Non-Recurring Capital Costs by Health Board

	NHS Borders	NHS D&G	NHS Fife	NHS Forth Valley	NHS Golden Jubilee	NHS Grampian	NHS GGC	NHS Lothian	NHS Orkney	NHS Shetland	NHS Tayside	NHS Western Isles
Non-Recurring Capital												
License Costs	0.02	0.22	0.28	0.30	0.05	0.60	1.86	0.81	0.02	0.02	0.37	0.02
Supplier Implementation	0.02	0.07	0.08	0.09	0.04	0.17	0.82	0.25	0.02	0.02	0.12	0.02
Design	0.00	0.01	0.01	0.01	0.00	0.02	0.05	0.03	0.00	0.00	0.01	0.00
Build and Local Config	0.01	0.04	0.05	0.05	0.02	0.11	0.25	0.13	0.01	0.01	0.06	0.01
Interface	0.00	0.01	0.01	0.01	0.00	0.02	0.05	0.02	0.00	0.00	0.01	0.00
Data Migration	0.00	0.01	0.01	0.01	0.00	0.02	0.10	0.03	0.00	0.00	0.01	0.00
Regional Implementation Team	0.08	0.09	0.25	0.16	0.04	0.51	0.66	0.54	0.03	0.03	0.41	0.04
Optimism Bias	0.01	0.02	0.04	0.03	0.01	0.09	0.19	0.10	0.01	0.01	0.06	0.01
VAT	0.01	0.07	0.09	0.10	0.02	0.20	0.65	0.26	0.01	0.01	0.12	0.01
Indexation	0.01	0.02	0.03	0.03	0.01	0.05	0.07	0.05	0.01	0.00	0.04	0.01
Total NRC Financial Cost	**0.17**	**0.55**	**0.84**	**0.78**	**0.21**	**1.78**	**4.69**	**2.23**	**0.11**	**0.11**	**1.22**	**0.12**

*Due to rounding, '0.00' costs are less than £10k

Table 24: 10-year Recurring Revenue Costs by Health Board

	NHS Borders	NHS D&G	NHS Fife	NHS Forth Valley	NHS Golden Jubilee	NHS Grampian	NHS GGC	NHS Lothian	NHS Orkney	NHS Shetland	NHS Tayside	NHS Western Isles
Recurring Revenue												
Annual Support & Hosting Fee	0.07	0.75	0.91	0.94	0.15	2.01	6.63	2.79	0.06	0.07	1.17	0.06
Optimism Bias	0.01	0.07	0.09	0.09	0.01	0.20	0.66	0.28	0.01	0.01	0.12	0.01
VAT	0.01	0.16	0.20	0.21	0.03	0.44	1.46	0.61	0.01	0.02	0.26	0.01
Indexation	0.01	0.10	0.12	0.13	0.02	0.26	0.82	0.35	0.01	0.01	0.16	0.01
Total RR Financial Cost	**0.10**	**1.08**	**1.32**	**1.37**	**0.22**	**2.91**	**9.56**	**4.04**	**0.09**	**0.10**	**1.71**	**0.09**

*Due to rounding, '0.00' costs are less than £10k

Table 25: 10-year Non-Recurring Revenue Costs by Health Board

	NHS Borders	NHS D&G	NHS Fife	NHS Forth Valley	NHS Golden Jubilee	NHS Grampian	NHS GGC	NHS Lothian	NHS Orkney	NHS Shetland	NHS Tayside	NHS Western Isles
Non-Recurring Revenue												
Additional Services	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26
National Implementation Team	0.05	0.07	0.16	0.13	0.04	0.23	0.52	0.35	0.01	0.01	0.18	0.02
Optimism Bias	0.03	0.03	0.04	0.04	0.03	0.05	0.08	0.06	0.03	0.03	0.04	0.03
VAT	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Indexation	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.03	0.03	0.04	0.03
Total NRR Financial Cost	**0.43**	**0.45**	**0.55**	**0.52**	**0.41**	**0.63**	**0.95**	**0.76**	**0.38**	**0.38**	**0.58**	**0.39**

5.5. Cost Comparison with OBC

In line with HM Treasury guidance, the cost estimates in this business case have been compared to those presented in the OBC to assess the materiality of any changes.

There are some key differences between the financial models in the FBC and the OBC that should be noted when reviewing this comparison:

- NHS Western Isles was not included in the OBC case but has been included in the financial models for the FBC.
- The OBC figures were based on CliniSys as the supplier. CliniSys provided significantly higher pricing than Wellbeing Software in the final bid.
- The cost types for cost lines have been updated from the OBC (see below table).

Table 26: Cost Type per Cost Item

Cost item	Cost Type OBC	Cost Type FBC
LIMS Software Licence	NRC	NRC
Annual Support	RR	RR
Supplier Implementation	NRC	NRC
Design	NRR	NRC
Build & Local Config	NRR	NRC
Rollout [Regional + National Implementation Team]	NRR	NRC/ NRR
BAU	RR	-
LIMS Interface Build	NRC	NRC
LIMS Interface Support [Additional Services]	RR	NRR
Additional Interface Build	NRC	NRC
Additional Interface Recurring [Additional Services]	RR	NRR
Downstream Interfaces	NRC	NRC
Hosting Hardware	RR	-

In the table below financial costs for the FBC have been calculated based on the following scenario:

- Implementation approach: **Individual Health Board instances**
- Support model: **Support model set out in the call of contract**
- License type: **Concurrent User License**
- Hosting: **On-premises hosting**

Table 27: Cost Comparison OBC – all Consortium Boards

Cost	Year										Total	
	1	2	3	4	5	6	7	8	9	10	FBC	OBC
License Costs	0.33	2.18	2.03	0.04	-	-	-	-	-	-	4.57	1.60
Support Fee	0.38	0.69	1.67	1.84	1.84	1.84	1.84	1.84	1.84	1.84	15.60	33.74
Supplier Implementation	0.49	0.77	0.41	0.02	-	-	-	-	-	-	1.70	10.45
Design	0.02	0.10	0.03	0.00	-	-	-	-	-	-	0.15	0.33
Build and Local Config	0.21	0.42	0.13	0.01	-	-	-	-	-	-	0.77	3.67
Interface	0.03	0.08	0.02	0.00	-	-	-	-	-	-	0.14	3.78
Data Migration	0.03	0.12	0.05	0.00	-	-	-	-	-	-	0.20	-
Additional Services	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	3.11	3.80
Regional Implementation Team	0.63	1.36	0.81	0.03	-	-	-	-	-	-	2.83	2.70
National Implementation Team	0.43	0.86	0.45	0.01	-	-	-	-	-	-	1.77	-
Hosting hardware											-	4.40
BAU												5.82
Optimism Bias	0.25	0.47	0.39	0.22	0.21	0.21	0.21	0.21	0.21	0.21	2.63	21.08
Total	**3.12**	**7.36**	**6.31**	**2.49**	**2.36**	**2.36**	**2.36**	**2.36**	**2.36**	**2.36**	**33.47**	**91.36**
Net Present Cost	**3.07**	**6.99**	**5.79**	**2.21**	**2.02**	**1.96**	**1.89**	**1.83**	**1.76**	**1.70**	**29.22**	**82.06**
NRC (Incl. VAT and indexation)	2.13	6.21	4.35	0.14	-	-	-	-	-	-	12.82	24.69
NRR (Incl. VAT and indexation)	0.89	1.39	0.95	0.45	0.44	0.45	0.46	0.46	0.47	0.48	6.44	8.78
RR (Incl. VAT and indexation)	0.50	0.93	2.29	2.56	2.61	2.65	2.69	2.74	2.79	2.83	22.59	78.08
Total Financial Cost	**3.51**	**8.53**	**7.58**	**3.15**	**3.05**	**3.10**	**3.15**	**3.20**	**3.26**	**3.31**	**41.85**	**111.55**

The table shows that overall costs are significantly lower than those estimated in the OBC (£41.85m compared to £111.55). Two factors affect this

- The OBC calculations were carried out using indicative costs from CliniSys ahead of the procurement exercise. In the pricing for the final bids, CliniSys were significantly more expensive than both InterSystems and Wellbeing Software.
- Optimism Bias has been reduced from 30% to 0% for licences and 10% for all other cost elements.

5.6. Sensitivity Analysis

A number of scenarios were assessed to evaluate the impact of altering aspects of the key underlying assumptions within the cost model. The below scenarios were identified and modelled:

- Support Models 1 (call-off contract), 2 (alternate model 1) and 3 (alternate model 2) (individual Health Board implementation approach only)
- Implementation approach: individual instances vs regional instances vs single national instance
- License mode (single national instance implementation approach only) – Concurrent License / Enterprise License vs Revenue model
- Hosting: On-premises vs supplier hosted

5.6.1. Support model

For the regional and national instance implementation approaches, Wellbeing Software have only provided costings for Support Model 1 (the support model that is defined in the call-off contract). Therefore, the alternate support models could only be assessed for the individual instance implementation approach.

As the support model costs for all three support models provided by Wellbeing Software are relatively similar, there were no significant changes to the overall costs of the annual support, maintenance and hosting fees for individual Boards over the 10-year period.

The below table illustrates the differences between the support models for the regions and all Consortium Boards for the following scenario:

- Implementation approach: **Individual Health Board instances**
- License type: **Concurrent User License**
- Hosting: **On-premises hosting**

Table 28: Impact of different support models on costs over 10-year period

	West Region	East Region	North Region	All Consortium Boards
Support Model 1: As defined in call of contract				
Annual Support, Maintenance and Hosting Fee	14.32	6.44	5.87	**26.63**
Optimism Bias	1.43	0.64	0.59	2.66
Support Model 2: Alternate Support 1: All Priority levels - 08:00-18:00 Monday – Friday only				
Annual Support, Maintenance and Hosting Fee	13.76	6.19	5.63	**25.58**
Optimism Bias	1.38	0.62	0.56	2.56
Support Model 3: Alternate Support 2: All Priority levels - 08:00-18:00 Monday – Friday only and Priority 1 and 2 calls 24/7				
Annual Support, Maintenance and Hosting Fee	13.95	6.27	5.71	**25.93**
Optimism Bias	1.39	0.63	0.57	2.59

5.6.2. Implementation Approach

The below table illustrates the differences between the alternative implementation approaches for the regions and all Consortium Boards for the following scenario:

- Support model: **Support model set out in the call of contract**
- License type: **Concurrent User License**
- Hosting: **On-premises hosting vs supplier hosting**

Table 29: Total Financial Cost incl. VAT and Indexation by Implementation Approach over the 10-year period

	On-premises hosting			Supplier hosting		
	Individual Health Board Instances	Regional instances	Single national instance	Individual Health Board Instances	Regional instances	Single national instance
West Region	34.10	30.63	N/A	38.11	31.77	27.11
East Region	15.59	15.01	N/A	20.77	16.20	14.64
North Region	15.99	15.02	N/A	23.77	16.14	16.00
All Consortium Boards	**62.97**	**60.65**	**N/A**	**82.65**	**64.10**	**57.76**

The table above illustrates that financially, implementing a single national instance provides the most significant cost savings, whereas Boards implementing individual instances is the most expensive option. While there are no large cost savings over the 10-year period for implementing regional instances, this remains the recommended position based on the analysis of all contributing factors in the strategic and economic cases.

Compared to the individual instance implementation approach, Wellbeing Software have provided significant cost savings for the regional and national approaches for a supplier hosted solution.

5.6.3. License Type

Wellbeing Software have only provided costing for the Revenue Licensing model for the single national instance implementation approach.

The below table illustrates the differences between the license types for the regions and all Consortium Boards for the following scenario:

- Implementation approach: **Single national instance**
- Support model: **Support model set out in the call of contract**
- Hosting: **Supplier hosting** (on premise hosting is not available for a single national instance implementation approach)

Table 30: Total Financial Cost incl. VAT and Indexation for Licensing approaches (single national instance) over the 10-year period

	Total Financial Cost	
	Concurrent License	Revenue License
West Region	27.11	28.08
East Region	14.64	16.16
North Region	16.00	17.00
All Consortium Boards	**57.76**	**61.24**

The above table showcases that the Software as a Service revenue model is more expensive compared to the Concurrent License/ Enterprise license model over the 10-year period.

5.6.4. Hosting model

The below table illustrates the differences between the hosting models for the regions and all Consortium Boards for the following scenario:

- Implementation approach: **Individual Health Board instances**
- Support model: **Support model set out in the call of contract**
- License type: **Concurrent User License**

Table 31: Total Financial Cost incl. VAT and Indexation for Hosting approaches

	Total Financial Cost	
	On-premises hosting	Supplier hosting
West Region	34.10	38.11
East Region	15.59	20.77
North Region	15.99	23.77

All Consortium Boards	**62.97**	**82.65**

The above table illustrates that for the individual Health Board implementation approach, on-premises hosting is significantly less expensive than a supplier hosted LIMS solution. As shown in the section on implementation approaches, supplier hosting becomes comparable to the on premise hosted solution in the regional instance implementation approach.

6. Management Case

In this section, the proposed governance and management approach for LIMS implementation post contract award is set out.

We recommend that the Consortium Boards agree national standards and a national approach that can then be applied locally, with a collaborative, staged approach to implementation.

Oversight would be provided by the National LIMS Operational Group (NLOG), a collaborative group made up of members from Boards across Scotland, that will report to the Boards and the Laboratories Executive Board (LEB), the Diagnostics in Scotland Strategy Group (DiSSG), and ultimately the Chief Executives.

6.1. LIMS Governance

The proposed future governance structure is set out in Figure 3 below. This structure leverages existing governing bodies and enables Consortium Boards to work collaboratively to implement LIMS.

The existing LIMS Project Board is responsible for shortlisting of vendors and selection of the preferred solution. They are also responsible for approving this Full Business Case (FBC). Following award of the framework, the LIMS Project Board will be stood down and replaced by an operational governance model to coordinate implementation, operation, and development of LIMS across Consortium Boards. Key to this will be the NLOG, who will support drive for consistency and commonality of approach during the implementation, coordinating development and adoption of standards and reviewing how those standards are applied locally. The NLOG will act as the design authority for LIMS across Scotland to ensure that any changes requested locally are in line with the nationally agreed approach and standards.

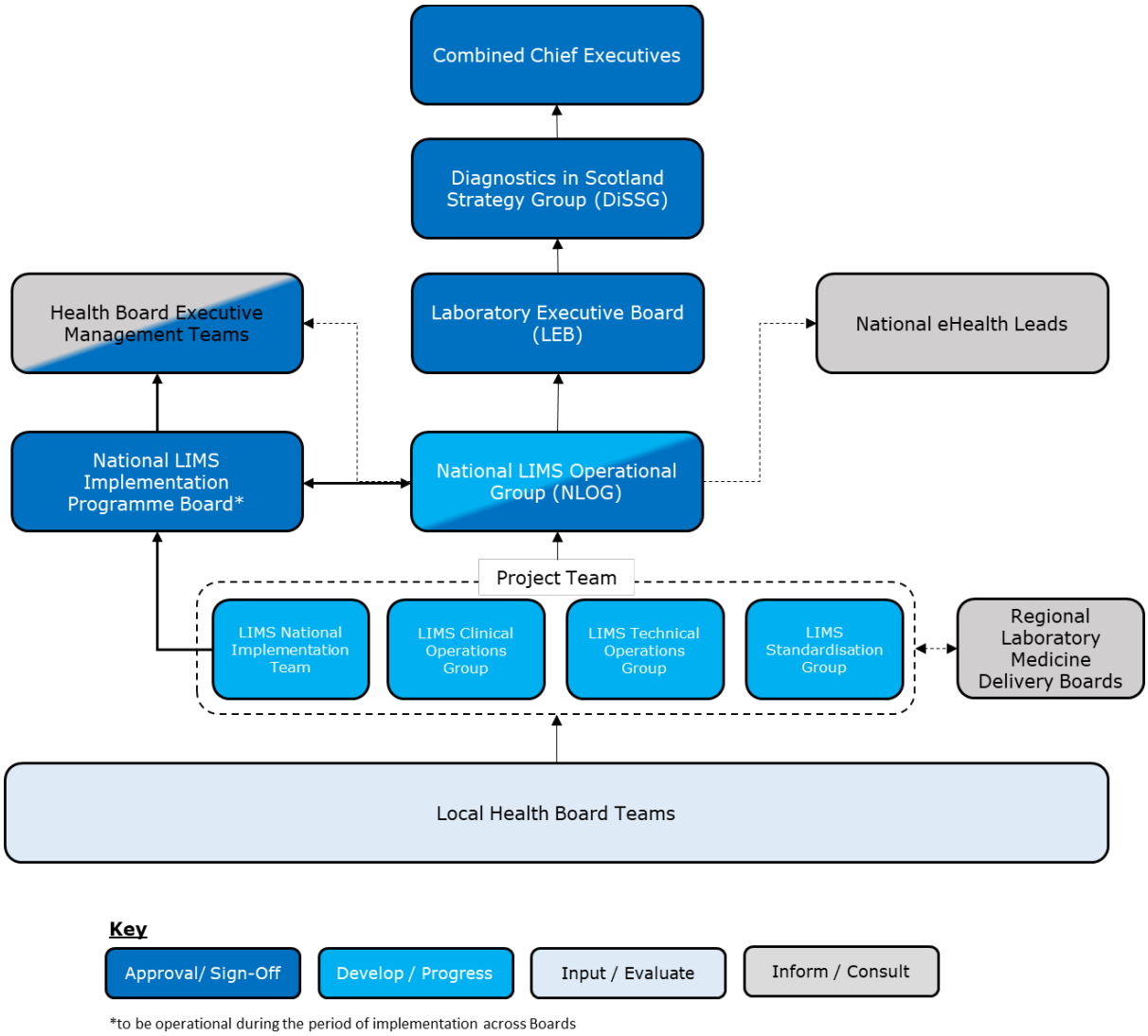
During the period where Boards are implementing LIMS there will be a specific National LIMS Implementation Programme Board established, to operate alongside the NLOG, to provide specific oversight and management of implementation activities. This programme board should then be stepped down once all Consortium Boards have completed implementation.

The NLOG would report directly to LEB, which is overseen by DiSSG. DiSSG is a senior decision-making group, responsible for supporting the progress of the Executive Board agendas at the highest level. Note that at the time of writing there are ongoing discussions, coordinated by NSS related to the re-organisation of DiSSG into networks, however, finalised plans for this have not been publicly communicated.

The current LIMS Project Team is supported by the LIMS Evaluation User Group comprising of Subject Matter Experts (SMEs) and Consortium Board representatives. The Project Team may seek additional advice and support from the Regional Laboratory Medicine Delivery Boards as required however no formal reporting into these boards will be put in place. Post contract award there will be a new project team set up to support the NLOG. It is suggested that this team would be divided into smaller groups, comprising a LIMS National Implementation Team, LIMS Clinical Operations Group, LIMS Technical Operations Group and a LIMS Standardisation Group.

The eHealth Strategy Leads and Local Board Executive Management Teams will be kept informed and consulted throughout to ensure effective alignment with local, regional and national planning. Local Board Executive Management Teams will be asked to review and approve local business cases for implementation and to provide oversight for local implementation activities.

Figure 3: Governance Structure



6.1.1. National LIMS Implementation Programme Board

The purpose of the programme board is to coordinate and drive implementation of LIMS across all Consortium Boards in an efficient, effective, and coordinated manner. The board will be established prior to the first Board implementation and will be stood down once all Consortium Boards have completed implementation. The programme board is set up to empower a programme manager to run the programme on a day-to-day basis. The programme manager is accountable for the successful delivery of the individual Board implementation projects and reports to the programme board.

During the period of each Board implementation project the programme board will provide regular reporting and escalations to the relative Health Board Executive Management Team, and will seek approval from them for local resource, investment, and activity.

The programme board will be comprised of senior stakeholders from across the consortium Boards, with authority to make decisions within either their individual Board or the region they represent. The following are standing members of the programme board.

- Programme Board Chair
- National LIMS Implementation Programme Manager
- Consortium Board & Region Representatives

The full membership of the programme board and Terms of Reference (ToR) are to be developed and agreed.

This board will have responsibility for:

- Monitoring the progress of the overall programme
- Monitoring the RAID log for the programme and agreeing actions, mitigations, or escalations
- Coordinating the timings of local implementation projects
- Overseeing the usage of national and local resourcing
- Monitoring the utilisation supplier resourcing and availability
- Updating key governance groups, the Laboratory Executive Board, and Health Board executive management teams of key decisions and outcomes

Upon completion of all Consortium Board implementations the Implementation Programme Board will be stood down and ongoing activity transferred to NLOG.

6.1.2. National LIMS Operational Group (NLOG)

The National LIMS Operational Group (NLOG) will oversee the long-term governance, operation and development of any new LIMS implemented in NHS Scotland. It will be the national coordination group enabling standardisation and harmonisation of working practices across Consortium Board laboratories. It will operate as the central Design Authority for LIMS across the Consortium Boards.

In April 2021 Mike Gray (co-chair of the LIMS procurement project and East Region Laboratory Medicine Representative) submitted an SBAR to the LEB and the DiSSG to seek approval for the creation of the NLOG. The stated purpose of the NLOG was to ensure ongoing appropriate governance was in place to manage and control the continued development and tactical operation of the LIMS across NHS Scotland. The LEB approved the approach in April 2021, with DiSSG approval in November 2021.

The agreed terms of reference (ToR) for the NLOG are provided in Appendix A.

The NLOG will report directly to the LEB, which will ensure that the strategic aims of Laboratory Medicine with regards to the new LIMS are being addressed and delivered efficiently and effectively in line with national strategy. A full outline of the structure is shown in Figure 3. The NLOG will also interface with other local and national governance structures.

The NLOG would ultimately be responsible for ensuring the alignment of the national laboratory strategy with the deployment of the LIMS. It will ensure that the appropriate guidance and consideration has been given when shaping the development of the LIMS. The main aims will be to -

- To operationally manage specific NLOG subgroups highlighted in Figure 3
- Prevent unregulated "local" divergence and thus risk increasing supplier management fees
- Prevent discipline specific developments that impact on other disciplines
- Enable composite and whole system reports
- Enable the application of standardised laboratory coding
- Enable application of standardised costing models for work done across Scottish laboratory services
- Ensure alignment and delivery to national and regional strategies for all laboratory disciplines
- Be an enabler to the development of new ways of working
- Be a driver for innovation at both local, regional and national level
- Be inclusive ensuring participation from all Boards thus providing greater support and resilience for remote and rural Boards
- Work with appropriate stakeholders in agreeing the definition and ongoing management of the design and implementation
- Ensure the agreement of system-wide coding structures and workflows that will be implemented across the agreed solution (for example ISD coding for GPs)

- Ensure minimal disruption to down-stream systems (SCI store, TrakCare, ICE, ECOSS and ICNET) across Scottish Boards
- Engage with service users

It will operate as the central Design Authority for LIMS, which will require Consortium Boards to consider any differences through the design authority to reduce deviation across different Consortium Boards. This will ensure that it remains possible to introduce a national solution in the future.

The suggested membership structure, including terms of reference, is provided in Appendix A Table 35.

6.1.3. National LIMS Implementation Team

To support the national programme of implementation of LIMS across the Consortium Boards a national team should be established for the period during which Consortium Boards are implementing LIMS. This approach will ensure consistency throughout the implementations and provide a common focus on standardisation and continual service improvement. It will manage the engagement with Wellbeing Software throughout implementation to help coordinate resourcing, activity and performance, balancing the needs and requirements of all Consortium Boards to enable all to achieve successful operational go-live. A detailed set of roles is shown in Appendix B Table 38.

6.1.4. Diagnostics in Scotland Strategy Group (DiSSG)

The Diagnostics in Scotland Strategic Group (DiSSG) is the senior decision-making group, responsible for supporting the progress of the Executive Board agendas at the highest level and ensures the ongoing, coherent development and delivery of high-quality services[15]. It takes into account the strategic direction set by the Health and Social Care Delivery Plan and the National Clinical Strategy. In particular, it focuses on the effective and safe quality ambitions:

- the most appropriate treatments, interventions, support and services will be provided at the right time to everyone who'll benefit, with no wasteful or harmful variation
- no avoidable injury or harm to people from the healthcare they receive, and that they are cared for in an appropriate, clean and safe environment at all times.

Full terms of reference, including membership of the DiSSG, are available in Appendix A Table 36.

6.1.5. Laboratories Executive Board (LEB)

The Laboratories Executive Board (LEB) is accountable to the DiSSG and, through DiSSG, to the NHS Chief Executives Group. The LEB was originally accountable for ensuring that the National Laboratories Programme (NLP) achieves its anticipated outcomes and that networks progress appropriate work plans, in keeping with agreed strategic aims. The networks include:

- Scottish Microbiology and Virology Network (SMVN)
- Haematology and Transfusion Scotland Network (HaTS)
- Scottish Clinical Biochemistry Network (SCBN)
- Scottish Pathology Network (SPAN)

[15]https://www.nss.nhs.scot/specialist-healthcare/national-networks/what-are-national-networks/diagnostic-networks/

The LEB membership comprises executive level representation from across NHS Scotland as shown in Appendix A Table 37.

6.2. Contract Management

During implementation and ongoing service delivery, or when updates or changes are required to LIMS, engagement and management of the supplier should be coordinated through the NLOG project team in line with the national framework and local call-off contracts. There should also be regular review with the supplier relating to product road map and available functionality.

Monthly reviews with the supplier, the project team and NLOG need to be put in place with alternate meetings focussing on:

Performance of the solution, hosting arrangements, and support. During these sessions the focus will be on reviewing

- Key performance measures for the previous period in line with the Service Level Agreement and if required corrective actions plans agreed.
- Reported faults and issues including highlighting any recurring faults and agreeing resolution or enhancements.
- Resourcing over the previous period and requirements for the next period.

Roadmap for the programme and LIMS During these sessions the focus will be on reviewing:

- The strategic direction, new functionality, roadmap, additional modules in development and improvements planned to the LIMS product range including any new modules.
- The strategic direction of the Programme.
- Key priorities and recognised opportunities for laboratory medicine across Scotland.

6.3. Implementation Plan

The expectation is that the NHS will implement a common solution for LIMS based on multiple instances (likely three regional instances - West of Scotland, East of Scotland and North of Scotland). Implementation should take a collaborative, staged approach with a single national instance or three regional instances providing the most sensible and cost-effective solution.

Once Boards have developed national standards and the approach has been nationally agreed, Health Board specific implementation would follow. These Health Board specific implementations would follow the detailed implementation plan provided by the preferred supplier.

NHS GGC is ready to start implementing a modernised LIMS solution and will likely be the first to implement the new solution. This could be a NHS GGC specific implementation or lead the way for the West of Scotland instance. It is likely that NHS Lothian would follow very quickly, leading the East of Scotland instance with NHS Fife and NHS Borders. We recommend that the first LIMS implementation be driven collaboratively to ensure that the solution is suitable across different Consortium Boards. This approach ensures that systems are standardised, while providing the flexibility of local configuration where required.

Suppliers were asked to provide a pricing model based on the assumption that the Boards would adopt the modern LIMS solution in a phased, regional approach in the below order. Note that this is indicative and subject to change.

- West of Scotland
    - First Board: NHS GGC
    - Second Board: NHS Dumfries and Galloway (+12 months)
    - Third Board: NHS Forth Valley (+6 months)
    - Fourth Board: NHS Golden Jubilee (+4 months)
- East of Scotland

    - First Board: NHS Lothian
    - Second Board: NHS Fife (+12 months)
    - Third Board: NHS Borders (+6 months)
- North of Scotland
    - First Board: NHS Grampian
    - Second Board: NHS Tayside (+12 months)
    - Third Board: NHS Shetland (+12 months)
    - Fourth Board: NHS Orkney (+4 months)
    - Fifth Board: NHS Western Isles (+4 months)

The indicative implementation plan for LIMS across Scotland is illustrated in Figure 3 below based on review of the proposals from the three short listed suppliers.

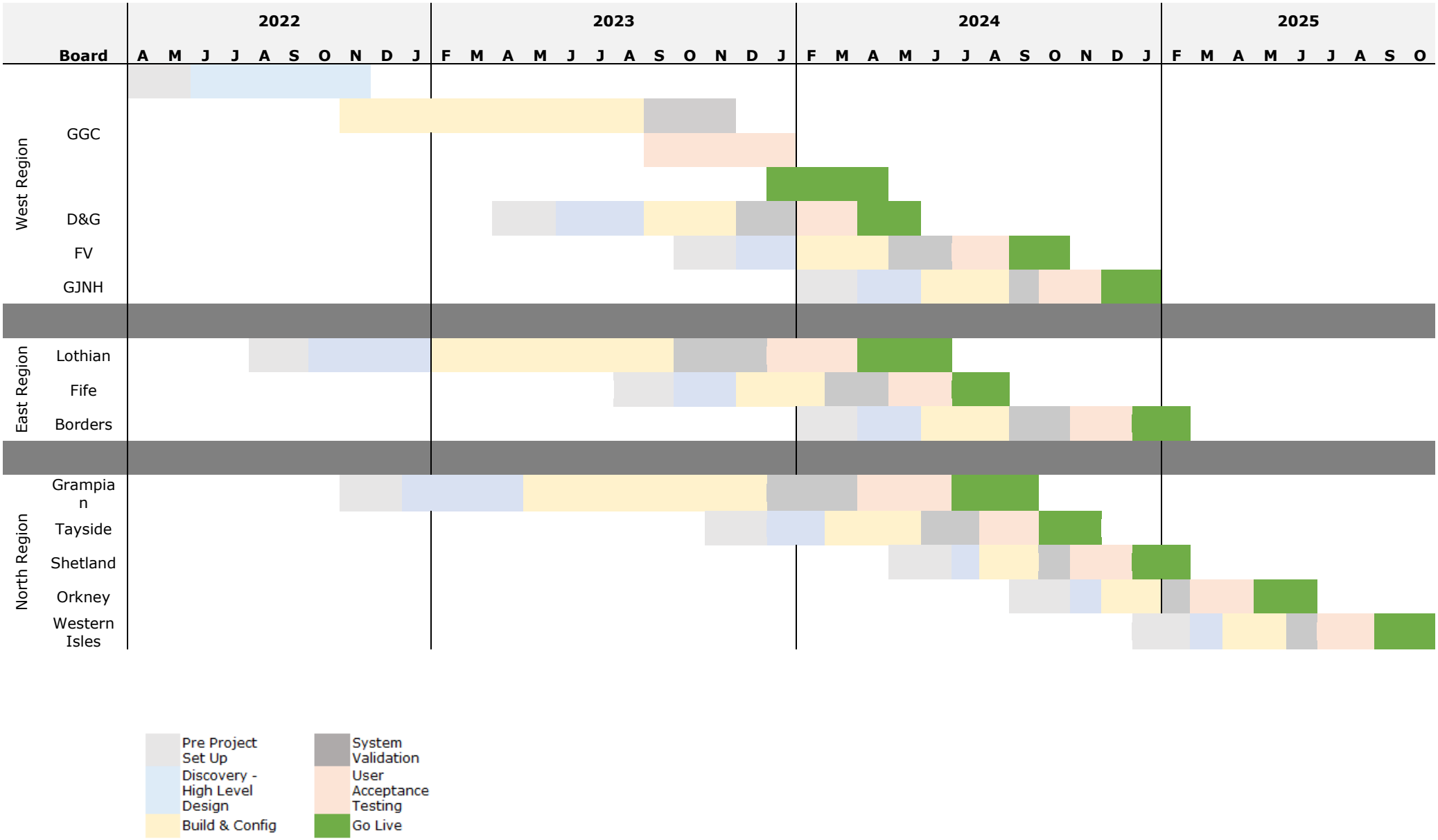
The following assumptions have been made for the suggested timeline based on the information provided by the short-listed suppliers during the procurement process:

1. Implementation involves 6 phases: "Pre-Project set up", "Discovery", "Build & Configuration", "System Validation", "User Acceptance Testing" and "Go Live"
2. The first board in the first region (i.e. NHS GGC) to implement would have the overall longest timeline of all Consortium Boards (due to the longer Discovery phase)
3. NHS GGC calls off against the framework in March 2022, starting in April 2022
4. NHS Lothian calls off against the framework in July 2022
5. NHS Grampian calls off against the framework in October 2022
6. The first Consortium Boards in the East and the North region (NHS Lothian and NHS Grampian respectively) have longer "Build & Configuration" phases than subsequent boards, as detailed configuration will have to be agreed by the Consortium Boards
7. NHS Shetland, NHS Orkney and NHS Western Isles have relatively shorter "Discovery" and "Build & Configuration" phases due to their smaller size

The following are key considerations for the implementation plan:

- The order in which the solution is implemented may change depending on when funding is available for different Consortium Boards and how quickly they need to replace their existing LIMS (e.g. when support for their current system becomes unavailable).
- We have assumed that NHS Forth Valley would join the West region, however, it is possible that they may join the East region instead.
- Some Boards may need to refresh their hardware.
- Implementation should be carried out board by board rather than by individual disciplines.

Figure 4: Suggested Implementation plan for a regional phased implementation



6.3.1. Risk Management

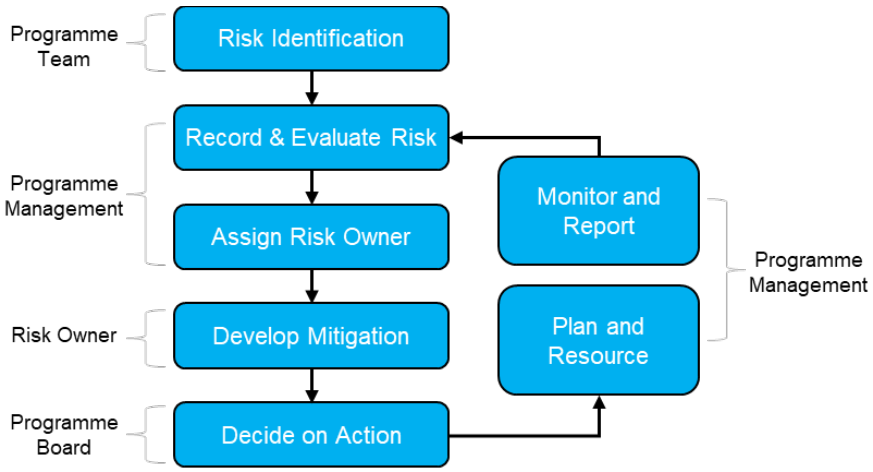
Risk identification and management will be a continual process to monitor the level of exposure to risk at any point and keep unwanted outcomes to a minimum. The NLOG will approach risk definition, initial risk identification, management and resolution; and Issue identification, management and resolution in line with NHS Health Scotland's risk management policy[16]. An appropriate risk management model to follow is the NSS Integrated Risk Management Approach (IRMA), which integrates the processes for performance management, risk action plans and internal controls assurance.

It is important to ensure that the following risk processes are established at a national and Board level:

- up-to-date risks register. It is recommended formal updates are made by designated individuals only;
- all risks should be reviewed regularly, and key risks escalated to the LIMS Project Board for management by exception;
- significant risks must have mitigation plans which are formally reviewed by the LIMS Project Board; and
- processes should be put in place to monitor risk.

It will be the responsibility of all Project Team members to identify risks as and when they become aware of them, and to use the risk management processes. These processes ensure that the risks are logged and assigned to owners to manage and continually review the individual risks.

Figure 5: Risk management approach



6.3.2. Change Management

Effective change management and visible leadership will be critical to the success of the project in order to:

- achieve buy-in across stakeholder groups from various Laboratory disciplines;
- gain commitment from users, recognising potential disruption to services and additional effort required of laboratory staff during the implementation period;

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- support the changes in working practices that the new arrangements will require (depending on collaboration approach; and
- realise the benefits of LIMS replacement, as outlined in section 3.

It is recommended Boards develop the following artefacts as part of their local planning activities:

- Change Management Strategy: to include an assessment of the potential impact of the proposed change on the culture, systems, processes and people. An underpinning communication strategy for affected disciplines and staff will also need to be defined;
- Change Management Framework: this sets out the organisational structure and personnel required to direct, manage, implement and evaluate the change, along with details of roles and responsibilities, and to support staff through the change; and
- Change Management Plans: this defines the communication required for the implementation phase.

6.3.3. Benefits Realisation and Measurement

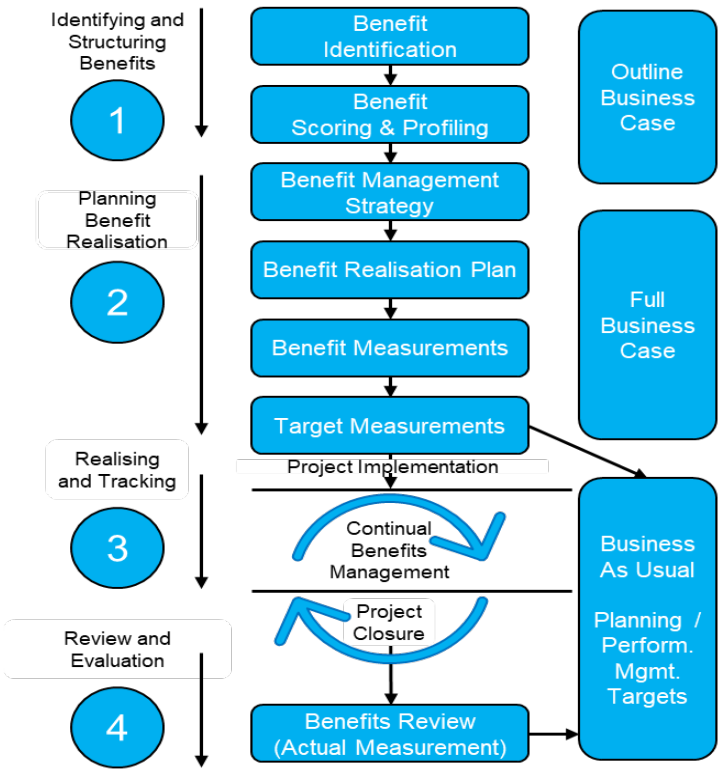
The economic section identified a number of non-financial benefits to be delivered by the implementation of LIMS. It is important that a benefits management approach is adopted by each board that enables benefits realisation to be monitored and benefits to be proactively managed across all Consortium Boards.

Prior to implementation it is recommended that further analysis of current processes is carried out in order to develop detailed baseline measures against which to monitor and assess LIMS benefits. A proposed approach for benefits realisation is shown in the Figure 6 below.

A number of key metrics will need be developed to track the delivery of benefits post implementation. It is recognised that post implementation benefit realisation activities are difficult to resource; however, it will be important to drive value out of the LIMS system and have specified metrics. These should focus on key benefit areas and provide a realistic basis on which to monitor and assess benefits realisation.

As the project progresses the details for the strategy, framework and plan for the management delivery and evaluation of benefits should be developed and documented as part of local cases.

Figure 6: Potential Benefits and Realisation Approach



Appendix A: Project Membership

National Collaborative LIMS Project Board

Table 32: National Collaborative LIMS Project Board membership

Member Name	NHS Health Board	Functional Area	Role in Host Board
William Edwards	NHS Greater Glasgow & Clyde	Board Co-Chair / eHealth	COO
Mike Gray	NHS Lothian	Board Co-Chair / Laboratories Service Manager Representative	Service Manager for Laboratory Medicine
Denise Brown	NHS Greater Glasgow & Clyde	eHealth	Interim Director of eHealth
Jackie Wales	Golden Jubilee National Hospital	Golden Jubilee National Hospital Representative	Head of Laboratories
Gerry Newlands	Golden Jubilee National Hospital	Golden Jubilee National Hospital Representative	Interim Head of eHealth
Jim Binnie	National Services Scotland	Procurement	Senior Business & Procurement Advisor
Jackie Stephen	NHS Borders	eHealth	Head of IM&T
Martyn McAdam	NHS Dumfries & Galloway	NHS Dumfries & Galloway Representative	Blood Science Service Manager
Donna Galloway	NHS Fife	NHS Fife Representative	Head of Laboratory Services
James Allison	NHS Grampian	NHS Grampian Representative	Unit Clinical Director – Laboratory Medicine Unit
Gareth Bryson	NHS Greater Glasgow & Clyde	West Region Representative	Clinical Director for Laboratory Medicine
Arwel Williams	NHS Greater Glasgow & Clyde	Diagnostics Management Representative	Director - Diagnostic Services
Carol Thomson	NHS Lothian	East Region Representative	Labs IM&T Service Manager
Carol Thomson	NHS Lothian	Laboratories Systems Manager Representative	Labs IM&T Service Manager
Elizabeth Furrie	NHS Tayside	NHS Orkney Representative	Consultant Clinical Scientist and Clinical Lead
Dawn Smith	NHS Tayside	NHS Shetland Representative	Diagnostics and Elective Services Manager

Ellie Dow	NHS Tayside	North Region Representative	Consultant in Biochemical Medicine
Anne Thomson	Scottish National Blood Transfusion Service	Blood Transfusion Representative	Interim Head of Blood Banking
Stephen McGlashan	NHS Fife	SMVN Representative	Microbiology Service Manager
TBC	NHS Orkney	NHS Orkney Representative	TBC
Scott Douglas	NHS Greater Glasgow and Clyde	Programme Manager	Programme Manager
Rob Gardiner	NHS Greater Glasgow and Clyde	General Manager Laboratory Medicine	General Manager for Laboratory Medicine
Andrew Ferguson	NHS Greater Glasgow and Clyde	SDPM Diagnostics	Service Delivery Manager
Charlotte Syme	NHS Forth Valley	NHS Forth Valley Representative	Consultant Clinical Biochemist

Responsibilities include (extract from the ToR):

- Establishing a forum for effective links and engagement between senior stakeholders from across Scotland to provide delivery assurance, support and guidance to the National Collaborative LIMS Project
- Taking a holistic view and making decisions on what is best for NHS Scotland as a whole and not individual Boards, whilst recognising that some Boards may have more predominant prevailing need than others for a replacement system
- Ensure alignment with broader NHS Scotland strategy ambitions including The National Clinical Strategy, Scotland's Digital Health and Care Strategy and Beating Cancer: Ambition and Action.
- Ensure a viable and achievable Business Case exists for the National Collaborative LIMS Project
- The resourcing, management and monitoring of the delivery of the National Collaborative LIMS Project plan and its individual component projects / workstreams / deliverables
- Use the opportunity to critically evaluate existing services and how these can be redesigned and improved, taking account of changing population needs, demographics and patterns of service usage
- Ensuring the individual component projects / workstreams produce deliverables that provide the desired outcomes and meet the user requirements
- Issue resolution at the appropriate level associated with National Collaborative LIMS Project plan and individual component projects
- Providing guidance and suggestions on the strategic direction, prioritisation and associated timelines of the plan deliverables in conjunction with interested stakeholders
- Allocation of a Senior Responsible Officer (SRO) for the National Collaborative LIMS Project
- Ensuring appropriate and proportionate project management products are in place to manage, monitor and control the output of the National Collaborative LIMS Project plan and individual component projects / workstreams / deliverables
- Acting as forum for sharing knowledge and best practice across NHS Scotland
- Acting upon any matters referred to it from executive governance authorities or escalated to it from underlying component projects / workstreams

National Collaborative LIMS Project Team

Table 33: National Collaborative LIMS Project Team

Name	Board	Role	Role on Project
Scott Douglas	NHS GGC	Programme Manager	Programme Manager
Daniel Wood	NHS GGC	Senior Business Analyst/Project lead	Project Manager
John Gallagher	NHS GGC	Project Support Officer	Project Support Officer
Carol Thomson	NHS Lothian	Labs IM&T Service Manager	LIMS Systems Manager Lead
Moray Saville	NHS Grampian	Labs IM&T Service Manager	LIMS Systems Manager Lead
Paul Docherty	NHS GGC	Application Architect	Technical/ eHealth Lead
Jim Binnie	NHS NSS	Senior Business & Procurement Advisor	Procurement Lead
Nick Bradbury	NHS Lothian	Capital Finance Manager	Finance Lead
Margaret Passmore/ Nicola Rinaldi	CLO (as and when required)	Head of Commercial Contacts/ Senior Solicitor	Legal Lead
Owen Inglis Humphrey	Deloitte	FBC Support Lead	FBC Support Lead
Giulia Melchiorre	Deloitte	FBC Support Consultant	FBC Support Consultant

Responsibilities include (extract from the ToR):

- Undertaking project activities as directed by the National Collaborative LIMS Project Board.
- Take responsibility for all activities required to ensure the successful procurement of a new LIMS.
- Managing and where required escalate project Risks via appropriate governance channels.
- Establishing and managing the Evaluation User Group / Technical & Clinical User Group whose primary role will be to advice the procurement team on the clinical, technical, and commercial aspects associated with the procurement of the LIMS.
- Ensuring discipline specific subgroups are established.
- Develop a viable and achievable Business Case for the National Collaborative LIMS Project.
- The resourcing, management and monitoring of the delivery of the National Collaborative LIMS Project plan and its individual component projects / workstreams / deliverables.
- Use the opportunity to critically evaluate existing services and how these can be redesigned and improved, taking account of changing population needs, demographics and patterns of service usage.
- Ensuring the individual component projects / workstreams produce deliverables that provide the desired outcomes and meet the user requirements.
- Issue resolution at the appropriate level associated with National Collaborative LIMS Project plan and individual component projects.
- Ensuring appropriate and proportionate project management products are in place to manage, monitor and control the output of the National Collaborative LIMS Project plan and individual component projects / workstreams / deliverables.
- Acting upon any matters referred to it from executive governance authorities or escalated to it from underlying component projects / workstreams.

LIMS Evaluation User Group (Clinical Technical User Group)

Table 34: LIMS Evaluation User Group membership

Name	Board	Role on Project	Role
Andrew Rattrie	NHS Fife	NHS Fife Representative	Laboratory IT Administrator
Carol Thomson	NHS Lothian	Project Team	Laboratory Lead
Charlotte Syme	NHS Forth Valley	Chair of Blood sciences Subgroup	Consultant Clinical Biochemist
Daniel Wood	NHS GGC	Project Manager	Project lead
Douglas Robertson	NHS Grampian	Standardisation (NLP) rep	Deputy Laboratory Manager
Deborah Hughes	NHS Borders	NHS Borders Representative	Laboratory Quality Manager
Eamonn Keyes	NHS Orkney	NHS Orkney Representative	Laboratory Manager
Ellie Dow	NHS Tayside	NHS Tayside Representative	Consultant & Honorary Senior Lecturer, Biochemical Medicine
Gareth Bryson	NHS GGC	NHS GGC Representative	Head of Service for Pathology
Gillian Lowe	NHS Forth Valley	NHS Forth Valley Representative	Department Manager, Haematology/Clinical Chemistry/Blood Transfusion
Ian Godber	NHS GGC	NHS GGC Representative	Consultant Clinical Scientist (Biochemistry)
Jackie Scott	NHS Borders	NHS Borders Representative	Blood Sciences Manager
Jackie Stephen	NHS Borders	NHS Borders rep on Project Board	eHealth Lead
James Allison	NHS Grampian	NHS Grampian Rep on Project Board	Unit Clinical Director – Laboratory Medicine Unit
Jamie Wilson	NHS Tayside	Clinical Lead for Pathology	Consultant Histopathologist
Jamie Wilson	NHS Tayside	Scottish Pathology Network IT Representative	Consultant Histopathologist
Jim Binnie	NSS	Procurement Lead	Business and Procurement advisor
Linda Lodge	National Services Scotland	NSS Representatives	Head of IT SNBTS
Liz Furrie	NHS Tayside	NHS Orkney Representative	Consultant Clinical Scientist and Clinical Lead

Martyn McAdam	NHS D&G	NHS Dumfries and Galloway Representative	Blood Science Service Manager
Matt Noel	NHS Lothian	NHS Lothian Representative	IM & T Operational Manager
Matt Smith	NHS Shetland	NHS Shetland Representative	Laboratory IT Manager
Michael Lockhart	HPS	PHS Rep	Consultant Medical Microbiologist and Clinical Lead for the Public Health Microbiology team
Mike Gray	NHS Lothian	Co-Chair of Project Board	Lab service Manager
Moray Saville	NHS Grampian	Project Team	Laboratory Lead
Neil Greig	Clinical Network	SCBN Representative and NHS Tayside representative	Consultant Clinical Scientist and Clinical Lead (Biochemical Medicine)
Nick Bradbury	NHS Lothian	Project Finance Lead	Capital Finance Manager
Paul Docherty	NHS GGC	Project Technical lead	Application architect
Paul Docherty	NHS GGC	Chair of Technical Subgroup	Application architect
Paul Westwood	NHS GGC	Chair of Genetics Subgroup	Consultant Clinical Scientist (Genetics)
Paul Westwood	NHS GGC	Genetics Consortium Representative	Consultant Clinical Scientist (Genetics)
Scott Douglas	NHS GGC	Programme Manager	Programme Manager
Sonja Wright	NHS Grampian	HaTs Representative	Clinical Scientist
Stephen McGlashan	NHS Fife	SMVN Representative	Microbiology Service Manager
Stephen McGlashan	NHS Fife	NHS Fife Representative	Microbiology Service Manager
Stephanie Thomas	HPS	PHS Rep	Consultant Medical Microbiologist and Clinical Lead for the Public Health Microbiology team
Janice Watson	NSS	Terminology Services	Clinical Coding and Terminology Services Manager

Responsibilities include (extract from the ToR):

- Review the specifications presented by the subgroups to ensure that the specifications from the area they represent have been considered and are being met
- Make decisions that will used to inform the overarching LIMS specification

- Set specifications and standards
- Horizon scan, future proof where possible and build innovation into the specification
- Where possible and if appropriate rationalise and reduce variation
- Advise on the range of goods and services to be included as part of this procurement
- Participate in Tender evaluation
- Take responsibility for the deliverables relating to their assigned work stream
- Undertake tasks related to their assigned work stream
- Provide updates on the progress of their work stream and their assigned tasks
- Where required Escalate any issues that arise to the Project leads\Chair of the subgroup or to the appropriate local Board governance group where required in a timeous manner
- Identify risks and exceptions and recommend the appropriate course of action
- Act as a point of contact for their respective locations/teams in relation to the project – liaising with the project leads/other subgroups as appropriate
- Proactively share information with colleagues
- Be Change Champions for the LIMS re-procurement project within their respective locations/teams.
- Undertake project activities as directed by the Project Leads and LIMS Consortium Project Board and Team.

National LIMS Operational Group (NLOG) Proposed membership structure

Membership of the National Laboratory Information Management System Operational Group will comprise of senior stakeholder interests from across Scotland.

Table 35: NLOG Proposed membership structure

Health Board	Functional Area	Core Member Name	Core Member Role in Host Board
Ayrshire and Arran	Diagnostics\Laboratory Management Representative	TBC	TBC
Borders	Diagnostics\Laboratory Management Representative	TBC	TBC
Dumfries & Galloway	Diagnostics\Laboratory Management Representative	TBC	TBC
Fife	Diagnostics\Laboratory Management Representative	TBC	TBC
Forth Valley	Diagnostics\Laboratory Management Representative	TBC	TBC
Grampian	Diagnostics\Laboratory Management Representative	TBC	TBC
Greater Glasgow &Clyde	Diagnostics\Laboratory Management Representative	TBC	TBC
Highlands	Diagnostics\Laboratory Management Representative	TBC	TBC
Lanarkshire	Diagnostics\Laboratory Management Representative	TBC	TBC
Lothian	Diagnostics\Laboratory Management Representative	TBC	TBC
National Waiting Times	Diagnostics\Laboratory Management	TBC	TBC

Health Board	Functional Area	Core Member Name	Core Member Role in Host Board
Centre	Representative		
Orkney	Diagnostics\Laboratory Management Representative	TBC	TBC
Shetland	Diagnostics\Laboratory Management Representative	TBC	TBC
Tayside	Diagnostics\Laboratory Management Representative	TBC	TBC
Western Isles	Diagnostics\Laboratory Management Representative	TBC	TBC
NLOG Programme Director	Programme Director	TBC	TBC
Clinical Operations Group rep	Chair of COG	TBC	TBC
Technical Operations Group rep	Chair of TOG	TBC	TBC
Standardisation Group rep	Chair of Standardisation group	TBC	TBC
LIMS National Implementation Team rep	Programme Manager	TBC	TBC
Scottish National Blood Transfusion Service	Blood Transfusion Representative	TBC	TBC
National eHealth Lead	eHealth Lead	TBC	TBC
Public Health Scotland	Public Health Scotland Representative	TBC	TBC
GP Services	GP Services Representative	TBC	TBC
Acute	TBC	TBC	TBC
Scottish Government*	TBC	TBC	TBC

*To be confirmed whether there is need for a representative from Scottish Government given that NLOG will report into DiSSG.

Responsibilities include (extract from the ToR):

- Make decisions ensuring these are based on what is best for NHS Scotland Laboratory Medicine IT as a whole and not individual Board, whilst recognising that some Boards\Network\Discipline or stakeholder may have more predominant prevailing need than others for a development requests
- Allocate appropriate local Health Board resources (financial, material and human) to ensure successful guidance, direction and delivery of the National Laboratory Information Management

System Operational Group strategy and its individual component projects / workstreams / deliverables

- Be prepared to put forward your local Health Board to take a lead on individual component projects / workstreams for the greater good of NHS Scotland
- Confirming the National Laboratory Information Management System Operational Group strategy and individual component projects / workstreams produce deliverables that will deliver the desired outcomes and meet the user requirements within agreed timescales and other associated tolerances (cost, scope, risk, quality and benefits)
- Ensure work carried out on the National Laboratory Information Management System Operational Group adheres to wider national strategies and its own overarching principles
- Ensure the opportunity is exploited to redesign and improve existing services to take account of changing population needs, demographics and patterns of service usage
- Issue resolution when tolerances are exceeded at the appropriate level associated with National Laboratory Information Management System Operational Group strategy and individual component projects / workstreams
- Be prepared to act as or appropriately assign a Senior Responsible Officer (SRO) to each project / workstream associated with the overarching National Laboratory Information Management System Operational Group
- Confirming appropriate and proportionate project management products are in place to manage, monitor and control the output of the National Laboratory Information Management System Operational Group and individual component projects / workstreams
- Act upon any matters referred to the National Laboratory Information Management System Operational Group from executive governance authorities or escalated to it from underlying component projects / workstreams
- Act upon any assigned actions in a timely fashion
- Ensure appropriate communication with all stakeholder groups

Diagnostics Scotland Strategic Group (DiSSG) membership

Table 36: DiSSG membership

Name	Role
Mr Jeff Ace (Chair)	Chief Executive
Ms Donna Galloway	Executive Group Laboratories Representative
Mr Michael Conroy/ Mr Clinton Hesltine	Executive Group Imaging Representative(s)
Prof Andrew Reilly	Executive Group Medical Physics Representative
Mr Adrian Carragher	Executive Group Phyisiology Representative
Mr Boyd Peters	NHS Board Medical Director
Mr Andrew Bone	NHS Board Finance Director
N/A	NHS Board eHealth Lead
Dr David Stirling	Director of Healthcare Science
Mr Michael Lockhart	Consultant Microbiologist
Mrs Susan Walker	Partnership Representative
Ms Roseanne McDonald	National Planning Board Representative

Mr Jim Cannon	Regional Planning Representative
Ms Catherine Ross	Chief Healthcare Science Officer
Ms Carolyn McDonald	Chief Healthcare Science Officer
Mrs Sarah Ogilvie	Policy Lead – Strategic Planning and Clinical Priorities Team
Mr Jonathan Cameron	Policy Lead – Digital Health and Care Team
Ms Susi Buchanan	Specialist Service and Commissioning, NSD Director
Mrs Liz Blackman	Senior Programme Manager, MDN's
Mrs Hill Patte	Programme Director. SRTP
Dr Hamish McRitchie	Clinical Director, SRTP

Responsibilities include (extract from the ToR):

- Overseeing the development and implementation of a national blueprint for laboratories and a future service model for Scotland which aligns to the emerging regional and national Health and Social Care Delivery Plan priorities, and follows the principles set out in the National Clinical Strategy.
- Overseeing the ongoing development and implementation of the radiology transformation programme, ensuring the programme continues to deliver against its objectives to implement a sustainable and equitable service model.
- Acting as escalation point for the programmes constituent projects, including approving and regularly reviewing implementation priorities, providing a focus on programme delivery to drive the pace of change, and requesting clinical expertise and assurance from the Executive Boards.
- Approving scope for future projects and priorities (where this is outwith or additional to that already approved); aligning national and regional plans for transformational change.
- Advising NHS Board Chief Executives and SGHSCD on the strategic direction, planning and delivery of value based diagnostic services across NHS Scotland, taking account of relevant national and international evidence and advice as appropriate from relevant bodies/groups to ensure the continued coherent development of high quality diagnostic services. This will involve providing advice on:-
    - The appropriate use of diagnostics, including new tests
    - Investment in diagnostics that optimise clinical and cost effectiveness for the benefit of patients
    - Supporting the implementation of national strategy for strands of healthcare science delivery, relevant to diagnostics
    - The range of diagnostic processes that GPs can provide cost and clinically effectively in primary care and those GPs can access directly in secondary care
    - Cost and clinically effective diagnostic element of care pathways
- The development of robust and equitable referral protocols for diagnostic testing in secondary care
- In partnership with NHS Healthcare Improvement Scotland (HIS) – in particular Scottish Health Technology Group and Scottish Medicines Consortium - advise on which diagnostic tests / processes are cost effective and should be routinely available in NHS Scotland, including developing clear processes to provide advice on companion diagnostics.
- Approving recommendations on the data requirements for operational management and strategic planning of diagnostic services to ensure they are fit for purpose, practical and cost effective. This will include:
    - Ongoing development of data marts

- Ensuring robust benchmarking data are available and utilised to enable NHS boards improve quality, productivity and efficiency
- Making recommendations on workforce development and planning, and work in partnership with Scottish Government policy and NHS NES on educational requirements and provision
- Approving the annual workplans of National Managed Diagnostic Networks.
- Acting as escalation point for risks and issues related to diagnostic services.

Laboratories Executive Board (LEB) membership

Table 37: LEB membership

Name	Role
Liz Furrie, Ellie Dow, David Ashburn, Rob Gardiner, Mike Gray, Donna Galloway	Clinical and Managerial Leads
Prof Zosia Meidzebrodska, Dr Anca Oniscu, Dr David Baty, Fiona MacKenzie, Stuart Thomas, Amanda Malham, Robyn Gunn, Jim Allison	MDN Clinical and Managerial Leads
Gareth Bryson	Digital Pathology Lead
Scott Douglas	LIMS Programme Lead
Jess Henderson	NLP Programme Director
Bill Bartlett	NLP Clinical Lead
Liz Blackman	MDN Programme Manager
Heather Gilfillan	Partnership
Craig Spalding	SNBTS Director
David Stirling	HCS Director NSS
Michael Lockhart	Health Protection Scotland Clinical Lead
David Taggart	Procurement Rep
Peter Croan	National Services Division Commissioning Rep
Ed Clifton	Scottish Health Technologies Group Unit Head

Appendix B: Financial model assumptions

Detailed assumptions for the financial model are set out in Section 5: Economic and Financial Case. Below is additional relevant detail for these assumptions.

National implementation Team Costs

The implementation timeline assumes that it will take 43 months to implement the LIMS Solution across all Consortium Boards, from the project commencement of the first Board. Individual Boards will be expected to contribute the costs associated with the National Implementation Team, equivalent to the national cost apportionment percentage of the total cost. Those contributions will then be spread over the duration of the individual Board implementation project.

Table 38: National implementation team

	Grade	WTE	Period	Equivalent months in post	Total Implementation Cost
Senior Programme Manager	8c	1	43	43	£374,293.50
Programme Manager	8a	1	43	43	£258,602.00
Lab lead	8b	1	43	43	£311,187.42
Lab Admin	7	1	43	43	£226,570.58
PMO	5	1	43	43	£154,499.00
Change & Comms Lead	8a	0.5	43	21.5	£129,301.00
eHealth Lead / Architect	8a	0.5	43	21.5	£129,301.00
IG Lead	7	0.2	43	8.6	£45,314.12
Test Manager	7	0.6	43	25.8	£135,942.35
Total cost for National Implementation Team					**£1,765,010.97**

Regional implementation Team Costs

West Region

The timeline assumes that it will take 34 months for implementing LIMS across the West Region.

Table 39: West Region implementation team

	Grade	WTE	Period	Equivalent months in post	Total Region Implementation Cost
Project Manager	8a	1	34	34	£204,476.00
Domain Expert	8a	2	34	68	£408,952.00
Integration specialist	7	0.2	34	6.8	£35,829.77
Comms & Change	6	0.4	34	13.6	£60,805.60
Test facilitator	6	0.2	34	6.8	£30,402.80
Analyst	7	0.2	34	6.8	£35,829.77
Training Facilitator	5	0.2	34	6.8	£24,432.40
Business Reporting	6	0.2	34	6.8	£30,402.80
PMO	5	1	34	34	£122,162.00
Total cost for Regional Team					**£953,293.13**

East Region

The timeline assumes that it will take 31 months for implementing the LIMS Solution across all Boards in the East Region.

Table 40: East Region implementation team

Role	Grade	WTE	Period	Equivalent months in post	Total Region Implementation Cost
Project Manager	8a	1	31	31	£186,434.00
Domain Expert	8a	2	31	62	£372,868.00
Integration specialist	7	0.2	31	6.2	£32,668.32
Comms & Change	6	0.4	31	12.4	£55,440.40
Test facilitator	6	0.2	31	6.2	£27,720.20
Analyst	7	0.2	31	6.2	£32,668.32
Training Facilitator	5	0.2	31	6.2	£22,276.60
Business Reporting	6	0.2	31	6.2	£27,720.20
PMO	5	1	31	31	£111,383.00
				Total cost for Regional Team	**£869,179.03**

North Region

The timeline assumes that it will take 36 months for implementing the LIMS Solution across all Boards in the North Region.

Table 41: North Region implementation team

Role	Grade	WTE	Period	Equivalent months in post	Total Region Implementation Cost
Project Manager	8a	1	36	36	£216,504.00
Domain Expert	8a	2	36	72	£433,008.00
Integration specialist	7	0.2	36	7.2	£37,937.40
Comms & Change	6	0.4	36	14.4	£64,382.40
Test facilitator	6	0.2	36	7.2	£32,191.20
Analyst	7	0.2	36	7.2	£37,937.40
Training Facilitator	5	0.2	36	7.2	£25,869.60
Business Reporting	6	0.2	36	7.2	£32,191.20
PMO	5	1	36	36	£129,348.00
				Total cost for Regional Team	**£1,009,369.20**

Implementation Team costs per Health Board

Region	Board	Duration of implementation period (months)	Contribution to Regional Team	Contribution to National Team	Total Cost over Implementation period	Monthly Cost	Annual Cost
West	GGC	24	£658,522	£520,845	£1,179,367	£49,140	£589,684
West	D&G	14	£88,701	£70,157	£158,858	£11,347	£136,164
West	Forth Valley	13	£161,438	£127,686	£289,124	£22,240	£266,884
West	GJNH	12	£44,631	£35,300	£79,932	£6,661	£79,932
East	Lothian	23	£544,234	£351,053	£895,286	£38,925	£467,106
East	Fife	13	£247,655	£159,748	£407,403	£31,339	£376,064
East	Borders	13	£77,290	£49,855	£127,145	£9,780	£117,364
North	Grampian	23	£511,757	£228,340	£740,097	£32,178	£386,138
North	Tayside	13	£410,466	£183,145	£593,611	£45,662	£547,949
North	Shetland	10	£25,669	£11,453	£37,122	£3,712	£44,546
North	Orkney	10	£26,345	£11,755	£38,100	£3,810	£45,720
North	Western Isles	10	£35,131	£15,675	£50,807	£5,081	£60,968
		Total	**£2,831,841**	**£1,765,011**	**£4,596,852**		

Appendix C: Cost Line Items and Calculation Methodology

Cost Line	Forecast Calculation	Input Data Fields
License costs	National Instance: License costs = direct input Regional Instance: License costs = direct input Individual Health Board Instance: License costs = direct input	
Annual Support, Maintenance and Hosting Fee	National Instance: Annual Support, Maintenance and Hosting Fee = A + B + C + (D x E) Regional Instance: Annual Support, Maintenance and Hosting Fee = A + B + C + (F x G) Individual Health Board Instance: Annual Support, Maintenance and Hosting Fee = direct input	A = Genetics support cost (if applicable) B = Blood transfusion support cost (if applicable) C = Support model cost (based on selection) D = % Supplier National Hosting Allocation E = National hosting fee (on premise or supplier hosted) F = % Supplier Regional Hosting Allocation G = Regional hosting fee (on premise or supplier hosted)
Supplier Implementation	National Instance: Supplier implementation costs = direct input Regional Instance: Supplier implementation costs = direct input Individual Health Board Instance: Supplier implementation costs = direct input	
Design	National Instance: Design costs = direct input Regional Instance: Design costs = direct input Individual Health Board Instance: Design costs = direct input	
Build and Local Config	National Instance: Build & Local Config costs = direct input Regional Instance: Build & Local Config costs = direct input Individual Health Board Instance: Build & Local Config costs = direct input	
Interface	National Instance: Interface costs = direct input Regional Instance: Interface costs = direct input Individual Health Board Instance: Interface costs = direct input	
Data Migration	National Instance: Data migration costs = direct input Regional Instance: Data migration costs = direct input Individual Health Board Instance: Data migration costs = direct input	
Additional Services	National Instance: Additional Services = A x B x C x D Regional Instance: Additional Services = B x C x D x E Individual Health Board Instance: Additional services = B x C x D	A = Board % Allocation of National Costs based on NRAC B = Expected number of working days per year C = Day rate cost D = Number of staff E = Board % Allocation of Regional Costs based on NRAC

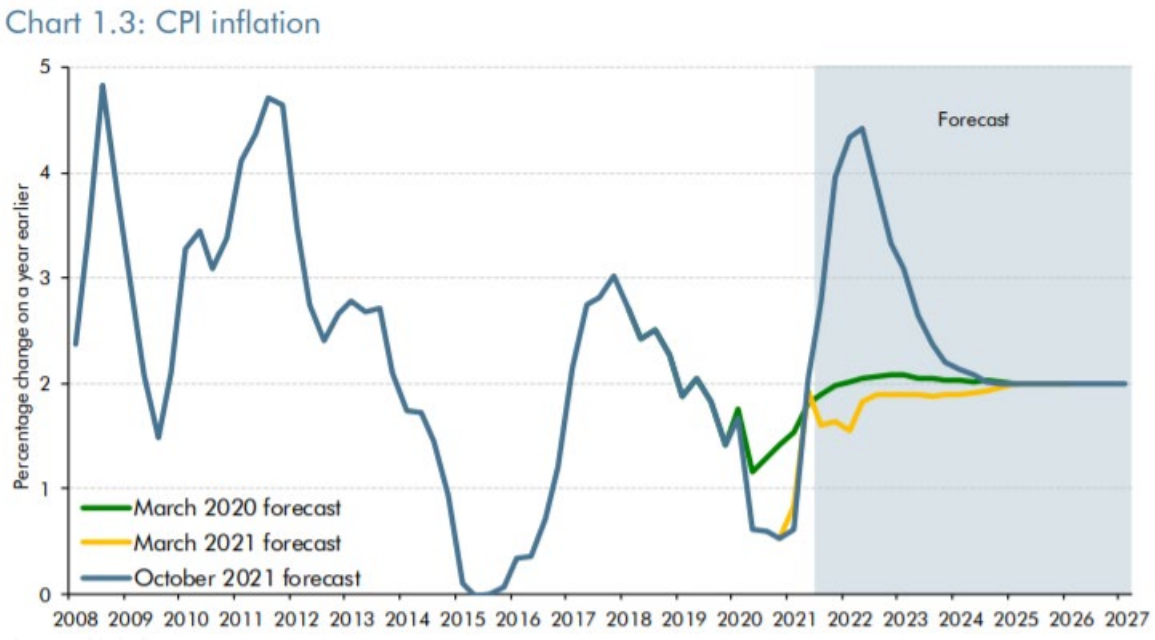
Cost Line	Forecast Calculation	Input Data Fields
Regional Implementation Team	National Instance: Regional Implementation Team costs = direct input Regional instances: Regional Implementation Team costs = direct input Individual Health Board Instance: Regional Implementation Team costs = A x B	A = Board % Allocation of Regional Costs based on adjusted NRAC B = Regional Implementation Team full team cost
National Implementation Team	National Instance: National Implementation Team costs = direct input Regional instances: National Implementation Team costs = direct input Individual Health Board Instance: National Implementation Team costs = A x B	A = Board % Allocation of National Costs based on adjusted NRAC B = National implementation team full team costs
Existing NHS Resources	National Instance: Existing NHS resource costs = direct input Regional Instance: Existing NHS resource = direct input Individual Health Board Instance: Existing NHS resource = direct input	

Appendix D: Inflation Calculation

Per Office of Budget Responsibility, inflation is set to rise in the short term before returning to target levels from 2025. Assuming a modelling term beginning in 2022 (base year), we have used the OBR's estimate of inflation for 2023 and 2024 and the Bank of England target rate of 2% from 2025 onwards.

Since the period begins in April 2022, we have used a blended rate for each annual period modelled after the Year 1 base year, i.e. (OBR forecasts 2.6% CPI inflation in 2023 and 2.1% in 2024; since period 2 March 2023 – 29 February 2024 includes 10 months of 2023 and 2 months of 2024 the Year 2 inflation for modelling purposes is (2.6%*(10/12))+(2.1%*(2/12)) = 2.52%.

Year	Inflation	Source
Year 1 (2022-23)	N/A	Base Year
Year 2 (2023-24)	2.52%	OBR Economic & Fiscal Outlook October 2021
Year 3 (2024-25)	2.08%	OBR Economic & Fiscal Outlook October 2021
Years 4 – 16	2%	Bank of England Target Rate



	Percentage change on a year earlier, unless otherwise stated						
	Outturn	Forecast					
	2020	2021	2022	2023	2024	2025	2026
Output at constant market prices							
Gross domestic product (GDP)	-9.8	6.5	6.0	2.1	1.3	1.6	1.7
GDP per capita	-10.2	6.3	5.6	1.7	1.0	1.3	1.4
GDP levels (2020=100)	100.0	106.5	112.8	115.2	116.7	118.6	120.6
Output gap	-0.4	0.9	0.6	0.5	0.1	0.0	0.0
Expenditure components of real GDP							
Household consumption	-10.9	4.7	9.8	1.3	1.7	1.3	1.0
General government consumption	-6.5	14.7	2.0	1.5	1.2	1.7	2.1
Business investment	-10.2	-2.4	15.7	4.7	-0.8	4.8	5.8
General government investment	3.5	14.7	-2.1	6.5	-1.0	1.1	1.8
Net trade[1]	0.8	-0.8	-2.5	0.3	0.1	-0.1	-0.2
Inflation							
CPI	0.9	2.3	4.0	2.6	2.1	2.0	2.0
Labour market							
Employment (million)	32.5	32.2	32.6	33.0	33.2	33.3	33.4
Average earnings	1.2	5.0	3.9	3.0	2.2	2.9	3.5
LFS unemployment (rate, per cent)	4.6	4.9	4.8	4.3	4.2	4.2	4.2

[1] Contribution to GDP growth.

Source: OBR Economic and fiscal outlook – October 2021 - https://obr.uk/efo/economic-and-fiscal-outlook-october-2021/

Appendix E: Optimism Bias Calculation

Background

The UK Green Book offers supplementary guidance on the calculation of contingency / optimism bias. This guidance sets the suggested upper limit starting point contingency % for various different types of projects. IT projects, and the specific NHS UCR record this business case addresses, fall under the "Equipment – Capital Expenditure" Grouping which has a suggested starting point of 200%. The guidance advises a variety of relevant factors which contribute towards that starting point % figure, including their % contribution to the total. The next step in the calculation is to evaluate how far these factors are mitigated by applying a mitigation % factor to each.[17]

Background to each factor

The Green Book supplementary guidance offers background on each of the relevant factors which has been summarised below.

Factor	Description	Contributory Factors
Complexity of Contract Structure	A more complex and less defined contract structure is deemed to create uncertainty which adds to the contingency requirement.	• Details of risk transfer had to be clarified • Payment mechanism had to be defined • Unforeseen amount of negotiation required on terms of contract
Late Contractor Involvement in Design	A successful estimate is considered to be more likely when the contractor/supplier is involved from an earlier stage of the process.	• Value management was necessary but contractor was not involved early enough to allow for it • The design could not be built due to construction problems (e.g. access) • Contractor provided design / construction feedback at a late stage resulting in a redesign
Poor Contractor Capabilities	A successful estimate is considered to be more likely when the contractor/supplier is deemed competent and reliable.	• Contractor was inexperienced • Health and safety standards were not met • Implementation not carried out to the necessary standards • The contractor had insufficient resources
Information Management	A successful estimate is considered to be more likely when there is a clear flow of relevant information between	• The interfaces between the stakeholders were not managed efficiently resulting in information not being transferred effectively.

[17] **https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/191507/Optimism_bias.pdf**

Factor	Description	Contributory Factors
	stakeholders.	
Design Complexity	Complexity of the IT system design is deemed to contribute towards a higher uncertainty.	• The design had to be built in difficult conditions e.g. a hydropower station
Degree of Innovation	A new and innovative IT system design is deemed to contribute towards a higher uncertainty.	• New generation design • Unusual site conditions requiring innovative solutions e.g. large wind forces, chemical nature of soil and soil contamination
Inadequacy of the Business Case	Poor quality business cases are deemed to contribute towards higher uncertainty. Note, this is deemed N/A as the contingency factor is being prepared for a business case.	N/A
Project Management Team	A more competent project management team is deemed to mitigate uncertainty and result in a lower required contingency.	• The project management team was inexperienced in delivering a project of this nature • Inadequate review of drawings by the project manager before implementation
Poor Project Intelligence	A lack of information and knowledge of the requirements of a successful project is deemed to increase uncertainty.	• Insufficient ground investigation • The detailed design was based on insufficient information • Insufficient consideration of existing conditions
Legislation / Regulations	Required legislation/regulation considerations are deemed to add a level of complexity and increase uncertainty around the project.	• Change in required standards
Technology	Technology is deemed a large factor in implementation of any IT project, being central to the nature of the project. Areas in which technology acquired is likely to be redundant are less likely to lead to a successful project implementation.	• Unanticipated technological advancements • Computer virus • Limits in technology

Calculation

In line with Green Book guidance discussed above, each factor contributing towards the 200% starting point total for IT projects has been set out. A mitigation % factor has then been applied for each, and rationale provided for that mitigation factor. The total mitigation factor is then deducted from the full factor contribution (100%) and applied to the starting point score. In this case, a total mitigation factor of 95% leaves an unmitigated % factor of 5%, which has been applied to the starting point of 200% to result in a final contingency % of 10%.

Factor	% Factor Contribution	Score	Mitigation %	Mitigation % Rationale	Mitigation Calculation
Complexity of Contract Structure	7%	14	100%	Contract structure has been defined.	7%
Late Contractor Involvement in Design	7%	14	95%	All three suppliers considered, InterSystems, Wellbeing Software and CliniSys have been heavily involved in detailed discussions throughout the procurement process.	7%
Poor Contractor Capabilities	4%	8	95%	Suppliers are established suppliers and have supplied to NHS in the past with no significant issues. Wellbeing Software have recently won the contract to implement a national LIMS solution in Wales, and they are well established in Australia.	4%
Information Management	5%	10	95%	Due diligence well progressed at FBC stage.	5%
Design Complexity	10%	20	95%	The system has already been designed and implemented elsewhere – but still bits and pieces that will be relatively new.	10%
Degree of Innovation	17%	34	100%	The system has already been designed and implemented elsewhere - technology that is well proven	17%
Inadequacy of the Business Case	18%	36	100%	N/A - Analysis undertaken for business case, which is being developed by Deloitte according to Green Book and Scottish Capital Investment Manual guidance. OBC prepared in 2020 by Deloitte with no issues.	18%

Factor	% Factor Contribution	Score	Mitigation %	Mitigation % Rationale	Mitigation Calculation
Project Management Team	5%	10	90%	Project management team requirements and structure identified and defined. This includes a defined governance structure and a list of NHS resource required. However, not all personnel are yet in place.	5%
Poor Project Intelligence	4%	8	90%	Very detailed requirements were developed by experts from Consortium Boards with extensive planning. NHS Scotland received information from existing sites.	4%
Legislation / Regulations	5%	10	60%	Certain pieces around GDPR and personal data that will add degree of complexity	3%
Technology	18%	36	95%	Unlikely to be technological advancements in the near future which render the system obsolete. The technology has already been implemented in other places which is judged to mitigate against risk of the technology being deficient. Not fully mitigated against due to unavoidable uncertainty with technology over a 10 - 20 year period, and although NHS have appropriate anti-virus mitigations in place technology does hold an inherent risk of virus attack.	17%
Totals	**100%**	**200**			**95%**

Contingency Calculation:

(Unmitigated Factor % Contribution – Mitigated Factor % Contribution) * Total Score for IT project = Applied Contingency %

(100% - 95%) * 200 = 10.2%

Appendix F: Full Economic & Financial costs by Health Board

The tables below show the total Economic and Financial Costs for the following scenario based on the assumptions set out in Section 5:

- Implementation approach: **Individual Health Board instances**
- Support model: **Support model set out in the call of contract**
- License type: **Concurrent User License**
- Hosting: **On-premises hosting**

NHS Borders

Cost line	Year										
	1	2	3	4	5	6	7	8	9	10	Total
License Costs (NRC)	-	0.00	0.02	-	-	-	-	-	-	-	0.02
Annual Support & Hosting Fee (RR)	-	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.07
Supplier Implementation (NRC)	-	0.00	0.02	-	-	-	-	-	-	-	0.02
Design (NRC)	-	-	0.00	-	-	-	-	-	-	-	0.00
Build and Local Config (NRC)	-	-	0.01	-	-	-	-	-	-	-	0.01
Interface (NRC)	-	-	0.00	-	-	-	-	-	-	-	0.00
Data Migration (NRC)	-	-	0.00	-	-	-	-	-	-	-	0.00
Additional Services (NRR)	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.26
Regional Implementation Team (NRC)	-	0.01	0.07	-	-	-	-	-	-	-	0.08
National Implementation Team (NRR)	-	0.01	0.04	-	-	-	-	-	-	-	0.05
Optimism Bias Total	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05
Total with Contingency	**0.03**	**0.05**	**0.21**	**0.04**	**0.04**	**0.04**	**0.04**	**0.04**	**0.04**	**0.04**	**0.56**
Total NRC	-	0.02	0.13	-	-	-	-	-	-	-	0.15
Total NRR	0.03	0.04	0.07	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.34
Total RR	-	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.07
Total	**0.03**	**0.05**	**0.21**	**0.04**	**0.04**	**0.04**	**0.04**	**0.04**	**0.04**	**0.04**	**0.56**
Discount Factor	*0.98*	*0.95*	*0.92*	*0.89*	*0.86*	*0.83*	*0.80*	*0.77*	*0.75*	*0.72*	-
Net Present Cost	**0.03**	**0.05**	**0.19**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.49**
VAT											-
NRC	-	0.00	0.01	-	-	-	-	-	-	-	0.01
NRR	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.06
RR	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Total VAT	**0.01**	**0.01**	**0.02**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.08**
Total Indexation	**-**	**0.00**	**0.01**	**0.00**	**0.00**	**0.00**	**0.01**	**0.01**	**0.01**	**0.01**	**0.05**
NRC (Incl. VAT & indexation)	-	0.02	0.15	-	-	-	-	-	-	-	0.17
NRR (Incl. VAT & indexation)	0.03	0.04	0.08	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.43
RR (Incl. VAT & indexation)	-	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.10
Total (Including VAT and indexation)	**0.03**	**0.06**	**0.24**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.69**
Annual Depreciation	-	0.00	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.15
Existing Local BAU Resources	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.07
Less Existing License + Hardware Fee	-	-	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.41

*Due to rounding, '0.00' costs are less than £10k

NHS Dumfries & Galloway

Cost line	Year										
	1	2	3	4	5	6	7	8	9	10	Total
License Costs (NRC)	-	0.07	0.16	-	-	-	-	-	-	-	0.22
Annual Support & Hosting Fee (RR)	-	0.03	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.75
Supplier Implementation (NRC)	-	0.05	0.01	-	-	-	-	-	-	-	0.07
Design (NRC)	-	0.01	-	-	-	-	-	-	-	-	0.01
Build and Local Config (NRC)	-	0.04	-	-	-	-	-	-	-	-	0.04
Interface (NRC)	-	0.01	-	-	-	-	-	-	-	-	0.01
Data Migration (NRC)	-	0.01	0.00	-	-	-	-	-	-	-	0.01
Additional Services (NRR)	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.26
Regional Implementation Team (NRC)	-	0.08	0.01	-	-	-	-	-	-	-	0.09
National Implementation Team (NRR)	-	0.06	0.01	-	-	-	-	-	-	-	0.07
Optimism Bias Total	0.00	0.03	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.13
Total with Contingency	**0.03**	**0.40**	**0.33**	**0.13**	**0.13**	**0.13**	**0.13**	**0.13**	**0.13**	**0.13**	**1.65**
Total NRC	-	0.27	0.19	-	-	-	-	-	-	-	0.46
Total NRR	0.03	0.09	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.36
Total RR	-	0.04	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.82
Total	**0.03**	**0.40**	**0.33**	**0.13**	**0.13**	**0.13**	**0.13**	**0.13**	**0.13**	**0.13**	**1.65**
Discount Factor	*0.98*	*0.95*	*0.92*	*0.89*	*0.86*	*0.83*	*0.80*	*0.77*	*0.75*	*0.72*	-
Net Present Cost	**0.03**	**0.38**	**0.30**	**0.11**	**0.11**	**0.11**	**0.10**	**0.10**	**0.09**	**0.09**	**1.42**
VAT											-
NRC	-	0.04	0.03	-	-	-	-	-	-	-	0.07
NRR	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.06
RR	-	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.16
Total VAT	**0.01**	**0.05**	**0.06**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.29**
Total Indexation	**-**	**0.01**	**0.02**	**0.01**	**0.01**	**0.01**	**0.02**	**0.02**	**0.02**	**0.03**	**0.14**
NRC (Incl. VAT & indexation)	-	0.32	0.23	-	-	-	-	-	-	-	0.55
NRR (Incl. VAT & indexation)	0.03	0.10	0.05	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.45
RR (Incl. VAT & indexation)	-	0.04	0.12	0.12	0.13	0.13	0.13	0.13	0.14	0.14	1.08
Total (Including VAT and indexation)	**0.03**	**0.46**	**0.40**	**0.16**	**0.16**	**0.17**	**0.17**	**0.17**	**0.18**	**0.18**	**2.08**
Annual Depreciation	-	0.03	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.48
Existing Local BAU Resources	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.08
Less Existing License + Hardware Fee	-	-	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.94

*Due to rounding, '0.00' costs are less than £10k

NHS Fife

Cost line	Year										
	1	2	3	4	5	6	7	8	9	10	Total
License Costs (NRC)	-	0.08	0.20	-	-	-	-	-	-	-	0.28
Annual Support & Hosting Fee (RR)	-	0.03	0.09	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.91
Supplier Implementation (NRC)	-	0.04	0.05	-	-	-	-	-	-	-	0.08
Design (NRC)	-	0.01	0.00	-	-	-	-	-	-	-	0.01
Build and Local Config (NRC)	-	0.04	0.01	-	-	-	-	-	-	-	0.05
Interface (NRC)	-	0.01	-	-	-	-	-	-	-	-	0.01
Data Migration (NRC)	-	0.00	0.01	-	-	-	-	-	-	-	0.01
Additional Services (NRR)	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.26
Regional Implementation Team (NRC)	-	0.15	0.10	-	-	-	-	-	-	-	0.25
National Implementation Team (NRR)	-	0.10	0.06	-	-	-	-	-	-	-	0.16
Optimism Bias Total	0.00	0.04	0.03	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.17
Total with Contingency	**0.03**	**0.53**	**0.57**	**0.15**	**0.15**	**0.15**	**0.15**	**0.15**	**0.15**	**0.15**	**2.19**
Total NRC	-	0.36	0.37	-	-	-	-	-	-	-	0.73
Total NRR	0.03	0.14	0.10	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.46
Total RR	-	0.03	0.10	0.12	0.12	0.12	0.12	0.12	0.12	0.12	1.00
Total	**0.03**	**0.53**	**0.57**	**0.15**	**0.15**	**0.15**	**0.15**	**0.15**	**0.15**	**0.15**	**2.19**
Discount Factor	*0.98*	*0.95*	*0.92*	*0.89*	*0.86*	*0.83*	*0.80*	*0.77*	*0.75*	*0.72*	-
Net Present Cost	**0.03**	**0.50**	**0.52**	**0.13**	**0.13**	**0.13**	**0.12**	**0.12**	**0.11**	**0.11**	**1.90**
VAT											-
NRC	-	0.04	0.05	-	-	-	-	-	-	-	0.09
NRR	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.06
RR	-	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.20
Total VAT	**0.01**	**0.05**	**0.08**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.35**
Total Indexation	**-**	**0.01**	**0.03**	**0.01**	**0.01**	**0.02**	**0.02**	**0.02**	**0.03**	**0.03**	**0.18**
NRC (Incl. VAT & indexation)	-	0.41	0.44	-	-	-	-	-	-	-	0.84
NRR (Incl. VAT & indexation)	0.03	0.15	0.11	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.55
RR (Incl. VAT & indexation)	-	0.04	0.13	0.16	0.16	0.16	0.16	0.17	0.17	0.17	1.32
Total (Including VAT and indexation)	**0.03**	**0.59**	**0.67**	**0.19**	**0.20**	**0.20**	**0.20**	**0.21**	**0.21**	**0.21**	**2.72**
Annual Depreciation	-	0.04	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.75
Existing Local BAU Resources	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.19
Less Existing License + Hardware Fee	-	-	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	1.53

*Due to rounding, '0.00' costs are less than £10k

NHS Forth Valley

Cost line	Year										
	1	2	3	4	5	6	7	8	9	10	Total
License Costs (NRC)	-	0.03	0.27	-	-	-	-	-	-	-	0.30
Annual Support & Hosting Fee (RR)	-	0.02	0.09	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.94
Supplier Implementation (NRC)	-	0.03	0.06	-	-	-	-	-	-	-	0.09
Design (NRC)	-	0.00	0.01	-	-	-	-	-	-	-	0.01
Build and Local Config (NRC)	-	0.03	0.02	-	-	-	-	-	-	-	0.05
Interface (NRC)	-	0.01	0.00	-	-	-	-	-	-	-	0.01
Data Migration (NRC)	-	0.00	0.01	-	-	-	-	-	-	-	0.01
Additional Services (NRR)	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.26
Regional Implementation Team (NRC)	-	0.07	0.09	-	-	-	-	-	-	-	0.16
National Implementation Team (NRR)	-	0.06	0.07	-	-	-	-	-	-	-	0.13
Optimism Bias Total	0.00	0.02	0.04	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.17
Total with Contingency	**0.03**	**0.30**	**0.67**	**0.16**	**0.16**	**0.16**	**0.16**	**0.16**	**0.16**	**0.16**	**2.13**
Total NRC	-	0.19	0.47	-	-	-	-	-	-	-	0.66
Total NRR	0.03	0.09	0.10	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.43
Total RR	-	0.02	0.10	0.13	0.13	0.13	0.13	0.13	0.13	0.13	1.04
Total	**0.03**	**0.30**	**0.67**	**0.16**	**0.16**	**0.16**	**0.16**	**0.16**	**0.16**	**0.16**	**2.13**
Discount Factor	*0.98*	*0.95*	*0.92*	*0.89*	*0.86*	*0.83*	*0.80*	*0.77*	*0.75*	*0.72*	-
Net Present Cost	**0.03**	**0.29**	**0.62**	**0.14**	**0.14**	**0.13**	**0.13**	**0.12**	**0.12**	**0.12**	**1.83**
VAT											-
NRC	-	0.02	0.08	-	-	-	-	-	-	-	0.10
NRR	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.06
RR	-	0.00	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.21
Total VAT	**0.01**	**0.03**	**0.10**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.36**
Total Indexation	**-**	**0.01**	**0.03**	**0.01**	**0.01**	**0.02**	**0.02**	**0.02**	**0.03**	**0.03**	**0.19**
NRC (Incl. VAT & indexation)	-	0.21	0.57	-	-	-	-	-	-	-	0.78
NRR (Incl. VAT & indexation)	0.03	0.10	0.11	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.52
RR (Incl. VAT & indexation)	-	0.03	0.12	0.17	0.17	0.17	0.17	0.18	0.18	0.18	1.37
Total (Including VAT and indexation)	**0.03**	**0.34**	**0.81**	**0.20**	**0.21**	**0.21**	**0.21**	**0.22**	**0.22**	**0.22**	**2.68**
Annual Depreciation	-	0.02	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.69
Existing Local BAU Resources	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.14
Less Existing License + Hardware Fee	-	-	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.98

*Due to rounding, '0.00' costs are less than £10k

NHS Golden Jubilee

Cost line	Year										
	1	2	3	4	5	6	7	8	9	10	Total
License Costs (NRC)	-	0.00	0.04	-	-	-	-	-	-	-	0.05
Annual Support & Hosting Fee (RR)	-	0.00	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.15
Supplier Implementation (NRC)	-	0.00	0.03	-	-	-	-	-	-	-	0.04
Design (NRC)	-	-	0.00	-	-	-	-	-	-	-	0.00
Build and Local Config (NRC)	-	-	0.02	-	-	-	-	-	-	-	0.02
Interface (NRC)	-	-	0.00	-	-	-	-	-	-	-	0.00
Data Migration (NRC)	-	-	0.00	-	-	-	-	-	-	-	0.00
Additional Services (NRR)	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.26
Regional Implementation Team (NRC)	-	0.01	0.04	-	-	-	-	-	-	-	0.04
National Implementation Team (NRR)	-	0.01	0.03	-	-	-	-	-	-	-	0.04
Optimism Bias Total	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06
Total with Contingency	**0.03**	**0.05**	**0.23**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.66**
Total NRC	-	0.02	0.16	-	-	-	-	-	-	-	0.17
Total NRR	0.03	0.03	0.06	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.32
Total RR	-	0.00	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.16
Total	**0.03**	**0.05**	**0.23**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.66**
Discount Factor	*0.98*	*0.95*	*0.92*	*0.89*	*0.86*	*0.83*	*0.80*	*0.77*	*0.75*	*0.72*	-
Net Present Cost	**0.03**	**0.05**	**0.21**	**0.04**	**0.04**	**0.04**	**0.04**	**0.04**	**0.04**	**0.04**	**0.57**
VAT											-
NRC	-	0.00	0.02	-	-	-	-	-	-	-	0.02
NRR	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.06
RR	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Total VAT	**0.01**	**0.01**	**0.03**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.11**
Total Indexation	**-**	**0.00**	**0.01**	**0.00**	**0.00**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.06**
NRC (Incl. VAT & indexation)	-	0.02	0.19	-	-	-	-	-	-	-	0.21
NRR (Incl. VAT & indexation)	0.03	0.04	0.07	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.41
RR (Incl. VAT & indexation)	-	0.00	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.22
Total (Including VAT and indexation)	**0.03**	**0.06**	**0.27**	**0.06**	**0.06**	**0.07**	**0.07**	**0.07**	**0.07**	**0.07**	**0.83**
Annual Depreciation	-	0.00	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.18
Existing Local BAU Resources	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Less Existing License + Hardware Fee	-	-	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.61

*Due to rounding, '0.00' costs are less than £10k

NHS Grampian

Cost line	Year										
	1	2	3	4	5	6	7	8	9	10	Total
License Costs (NRC)	0.06	0.12	0.42	-	-	-	-	-	-	-	0.60
Annual Support & Hosting Fee (RR)	0.04	0.09	0.20	0.24	0.24	0.24	0.24	0.24	0.24	0.24	2.01
Supplier Implementation (NRC)	0.02	0.07	0.07	-	-	-	-	-	-	-	0.17
Design (NRC)	-	0.02	-	-	-	-	-	-	-	-	0.02
Build and Local Config (NRC)	0.02	0.09	-	-	-	-	-	-	-	-	0.11
Interface (NRC)	-	0.02	-	-	-	-	-	-	-	-	0.02
Data Migration (NRC)	-	0.01	0.01	-	-	-	-	-	-	-	0.02
Additional Services (NRR)	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.26
Regional Implementation Team (NRC)	0.11	0.27	0.13	-	-	-	-	-	-	-	0.51
National Implementation Team (NRR)	0.05	0.12	0.06	-	-	-	-	-	-	-	0.23
Optimism Bias Total	0.03	0.07	0.05	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.33
Total with Contingency	**0.35**	**0.90**	**0.97**	**0.29**	**0.29**	**0.29**	**0.29**	**0.29**	**0.29**	**0.29**	**4.28**
Total NRC	0.23	0.65	0.66	-	-	-	-	-	-	-	1.54
Total NRR	0.08	0.16	0.09	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.54
Total RR	0.04	0.09	0.22	0.26	0.26	0.26	0.26	0.26	0.26	0.26	2.21
Total	**0.35**	**0.90**	**0.97**	**0.29**	**0.29**	**0.29**	**0.29**	**0.29**	**0.29**	**0.29**	**4.28**
Discount Factor	*0.98*	*0.95*	*0.92*	*0.89*	*0.86*	*0.83*	*0.80*	*0.77*	*0.75*	*0.72*	-
Net Present Cost	**0.35**	**0.86**	**0.89**	**0.26**	**0.25**	**0.24**	**0.23**	**0.23**	**0.22**	**0.21**	**3.74**
VAT											-
NRC	0.02	0.07	0.10	-	-	-	-	-	-	-	0.20
NRR	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.06
RR	0.01	0.02	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.44
Total VAT	**0.04**	**0.10**	**0.15**	**0.06**	**0.06**	**0.06**	**0.06**	**0.06**	**0.06**	**0.06**	**0.69**
Total Indexation	**-**	**0.02**	**0.05**	**0.02**	**0.03**	**0.03**	**0.04**	**0.05**	**0.05**	**0.06**	**0.34**
NRC (Incl. VAT & indexation)	0.25	0.74	0.79	-	-	-	-	-	-	-	1.78
NRR (Incl. VAT & indexation)	0.09	0.17	0.10	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.63
RR (Incl. VAT & indexation)	0.05	0.12	0.28	0.34	0.34	0.35	0.35	0.36	0.36	0.37	2.91
Total (Including VAT and indexation)	**0.39**	**1.02**	**1.17**	**0.37**	**0.38**	**0.38**	**0.39**	**0.40**	**0.40**	**0.41**	**5.32**
Annual Depreciation	0.02	0.10	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	1.59
Existing Local BAU Resources	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.27
Less Existing License + Hardware Fee	-	-	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	1.12

*Due to rounding, '0.00' costs are less than £10k

NHS GGC

Cost line	Year										
	1	2	3	4	5	6	7	8	9	10	Total
License Costs (NRC)	0.19	1.67	-	-	-	-	-	-	-	-	1.86
Annual Support & Hosting Fee (RR)	0.27	0.39	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	6.63
Supplier Implementation (NRC)	0.41	0.41	-	-	-	-	-	-	-	-	0.82
Design (NRC)	0.02	0.03	-	-	-	-	-	-	-	-	0.05
Build and Local Config (NRC)	0.14	0.11	-	-	-	-	-	-	-	-	0.25
Interface (NRC)	0.02	0.02	-	-	-	-	-	-	-	-	0.05
Data Migration (NRC)	0.03	0.07	-	-	-	-	-	-	-	-	0.10
Additional Services (NRR)	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.26
Regional Implementation Team (NRC)	0.33	0.33	-	-	-	-	-	-	-	-	0.66
National Implementation Team (NRR)	0.26	0.26	-	-	-	-	-	-	-	-	0.52
Optimism Bias Total	0.15	0.16	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.93
Total with Contingency	**1.84**	**3.48**	**0.85**	**0.85**	**0.85**	**0.85**	**0.85**	**0.85**	**0.85**	**0.85**	**12.12**
Total NRC	1.23	2.74	-	-	-	-	-	-	-	-	3.97
Total NRR	0.31	0.31	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.86
Total RR	0.29	0.42	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	7.29
Total	**1.84**	**3.48**	**0.85**	**0.85**	**0.85**	**0.85**	**0.85**	**0.85**	**0.85**	**0.85**	**12.12**
Discount Factor	*0.98*	*0.95*	*0.92*	*0.89*	*0.86*	*0.83*	*0.80*	*0.77*	*0.75*	*0.72*	-
Net Present Cost	**1.80**	**3.31**	**0.78**	**0.75**	**0.73**	**0.70**	**0.68**	**0.66**	**0.63**	**0.61**	**10.66**
VAT											-
NRC	0.17	0.48	-	-	-	-	-	-	-	-	0.65
NRR	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.06
RR	0.06	0.08	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	1.46
Total VAT	**0.24**	**0.57**	**0.17**	**0.17**	**0.17**	**0.17**	**0.17**	**0.17**	**0.17**	**0.17**	**2.16**
Total Indexation	**-**	**0.09**	**0.04**	**0.06**	**0.08**	**0.09**	**0.11**	**0.13**	**0.15**	**0.17**	**0.92**
NRC (Incl. VAT & indexation)	1.40	3.29	-	-	-	-	-	-	-	-	4.69
NRR (Incl. VAT & indexation)	0.32	0.33	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.95
RR (Incl. VAT & indexation)	0.35	0.52	1.02	1.04	1.06	1.08	1.09	1.11	1.13	1.15	9.56
Total (Including VAT and indexation)	**2.07**	**4.14**	**1.06**	**1.08**	**1.10**	**1.11**	**1.13**	**1.15**	**1.17**	**1.19**	**15.21**
Annual Depreciation	0.12	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	4.04
Existing Local BAU Resources	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.79
Less Existing License + Hardware Fee	-	-	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	5.43

*Due to rounding, '0.00' costs are less than £10k

NHS Lothian

Cost line	Year										
	1	2	3	4	5	6	7	8	9	10	Total
License Costs (NRC)	0.08	0.16	0.57	-	-	-	-	-	-	-	0.81
Annual Support & Hosting Fee (RR)	0.08	0.12	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	2.79
Supplier Implementation (NRC)	0.06	0.14	0.05	-	-	-	-	-	-	-	0.25
Design (NRC)	0.00	0.02	-	-	-	-	-	-	-	-	0.03
Build and Local Config (NRC)	0.05	0.08	-	-	-	-	-	-	-	-	0.13
Interface (NRC)	0.01	0.02	-	-	-	-	-	-	-	-	0.02
Data Migration (NRC)	0.00	0.02	0.00	-	-	-	-	-	-	-	0.03
Additional Services (NRR)	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.26
Regional Implementation Team (NRC)	0.19	0.28	0.07	-	-	-	-	-	-	-	0.54
National Implementation Team (NRR)	0.12	0.18	0.05	-	-	-	-	-	-	-	0.35
Optimism Bias Total	0.05	0.09	0.05	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.44
Total with Contingency	**0.68**	**1.14**	**1.14**	**0.39**	**0.39**	**0.39**	**0.39**	**0.39**	**0.39**	**0.39**	**5.65**
Total NRC	0.43	0.78	0.71	-	-	-	-	-	-	-	1.91
Total NRR	0.16	0.23	0.08	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.67
Total RR	0.08	0.13	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	3.07
Total	**0.68**	**1.14**	**1.14**	**0.39**	**0.39**	**0.39**	**0.39**	**0.39**	**0.39**	**0.39**	**5.65**
Discount Factor	*0.98*	*0.95*	*0.92*	*0.89*	*0.86*	*0.83*	*0.80*	*0.77*	*0.75*	*0.72*	-
Net Present Cost	**0.66**	**1.08**	**1.05**	**0.34**	**0.33**	**0.32**	**0.31**	**0.30**	**0.29**	**0.28**	**4.96**
VAT											-
NRC	0.04	0.09	0.13	-	-	-	-	-	-	-	0.26
NRR	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.06
RR	0.02	0.03	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.61
Total VAT	**0.07**	**0.12**	**0.20**	**0.08**	**0.08**	**0.08**	**0.08**	**0.08**	**0.08**	**0.08**	**0.93**
Total Indexation	**-**	**0.03**	**0.05**	**0.03**	**0.03**	**0.04**	**0.05**	**0.06**	**0.07**	**0.08**	**0.44**
NRC (Incl. VAT & indexation)	0.47	0.89	0.86	-	-	-	-	-	-	-	2.23
NRR (Incl. VAT & indexation)	0.17	0.24	0.09	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.76
RR (Incl. VAT & indexation)	0.10	0.16	0.45	0.45	0.46	0.47	0.48	0.48	0.49	0.50	4.04
Total (Including VAT and indexation)	**0.74**	**1.29**	**1.40**	**0.49**	**0.50**	**0.51**	**0.51**	**0.52**	**0.53**	**0.54**	**7.03**
Annual Depreciation	0.04	0.13	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	1.97
Existing Local BAU Resources	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.43
Less Existing License + Hardware Fee	-	-	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	3.78

*Due to rounding, '0.00' costs are less than £10k

NHS Orkney

Cost line	Year										
	1	2	3	4	5	6	7	8	9	10	Total
License Costs (NRC)	-	-	0.01	0.02	-	-	-	-	-	-	0.02
Annual Support & Hosting Fee (RR)	-	-	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.06
Supplier Implementation (NRC)	-	-	0.01	0.01	-	-	-	-	-	-	0.02
Design (NRC)	-	-	0.00	-	-	-	-	-	-	-	0.00
Build and Local Config (NRC)	-	-	0.01	-	-	-	-	-	-	-	0.01
Interface (NRC)	-	-	0.00	-	-	-	-	-	-	-	0.00
Data Migration (NRC)	-	-	0.00	0.00	-	-	-	-	-	-	0.00
Additional Services (NRR)	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.26
Regional Implementation Team (NRC)	-	-	0.02	0.01	-	-	-	-	-	-	0.03
National Implementation Team (NRR)	-	-	0.01	0.00	-	-	-	-	-	-	0.01
Optimism Bias Total	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.04
Total with Contingency	**0.03**	**0.03**	**0.10**	**0.08**	**0.04**	**0.04**	**0.04**	**0.04**	**0.04**	**0.04**	**0.46**
Total NRC	-	-	0.06	0.03	-	-	-	-	-	-	0.09
Total NRR	0.03	0.03	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.30
Total RR	-	-	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.07
Total	**0.03**	**0.03**	**0.10**	**0.08**	**0.04**	**0.04**	**0.04**	**0.04**	**0.04**	**0.04**	**0.46**
Discount Factor	*0.98*	*0.95*	*0.92*	*0.89*	*0.86*	*0.83*	*0.80*	*0.77*	*0.75*	*0.72*	-
Net Present Cost	**0.03**	**0.03**	**0.09**	**0.07**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.39**
VAT											-
NRC	-	-	0.01	0.01	-	-	-	-	-	-	0.01
NRR	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.06
RR	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Total VAT	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.08**
Total Indexation	**-**	**0.00**	**0.00**	**0.01**	**0.00**	**0.00**	**0.01**	**0.01**	**0.01**	**0.01**	**0.04**
NRC (Incl. VAT & indexation)	-	-	0.07	0.04	-	-	-	-	-	-	0.11
NRR (Incl. VAT & indexation)	0.03	0.03	0.05	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.38
RR (Incl. VAT & indexation)	-	-	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.09
Total (Including VAT and indexation)	**0.03**	**0.03**	**0.12**	**0.09**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.59**
Annual Depreciation	-	-	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.10
Existing Local BAU Resources	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Less Existing License + Hardware Fee	-	-	-	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.27

*Due to rounding, '0.00' costs are less than £10k

NHS Shetland

Cost line	Year										
	1	2	3	4	5	6	7	8	9	10	Total
License Costs (NRC)	-	-	0.02	-	-	-	-	-	-	-	0.02
Annual Support & Hosting Fee (RR)	-	-	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.07
Supplier Implementation (NRC)	-	-	0.02	-	-	-	-	-	-	-	0.02
Design (NRC)	-	-	0.00	-	-	-	-	-	-	-	0.00
Build and Local Config (NRC)	-	-	0.01	-	-	-	-	-	-	-	0.01
Interface (NRC)	-	-	0.00	-	-	-	-	-	-	-	0.00
Data Migration (NRC)	-	-	0.00	-	-	-	-	-	-	-	0.00
Additional Services (NRR)	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.26
Regional Implementation Team (NRC)	-	-	0.03	-	-	-	-	-	-	-	0.03
National Implementation Team (NRR)	-	-	0.01	-	-	-	-	-	-	-	0.01
Optimism Bias Total	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
Total with Contingency	**0.03**	**0.03**	**0.14**	**0.04**	**0.04**	**0.04**	**0.04**	**0.04**	**0.04**	**0.04**	**0.47**
Total NRC	-	-	0.09	-	-	-	-	-	-	-	0.09
Total NRR	0.03	0.03	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.30
Total RR	-	-	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.08
Total	**0.03**	**0.03**	**0.14**	**0.04**	**0.04**	**0.04**	**0.04**	**0.04**	**0.04**	**0.04**	**0.47**
Discount Factor	*0.98*	*0.95*	*0.92*	*0.89*	*0.86*	*0.83*	*0.80*	*0.77*	*0.75*	*0.72*	-
Net Present Cost	**0.03**	**0.03**	**0.13**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.40**
VAT											-
NRC	-	-	0.01	-	-	-	-	-	-	-	0.01
NRR	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.06
RR	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
Total VAT	**0.01**	**0.01**	**0.02**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.09**
Total Indexation	**-**	**0.00**	**0.01**	**0.00**	**0.00**	**0.00**	**0.01**	**0.01**	**0.01**	**0.01**	**0.04**
NRC (Incl. VAT & indexation)	-	-	0.11	-	-	-	-	-	-	-	0.11
NRR (Incl. VAT & indexation)	0.03	0.03	0.05	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.38
RR (Incl. VAT & indexation)	-	-	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.10
Total (Including VAT and indexation)	**0.03**	**0.03**	**0.17**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.60**
Annual Depreciation	-	-	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.10
Existing Local BAU Resources	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Less Existing License + Hardware Fee	-	-	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.31

*Due to rounding, '0.00' costs are less than £10k

NHS Tayside

Cost line	Year										
	1	2	3	4	5	6	7	8	9	10	Total
License Costs (NRC)	-	0.04	0.34	-	-	-	-	-	-	-	0.37
Annual Support & Hosting Fee (RR)	-	0.02	0.10	0.15	0.15	0.15	0.15	0.15	0.15	0.15	1.17
Supplier Implementation (NRC)	-	0.03	0.09	-	-	-	-	-	-	-	0.12
Design (NRC)	-	0.00	0.01	-	-	-	-	-	-	-	0.01
Build and Local Config (NRC)	-	0.03	0.04	-	-	-	-	-	-	-	0.06
Interface (NRC)	-	0.00	0.01	-	-	-	-	-	-	-	0.01
Data Migration (NRC)	-	0.00	0.01	-	-	-	-	-	-	-	0.01
Additional Services (NRR)	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.26
Regional Implementation Team (NRC)	-	0.16	0.25	-	-	-	-	-	-	-	0.41
National Implementation Team (NRR)	-	0.07	0.11	-	-	-	-	-	-	-	0.18
Optimism Bias Total	0.00	0.03	0.06	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.22
Total with Contingency	**0.03**	**0.41**	**1.04**	**0.19**	**0.19**	**0.19**	**0.19**	**0.19**	**0.19**	**0.19**	**2.84**
Total NRC	-	0.28	0.78	-	-	-	-	-	-	-	1.06
Total NRR	0.03	0.11	0.15	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.49
Total RR	-	0.02	0.11	0.16	0.16	0.16	0.16	0.16	0.16	0.16	1.29
Total	**0.03**	**0.41**	**1.04**	**0.19**	**0.19**	**0.19**	**0.19**	**0.19**	**0.19**	**0.19**	**2.84**
Discount Factor	*0.98*	*0.95*	*0.92*	*0.89*	*0.86*	*0.83*	*0.80*	*0.77*	*0.75*	*0.72*	-
Net Present Cost	**0.03**	**0.39**	**0.96**	**0.17**	**0.17**	**0.16**	**0.15**	**0.15**	**0.14**	**0.14**	**2.46**
VAT											-
NRC	-	0.02	0.10	-	-	-	-	-	-	-	0.12
NRR	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.06
RR	-	0.00	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.26
Total VAT	**0.01**	**0.03**	**0.13**	**0.04**	**0.04**	**0.04**	**0.04**	**0.04**	**0.04**	**0.04**	**0.44**
Total Indexation	**-**	**0.01**	**0.05**	**0.01**	**0.02**	**0.02**	**0.03**	**0.03**	**0.03**	**0.04**	**0.24**
NRC (Incl. VAT & indexation)	-	0.31	0.91	-	-	-	-	-	-	-	1.22
NRR (Incl. VAT & indexation)	0.03	0.11	0.17	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.58
RR (Incl. VAT & indexation)	-	0.03	0.14	0.21	0.21	0.22	0.22	0.22	0.23	0.23	1.71
Total (Including VAT and indexation)	**0.03**	**0.45**	**1.22**	**0.25**	**0.25**	**0.25**	**0.26**	**0.26**	**0.27**	**0.27**	**3.51**
Annual Depreciation	-	0.03	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	1.10
Existing Local BAU Resources	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.26
Less Existing License + Hardware Fee	-	-	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	1.06

*Due to rounding, '0.00' costs are less than £10k

NHS Western Isles

Cost line	Year										
	1	2	3	4	5	6	7	8	9	10	Total
License Costs (NRC)	-	-	0.00	0.02	-	-	-	-	-	-	0.02
Annual Support & Hosting Fee (RR)	-	-	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.06
Supplier Implementation (NRC)	-	-	0.00	0.01	-	-	-	-	-	-	0.02
Design (NRC)	-	-	-	0.00	-	-	-	-	-	-	0.00
Build and Local Config (NRC)	-	-	0.00	0.01	-	-	-	-	-	-	0.01
Interface (NRC)	-	-	-	0.00	-	-	-	-	-	-	0.00
Data Migration (NRC)	-	-	-	0.00	-	-	-	-	-	-	0.00
Additional Services (NRR)	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.26
Regional Implementation Team (NRC)	-	-	0.01	0.02	-	-	-	-	-	-	0.04
National Implementation Team (NRR)	-	-	0.00	0.01	-	-	-	-	-	-	0.02
Optimism Bias Total	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.04
Total with Contingency	**0.03**	**0.03**	**0.06**	**0.13**	**0.04**	**0.04**	**0.04**	**0.04**	**0.04**	**0.04**	**0.47**
Total NRC	-	-	0.02	0.08	-	-	-	-	-	-	0.10
Total NRR	0.03	0.03	0.03	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.30
Total RR	-	-	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.07
Total	**0.03**	**0.03**	**0.06**	**0.13**	**0.04**	**0.04**	**0.04**	**0.04**	**0.04**	**0.04**	**0.47**
Discount Factor	*0.98*	*0.95*	*0.92*	*0.89*	*0.86*	*0.83*	*0.80*	*0.77*	*0.75*	*0.72*	-
Net Present Cost	**0.03**	**0.03**	**0.05**	**0.11**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.40**
VAT											-
NRC	-	-	0.00	0.01	-	-	-	-	-	-	0.01
NRR	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.06
RR	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Total VAT	**0.01**	**0.01**	**0.01**	**0.02**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.08**
Total Indexation	**-**	**0.00**	**0.00**	**0.01**	**0.00**	**0.00**	**0.01**	**0.01**	**0.01**	**0.01**	**0.05**
NRC (Incl. VAT & indexation)	-	-	0.02	0.10	-	-	-	-	-	-	0.12
NRR (Incl. VAT & indexation)	0.03	0.03	0.04	0.05	0.04	0.04	0.04	0.04	0.04	0.04	0.39
RR (Incl. VAT & indexation)	-	-	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.09
Total (Including VAT and indexation)	**0.03**	**0.03**	**0.07**	**0.16**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.60**
Annual Depreciation	-	-	0.00	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.11
Existing Local BAU Resources	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Less Existing License + Hardware Fee	-	-	-	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.27

*Due to rounding, '0.00' costs are less than £10k

Appendix G: Wellbeing Software Bid Exec Summary

Introduction

Healthcare Software Solutions, trading as Wellbeing Software, is pleased to submit this fully compliant response to the NHS National Services Scotland (NSS) for the supply of a Laboratory Information Management System (LIMS). Our submission is designed to enable the NSS to benefit from the outlined Distributed Service Model (DSM) that is being proposed to ensure the future needs of the NHS, delivering the RIGHT TEST, in the RIGHT PLACE at the RIGHT TIME are met.

The Wellbeing solution has been carefully drafted as we have thoughtfully reviewed the business case and detail provided to potential bidders. We have provided responses explaining how we fulfil the requirements of each question and the submission provides all costs of the proposed Evolution vLab LIMS across the participating Scottish Consortium Boards. Throughout our response, Wellbeing Software may be referred to as "Wellbeing" and our Laboratory Information Management System referred to as "EVOLUTION vLab" or simply "EVOLUTION". We are excited by the opportunity to genuinely partner with NSS and fully commit all necessary resources to ensure the project is implemented as expected and delivers the anticipated benefits.

About Wellbeing Software

Wellbeing software is a UK-based organisation and a part of The Citadel Group Limited, a company operating in the technology, health and government sectors. Our vision is 'to be a leading global healthcare software company, assisting doctors and healthcare professionals as they care for the chronically ill throughout their patient journey'.

Since 1989, the company has specialised in creating, delivering and supporting proven software products for the public and private healthcare industry covering pathology, radiology, maternity, oncology and further clinical applications.

Currently, more than 80% of all NHS Trusts use at least one Wellbeing product. We also have been the main provider of LIMS across Public Pathology Australia for several decades. Our solutions are delivered through trusted advisory services, long-term managed ICT services, software applications and software-as-a-service where applicable.

The Wellbeing Proposal

Wellbeing is proposing to deliver its Evolution vLab LIMS software to NSS under the proposed framework agreement that includes all associated services to the participating Consortium Boards. The solution as detailed will meet the requirements of all core laboratory disciplines including Genetics as outlined in the NSS business case and ITSIB documentation.

Evolution vLab is a fully operational, enterprise, multi-site and multi-discipline LIMS which supports the activities of all pathology disciplines including Genetics and can be readily deployed. The solution will integrate with existing capabilities as outlined and provided as part of the ITSIB. Wellbeing will support the transition of data, services, workflows and functionality to ensure the delivery of safe, timely and high-quality clinical care to all patients across NSS that utilise the Evolution LIMS.

Evolution has been meticulously designed and developed as a cost-effective solution using a reliable infrastructure configuration that can readily be adopted by participating Boards. The solution is currently deployed in several large settings, providing services to more than 40% of public pathology providers across Australia. Evolution supports the needs of high throughput, multi-site, public and private laboratories with complex and diverse requirements. The solution easily manages complex integrations to support all aspects of pathology workflows, accommodating site specific nuances where required.

Evolution meets or exceeds all the currently mandated functional and non-functional requirements whilst providing future flexibility to support rationalised service delivery to maximise efficiency and reduce costs into the future.

Wellbeing software offers a low-risk approach to deliver to the NSS precise requirements, enabling all laboratories and locations to be established and operational within required timescales. Wellbeing will utilise a proven implementation approach that has been further refined based on multiple recent successful implementations and is designed to deliver the project on time and to budget.

Capability overview

The EVOLUTION vLab solution offers the following key capabilities and benefits:

- A true multi-site, multi-discipline and multi-service Laboratory Information Management System,
- A common system and framework, single software instance and single database for all disciplines and sites. Flexible configuration options for implementing that include options for single Health Boards, Consortium Health Boards or a National solution.
- A vendor agnostic approach to integration, providing seamless integration to many other inbound and outbound platforms, systems and equipment,
- Capability to link and view patients across multiple geographical areas to improve clinical decision making,
- Flexibility to future proof against changing market demands,
- A highly available and cost-effective delivery and support model, providing value for money and the opportunity to streamline services,
- A platform meeting current and future quality and safety requirements following both UK and global standards.

Wellbeing is a trusted solution

There are many reasons why Wellbeing is the most relevant, experienced, suited and qualified partner for NSS. These reasons fall into the major categories of Product, Services, Position, People, Process and Partnership, as outlined below:

Product

Evolution is constantly subject to ongoing product development to ensure the software is the forefront leader in the global LIMS market. Under the guidance of the Board of Directors, we are committed to continually investing in the healthcare market and specifically Evolution so it meets the needs of all Consortium Health Boards, Managed Clinical Laboratory Networks, and the Genetics Consortium and the broader stakeholder groups today and into the future. We ensure our product roadmap takes into consideration the needs of our customers, industry trends, technical innovations and legal requirements through an active and concerted engagement process.

> Services

As a well-established provider of hosted and fully managed solutions, Wellbeing has deployed several large-scale projects across the NHS. Wellbeing will provide:

- A mature and sophisticated implementation approach and well-refined processes to ensure a seamless delivery of all phases of the project from concept to delivery,
- Continuity of information with success migrating large amounts of legacy data,
- Commissioning, installation and ongoing monitoring of required infrastructure with in-built redundancy that provides over 99.9% availability, minimising downtime and clinical risk,
- Complex system monitoring of over 10,000 data points with in-built tolerances and associated alerts, allowing staff to rectify issues swiftly, often before users become aware of any issue,
- Industry leading Service Level Agreements and support desk service,
- ISO Certified Business Continuity Management and Quality Management approach to the project.

> Position

The Wellbeing Evolution vLab LIMS solution is currently deployed in numerous prestigious and diverse healthcare organizations. It provides more than 40% of the Public Pathology services in Australia including running all public pathology across the Australian state of Queensland and some of the most reputable public pathology labs in NSW and Victoria. The company has also completed several successful high profile new implementation projects very recently including delivering to one of the UK's Lighthouse labs. Some examples of in-situ Evolution vLab installations include:

- Queensland Health: A single state-wide service covering 35 primary laboratories with over 1,300 concurrent users, 180 system-to-system interfaces and over 650 analysers. The service has been in operation for over 25 years and is contracted until the end of this decade. This is the largest public laboratory LIMS implementation in the Southern Hemisphere,
- NSW Health Pathology: A contract in place since 1997 with a consolidation project completed in 2018 to combine multiple laboratories onto a single instance of the software, creating a regional Pathology Service across the bulk of New South Wales,
- Eastern Health: A contract in place since 2013 providing EVOLUTION across three laboratories, creating a regional Pathology Service in the eastern suburbs of Melbourne,
- Peter MacCallum Cancer Centre: Implemented in 2017 to the largest specialist cancer centre provider in Australia,
- Royal Melbourne Hospital: Implemented in 2017 to one of the largest tertiary public health providers in Australia,
- Austin Health: Implemented in 2018 to one of the leading research hospitals in Victoria, it has been further extended to several neighbouring health services,
- Adelaide University: Implemented in 2020 as a single service supporting two laboratories into a single instance of the software.

> People

Our committed and experienced staff have deep domain expertise along with extensive implementation and integration experience. It is our people that make the difference, both for our clients and the company. We are committed to understanding and delivering a solution that meets the clinical, administrative and commercial aspects of the requirements. Our shared passion for patient-centric care and improved healthcare outcomes motivate our team to work with you to deliver the best possible outcome for all of the NSS consortium. The staff we will assign to deliver this project have a deep understanding of the pathology industry and are subject matter experts in their field, with project management, clinical and technical backgrounds and significant industry experience.

> Process

Wellbeing has delivered several recent successful LIMS implementations, consolidating disparate legacy systems and data across multiple sites and large geographical areas to Evolution. We combine the best of PRINCE2, Waterfall and Agile project management theories, tailoring them into a Wellbeing specific methodology which draws on the company's wealth of experience. This combined approach ensures that the implementation processes are both sufficiently structured, yet remain nimble, to deliver successful outcomes. We adopt a continuous improvement approach to implementations, continuing to further refine the methodology to reflect lessons learned to ensure we deliver reliable results, on time and on budget.

Wellbeing is committed to ensuring the project's success and welcomes the invaluable input of the subject matter experts at each stage of the project to ensure the final solution is delivered as intended and provides the expected benefits.

> Partnership

Wellbeing seeks to grow a long-term, mutually beneficial and strategic partnership with National Services Scotland. Our company vision and leadership in developing solutions to resolve and improve healthcare solutions ensures long-term relevance and benefit for Scotland.

> Value for Money

Wellbeing is committed to providing true value for money with not only a compelling pricing proposal, but also a solution that delivers true economic and quality benefits. NSS can be confident that our ability to scale our solution across the participating Consortium Boards is achievable at an affordable cost with minimal risk.

> Quantifiable Benefits

Over the years Evolution has delivered many direct and indirect benefits to its clients driving value and quality in pathology service delivery, including increased testing capacity; increased efficiency; improved safety and quality outcomes; comprehensive data capture; improved processes and turnaround times; delivery of complex integrations; and increased user satisfaction. Wellbeing is confident that the benefits realised through the breadth and depth of functionality of Evolution, will deliver a measurable improvement throughout Scotland.

Conclusion

Wellbeing seeks a genuine long-term, mutually beneficial partnership with Scotland that provides robust and comprehensive software and services, along with a commitment to excellence matched only by your own. Our response includes many features, facts and figures, but above all, it represents a sincere desire on the part of Wellbeing to build a meaningful and lasting relationship with NSS and the pathology providers.

Wellbeing's loyal client base is further evidence of Evolution as the market leader in the provision of Laboratory Information Management Systems. We expect that our proven experience with organisations similar to this opportunity, and count of successful implementations should provide you with complete confidence in our ongoing expertise in Pathology solutions and services.

Our proposal and pricing reflect a comprehensive suite of proven software that will support the pathology service across the Consortium. Wellbeing is the primary contractor for all software and services and therefore not reliant on any third-party services, thus assuring continued focus, commitment and performance to the highest standards.

We are confident that after careful consideration of the many benefits and opportunities that a partnership with Wellbeing can offer, you will agree that Wellbeing provides the capabilities, expertise and commitment to meet your clinical, strategic and business requirements now and well into the future.

Yours sincerely,

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To see the full bid submitted by Wellbeing Software, please contact Scott Douglas **Scott.Douglas@ggc.scot.nhs.uk**.

Addendum 1: Central Funding

At the NHS Scotland: Directors of Finance Meeting, held on 17th March 2022, the paper below was presented and approval given that there should a national approach to funding of capital, including purchase of all software licenses before 31st March to be coordinated through NSS. Implementation costs would be assumed to be capitalised and funded centrally. The principal benefits identified to support this agreement included

- Reduction of capital funding requirement for Boards to implement system upgrade, potentially to zero if no local implementation costs are required.
- Opportunity for Boards to deliver system upgrade within affordable revenue envelope.
- Encourages the coordinated roll out of system across Boards and maximises the opportunity to deliver benefits of standardisation.
- Streamlines governance requirements for Boards to progress implementation.
- Provides clear statement of support by Scottish Government for delivery of important upgrade.

Copy of DoFs LIMS paper 17th March 2022

DoFs LIMS March 2022.docx

The key risk identified in the Strategic Case that this agreement addresses is illustrated below

Risk	Category	Description	Mitigations
Funding	Business	There is a risk that Boards require additional funding and/or resource to implement, and the LIMS replacement becomes unaffordable	• Strong governance mechanisms will be implemented to ensure costs are closely managed and monitored. • Project management will be based on good practice to ensure costs are closely managed and monitored. • A procurement process is set out to ensure best value can be achieved with pricing being a significant evaluation criterion at 30%. • The agreement to centrally purchase licences and to fud non-recurring implementation costs significantly reduces the financial burden placed on Boards, bringing them in-line with, or less than current LIMS costs.

For consortium Boards, the implication of the Director of Finance meeting agreement are that

- All licences required by Boards will be pre-purchased by NSS, and will be released to adopting Boards as required, following individual Board approval to move ahead with implementation and adoption of the LIMS solution.
- Boards will still be required to fully consider the implications of implementing the LIMS solution and seek appropriate local approvals to proceed.

- National, Regional and local implementation activities required for individual Boards to effectively adopt the LIMS solution will be funded centrally through NSS.
- Boards will be locally responsible for ongoing, annual support and maintenance costs as well as activities and costs relating to local or regional developments. As part of local governance arrangements Boards must ensure that allocation of recurring revenue commitments have neem agreed to cover the anticipated 10-year period of use.
- As set out in the Management Case, adopting Boards should participate in, and adhere to the proposed LIMS governance structure and approach to ensure that the anticipated benefits can be achieved nationally with respect to standardisation and harmonisation.

Based on the cost lines described throughout the Business Case, the table below illustrates which elements will be funded centrally and which are still expected to be the responsibility of adopting Boards to fund.

Table 42 - Cost lines and source of funding

Cost Line	Source of funding	Notes
License costs	Nationally funded	Licences required for all consortium Boards have been purchased by NSS of behalf of the Boards, based on scope and usage data provided during the National Collaborative LIMS project and development of the FBS
Annual Support, Maintenance and Hosting Fee	Adopting Board responsibility	Recurring revenue requirements relating to the annual support, maintenance and hosting of LIMS remains the responsibility of the adopting Board
Supplier Implementation	Nationally funded	Costs associated with the initial design, setup, configuration, testing and implementation of LIMS within adopting Boards will be funded centrally, coordinated by NSS
Design	Nationally funded	Costs associated with the initial design, setup, configuration, testing and implementation of LIMS within adopting Boards will be funded centrally, coordinated by NSS
Build and Local Config	Nationally funded	Costs associated with the initial design, setup, configuration, testing and implementation of LIMS within adopting Boards will be funded centrally, coordinated by NSS
Interface	Nationally funded	Costs associated with the initial design, setup, configuration, testing and implementation of LIMS within adopting Boards will be funded centrally, coordinated by NSS. Outside of the initial implementation of LIMS within Boards the expectation will be that any future needs for interfaces or developments will be the responsibility of Boards to fund, whether individually, within region groups or nationally
Data Migration	Nationally funded	Costs associated with the initial design, setup, configuration, testing and implementation of LIMS within adopting Boards will be funded centrally, coordinated by NSS
Additional Services	Adopting Board responsibility	Within the framework there is provision for additional services to be provided by Wellbeing, mainly in relation to ongoing development, testing and training. Allocation has been made against each Board however these costs are discretionary based on the level of ongoing activity and future developments required.

Cost Line	Source of funding	Notes
Regional Implementation Team	Nationally funded	Costs associated with the initial design, setup, configuration, testing and implementation of LIMS within adopting Boards will be funded centrally, coordinated by NSS
National Implementation Team	Nationally funded	Costs associated with the initial design, setup, configuration, testing and implementation of LIMS within adopting Boards will be funded centrally, coordinated by NSS
Existing NHS Resources	Adopting Board responsibility	The assumption throughout the Business Case has been that resources already employed by Boards to operate, manage and maintain existing LIMS solutions will transfer to the newly implemented LIMS solution

The resulting 10-year financial implications for individual Boards are illustrated in the following Economic and Financial Cost tables for each Board, updated from those illustrated in Appendix F.

Table 43 - 10-year financial break down by Board

	NHS Borders	NHS D&G	NHS Fife	NHS Forth Valley	NHS Golden Jubilee	NHS Grampian	NHS GGC	NHS Lothian	NHS Orkney	NHS Shetland	NHS Tayside	NHS Western Isles
Consolidated Financial Considerations												
NRC (Incl. VAT & Indexation)	-	-	-	-	-	-	-	-	-	-	-	-
NRR (Incl. VAT & Indexation)	0.01	0.01	0.03	0.03	0.01	0.05	0.11	0.07	0.00	0.00	0.04	0.00
RR (Incl. VAT & Indexation)	0.10	1.08	1.32	1.37	0.22	2.91	9.56	4.04	0.09	0.10	1.71	0.09
Total Financial Cost (Incl. VAT & Indexation)	**0.11**	**1.10**	**1.35**	**1.40**	**0.22**	**2.96**	**9.67**	**4.11**	**0.09**	**0.10**	**1.75**	**0.09**
Capital Depreciation	-	-	-	-	-	-	-	-	-	-	-	-
Existing Local BAU Resources	0.07	0.08	0.19	0.14	0.01	0.27	0.79	0.43	0.01	0.01	0.26	0.01
Existing License + Hardware Fee	0.41	0.94	1.53	0.98	0.61	1.12	5.43	3.78	0.27	0.31	1.06	0.27

NHS Borders

Cost line	Year										
	1	2	3	4	5	6	7	8	9	10	Total
License Costs (NRC)	-	-	-	-	-	-	-	-	-	-	-
Annual Support & Hosting Fee (RR)	-	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.07
Supplier Implementation (NRC)	-	-	-	-	-	-	-	-	-	-	-
Design (NRC)	-	-	-	-	-	-	-	-	-	-	-
Build and Local Config (NRC)	-	-	-	-	-	-	-	-	-	-	-
Interface (NRC)	-	-	-	-	-	-	-	-	-	-	-
Data Migration (NRC)	-	-	-	-	-	-	-	-	-	-	-
Additional Services (NRR)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Regional Implementation Team (NRC)	-	-	-	-	-	-	-	-	-	-	-
National Implementation Team (NRR)	-	-	-	-	-	-	-	-	-	-	-
Optimism Bias Total	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Total with Contingency	**0.00**	**0.00**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.08**
Total NRC	-	-	-	-	-	-	-	-	-	-	-
Total NRR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Total RR	-	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.07
Total	**0.00**	**0.00**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.08**
Discount Factor	0.98	0.95	0.92	0.89	0.86	0.83	0.80	0.77	0.75	0.72	0.00
Net Present Cost	**0.00**	**0.00**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.07**
VAT											-
NRC	-	-	-	-	-	-	-	-	-	-	-
NRR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RR	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Total VAT	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.02**
Total Indexation	**-**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.01**
NRC (Incl. VAT & indexation)	-	-	-	-	-	-	-	-	-	-	-
NRR (Incl. VAT & indexation)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
RR (Incl. VAT & indexation)	-	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.10
Total (Including VAT and indexation)	**0.00**	**0.00**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.11**
Annual Depreciation	-	-	-	-	-	-	-	-	-	-	-
Existing Local BAU Resources	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.07
Less Existing License + Hardware Fee	-	-	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.41

*Due to rounding, '0.00' costs are less than £10k

NHS Dumfries & Galloway

Cost line	Year										
	1	2	3	4	5	6	7	8	9	10	Total
License Costs (NRC)	-	-	-	-	-	-	-	-	-	-	-
Annual Support & Hosting Fee (RR)	-	0.03	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.75
Supplier Implementation (NRC)	-	-	-	-	-	-	-	-	-	-	-
Design (NRC)	-	-	-	-	-	-	-	-	-	-	-
Build and Local Config (NRC)	-	-	-	-	-	-	-	-	-	-	-
Interface (NRC)	-	-	-	-	-	-	-	-	-	-	-
Data Migration (NRC)	-	-	-	-	-	-	-	-	-	-	-
Additional Services (NRR)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Regional Implementation Team (NRC)	-	-	-	-	-	-	-	-	-	-	-
National Implementation Team (NRR)	-	-	-	-	-	-	-	-	-	-	-
Optimism Bias Total	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.08
Total with Contingency	**0.00**	**0.04**	**0.10**	**0.10**	**0.10**	**0.10**	**0.10**	**0.10**	**0.10**	**0.10**	**0.83**
Total NRC	-	-	-	-	-	-	-	-	-	-	-
Total NRR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Total RR	-	0.04	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.82
Total	**0.00**	**0.04**	**0.10**	**0.10**	**0.10**	**0.10**	**0.10**	**0.10**	**0.10**	**0.10**	**0.83**
Discount Factor	0.98	0.95	0.92	0.89	0.86	0.83	0.80	0.77	0.75	0.72	0.00
Net Present Cost	**0.00**	**0.03**	**0.09**	**0.09**	**0.09**	**0.08**	**0.08**	**0.08**	**0.07**	**0.07**	**0.69**
VAT											-
NRC	-	-	-	-	-	-	-	-	-	-	-
NRR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RR	-	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.16
Total VAT	**0.00**	**0.01**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.17**
Total Indexation	**-**	**0.00**	**0.00**	**0.01**	**0.01**	**0.01**	**0.01**	**0.02**	**0.02**	**0.02**	**0.10**
NRC (Incl. VAT & indexation)	-	-	-	-	-	-	-	-	-	-	-
NRR (Incl. VAT & indexation)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
RR (Incl. VAT & indexation)	-	0.04	0.12	0.12	0.13	0.13	0.13	0.13	0.14	0.14	1.08
Total (Including VAT and indexation)	**0.00**	**0.04**	**0.12**	**0.13**	**0.13**	**0.13**	**0.13**	**0.13**	**0.14**	**0.14**	**1.10**
Annual Depreciation	-	-	-	-	-	-	-	-	-	-	-
Existing Local BAU Resources	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.08
Less Existing License + Hardware Fee	-	-	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.94

*Due to rounding, '0.00' costs are less than £10k

NHS Fife

Cost line	Year										
	1	2	3	4	5	6	7	8	9	10	Total
License Costs (NRC)	-	-	-	-	-	-	-	-	-	-	-
Annual Support & Hosting Fee (RR)	-	0.03	0.09	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.91
Supplier Implementation (NRC)	-	-	-	-	-	-	-	-	-	-	-
Design (NRC)	-	-	-	-	-	-	-	-	-	-	-
Build and Local Config (NRC)	-	-	-	-	-	-	-	-	-	-	-
Interface (NRC)	-	-	-	-	-	-	-	-	-	-	-
Data Migration (NRC)	-	-	-	-	-	-	-	-	-	-	-
Additional Services (NRR)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
Regional Implementation Team (NRC)	-	-	-	-	-	-	-	-	-	-	-
National Implementation Team (NRR)	-	-	-	-	-	-	-	-	-	-	-
Optimism Bias Total	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.09
Total with Contingency	**0.00**	**0.03**	**0.11**	**0.13**	**0.13**	**0.13**	**0.13**	**0.13**	**0.13**	**0.13**	**1.02**
Total NRC	-	-	-	-	-	-	-	-	-	-	-
Total NRR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Total RR	-	0.03	0.10	0.12	0.12	0.12	0.12	0.12	0.12	0.12	1.00
Total	**0.00**	**0.03**	**0.11**	**0.13**	**0.13**	**0.13**	**0.13**	**0.13**	**0.13**	**0.13**	**1.02**
Discount Factor	0.98	0.95	0.92	0.89	0.86	0.83	0.80	0.77	0.75	0.72	0.00
Net Present Cost	**0.00**	**0.03**	**0.10**	**0.11**	**0.11**	**0.10**	**0.10**	**0.10**	**0.09**	**0.09**	**0.84**
VAT											-
NRC	-	-	-	-	-	-	-	-	-	-	-
NRR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
RR	-	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.20
Total VAT	**0.00**	**0.01**	**0.02**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.20**
Total Indexation	**-**	**0.00**	**0.00**	**0.01**	**0.01**	**0.01**	**0.02**	**0.02**	**0.02**	**0.03**	**0.12**
NRC (Incl. VAT & indexation)	-	-	-	-	-	-	-	-	-	-	-
NRR (Incl. VAT & indexation)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
RR (Incl. VAT & indexation)	-	0.04	0.13	0.16	0.16	0.16	0.16	0.17	0.17	0.17	1.32
Total (Including VAT and indexation)	**0.00**	**0.04**	**0.13**	**0.16**	**0.16**	**0.17**	**0.17**	**0.17**	**0.17**	**0.18**	**1.35**
Annual Depreciation	-	-	-	-	-	-	-	-	-	-	-
Existing Local BAU Resources	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.19
Less Existing License + Hardware Fee	-	-	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	1.53

*Due to rounding, '0.00' costs are less than £10k

NHS Forth Valley

Cost line	Year										
	1	2	3	4	5	6	7	8	9	10	Total
License Costs (NRC)	-	-	-	-	-	-	-	-	-	-	-
Annual Support & Hosting Fee (RR)	-	0.02	0.09	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.94
Supplier Implementation (NRC)	-	-	-	-	-	-	-	-	-	-	-
Design (NRC)	-	-	-	-	-	-	-	-	-	-	-
Build and Local Config (NRC)	-	-	-	-	-	-	-	-	-	-	-
Interface (NRC)	-	-	-	-	-	-	-	-	-	-	-
Data Migration (NRC)	-	-	-	-	-	-	-	-	-	-	-
Additional Services (NRR)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
Regional Implementation Team (NRC)	-	-	-	-	-	-	-	-	-	-	-
National Implementation Team (NRR)	-	-	-	-	-	-	-	-	-	-	-
Optimism Bias Total	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.10
Total with Contingency	**0.00**	**0.03**	**0.10**	**0.13**	**0.13**	**0.13**	**0.13**	**0.13**	**0.13**	**0.13**	**1.06**
Total NRC	-	-	-	-	-	-	-	-	-	-	-
Total NRR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
Total RR	-	0.02	0.10	0.13	0.13	0.13	0.13	0.13	0.13	0.13	1.04
Total	**0.00**	**0.03**	**0.10**	**0.13**	**0.13**	**0.13**	**0.13**	**0.13**	**0.13**	**0.13**	**1.06**
Discount Factor	0.98	0.95	0.92	0.89	0.86	0.83	0.80	0.77	0.75	0.72	0.00
Net Present Cost	**0.00**	**0.02**	**0.09**	**0.12**	**0.11**	**0.11**	**0.11**	**0.10**	**0.10**	**0.10**	**0.86**
VAT											-
NRC	-	-	-	-	-	-	-	-	-	-	-
NRR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RR	-	0.00	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.21
Total VAT	**0.00**	**0.01**	**0.02**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.21**
Total Indexation	**-**	**0.00**	**0.00**	**0.01**	**0.01**	**0.01**	**0.02**	**0.02**	**0.02**	**0.03**	**0.13**
NRC (Incl. VAT & indexation)	-	-	-	-	-	-	-	-	-	-	-
NRR (Incl. VAT & indexation)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
RR (Incl. VAT & indexation)	-	0.03	0.12	0.17	0.17	0.17	0.17	0.18	0.18	0.18	1.37
Total (Including VAT and indexation)	**0.00**	**0.03**	**0.12**	**0.17**	**0.17**	**0.17**	**0.18**	**0.18**	**0.18**	**0.19**	**1.40**
Annual Depreciation	-	-	-	-	-	-	-	-	-	-	-
Existing Local BAU Resources	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.14
Less Existing License + Hardware Fee	-	-	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.98

*Due to rounding, '0.00' costs are less than £10k

NHS Golden Jubilee

Cost line	Year										
	1	2	3	4	5	6	7	8	9	10	Total
License Costs (NRC)	-	-	-	-	-	-	-	-	-	-	-
Annual Support & Hosting Fee (RR)	-	0.00	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.15
Supplier Implementation (NRC)	-	-	-	-	-	-	-	-	-	-	-
Design (NRC)	-	-	-	-	-	-	-	-	-	-	-
Build and Local Config (NRC)	-	-	-	-	-	-	-	-	-	-	-
Interface (NRC)	-	-	-	-	-	-	-	-	-	-	-
Data Migration (NRC)	-	-	-	-	-	-	-	-	-	-	-
Additional Services (NRR)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Regional Implementation Team (NRC)	-	-	-	-	-	-	-	-	-	-	-
National Implementation Team (NRR)	-	-	-	-	-	-	-	-	-	-	-
Optimism Bias Total	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
Total with Contingency	**0.00**	**0.00**	**0.01**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.17**
Total NRC	-	-	-	-	-	-	-	-	-	-	-
Total NRR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Total RR	-	0.00	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.16
Total	**0.00**	**0.00**	**0.01**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.17**
Discount Factor	0.98	0.95	0.92	0.89	0.86	0.83	0.80	0.77	0.75	0.72	0.00
Net Present Cost	**0.00**	**0.00**	**0.01**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.14**
VAT											-
NRC	-	-	-	-	-	-	-	-	-	-	-
NRR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RR	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Total VAT	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.03**
Total Indexation	**-**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.02**
NRC (Incl. VAT & indexation)	-	-	-	-	-	-	-	-	-	-	-
NRR (Incl. VAT & indexation)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
RR (Incl. VAT & indexation)	-	0.00	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.22
Total (Including VAT and indexation)	**0.00**	**0.00**	**0.02**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.22**
Annual Depreciation	-	-	-	-	-	-	-	-	-	-	-
Existing Local BAU Resources	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Less Existing License + Hardware Fee	-	-	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.61

*Due to rounding, '0.00' costs are less than £10k

NHS Grampian

Cost line	Year										
	1	2	3	4	5	6	7	8	9	10	Total
License Costs (NRC)	-	-	-	-	-	-	-	-	-	-	-
Annual Support & Hosting Fee (RR)	0.04	0.09	0.20	0.24	0.24	0.24	0.24	0.24	0.24	0.24	2.01
Supplier Implementation (NRC)	-	-	-	-	-	-	-	-	-	-	-
Design (NRC)	-	-	-	-	-	-	-	-	-	-	-
Build and Local Config (NRC)	-	-	-	-	-	-	-	-	-	-	-
Interface (NRC)	-	-	-	-	-	-	-	-	-	-	-
Data Migration (NRC)	-	-	-	-	-	-	-	-	-	-	-
Additional Services (NRR)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Regional Implementation Team (NRC)	-	-	-	-	-	-	-	-	-	-	-
National Implementation Team (NRR)	-	-	-	-	-	-	-	-	-	-	-
Optimism Bias Total	0.00	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.20
Total with Contingency	**0.04**	**0.10**	**0.23**	**0.27**	**0.27**	**0.27**	**0.27**	**0.27**	**0.27**	**0.27**	**2.24**
Total NRC	-	-	-	-	-	-	-	-	-	-	-
Total NRR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
Total RR	0.04	0.09	0.22	0.26	0.26	0.26	0.26	0.26	0.26	0.26	2.21
Total	**0.04**	**0.10**	**0.23**	**0.27**	**0.27**	**0.27**	**0.27**	**0.27**	**0.27**	**0.27**	**2.24**
Discount Factor	0.98	0.95	0.92	0.89	0.86	0.83	0.80	0.77	0.75	0.72	0.00
Net Present Cost	**0.04**	**0.09**	**0.21**	**0.24**	**0.23**	**0.22**	**0.21**	**0.21**	**0.20**	**0.19**	**1.85**
VAT											-
NRC	-	-	-	-	-	-	-	-	-	-	-
NRR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
RR	0.01	0.02	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.44
Total VAT	**0.01**	**0.02**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.45**
Total Indexation	**-**	**0.00**	**0.01**	**0.02**	**0.02**	**0.03**	**0.04**	**0.04**	**0.05**	**0.05**	**0.26**
NRC (Incl. VAT & indexation)	-	-	-	-	-	-	-	-	-	-	-
NRR (Incl. VAT & indexation)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.05
RR (Incl. VAT & indexation)	0.05	0.12	0.28	0.34	0.34	0.35	0.35	0.36	0.36	0.37	2.91
Total (Including VAT and indexation)	**0.05**	**0.12**	**0.28**	**0.34**	**0.35**	**0.35**	**0.36**	**0.36**	**0.37**	**0.38**	**2.96**
Annual Depreciation	-	-	-	-	-	-	-	-	-	-	-
Existing Local BAU Resources	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.27
Less Existing License + Hardware Fee	-	-	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	1.12

*Due to rounding, '0.00' costs are less than £10k

NHS GGC

Cost line	Year										
	1	2	3	4	5	6	7	8	9	10	Total
License Costs (NRC)	-	-	-	-	-	-	-	-	-	-	-
Annual Support & Hosting Fee (RR)	0.27	0.39	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	6.63
Supplier Implementation (NRC)	-	-	-	-	-	-	-	-	-	-	-
Design (NRC)	-	-	-	-	-	-	-	-	-	-	-
Build and Local Config (NRC)	-	-	-	-	-	-	-	-	-	-	-
Interface (NRC)	-	-	-	-	-	-	-	-	-	-	-
Data Migration (NRC)	-	-	-	-	-	-	-	-	-	-	-
Additional Services (NRR)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.08
Regional Implementation Team (NRC)	-	-	-	-	-	-	-	-	-	-	-
National Implementation Team (NRR)	-	-	-	-	-	-	-	-	-	-	-
Optimism Bias Total	0.03	0.04	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.67
Total with Contingency	**0.30**	**0.43**	**0.83**	**0.83**	**0.83**	**0.83**	**0.83**	**0.83**	**0.83**	**0.83**	**7.37**
Total NRC	-	-	-	-	-	-	-	-	-	-	-
Total NRR	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.08
Total RR	0.29	0.42	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	7.29
Total	**0.30**	**0.43**	**0.83**	**0.83**	**0.83**	**0.83**	**0.83**	**0.83**	**0.83**	**0.83**	**7.37**
Discount Factor	0.98	0.95	0.92	0.89	0.86	0.83	0.80	0.77	0.75	0.72	0.00
Net Present Cost	**0.30**	**0.41**	**0.76**	**0.74**	**0.71**	**0.69**	**0.66**	**0.64**	**0.62**	**0.60**	**6.12**
VAT											-
NRC	-	-	-	-	-	-	-	-	-	-	-
NRR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
RR	0.06	0.08	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	1.46
Total VAT	**0.06**	**0.09**	**0.17**	**0.17**	**0.17**	**0.17**	**0.17**	**0.17**	**0.17**	**0.17**	**1.47**
Total Indexation	**-**	**0.01**	**0.04**	**0.06**	**0.07**	**0.09**	**0.11**	**0.13**	**0.15**	**0.17**	**0.83**
NRC (Incl. VAT & indexation)	-	-	-	-	-	-	-	-	-	-	-
NRR (Incl. VAT & indexation)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.11
RR (Incl. VAT & indexation)	0.35	0.52	1.02	1.04	1.06	1.08	1.09	1.11	1.13	1.15	9.56
Total (Including VAT and indexation)	**0.36**	**0.53**	**1.03**	**1.05**	**1.07**	**1.09**	**1.11**	**1.12**	**1.14**	**1.16**	**9.67**
Annual Depreciation	-	-	-	-	-	-	-	-	-	-	-
Existing Local BAU Resources	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.79
Less Existing License + Hardware Fee	-	-	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	5.43

*Due to rounding, '0.00' costs are less than £10k

NHS Lothian

Cost line	Year										
	1	2	3	4	5	6	7	8	9	10	Total
License Costs (NRC)	-	-	-	-	-	-	-	-	-	-	-
Annual Support & Hosting Fee (RR)	0.08	0.12	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	2.79
Supplier Implementation (NRC)	-	-	-	-	-	-	-	-	-	-	-
Design (NRC)	-	-	-	-	-	-	-	-	-	-	-
Build and Local Config (NRC)	-	-	-	-	-	-	-	-	-	-	-
Interface (NRC)	-	-	-	-	-	-	-	-	-	-	-
Data Migration (NRC)	-	-	-	-	-	-	-	-	-	-	-
Additional Services (NRR)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.05
Regional Implementation Team (NRC)	-	-	-	-	-	-	-	-	-	-	-
National Implementation Team (NRR)	-	-	-	-	-	-	-	-	-	-	-
Optimism Bias Total	0.01	0.01	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.28
Total with Contingency	**0.09**	**0.13**	**0.36**	**0.36**	**0.36**	**0.36**	**0.36**	**0.36**	**0.36**	**0.36**	**3.13**
Total NRC	-	-	-	-	-	-	-	-	-	-	-
Total NRR	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.06
Total RR	0.08	0.13	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	3.07
Total	**0.09**	**0.13**	**0.36**	**0.36**	**0.36**	**0.36**	**0.36**	**0.36**	**0.36**	**0.36**	**3.13**
Discount Factor	0.98	0.95	0.92	0.89	0.86	0.83	0.80	0.77	0.75	0.72	0.00
Net Present Cost	**0.09**	**0.13**	**0.33**	**0.32**	**0.31**	**0.30**	**0.29**	**0.28**	**0.27**	**0.26**	**2.58**
VAT											-
NRC	-	-	-	-	-	-	-	-	-	-	-
NRR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
RR	0.02	0.03	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.61
Total VAT	**0.02**	**0.03**	**0.07**	**0.07**	**0.07**	**0.07**	**0.07**	**0.07**	**0.07**	**0.07**	**0.63**
Total Indexation	**-**	**0.00**	**0.02**	**0.02**	**0.03**	**0.04**	**0.05**	**0.06**	**0.06**	**0.07**	**0.36**
NRC (Incl. VAT & indexation)	-	-	-	-	-	-	-	-	-	-	-
NRR (Incl. VAT & indexation)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.07
RR (Incl. VAT & indexation)	0.10	0.16	0.45	0.45	0.46	0.47	0.48	0.48	0.49	0.50	4.04
Total (Including VAT and indexation)	**0.11**	**0.16**	**0.45**	**0.46**	**0.47**	**0.48**	**0.48**	**0.49**	**0.50**	**0.51**	**4.11**
Annual Depreciation	-	-	-	-	-	-	-	-	-	-	-
Existing Local BAU Resources	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.43
Less Existing License + Hardware Fee	-	-	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	3.78

*Due to rounding, '0.00' costs are less than £10k

NHS Orkney

Cost line	Year										
	1	2	3	4	5	6	7	8	9	10	Total
License Costs (NRC)	-	-	-	-	-	-	-	-	-	-	-
Annual Support & Hosting Fee (RR)	-	-	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.06
Supplier Implementation (NRC)	-	-	-	-	-	-	-	-	-	-	-
Design (NRC)	-	-	-	-	-	-	-	-	-	-	-
Build and Local Config (NRC)	-	-	-	-	-	-	-	-	-	-	-
Interface (NRC)	-	-	-	-	-	-	-	-	-	-	-
Data Migration (NRC)	-	-	-	-	-	-	-	-	-	-	-
Additional Services (NRR)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Regional Implementation Team (NRC)	-	-	-	-	-	-	-	-	-	-	-
National Implementation Team (NRR)	-	-	-	-	-	-	-	-	-	-	-
Optimism Bias Total	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Total with Contingency	**0.00**	**0.00**	**0.00**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.07**
Total NRC	-	-	-	-	-	-	-	-	-	-	-
Total NRR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total RR	-	-	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.07
Total	**0.00**	**0.00**	**0.00**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.07**
Discount Factor	0.98	0.95	0.92	0.89	0.86	0.83	0.80	0.77	0.75	0.72	0.00
Net Present Cost	**0.00**	**0.00**	**0.00**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.06**
VAT											-
NRC	-	-	-	-	-	-	-	-	-	-	-
NRR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RR	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Total VAT	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.01**
Total Indexation	**-**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.01**
NRC (Incl. VAT & indexation)	-	-	-	-	-	-	-	-	-	-	-
NRR (Incl. VAT & indexation)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RR (Incl. VAT & indexation)	-	-	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.09
Total (Including VAT and indexation)	**0.00**	**0.00**	**0.00**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.09**
Annual Depreciation	-	-	-	-	-	-	-	-	-	-	-
Existing Local BAU Resources	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Less Existing License + Hardware Fee	-	-	-	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.27

*Due to rounding, '0.00' costs are less than £10k

NHS Shetland

Cost line	Year										
	1	2	3	4	5	6	7	8	9	10	Total
License Costs (NRC)	-	-	-	-	-	-	-	-	-	-	-
Annual Support & Hosting Fee (RR)	-	-	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.07
Supplier Implementation (NRC)	-	-	-	-	-	-	-	-	-	-	-
Design (NRC)	-	-	-	-	-	-	-	-	-	-	-
Build and Local Config (NRC)	-	-	-	-	-	-	-	-	-	-	-
Interface (NRC)	-	-	-	-	-	-	-	-	-	-	-
Data Migration (NRC)	-	-	-	-	-	-	-	-	-	-	-
Additional Services (NRR)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Regional Implementation Team (NRC)	-	-	-	-	-	-	-	-	-	-	-
National Implementation Team (NRR)	-	-	-	-	-	-	-	-	-	-	-
Optimism Bias Total	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Total with Contingency	**0.00**	**0.00**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.08**
Total NRC	-	-	-	-	-	-	-	-	-	-	-
Total NRR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total RR	-	-	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.08
Total	**0.00**	**0.00**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.08**
Discount Factor	0.98	0.95	0.92	0.89	0.86	0.83	0.80	0.77	0.75	0.72	0.00
Net Present Cost	**0.00**	**0.00**	**0.00**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.06**
VAT											-
NRC	-	-	-	-	-	-	-	-	-	-	-
NRR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RR	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
Total VAT	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.02**
Total Indexation	**-**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.01**
NRC (Incl. VAT & indexation)	-	-	-	-	-	-	-	-	-	-	-
NRR (Incl. VAT & indexation)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RR (Incl. VAT & indexation)	-	-	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.10
Total (Including VAT and indexation)	**0.00**	**0.00**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.10**
Annual Depreciation	-	-	-	-	-	-	-	-	-	-	-
Existing Local BAU Resources	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Less Existing License + Hardware Fee	-	-	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.31

*Due to rounding, '0.00' costs are less than £10k

NHS Tayside

Cost line	Year										
	1	2	3	4	5	6	7	8	9	10	Total
License Costs (NRC)	-	-	-	-	-	-	-	-	-	-	-
Annual Support & Hosting Fee (RR)	-	0.02	0.10	0.15	0.15	0.15	0.15	0.15	0.15	0.15	1.17
Supplier Implementation (NRC)	-	-	-	-	-	-	-	-	-	-	-
Design (NRC)	-	-	-	-	-	-	-	-	-	-	-
Build and Local Config (NRC)	-	-	-	-	-	-	-	-	-	-	-
Interface (NRC)	-	-	-	-	-	-	-	-	-	-	-
Data Migration (NRC)	-	-	-	-	-	-	-	-	-	-	-
Additional Services (NRR)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Regional Implementation Team (NRC)	-	-	-	-	-	-	-	-	-	-	-
National Implementation Team (NRR)	-	-	-	-	-	-	-	-	-	-	-
Optimism Bias Total	0.00	0.00	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.12
Total with Contingency	**0.00**	**0.03**	**0.11**	**0.17**	**0.17**	**0.17**	**0.17**	**0.17**	**0.17**	**0.17**	**1.32**
Total NRC	-	-	-	-	-	-	-	-	-	-	-
Total NRR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Total RR	-	0.02	0.11	0.16	0.16	0.16	0.16	0.16	0.16	0.16	1.29
Total	**0.00**	**0.03**	**0.11**	**0.17**	**0.17**	**0.17**	**0.17**	**0.17**	**0.17**	**0.17**	**1.32**
Discount Factor	0.98	0.95	0.92	0.89	0.86	0.83	0.80	0.77	0.75	0.72	0.00
Net Present Cost	**0.00**	**0.03**	**0.11**	**0.15**	**0.14**	**0.14**	**0.13**	**0.13**	**0.13**	**0.12**	**1.08**
VAT											-
NRC	-	-	-	-	-	-	-	-	-	-	-
NRR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
RR	-	0.00	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.26
Total VAT	**0.00**	**0.01**	**0.02**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.26**
Total Indexation	**-**	**0.00**	**0.01**	**0.01**	**0.01**	**0.02**	**0.02**	**0.03**	**0.03**	**0.03**	**0.16**
NRC (Incl. VAT & indexation)	-	-	-	-	-	-	-	-	-	-	-
NRR (Incl. VAT & indexation)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
RR (Incl. VAT & indexation)	-	0.03	0.14	0.21	0.21	0.22	0.22	0.22	0.23	0.23	1.71
Total (Including VAT and indexation)	**0.00**	**0.03**	**0.14**	**0.21**	**0.22**	**0.22**	**0.22**	**0.23**	**0.23**	**0.24**	**1.75**
Annual Depreciation	-	-	-	-	-	-	-	-	-	-	-
Existing Local BAU Resources	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.26
Less Existing License + Hardware Fee	-	-	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	1.06

*Due to rounding, '0.00' costs are less than £10k

NHS Western Isles

Cost line	Year										
	1	2	3	4	5	6	7	8	9	10	Total
License Costs (NRC)	-	-	-	-	-	-	-	-	-	-	-
Annual Support & Hosting Fee (RR)	-	-	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.06
Supplier Implementation (NRC)	-	-	-	-	-	-	-	-	-	-	-
Design (NRC)	-	-	-	-	-	-	-	-	-	-	-
Build and Local Config (NRC)	-	-	-	-	-	-	-	-	-	-	-
Interface (NRC)	-	-	-	-	-	-	-	-	-	-	-
Data Migration (NRC)	-	-	-	-	-	-	-	-	-	-	-
Additional Services (NRR)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Regional Implementation Team (NRC)	-	-	-	-	-	-	-	-	-	-	-
National Implementation Team (NRR)	-	-	-	-	-	-	-	-	-	-	-
Optimism Bias Total	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Total with Contingency	**0.00**	**0.00**	**0.00**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.07**
Total NRC	-	-	-	-	-	-	-	-	-	-	-
Total NRR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total RR	-	-	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.07
Total	**0.00**	**0.00**	**0.00**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.07**
Discount Factor	0.98	0.95	0.92	0.89	0.86	0.83	0.80	0.77	0.75	0.72	0.00
Net Present Cost	**0.00**	**0.00**	**0.00**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.06**
VAT											-
NRC	-	-	-	-	-	-	-	-	-	-	-
NRR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RR	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Total VAT	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.01**
Total Indexation	**-**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.01**
NRC (Incl. VAT & indexation)	-	-	-	-	-	-	-	-	-	-	-
NRR (Incl. VAT & indexation)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RR (Incl. VAT & indexation)	-	-	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.09
Total (Including VAT and indexation)	**0.00**	**0.00**	**0.00**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.09**
Annual Depreciation	-	-	-	-	-	-	-	-	-	-	-
Existing Local BAU Resources	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Less Existing License + Hardware Fee	-	-	-	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.27

*Due to rounding, '0.00' costs are less than £10k

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NHS SCOTLAND

NHS Scotland

Laboratory Information Management System (LIMS)
Outline Business Case

September 2020

Change Log

Revision History

Version	Date	Source of Changes	Author(s)
1.0 Final	July 2020	Final OBC issued	Deloitte
2.0 Revised	Sept 2020	Revised OBC with further appendices issued	Deloitte

Contents

Executive Summary

This document sets out the Outline Business Case (OBC) for Laboratory Information Management System (LIMS) across 11 NHS Scotland Consortium Health Boards. The purpose of this business case is to articulate the strategic rationale for the programme, outline its scope and breadth, and provide an indication of the likely benefits and costs associated with delivery.

Strategic Case

Introduction

Laboratory Medicine provides laboratory services to primary and secondary care centres across Scotland. LIMS is absolutely crucial to the function of Laboratory Medicine as it is used to result and report all primary, secondary and tertiary laboratory requests received by Laboratory Medicine (with the exception of Genetics). It also provides capability to create automation of workflows, integration of instruments, and management of samples and their associated information.

Current LIMS that underpin the function of the majority of departments within Laboratories within NHS Scotland Health Boards are archaic, often over 25 years in use, and are considered end of life. For most Boards, rolling support contracts are not offering value for money, while in others, the LIMS in use are nearing end of support. Differences in LIMS systems, versions, local service configurations and processes also lead to variation and complexity. Current disparity between laboratory software and data means that meaningful cross border analysis is not currently possible and does not enable optimal use of resources on a national basis.

National Collaborative LIMS Project

NHS Greater Glasgow & Clyde commissioned the development of this OBC in March 2020 on behalf of the LIMS Consortium Project. This business case will enable Boards (either individually or as a consortium) to make investment decisions around the potential acquisition and deployment of a modern LIMS. It will not replace the need for local business cases within Boards as the LIMS implementation may require fundamental changes to established ways of working as well as significant local investment of resources and effort.

Case for Change

Strategic Landscape

NHS Scotland's strategic aim for clinical laboratory services is that the delivery should take the form of a Distributed Service Model (DSM). Services will be developed incrementally following the National Blueprint published in the National Strategy and Business Case. The aim is to ensure that no matter where health care is delivered in Scotland, patients will have equitable access to efficient, effective, sustainable and affordable laboratory services.

Implementation of a common and modern LIMS would also help realise the aims of NHS Scotland's eHealth Strategies. "Scotland's Digital Health and Care Strategy" sets out the need for transformational change to services. There is a particular focus on working in partnership to deliver services in a radically different way, including the need for collaboration, innovation and flexibility.

Clinical Value

Alongside the move to a DSM, a modern LIMS is a key enabler to altering care pathways with potential benefits to patient experience and operational efficiencies through performance gains. LIMS will enable multidisciplinary team working, in particular the production of diagnostic pathways and cascading of tests to support appropriate use of resources. It will support improved productivity and efficiency across laboratories to allow staff to work smarter as well as streamline less efficient processes. This will help to improve turnaround times on referred patient results as well as improving the patient pathways resulting in an enhanced patient experience and

enable operational efficiencies. For example, the potential to reduce length of bed stay as faster availability of test results will help enable speedier diagnosis and therefore provides the opportunity to reduce the time to discharge.

Sustainability

As reported in the DSM business case, the current model of laboratory services delivery across Scotland is not equitable nor is it nationally sustainable in light of the challenges they face. Demand across services is increasing, requiring Boards to utilise the same, or even fewer, resources to maintain current services.

There is significant complexity with each of the Boards current LIMS which has evolved organically over many years. Due to the poor and limited functionality of existing solutions there is a high reliance on bolt-on solutions, many of which are built in-house and not properly supported. This presents a significant business continuity and security risk. Adopting a common LIMS and standardising associated processes and data sets across NHS Scotland provides a significant opportunity to have a more sustainable and robust solution. Standardisation may also make it easier to replace or rationalise other national solutions in the future (for example SCI Store).

Demand Optimisation

Nationally, for Laboratory Medicine, the vision for Scotland is to deliver the Right Test, in the Right Place, at the Right Time, with the Right Impact. Demand Optimisation is key to this vision. It has been recognised for many years that there is considerable variation in the use of diagnostic tests across NHS Scotland. While some of this variation can be explained by clinical circumstances and demographic differences, there still exists considerable levels of inappropriate requesting by clinicians, practises of over-requesting and under-requesting etc. A modern LIMS is a key enabler to reducing unnecessary testing across primary and secondary care. This will free up capacity to address rising demand and deliver testing that positively affects the patient pathway, supports primary care preventative measures, reduces hospital referrals and admissions, and supports equity of care for patients regardless of where they are or where they access Laboratory services.

Economic Case

Option Short-listing

Multiple options were set out for the implementation of LIMS. A short-listing exercise was undertaken to determine the options to take forward for further analysis within the OBC. This exercise was completed by Project Team & Evaluation User Group (see Appendix A).

The below options were shortlisted for further analysis:

Option 1: Do Nothing - all 'core'[1] laboratory services including blood sciences, microbiology, and histopathology[2] will be delivered from existing LIMS. For NHS Boards that have molecular genetics and blood transfusion, these will continue to reside on their own separate LIMS. There will be no change to cross Board / Region working practices or standards.

Option 3: Unified Consortium - boards collaborate to agree a national LIMS specification and select a solution all Consortiums adopt. The implementation approach, roll out strategy and hosting approach will be informed as part of the procurement process. However, it is anticipated that some Boards will work together to implement and utilise a common LIMS instance.

[1] 'Core' Lab services do not include Genetics & Blood Transfusion for the purposes of this OBC.
[2] For OBC purposes, Blood Sciences covers disciplines including biochemistry, haematology and immunology, and Microbiology covers disciplines including bacteriology and virology.

- Option A: Core LIMS, Genetics and Blood Transfusion - all disciplines are included in the procurement scope including Genetics and Blood Transfusion for Boards that require these capabilities.
- Option B: Core LIMS and Genetics - Core LIMS disciplines and Genetics, for Boards that require this capability, are in scope. Blood Transfusion is not included in the procurement scope.
- Option C: Core LIMS and Blood Transfusion - Core LIMS disciplines and Blood Transfusion for Boards that require this capability, are included in the procurement scope. Genetics is not included in scope.
- Option D: Core LIMS only - Core LIMS disciplines are only included in the procurement scope. Genetics and Blood Transfusion are not included in scope.

Benefits Assessment

The key benefits that are expected to be realised by a modern LIMS is described below. These benefits outline how replacing the current ageing LIMS system will provide improved clinical value, improved and sustainable operations and help Laboratory teams effectively manage and optimise demand. While the benefits are primarily described in the context of operational improvements, ultimately, they will contribute to improved patient outcomes.

- **Clinical Value**
  - Improved reporting, including integrated reporting in keeping with NICE guidelines
  - Improved functionality allowing modern analytical tests to be reported appropriately
  - Histopathology case tracking, and improved general laboratory tracking reducing chances of mismatching patient requests
  - Increased communication options between disciplines, lab sites and NHS Health Boards
  - Improved flagging of results requiring action
- **Operational**
  - Reduction in burden for transition of staff and work, through the reduction in re-training of staff & re-booking of results
- **Sustainability**
  - Reduction in risk of hardware and software failures through the innovative use of technology, the simplification of technical & clinical architecture
  - Supports the development of the DSM for Scotland
  - Standardisation of outputs will make it easier to replace connecting solutions in the future (e.g. SCI Store)
- **Demand Optimisation**
  - Optimises diagnostic testing use to maximise appropriate testing
  - Optimises the use of resource while reducing turnaround times by automating current clinical authorisation

A weighting and scoring exercise was undertaken to rank each of the shortlisted options in terms of their relative non-financial benefit. The purpose of this assessment was to understand any differential between shortlisted options in non-monetary terms.

Risks Assessment

The Evaluation User Group also undertook a similar exercise for identified risks. These are outlined below.

- **Supplier Capability / Capacity:** There is a risk that suppliers may fail to understand Boards' requirements, or that their product may not be capable of meeting those requirements.
- **NHS Resource Capacity:** There is a risk that there will be insufficient NHS resources to deliver and maintain the solution.
- **Incomplete Specification:** There is a risk that an incomplete specification leads to increased cost of the solution as a result of increased change control during the contract.

- **Integration / Technical Complexity:** There is a risk that suppliers may struggle to deliver interfaces to the required levels of functionality, performance, reliability and maintainability. This may lead to increased costs due to extra effort to develop the interfaces and delays to the project timescales.
- **LIMS Availability:** There is a risk that weakness in local infrastructure or a poorly designed/implemented solution leads to multiple and/or sustained periods of unavailability of the solution.
- **Change Management:** There is a risk that inadequate change management and/or leadership results in poor adoption of LIMS and or unrealistic expectations meaning that anticipated benefits are not realised.
- **Funding:** There is a risk that more funding is required and the LIMS replacement becomes unaffordable.
- **Divergence of Standards:** There is a risk that the governance is not effective and Boards adopt their own standards and therefore the anticipated benefits are not realised.

As with the identified benefits, the above risks were scored by the Evaluation User Group to distinguish between the shortlisted options. The objective of the scoring exercise was to assess the level of new or additional risk that each option may introduce.

Total Economic Cost

The full economic cost of each shortlisted option has been calculated for the full 10 year period for all Consortium Boards, and is based on a number of principles and assumptions as found within the main body of the OBC (Section 2.5.2).

Option 3a (Core LIMS, Genetics and Blood Transfusion) has a total NPC of c£82m over the 10 year, with option 3b (Core LIMS and Genetics) and 3c (Core LIMS and Blood Transfusion) being similar in cost at c£81m and c£80m respectively. Option 3d (Core LIMS only) has the lowest economic cost of c£78m, though this is unsurprising as a reduction in scope directly relates to cost reduction.

Option Appraisal and Preferred Option

Option 3a (Core LIMS, Genetics and Blood Transfusion) attracted the highest benefit score reflecting that increasing the scope of the LIMS will deliver the greatest opportunity for maximising benefits against each of the benefit categories. Option 3a also however attracted the highest risk score indicating that increasing scope will be more complex for Boards to implement whereas 3d (Core LIMS only) scored the lowest given the scope of the replacement is more closely aligned to current solutions in place by Boards.

The table below incorporates the economic cost of each option with the identified weighted benefits and risks.

Option Appraisal	Option 3a: Core LIMS, Genetics and Blood Transfusion	Option 3b: Core LIMS and Genetics	Option 3c: Core LIMS and Blood Transfusion	Option 3d: Core LIMS only
Weighted Benefits Points	931	805	673	558
Weighted Risk Points	1578	1406	1236	1167
Risk Per Benefit Point	1.69	1.74	1.84	2.09
Option Rank	1.00	2.00	3.00	4.00
NPC Per Option (£k)	82,060	80,610	80,020	78,130
Cost Per Benefit Point (£k)	88	100	119	140
Option Rank	1.00	2.00	3.00	4.00

Option 3A (Core LIMS, Genetics and Blood Transfusion) shows the lowest cost per benefit point, and as such has been identified as the preferred option for Consortium Boards. Option 3B has a relatively similar cost per benefit point evidencing the importance of Genetics inclusion in LIMS Replacement.

NHS Scotland Preferred Option for Each Consortium Board

The preferred option, Option 3a (Core LIMS, Genetics and Blood Transfusion) has been profiled over a 10 year period for each Consortium Board as shown in the below table. Further detail can be found in the main body of the OBC (Section 2.6.2) and Appendix F.

Option 3A - 10 Year Cost (£m)	NHS Borders	NHS D&G	NHS Fife	NHS Forth Valley	NHS Golden Jubilee	NHS Gram-pian	NHS GGC	NHS Lothian	NHS Orkney	NHS Shet-land	NHS Tayside
LIMS Software Licence	0.04	0.05	0.12	0.07	0.01	0.19	0.67	0.27	0.00	0.00	0.17
Supplier Annual Support	2.06	2.06	2.29	2.29	2.06	3.16	6.27	6.27	2.06	2.06	3.16
Supplier Implementation	0.58	0.58	0.80	0.80	0.58	0.97	2.00	2.00	0.58	0.58	0.97
Design	0.01	0.01	0.03	0.02	0.00	0.04	0.11	0.06	0.00	0.00	0.04
Build & Local Config	0.07	0.08	0.24	0.18	0.01	0.43	1.44	0.79	0.01	0.01	0.40
Rollout	0.05	0.06	0.19	0.14	0.01	0.35	1.01	0.55	0.01	0.01	0.33
BAU	0.19	0.21	0.49	0.36	0.03	0.71	2.02	1.11	0.03	0.03	0.66
LIMS Interface Build	0.06	0.06	0.09	0.09	0.07	0.22	0.23	0.20	0.09	0.09	0.13
LIMS Interface Support	0.03	0.03	0.04	0.04	0.05	0.33	0.36	0.29	0.03	0.03	0.08
Add. Licences Build	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
Add. Licences Recurring	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23
Downstream Interfaces	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Hosting Hardware	0.22	0.22	0.33	0.33	0.22	0.44	0.88	0.88	0.22	0.22	0.44
Optimism Bias	**1.13**	**1.14**	**1.52**	**1.43**	**1.05**	**2.18**	**4.64**	**3.86**	**1.04**	**1.04**	**2.05**
Total with OB	**4.88**	**4.96**	**6.60**	**6.21**	**4.53**	**9.46**	**20.09**	**16.73**	**4.52**	**4.52**	**8.86**
Non Recurring Capital (NRC)	1.17	1.20	1.61	1.55	1.15	2.08	4.07	3.50	1.16	1.16	1.93
Non Recurring Revenue (NRR)	0.18	0.20	0.60	0.44	0.03	1.06	3.33	1.83	0.03	0.03	0.99
Recurring Revenue (RR)	3.53	3.56	4.40	4.22	3.36	6.32	12.69	11.41	3.33	3.33	5.94
Total with Optimism Bias over 10 years	**4.88**	**4.96**	**6.60**	**6.21**	**4.53**	**9.46**	**20.09**	**16.73**	**4.52**	**4.52**	**8.86**
NPC over 10 years	4.36	4.43	5.95	5.59	4.04	8.51	18.14	15.02	4.03	4.03	7.97

The table above shows the total NPC for each Consortium Board. NHS GGC and NHS Lothian have the highest cost (c£18m and £15m respectively over 10 years), as both are defined as Very Large Boards, while the smaller Boards including NHS Borders and NHS D&G have a similar total cost of c.£4m.

For each Board the highest costs are those associated with supplier support and implementation. **Optimism Bias** also adds **30% onto the total costs**, equating to an additional c.£1- 4m depending on Board size.

Financial Case

A financial appraisal based on a number of assumptions has been undertaken to illustrate the estimated affordability of the Preferred Option.

Option 3A - 10 Year Cost (£m)	NHS Borders	NHS D&G	NHS Fife	NHS Forth Valley	NHS Golden Jubilee	NHS Grampian	NHS GGC	NHS Lothian	NHS Orkney	NHS Shetland	NHS Tayside
Consolidated Financial Considerations											
NRC (Incl. VAT & Indexation)	1.41	1.44	1.93	1.86	1.38	2.50	4.88	4.20	1.39	1.39	2.32
NRR (Incl. VAT & Indexation)	0.18	0.20	0.60	0.44	0.03	1.07	3.36	1.84	0.03	0.03	1.00
RR (Incl. VAT & Indexation)	4.49	4.52	5.50	5.31	4.30	7.92	15.76	14.32	4.26	4.26	7.44
Total (Incl. VAT & Index.)	**6.07**	**6.16**	**8.03**	**7.61**	**5.71**	**11.48**	**24.0**	**20.36**	**5.68**	**5.69**	**10.76**
Existing Resources In Post	(0.02)	(0.02)	(0.07)	(0.05)	(0.00)	(0.12)	(0.38)	(0.21)	(0.00)	(0.00)	(0.11)
Total Financial Cost	**6.05**	**6.14**	**7.96**	**7.56**	**5.70**	**11.36**	**23.63**	**20.16**	**5.68**	**5.68**	**10.64**

Capital Depreciation	1.17	1.20	1.61	1.55	1.15	2.08	4.07	3.50	1.16	1.16	1.93

*Due to rounding, '0.00' costs are less than £10k

The table illustrates that VAT & Depreciation considerations increase the total Financial Cost to each Board over the 10 year period. Each Board has a minimum VAT cost of c£800k, and indexation of c£300k over the 10 year period, with the larger Boards having higher costs as expected.

It has been assumed that the majority of funding, other than shared resources, for LIMS will come from individual Consortium Board budgets. However, as the project progresses, further discussions will be required to agree the most appropriate funding model.

Commercial Case

Procurement Procedure

NHS Scotland procurement advisors has advised that the Competitive Procedure with Negotiation (CPN) is the preferred procurement procedure.

CPN is a relatively new procedure but NHS Scotland has used this procurement route previously including on the GP IT and CHI procurements. This has provided valuable lessons to support the LIMS procurement including the need for strong governance, being clear on the points of negotiation upfront and the need for dedicated resource on the procurement team.

The items to be negotiated will need to be defined and documented as part dialogue planning. At this stage it is envisaged that dialogue is likely to focus on areas such as Genetics functionality, hosting, and managed service proposition.

An indicative timeline for the procurement process is outlined in the below table.

Milestone	Date
Contract Notice Publication & ESPD Issued	September 2020
ESPD Deadline	October 2020
Issue Instructions to Bidders	November 2020
Initial Bid Submission Deadline	December 2020
Initial Bid evaluation	January 2021
Initial Negotiation	April 2021
Negotiation Phase (Optional)	June 2021
Invitation to Submit Final Bids	July 2021
Return of Final Bids	July 2021
Successful Bidders Announcement	August 2021
Framework Agreement Award	August 2021

Having well-defined requirements in all areas is important to help expedite the process. Further consideration and detail of the procurement timelines will be undertaken when developing the Procurement Strategy.

Management Case

Governance

To realise the benefits of a common solution, the PMS project highlights the need for strong governance that supports a common approach, for example to agree national standards, sharing of resources and managing suppliers as a consortium to drive positive supplier behaviour.

The Project Board is responsible for approving the procurement strategy, shortlisting of vendors and selection of the preferred solution. The eHealth Leads Strategy Group is responsible for approving the Full Business Case (FBC).

The Project Team will be supported by a LIMS Evaluation User Group comprising of Subject Matter Experts (SMEs) and consortium board representatives. The Project Team may seek additional advice and support from the Regional Laboratory Medicine Delivery Boards as required however no formal reporting into these boards will be put in place.

The Laboratories Oversight Board (LOB) and Local Board Executive Management Teams will be kept informed however will not provide approval / sign-off of any of the procurement artefacts.

Benefits, risks and change management are also discussed in the main body of the OBC (Section 5).

Introduction

This document sets out an Outline Business Case (OBC) for investment in a modern Laboratory Information Management System (LIMS) across the following NHS Scotland Consortium Boards:

- NHS Borders
- NHS Dumfries & Galloway
- NHS Fife
- NHS Forth Valley
- NHS Golden Jubilee / NHS National Waiting Times Centre
- NHS Grampian
- NHS Greater Glasgow & Clyde
- NHS Lothian
- NHS Orkney
- NHS Shetland
- NHS Tayside

This OBC builds on existing work conducted in this area within NHS Scotland and presents a national picture of the benefits, costs and risks associated with investing in LIMS. It has been prepared in accordance with HM Treasury Green Book guidance and is structured into five sections as set out below:

- the **Strategic Case** considers the key strategic drivers and the case for change;
- the **Economic Case** sets out the options and option short-listing process, LIMS benefits and risks, cost assumptions, and the total economic cost of the preferred option;
- the **Financial Case** sets out the financial appraisal and funding options for the preferred option;
- the **Commercial Case** provides an overview of the proposed procurement approach; and
- the **Management Case** sets out the governance structures, project plan, implementation and risk management arrangements, and benefit realisation approach.

Further information is provided in a series of appendices including project membership and detailed assumptions.

1. Strategic Case

1.1. Introduction

In this section the background to the project is set out alongside the current Laboratory Information Management System (LIMS) landscape and case for change. It builds on existing work conducted by the Consortium Boards participating in this project.

1.1.1. Background

Laboratory Medicine provides laboratory services to primary and secondary care centres across Scotland. Laboratories across Consortium Boards perform over 84 million tests per year and employ over 4000 staff. Laboratories provide a 24/7 clinical and medical laboratory service and a comprehensive range of investigations including decentralised testing sites. Laboratory tests play a part in 70 – 80% of all health care decisions affecting diagnosis of disease, treatment and monitoring response to treatment.

LIMS is absolutely crucial to the function of Laboratory Medicine as it is used to result and report all primary, secondary and tertiary laboratory requests received by Laboratory Medicine (with the exception of Genetics). It also provides capability to create automation of workflows, integration of instruments, and management of samples and their associated information. LIMS systems interface with a number of key local and national healthcare systems, for example:

- Patient Administration Systems
- Electronic Patient Records
- Analytical Middleware
- Electronic Order Communication Systems
- Regional and National Systems

Current LIMS that underpin the function of the majority of departments within Laboratories within NHS Scotland Health Boards are archaic, often over 25 years in use, and are considered end of life. For most Boards, rolling support contracts are not offering value for money, while in others, the LIMS in use are nearing end of support.

Differences in LIMS systems, versions, local service configurations and processes also lead to variation and complexity. Current disparity between laboratory software and data means that meaningful cross border analysis is not currently possible and does not enable optimal use of resources on a national basis. Most suppliers now have a LIMS available that offers functionality and automation that is far in excess of what is currently used by Boards, for example:

- multidisciplinary team working; in particular the production of diagnostic pathways and cascading of tests to support appropriate use of resources;
- integrated reporting and multidisciplinary meetings capability; and
- real time access to information on performance, quality and cost.

There are strong drivers, as set out in the remainder of this section, for Boards to replace their existing solutions with a modern LIMS.

1.1.2. National Collaborative LIMS Project

In 2018, a Prior Information Notice (PIN) was published by NHS Greater Glasgow & Clyde (NHS GGC) to gather information on what LIMS were available in the market and indicative costs. Eight vendors responded and attended a Q&A day. After the PIN process was completed, NHS GGC were approached by three Boards from

the East region (undertaking work as part of the National Laboratories Programme in the East), to investigate the position of working collaboratively, as they were in the same position with an urgent need to replace their LIMS. Since then 11 Boards in total from across NHS Scotland have expressed an interest to join a national LIMS procurement (NHS Shetland, NHS Orkney, NHS Tayside, NHS Fife, NHS GG&C, NHS Forth Valley, NHS Dumfries & Galloway, NHS Lothian and NHS Grampian). The vision is for a single supplier framework which Boards can call off to procure a new LIMS.

It is expected that working together as a consortium will bring a number of benefits including:

- shared specification to promote standardisation across large parts of Scotland, based on the work already done for the National Laboratories Programme;
- the ability to use economies of scale to drive down costs; and
- an opportunity to share project costs between multiple Boards.

The Scottish Government eHealth Directorate commissioned the development of this OBC in March 2020 with NHS GGC providing overall sponsorship. Deloitte was engaged to support this work. The project will report into the National eHealth Leads Strategy Board who is responsible for approving the business case.

This business case will enable Boards (either individually or as a consortium) to make investment decisions around the potential acquisition and deployment of a modern LIMS. It will not replace the need for local business cases within Boards as the LIMS implementation may require fundamental changes to established ways of working as well as significant local investment of resources and effort.

A Project Team was formed and met regularly to review key outputs and provide overall assurance of the process. The Project Team membership is set out in Appendix A.

A LIMS Evaluation User Group was also formed to support the development of this OBC comprising of a number of cross-discipline technical and clinical stakeholders from various sub-groups across the Consortium Boards including eHealth and clinical representatives. The Evaluation User Group membership is also set out in Appendix A.

1.2. LIMS Landscape & Challenges

1.2.1. LIMS Landscape

Current IT infrastructures and architectures across NHS Boards are highly complex and have evolved over many years. Historically, each hospital site and discipline may have had its own instance of the LIMS or LIMS module respectively. This was thought appropriate for the working practices of the time but has resulted in a high degree of variation and challenges around working as part of a multidisciplinary team, which current practices require. Table 1 provides an overview of current LIMS in use across NHS Scotland.

Table 1: Current LIMS landscape

LIMS	Version	NHS Board
Clinisys / WinPath	1.1	Ayrshire & Arran
Medpath	1.12	Western Isles
Technidata	-	Lanarkshire
Clinisys / LabCentre	1.1	Shetland
		Orkney
	1.11	Borders
		Golden Jubilee / National Waiting Times Centre
	1.12	Tayside

	1.13	Fife
DXC/Telepath	1.9	Greater Glasgow & Clyde
DXC/iLab	5.8	Forth Valley
	5.8.10022.3b3	Dumfries & Galloway
	6.1b6	Lothian
	6	Grampian

Supplier development effort is now being directed towards the production of new LIMS offerings. This has resulted in markedly reduced product support for a number of Board solutions, with very significant timelines for problem resolution, even for issues considered as business critical. There is significant risk that support will be completely removed from existing products as new versions and solutions are brought to market. Lack of support also poses a significant security risk as new vulnerabilities may either not be caught or remain unpatched. The lack of development and old database architecture is also significantly impacting on the operational effectiveness of laboratory medicine and is preventing the streamlining of diagnostic workflows and demand optimisation pathways.

1.2.2. Board Challenges

The common challenges associated to current LIMS raised by the Consortiums are summarised below:

- Current LIMS do not meet the needs current and future needs of the service; modern collaborative working practices, streamlining of workflows and mainstreaming of new technology cannot be implemented. For example, the introduction of SNOMED-CT and other required standards to deliver against the National Laboratory Programme cannot be met.
- The continued use of disparate LIMS with local coding, requesting and reporting practices do not meet the National Laboratories Programme agenda of standardisation of tests, reduction in IT variation and facilitating cross Board working.
- Current disparity between both laboratory software and data across Boards means that meaningful cross border information sharing and analysis is challenging.
- Where common solutions are in place, differences in service configurations and processes lead to variation and complexity in LIMS configurations. Together, these introduce barriers to cross border working of laboratory professionals (e.g. cross border reporting and results validations) and aggregation of data.
- Multimodality/integrated reporting is not supported by current solutions to enable the production of comprehensive and consolidated diagnostics reports. This leads to significant inefficiencies in working practice and, since many vital pieces of patient information are still held on paper, this frequently makes them unavailable when needed and could be considered a risk to patient safety. This challenge has been highlighted during the current Covid-19 pandemic.
- There is limited or no support for modern communication methods (email, SMS, new HL7 standards e.g. FHIR). For example, in some Boards the Genetics and Cytogenetics LIMS do not interface with the Patient Administration Systems and their results do not get filed within the electronic patient record.
- There is a lack of integrated business intelligence tools making it difficult and time consuming to extract information from LIMS to provide timely management information, audit information and demand management control.
- There is no nationally agreed data set or definitions for laboratories in Scotland and therefore an inability to meaningfully collate data for strategic planning or service improvement. There is an inability to share test information between NHS Boards with disparate and disjointed approaches to data collection, analysis and storage.

1.3. Case for Change

1.3.1. Strategic Landscape

NHS Scotland's strategic aim for clinical laboratory services is that the delivery should take the form of a Distributed Service Model (DSM). Services will be developed incrementally following the National Blueprint published in the National Strategy and Business Case[3]. The aim is to ensure that no matter where health care is delivered in Scotland, patients will have equitable access to efficient, effective, sustainable and affordable laboratory services.

A replacement modern common system implemented across Scotland is a key enabler for the vision of a DSM to be realised, and enable efficiencies associated with standardisation, service redesign regionally and ultimately nationally to be developed in a unified laboratory system without Board boundaries. However, it is also acknowledged that delivery of common LIMS for Scotland requires convergence of laboratory and other processes, use of shared protocols, common coding systems and taxonomies.

Implementation of a common and modern LIMS would also help realise the aims of NHS Scotland's eHealth Strategies. "Scotland's Digital Health and Care Strategy[4]" sets out the need for transformational change to services. There is a particular focus on working in partnership to deliver services in a radically different way. Furthermore, it highlights need for collaboration, innovation and flexibility. The strategy identifies the massive potential for digital technology to change the way health services are delivered for the better to deliver consistent outcomes across all health services.

Research undertaken by the Royal College of Pathologists[5] in January 2017 examined how integrated reporting across Histopathology and Genetics could be achieved. The report identifies currents LIMS as a key barrier given that reporting interfaces do not uniformly provide functionality to integrate data from a variety of sources into a single definitive report. Moving to a common modern LIMS is a key enabler to achieving the recommendations within this report.

Within the Scottish Public Sector there continues to be a focus on regional working and shared services. Testing volumes vary by discipline however overall anecdotal evidence provided to the project team estimates that there is approximately a 2-3% increase in testing each year. The increasing demand on services will have to be met within the resources to sustain current services - financial and human - that NHS Scotland has at its disposal. By adopting a 'Once for Scotland' approach and changing the way organisations work, the ambition is to improve, integrate and co-ordinate services within the Scottish public sector. This will be done through reducing geographical and organisational barriers to the delivery of support services and functions.

1.3.2. Clinical Value

Alongside the move to a DSM, a modern LIMS is a key enabler to altering care pathways with potential benefits to patient experience and operational efficiencies through performance gains. LIMS will enable multidisciplinary team working, in particular the production of diagnostic pathways and cascading of tests to support appropriate use of resources. It will support improved productivity and efficiency across laboratories to allow staff to work smarter as well as streamline less efficient processes. This will help to improve turnaround times on referred patient results as well as improving the patient pathways resulting in an enhanced patient experience and

[3]https://www.labs.scot.nhs.uk/wp-content/uploads/2019/01/Shared-Services-Laboratories-Programme-Business-Case-v1.0.pdf

[4] https://www.gov.scot/binaries/content/documents/govscot/publications/strategy-plan/2018/04/scotlands-digital-health-care-strategy-enabling-connecting-empowering/documents/00534657-pdf/00534657-pdf/govscot%3Adocument/00534657.pdf?forceDownload=true

[5] https://www.rcpath.org/asset/442FCDC1-AF22-401F-8FCD1B4B65603810/

enable operational efficiencies. For example, the potential to reduce length of bed stay as faster availability of test results will help enable speedier diagnosis and therefore provides the opportunity to reduce the time to discharge.

LIMS will also provide capability for advanced reporting across multi disciplines, for example, older LIMS do not have the functionality to generate integrated report for genetics haematology and pathology - this capability would help clinicians identify appropriate treatments and follow up tests potentially leading to improved patient safety and outcomes.

1.3.3. Sustainability

As reported in the DSM business case[6], the current model of laboratory services delivery across Scotland is not equitable nor is it nationally sustainable in light of the challenges they face. Demand across services is increasing, requiring Boards to utilise the same, or even fewer, resources to maintain current services.

There is significant complexity with each of the Boards current LIMS which has evolved organically over many years. Due to the poor and limited functionality of existing solutions there is a high reliance on bolt-on solutions, many of which are built in-house and not properly supported. This presents a significant business continuity and security risk. Adopting a common LIMS and standardising associated processes and data sets across NHS Scotland provides a significant opportunity to have a more sustainable and robust solution. Standardisation may also make it easier to replace or rationalise other national solutions in the future (for example SCI Store).

1.3.4. Demand Optimisation

Nationally, for Laboratory Medicine, the vision for Scotland is to deliver the Right Test, in the Right Place, at the Right Time, with the Right Impact[7]. Demand Optimisation is key to this vision. Demand Optimisation is defined as the process by which diagnostic test use is optimised to maximise appropriate testing, which in turn optimises clinical care and drives more efficient use of a scarce resource.

It has been recognised for many years that there is considerable variation in the use of diagnostic tests across NHS Scotland. While some of this variation can be explained by clinical circumstances and demographic differences, there still exists considerable levels of inappropriate requesting by clinicians, practises of over-requesting and under-requesting etc. In addition, lack of availability of certain tests across the NHS Boards may also limit their optimal universal utility.

A modern LIMS is a key enabler to reducing unnecessary testing across primary and secondary care. This will free up capacity to address rising demand and deliver testing that positively affects the patient pathway, supports primary care preventative measures, reduces hospital referrals and admissions, and supports equity of care for patients regardless of where they are or where they access Laboratory services.

[6]https://www.labs.scot.nhs.uk/wp-content/uploads/2019/01/Shared-Services-Laboratories-Programme-Business-Case-v1.0.pdf
[7] https://www.labs.scot.nhs.uk/

2. Economic Case

2.1. Introduction

This section summarises the value for money assessment of the short-listed LIMS options including an appraisal of the benefits, risks and costs associated with each option.

The Economic Case, and in particular, the options, benefits and risks were developed working closely with the Evaluation User Group (see Appendix A for membership). A number of workshops with the Evaluation User Group were held during April and May 2020 as outlined below:

- **Workshop 1. Defining the Options**: this workshop focused on defining the long-list of options and undertaking an initial sifting exercise to determine the short-listed options to be taken forward.
- **Workshop 2. Benefit Assessment:** this workshop focused on identifying the benefits and weighting each benefit aligned to the Boards' priorities. A follow-up exercise was completed by the workshop participants to assign a benefit score for each option.
- **Workshop 3. Risk Assessment:** this workshop focused on identifying the implementation risks and weighting each risk by level of impact. A follow-up exercise was completed by the workshop participants to assign a risk score for each option.
- **Workshop 4. Implementation Approach:** this workshop focused on defining the implementation approach assumptions to be used for costing each shortlisted option.
- **Workshop 5. Financial Assumption:** this workshop focused on agreeing the financial assumptions including supplier costs, NHS resource profiles, optimism bias and accounting treatments to be applied to the shortlisted options.

The Project Team met regularly to review the output of these workshops and provide overall assurance of the process. They were also involved in reviewing the costs associated with each option and the implementation approach.

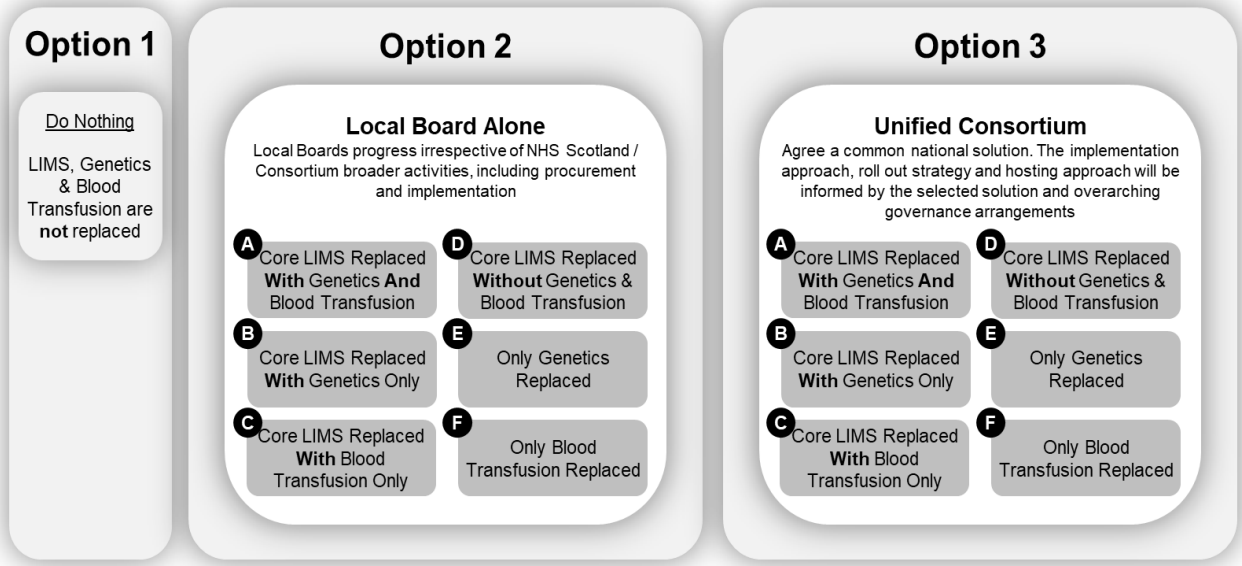
The Project Team also met with a subset of the eHealth leads (NHS Borders, NHS GGC, NHS Lothian, and NHS Grampian) twice during the project to review the workshop findings and the assumptions relating to the implementation approach.

2.2. Shortlisted Options

To determine the options to be taken forward (shortlisted) for detailed evaluation, a long list of options was drawn up describing possible scope and collaboration options. The long list of options was derived from discussions within the Project Team and a workshop with the Evaluation User Group

Figure 1 shows the long list of options identified for initial review.

Figure 1: LIMS Options Long List



Option 1: Do Nothing

All 'core'[8] laboratory services including blood sciences, microbiology, and histopathology[9] will be delivered from existing LIMS. For NHS Boards that have molecular genetics and blood transfusion, these will continue to reside on their own separate LIMS. There will be no change to cross Board / Region working practices or standards.

Option 2: Local Approach

Boards progress LIMS replacement alone, irrespective of national strategy. There will be no change to cross Board / region working practices or standards.

Option 3: Unified Consortium

Boards collaborate to agree a national LIMS specification and select a solution all Consortiums adopt. The implementation approach, roll out strategy and hosting approach will be informed as part of the procurement process. However, it is anticipated that some Boards will work together to implement and utilise a common LIMS instance.

Sub-options for Option 2 & Option 3

The sub options described below varies the discipline scope. Sub-options are the same for both Option 2 and Option 3:

- Option A: Core LIMS, Genetics and Blood Transfusion - all disciplines are included in the procurement scope including Genetics and Blood Transfusion for Boards that require these capabilities.
- Option B: Core LIMS and Genetics - Core LIMS disciplines and Genetics, for Boards that require this capability, are in scope. Blood Transfusion is not included in the procurement scope.

[8] 'Core' Lab services do not include Genetics & Blood Transfusion for the purposes of this OBC.
[9] For OBC purposes, Blood Sciences covers disciplines including biochemistry, haematology and immunology, and Microbiology covers disciplines including bacteriology and virology.

- Option C: Core LIMS and Blood Transfusion - Core LIMS disciplines and Blood Transfusion for Boards that require this capability, are included in the procurement scope. Genetics is not included in scope.
- Option D: Core LIMS only - Core LIMS disciplines are only included in the procurement scope. Genetics and Blood Transfusion are not included in scope.
- Option E: Genetics only - only Genetics is included in the procurement scope. Core LIMS disciplines and Blood Transfusion are not included in scope.
- Option F: Blood Transfusion only - only Blood Transfusion is included in the procurement scope. Core LIMS disciplines and Genetics are not included in scope.

The options were reviewed by the Evaluation User Group at two options appraisal workshops held during April 2020. The options were reviewed against the drivers set out in the Case for Change (see Section 1.3):

1. Alignment to national strategies including the move to a Distributed Service Model (DSM).
2. Maximises the opportunity to improve productivity and efficiency across laboratories leading to improved patient outcomes.
3. Contributes to the sustainability of laboratory services.
4. Maximises the opportunity for Demand Optimisation.

On this basis, the following options were discounted by the Evaluation User Group from further detailed benefit, risk and cost analysis for the reasons described below.

- **Option 2: Local Approach** – this option, including all sub options, would make it more difficult to move to a DSM given there would likely be continued divergence of solutions and standards. It also does not align to wider NHS Scotland strategies, which focus on working in partnership to deliver services in a radically different way.
- **Option 3E**: **Unified Consortium (Genetics only) –** this option was discounted as not replacing the core LIMS does not mitigate the risks associated with current LIMS such as support issues and collaboration limitations. Furthermore, it would have minimal impact on addressing the Sustainability, Demand Optimisation and Clinical Value drivers for change.
- **Option 3F**: **Unified Consortium (Blood Transfusion only) –** this option was discounted for the same reasons as outlined above in Option 3E.

The shortlisted options agreed by the Evaluation User Group for further benefit, risk and cost assessment are listed in Table 2 below. This assessment is described in the remainder of this section.

Table 2: LIMS Shortlisted Options

ID	Option	Sub Option
1	Do Nothing	N/A
3a	Unified Consortium	Core LIMS, Genetics and Blood Transfusion
3b	Unified Consortium	Core LIMS and Genetics
3c	Unified Consortium	Core LIMS and Blood Transfusion
3d	Unified Consortium	Core LIMS only

2.3. Benefits Assessment

This section describes the appraisal of the shortlisted options in relation to high level non-financial benefits. It describes the benefits framework employed and presents the results of the appraisal of the shortlisted options against this framework.

The key benefits identified by the Evaluation User Group that are expected to be realised by a modern LIMS is described in Table 3 below. These benefits outline how replacing the current ageing LIMS system will provide improved clinical value, improved and sustainable operations and help Laboratory teams effectively manage and optimise demand. While the benefits are primarily described in the context of operational improvements, ultimately, they will contribute to improved patient outcomes, for example:

- improved turnaround times on referred patient results;
- improved patient pathway – potential to reduce length of bed stays, faster availability of test results, quicker patient treatment and discharge;
- improved patient experience - reduced error rates in lab to lab requesting - reduced numbers of repeat patient attendances at clinics as a consequence of missing results;
- improved equity of care – a common and standardised LIMS enables a consistent approach regardless of patient location; and
- improved patient safety by reducing transcription errors with reports from provider labs being delivered electronically with commentary.

At this stage, it is not anticipated the move to a national LIMS will enable significant monetary benefits therefore, quantitative/monetary savings have not been included in the economic or financial appraisal elements of this business case. However, once the solution is more fully understood following the procurement it may be possible to quantity some efficiencies at FBC stage.

Quantitative savings will likely be as a result of a combination of initiatives involving modernising LIMS, implementation of a DSM and wider standardisation activity across NHS Scotland. Together these initiatives could achieve efficiencies to support future cost reduction initiatives e.g. reduction in administrative activities, reduced hosting costs through collaboration, increased clinical capacity through more efficient processes etc.

Table 3: LIMS Benefits

Category	**Benefit Description**
Clinical Value	Improved reporting, including integrated reporting in keeping with NICE guidelines
	Improved functionality allowing modern analytical tests to be reported appropriately
	Histopathology case tracking, and improved general laboratory tracking reducing chances of mismatching patient requests
	Increased communication options between disciplines, lab sites and NHS Health Boards
	Improved flagging of results requiring action
Operational	Reduction in burden for transition of staff and work, through the reduction in re-training of staff & re-booking of results
Sustainability	Reduction in risk of hardware and software failures through the innovative use of technology, the simplification of technical & clinical architecture
	Supports the development of the DSM for Scotland
	Standardisation of outputs will make it easier to replace connecting solutions in the future (e.g. SCI Store)
Demand Optimisation	Optimises diagnostic testing use to maximise appropriate testing
	Optimises the use of resource while reducing turnaround times by automating current clinical authorisation

A weighting and scoring exercise was undertaken to rank each of the shortlisted options in terms of their relative non-financial benefit. The purpose of this assessment was to understand any differential between shortlisted options in non-monetary terms.

This exercise involved distributing 100 points (100%) across the benefits with the most important benefits assigned the highest weighting. The second stage in the exercise was to score each option in terms of their relative benefit on a scale from one to five according to the degree to which the option contributes to the realisation of the benefit. The scorings across each benefit represent an average score provided by the Evaluation User Group participants. A worked example of this is presented beneath Table 4.

It should be noted that the status quo option was not scored against either benefit or risk. The key factor to consider was whether any of the options introduced additional benefits in comparison to benefits that are already delivered under existing arrangements. As such, the status quo option would be judged to score zero across all benefit categories.

The scoring of the short-listed options using the benefits evaluation criteria is presented in Table 4.

Table 4: Benefits Scoring Assessment

			Option 3a: Core LIMS, Genetics and Blood Transfusion	Option 3b: Core LIMS and Genetics	Option 3c: Core LIMS and Blood Transfusion	Option 3d: Core LIMS only
Category	**Benefit Description**	**Weighting**	**Average Score**	**Average Score**	**Average Score**	**Average Score**
Clinical Value	Improved reporting, including integrated reporting in keeping with NICE guidelines	10%	10	8	6	5
	Improved functionality allowing modern analytical tests to be reported appropriately	10%	10	8	7	6
	Histopathology case tracking, and improved general laboratory tracking reducing chances of mismatching patient requests	9%	9	8	8	6
	Increased communication options between disciplines, lab sites and NHS Health Boards	9%	10	9	7	6
	Improved flagging of results requiring action	8%	9	8	6	5
Operational	Reduction in burden for transition of staff and work, through the reduction in re-training of staff & re-booking of results	8%	9	8	7	5
Sustainability	Reduction in risk of hardware & software failures through the innovative use of technology, the simplification of technical & clinical architecture	9%	9	8	7	6
	Supports the development of the DSM for Scotland	10%	10	8	7	5
	Standardisation of outputs will make it easier to replace connecting solutions in the future (e.g. SCI Store)	10%	10	8	7	6

Demand Optimisation	Optimising diagnostic test use to maximise appropriate testing	9%	9	8	7	5
	Optimises the use of resource while reducing turnaround times by automating current clinical authorisation	8%	9	8	7	6
	Total Weighted Benefit Scores	100%	931	805	673	558
	Overall Benefit Ranking		1	2	3	4

Option 3a attracted the highest benefit score reflecting that increasing the scope of the LIMS will deliver the greatest opportunity for maximising benefits against each of the benefit categories. Conversely the lowest scoring option (Option 3d) scored significantly lower reflecting the impact a reduced scope would have on delivering benefits.

Worked Benefit Example:

- Benefit : Improved reporting, including integrated reporting in keeping with NICE guidelines
- Option : 3A Core LIMS Replaced WITH Genetics & Blood Transfusion
- Benefit Weighting:
    - 6 People Ranked it 5/5 = 30
    - 4 People Ranked it 4/5 = 16
    - 1 Person Ranked it 3/5 = 3
    - Total Ranking / Total People = 49 / 11 People = 4.4
    - Relative score of 4.4 (specific weighted benefit score) / total of 44 points (total of weighted benefits scores) = 10%

- Option Ability to Realise Benefit:
    - 6 People Ranked it 10/10 = 60
    - 1 Person Ranked it 7/10 = 7
    - Total Rank / Total People = 67 / 7 People = **9.6** (Rounded to 10 in Table 4).

2.4. Risk Assessment

The Evaluation User Group also undertook a similar scoring exercise for identified risks. A risk workshop focused on identifying the implementation risks and weighting each risk by level of concern. A follow-up exercise was completed by the workshop participants to assign a risk score for each option. Table 5 details the risks identified.

Table 5: LIMS Implementation Risks

Risk	Description	Mitigation
Supplier Capability / Capacity	There is a risk that suppliers may fail to understand Boards' requirements, or that their product may not be capable of meeting those requirements.	• At the time of writing there has been market engagement with suppliers and this input has been considered and reflected in the specification and approach to procurement where appropriate. • Strong governance arrangements will be implemented to QA the specification
NHS Resource Capacity	There is a risk that there will be insufficient NHS resources to deliver and maintain the solution.	• Regional and national working exploits economies of scale and shared learning • Deployment strategy to be phased according to capacity
Incomplete Specification	There is a risk that an incomplete specification leads to increased cost of the solution as a result of increased change control during the contract	• Strong governance arrangements will be implemented to QA the specification • Ensure the business requirements are identified by importance with the mandatory requirements being limited to the absolute essential ones
Integration / Technical Complexity	There is a risk that suppliers may struggle to deliver interfaces to the required levels of functionality, performance, reliability and maintainability. This may lead to increased costs due to extra effort to develop the interfaces and delays to the project timescales.	• Ensure that the full complexity of requirements is identified and understood before interfaces are developed, and by maintaining close dialogue between Boards and suppliers • New interfaces require ongoing monitoring, management and maintenance procedures
LIMS Availability	There is a risk that weakness in local infrastructure or a poorly designed/implemented solution leads to multiple and/or sustained periods of unavailability of the solution.	• Rigorous performance testing to provide confidence the availability requirements are satisfied • Motivate suppliers through appropriate service levels/credit regime in the contract • Ensure Boards are made aware of the relevant network and

		infrastructure requirements of the solution provider so that costs of upgrades are incorporated into local business cases
Change Management	There is a risk that inadequate change management and/or leadership results in poor adoption of LIMS and or unrealistic expectations meaning that anticipated benefits are not realised.	• It is essential that existing and future processes are examined and understood. This will help the implementation team support operational staff in the transition to the new LIMS • Strong clinical leadership is an essential part of successfully achieving this change to working practice, and in particular in ensuring that the new system and way of working is widely adopted • Implementation team to include appropriate levels of business change and readiness resource
Funding	There is a risk that more funding is required and the LIMS replacement becomes unaffordable	• Strong governance mechanisms will be implemented to ensure costs are closely managed and monitored • Project management will be based on good practice to ensure costs are closely managed and monitored • A robust procurement will be run to ensure it is competitive and best value can be achieved
Divergence of Standards	There is a risk that the governance is not effective and Boards adopt their own standards and therefore the anticipated benefits are not realised.	• Strong governance mechanisms will be implemented to ensure standards are set and controlled alongside appropriate change control processes • Clear expectations of the role and responsibilities of the consortium Boards will be defined and communicated including commitment to standardisation

The above risks were scored by the Evaluation User Group to distinguish between the shortlisted options. The objective of the scoring exercise was to assess the level of new or additional risk that each option may introduce. Each option was considered against each risk in turn and assigned a score in a range of 1 – 5 for the two key factors associated with risk - likelihood and impact:

Likelihood

- 0: The option will not introduce any additional or new risk in this area.
- 1: The option will introduce a marginal level of additional or new risk in this area.

- 2: The option will introduce a small level of additional or new risk in this area.
- 3: The option will introduce a moderate level of additional or new risk in this area.
- 4: The option will introduce a high level of additional or new risk in this area.
- 5: The option will introduce a very high level of additional or new risk in this area.

Impact

- 0: The risk will have no negative impact on the Board if it occurs.
- 1: The risk will have minimal negative impact on the Board if it occurs.
- 2: The risk will have some negative impact on the Board if it occurs.
- 3: The risk will have moderate negative impact on the Board if it occurs.
- 4: The risk will have a high negative impact on the Board if it occurs.
- 5: The risk will have a very high negative impact on the Board if it occurs.

The total risk score was calculated by multiplying the 'likelihood' score by the 'impact' score - once the weighting of the risk was applied, the total score was then presented as an overall ranking to align with the benefit scoring presentation. The weighting for risk categories indicates the area of risk judged to be of most concern and that Boards will have the least control over. A worked example of this is presented beneath Table 6.

It should be noted that the status quo option was not scored against either benefit or risk. The key factor to consider was whether any of the options introduced additional or new risks in comparison to risk that already exist under existing arrangements. As such, the status quo option would be judged to score zero across all risk categories.

The scoring of the short-listed options using the risk evaluation criteria is presented in Table 6.

Table 6: Scores from risk assessment of short-listed options

		Weighted Score			
Risk	**Weighting**	**Option 3a: Core LIMS, Genetics and Blood Transfusion**	**Option 3b: Core LIMS and Genetics**	**Option 3c: Core LIMS and Blood Transfusion**	**Option 3d: Core LIMS only**
Supplier Capability / Capacity	11%	197	153	102	114
Incomplete Specification	8%	98	88	78	70
Integration / Technical Complexity	9%	131	125	112	105
Deliverability of LIMS	11%	144	134	119	115
NHS Resource Capacity	12%	223	198	186	153
NHS Resource Capacity - Support	10%	168	168	148	120

LIMS Availability	10%	148	148	148	137
Change Management	9%	179	141	107	132
Divergence of Standards	10%	161	142	142	133
Funding	9%	129	109	94	88
Total Weighted Risk Score	100%	1578	1406	1236	1167
Overall Risk Ranking		4	3	2	1

Worked Risk Example:

- Risk : Supplier Capability / Capacity
- Option : 3A Core LIMS Replaced WITH Genetics & Blood Transfusion
- Risk Weighting:
    - 5 People Ranked it 5/5 = 25
    - 5 People Ranked it 4/5 = 20
    - Total Ranking / Total People = 45 / 10 People = 4.5
    - Relative score of 4.5 (specific weighted risk score) / total of 40 points (total weighted risk scores) = 11%

- Likelihood & Impact of Risk based on Option:
    - Likelihood:
        - 3 People Ranked it 5/5 = 15
        - 3 People Ranked it 4/5 = 12
        - Average Likelihood Score = 27/6 = 4.5
    - Impact:
        - 1 Person Ranked it 5/5 = 5
        - 3 People Ranked it 4/5 = 12
        - 2 People Ranked it 3/3 = 6
        - Average Likelihood Score = 23/6 = 3.8
    - Total Average Risk = 4.5 * 3.8 = 17
- Total Weighted Option Risk
        - Average Option Risk (17) * Risk Weighting (11%) *100 = **197** (seen in Table 6 above)

Option 3a (Core LIMS, Genetics and Blood Transfusion) attracted the highest risk score indicating that increasing scope will be more complex for Boards to implement whereas 3d (Core LIMS only) scored the lowest given the scope of the replacement is more closely aligned to current solutions in place by Boards and therefore was deemed to be lower risk. Option 3C (Core LIMS and Blood Transfusion) was assessed as being lower risk compared to Option 3b (Core LIMS and Genetics) which reflects that many Boards already have an implementation of Blood Transfusion incorporated within their LIMS whereas Genetics is outside the scope of existing LIMS and therefore would be a completely new implementation for most Boards.

A key point of discussion by the Evaluation User Group was the weighting % applied to the NHS Resource Capacity risk which reflects this was the highest area of concern amongst the Evaluation User Group. Given the complexity of the implementation it was highlighted that investment in NHS capacity would be critical to the success of the project to enable NHS staff to be backfilled to provide dedicated input into the project.

2.5. Economic Costing

In this section the economic costs of the shortlisted options are presented. The aim of the economic appraisal is to set out the relative cost of each option to identify the most economically efficient option for delivering LIMS replacement across Consortium Boards. The economic appraisal has been prepared in accordance with Treasury Green Book guidance.

2.5.1. Approach

This costing approach builds on previous work carried out by Consortium Boards via a national Prior Information Notion (PIN) exercise and NHS Lothian's Initial Agreement which sought approval to proceed to the next phase to replace the existing LIMS in use across NHS Lothian.

Cost assumptions have been developed and agreed in collaboration with the Project Team and Evaluation User Group.

2.5.2. Cost Principles

Key overarching principles applied to the cost assessment are described below:

- Costs per shortlisted option are presented as total costs for all Consortium Health Boards combined. Individual Board total cost for the preferred option are presented in section 2.5.7, with a detailed yearly breakdown for the Preferred Option provided in Appendix F.
- No quantitative/monetary savings have been identified as part of this work however the delivery of a modern LIMS is anticipated to achieve efficiencies which may support future cost reduction initiatives. Once the solution is more fully understood following the procurement it may be possible to quantity some of these efficiencies at FBC stage.
- As per standard practice, the Economic Case cost assessment has assumed that all expenditure is 'cash'. Any consideration of existing resources that could fill roles internally is taken into consideration in the Financial Case. Funding is also addressed in the Financial Case.
- Costs are based on relative Board size which has been calculated using an average of LIMS user numbers by Board and Board population.
    - For example, NHS Lothian has 523 LIMS users out of a total 4181 users across NHS Scotland (13%), and provides services to c900k people out of c5.4m (17%). The average of these (15%) is then used to categorise the relative board size as shown in Table 7, with the percentage thresholds shown in Table 8. The size has been used to estimate supplier costs and NHS resource costs for each Board.
- Procurement related costs and team have not been included and are assumed to be absorbed under existing budgets.
- Costs have been presented over an initial 10 year period to reflect the assumed useful life of the solution.
- The economic appraisal uses the Treasury recommended discount rate of 3.5%.

Table 7: Relative Board Size

Health Board	Region	Relative Percentage	Relative Size
NHS Ayrshire & Arran	West	6.2%	Medium
NHS Borders*	East	2.3%	Small
NHS Dumfries & Galloway*	West	2.6%	Small
NHS Fife*	East	6.2%	Medium
NHS Forth Valley*	West	4.6%	Medium

Golden Jubilee / National Waiting Times Centre*	West	0.3%	Small
NHS Grampian*	North	9.1%	Large
NHS Greater Glasgow & Clyde*	West	26.3%	Very Large
NHS Highland	North	7.1%	Medium
NHS Lanarkshire	West	10.6%	Large
NHS Lothian*	East	14.5%	Very Large
NHS Orkney*	North	0.3%	Small
NHS Shetland*	North	0.4%	Small
NHS Tayside*	North	8.5%	Large
NHS Western Isles	West	1.2%	Small

*Consortium Board

Table 8: Board Size Boundaries

Board Size	Lower Bound	Upper Bound
Very Large	12%+	
Large	8.1%	12.0%
Medium	4.1%	8.0%
Small	0.0%	4.0%

*Board size boundaries as agreed by the LIMS Project Team & Evaluation User Group

2.5.3. Supplier and Hardware Assumptions

This section describes the supplier and hardware cost assumptions. Once the solution is more fully understood following the procurement these assumptions should be reviewed and updated as required.

Supplier Costs

- CliniSys has been used as the basis for estimating the supplier costs (including LIMS user licences, supplier implementation, interface build and annual ongoing support) as this supplier provided the most comprehensive and robust cost information in response to the PIN exercise.
- Other suppliers that provided a response to the PIN exercise were assessed for potential comparison with CliniSys, however it was not possible to fully cost LIMS implementation for a like-for-like comparison using the limited information provided.

LIMS Software Licence

- Licence costs are based on those provided by CliniSys as per the rationale above.
- The total licence costs per shortlisted option are based on LIMS user numbers per discipline, per Board, multiplied by the average licence cost provided by CliniSys in their PIN response (£2k per concurrent user licence).
- The number of users under each option varies based on scope therefore licence costs vary by option.
- Individual Board's will also run at various levels of concurrency (active licences for use). For the purposes of this business case, a base assumption of 25% concurrency has been used.
- To provide a comparison for Boards likely to have concurrency rates closer to 50%, Appendix G show's total 10-year Economic and Financial costs for 50% and 100% concurrency for Each Board based on the preferred option.
- While the licencing model used in this Business Case is based on concurrency, this is for costing purposes only, and does not lock NHS Scotland Consortium Boards into this model. Other models (such as perpetual licences, charges by online user time, charges based on throughput of lab tests) may be preferred or offer better value for money. Licence model options will be explored and finalised during the procurement phase.

LIMS Supplier Implementation

- Supplier implementation costs are based on those provided by CliniSys as per the rationale above.

- Relative Board size has been used to determine implementation costs at a Board level.
- Varying concurrency levels of users will not affect Supplier Implementation costs, as, for example, the full user pool will require training on any new LIMS solution.
- As costs are presented as total Board cost, and not based on user numbers, the supplier implementation costs do not vary by option but do vary by Board size.
- Each Board has been costed with an individual supplier implementation based on relative size. It is likely this cost will reduce given the potential for regional collaboration which would likely lead to efficiency savings.

LIMS Supplier Annual Support

- Support costs are based on those provided by CliniSys as per the rationale above.
- Relative Board size has been used to determine support costs at a Board level.
- Varying concurrency levels of users will not affect Annual Support costs, as, for example, the entire user pool will require ongoing support from chosen supplier.
- As costs are presented as total consortium costs, support costs do not vary by option but do vary by Board size.
- Each Board has been costed with an individual annual support cost based on relative size. It is likely this cost will reduce given the potential for regional collaboration which would likely lead to efficiency savings.

LIMS Interfaces

- Interface implementation costs are based on those provided by CliniSys as per the rationale above.
- Implementation costs have calculated by multiplying the cost per interface by the number of Analyser Interfaces / Middleware by discipline by Board + additional interfaces required (assumed 4 interfaces including TRAK / NPECs / Order Comms / +1 Other HL7 interface), and Data Migration per discipline.
- The number of interfaces required under each option varies based on scope therefore licence costs vary by option.

3rd Party Downstream Interfaces

- Third party downstream interface costs have been included at £40k per board.
- This is an indicative cost for four key downstream systems that LIMS communicate with, at £10k per system.
- The four key systems are TrakCare, SCI Store, ECOSS and the Order Communication Systems (OCS) in use.
- Individual board configuration will have an impact on this cost, and this cost will need to be assessed as part of local business cases.

LIMS Hosting Hardware

- LIMS hardware costs are based on current LIMS hardware costs provided by Consortium Boards.
- At the time of drafting this document, the Project Team did not have access to all hardware costs for all of the Consortium Boards therefore the relative Board size has been used to extrapolate costs across all Boards.
- This includes a one-off hardware cost for hosting, which requires refreshing every 5 years and a 2% annual recurring support cost.
- This should be reviewed as part of future business cases, based on outcomes of the procurement exercise and preferred hosting model.
- It is likely this cost will reduce given the potential for regional collaboration which would likely lead to efficiency savings.

2.5.4. NHS Resource and Implementation Assumptions

This section describes the NHS resource assumption required for a LIMS implementation.

It has been assumed that the implementation of LIMS will follow a four phase approach based on a combination of national and local NHS resources. This is described in Table 9 below.

Table 9: Implementation Approach Assumptions

Phase	1. Design	2. Build & Configuration	3. Rollout	4. Business As Usual (BAU)
Delivered by	National Team	Board Team	Board Team	Board Team
Description	To ensure a national standard is followed, the Design phase will be carried out by a National team with representation and input from all Consortium Boards. This phase will be informed by the approach taken by the selected supplier but is likely to involve an upfront Discovery phase.	Each Board has varying systems and processes that a replacement LIMS would need to integrate with therefore this phase will be delivered locally. For example, while Trakcare is used across NHS Scotland, each Board has various versions and modules of Trakcare which would mean varying levels of bespoke integration development.	Local teams will be best placed to rollout LIMS. There may be potential efficiencies from a regional rollout and Boards should be encouraged to adopt this approach, however, this has not been assumed for the purposes of this OBC given these collaborations are not yet agreed.	As each Board currently has existing standalone labs, BAU activity to maintain LIMS is assumed to be based on Board resource. There may be further opportunity to achieve efficiencies in BAU costs if the lab services model changes.
Phase Length Assumption	6 months	Based on relative Board size with a minimum length of 4 months assumed	Based on a discipline-based rollout, with 1 month required per discipline	Ongoing

The number of months to complete each phase by Board size and by option is shown in table 10 below.

Table 10: Implementation timescales by option

Months Per Implementation Phase						
Board Size	Design (National Team)	Build & Configuration (Board Team)	Rollout (Board Team)			
			Option 3A	Option 3B	Option 3C	Option 3D
Very Large	6	4+3	5	4	4	3
Large		4+2	5	4	4	3
Medium		4+1	5	4	4	3
Small		4	5	4	4	3

Implementation Team

This section describes the implementation team which formed the basis of the cost assessment for each of the shortlisted options. The team roles and grades were developed collaboratively with the Project Team and Evaluation User Group over a series of workshops carried out during May 2020.

Table 11 details the National team NHS Scotland resource requirements. This encompasses all required resources for the Design phase. To calculate a cost per Board, the total cost is *divided* by relative Board size as calculated in the previous section.

Table 11: National NHS resource requirements for the Design phase

Role	Grade	WTE
LIMS Programme Team		
Programme Manager	8a	1.0
Labs Lead	8b	1.0
eHealth Lead	8a	1.0
Clinical Lead (Option dependent)	PAs	0.6 (Option 3d) / 0.8 (Option 3b/c) / 1.0 (Option 3a)
PMO / Admin	5	1.0
Business Analyst (Option dependent)	7	3.0 (Option 3d) / 4.0 (Option 3b/c) / 5.0 (Option 3a)
Information Governance Lead	7	0.5
eHealth Resources		
Config and Testing	5	1.0
Network	6	1.0
PM Technical	7	1.0
Desktop Support	5	1.0
Development	6	1.0
Totals		**13.1 (Option 3d) / 14.3 (Option 3b/c) / 15.5 (Option 3a)**

A brief description of the National Team roles is provided below:

- **Project Team.** An overarching Programme Team put in place to govern the initial design to be implemented across all Consortium Boards and lead and manage the subsequent transition to local Board implementation teams for Board roll out. This team focuses on the high-level Design period ensuring that commonality and standardisation across all Consortium boards is incorporated within the design. This team includes programme management, laboratory lead, clinical lead and eHealth lead, business analysis, Information Governance and admin support roles. None of these roles continue into BAU.

- **Laboratory Resources.** These resources focus on standardisation of code lists and common use of ISD Reference files; standardisation and creation of patient and other report templates; the Development and initial build of Interfaces for common systems such as Patient Management Systems (TrakCare, SCI Store) and Order Communication Systems (ICE), ECOSS, NPEX, EDT feeds; the standardisation and creation of RBACS; and initial system and interface testing.

- **eHealth Resources.** These resources focus on the Development and initial build of Interfaces for common systems such as Patient Management Systems (TrakCare, SCI Store) and Order Communication Systems (ICE), ECOSS, NPEX, EDT feeds, working closely with Lab resources. This also includes initial system and interface testing as above. They also are responsible for security, infrastructure reviews, initial server design and where possible configuration.

As this National Team will be comprised of resources from Consortium Boards, this cost will be shared. The timescales and cost distribution for these costs should be clarified at FBC stage, with any potential national capital funding through the Scottish Government Digital stream identified.

Table 12 details the resource requirements that NHS Lothian has estimated would be needed for their local Build & Configuration, Rollout and BAU phases. This profile has been *extrapolated* based on relative Board percentage as outlined I then previous section to determine estimated costs for each Board.

Table 12: NHS Lothian resource requirements (used for extrapolation)

Role	**Grade**	**WTE**		
LIMS Programme Team		Build & Config	Rollout	BAU
Programme Manager	8a	1.0	1.0	-
Labs Lead	8b	1.0	1.0	-
eHealth Lead	8a	1.0	1.0	-
Clinical Lead (Option Based)	PAs	0.6 (Option 3d) / 0.8 (Option 3b/c) / 1.0 (Option 3a)		-
Training Facilitator	5	0.5	1.0	-
PMO / Admin	7	1.0	1.0	-
Business Analyst	7	2.0	1.0	-
Lab Resources				
Lab Tech (2 Per Discipline Based On Option)		6.0 (Option 3d) / 8.0 (Option 3b/c) / 10.0 (Option 3a)		-
Lab Tech - 2 Overarching		2.0	2.0	3.0
eHealth Resources				
Config and Testing	5	1.0	1.0	-
Other integration & Data Migration	5	1.0	1.0	-
Network	6	1.0	1.0	-
PM Technical	7	1.0	1.0	-
Desktop Support	5	1.0	1.0	-
Development	6	1.0	1.0	-
Totals		**21.1 (Option 3d) / 23.3 (Option 3b/c) / 25.5 (Option 3a)**		**3.0**

A brief description of the Local Team roles is provided below:

- **Project Team.** Local project teams will be responsible for the management of all local board day to day implementation activities such as project management, local RAID logs etc., management of local teams and assigned tasks.

- **Lab Team Resources.** Following transition from the National Design phase, the local Lab resources will be responsible for building local configuration of the LIMS, covering such areas as creation of required local codes where no national\standard code exists, local RBACS where no standard national RBAC exists, local workflows, creation of local rules, development of local interfaces to analysers and middle platforms, etc. They will also be responsible for local configuration of interfaces delivered by the National team for systems including Patient Management systems and Order Communication Systems. Local testing and accreditation activities, such as UKAS/MHRA, will also be covered by this team.
- **eHealth Resources.** This team will assist with local configuration of interfaces delivered by National team as with the above Lab resources. They will also, where required, assist with infrastructure tasks such as networking, hardware and software build. Other activities include, but not limited to, testing of systems and interfaces and assisting with local RBACS.

LIMS Replacement Start Year

For the purposes of OBC costing, the costs for each Consortium has been profiled over 10 years. This is to provide a 10 year Net Present Cost (NPC) for each Board.

As this is for costing purposes only, it does not commit Boards to starting their LIMS replacement in Year 1 and it does not assume that this will be the preferred or feasible approach. There may also be potential collaboration opportunities for Boards to consider, for example regions may collaborate to reduce implementation timescales and/or costs through implementation of a single LIMS instance.

Final implementation profiling will be based on supplier capacity, available internal resources by Board and other collaboration considerations. This should be further reviewed following the national LIMS procurement and reflected within local business cases.

2.5.5. Contingency/Optimism Bias

The Treasury Green Book published in 2003 introduced a requirement for an adjustment to be made for optimism bias for all business cases. This refers to the known tendency for the costs of projects to be underestimated, particularly in the early stages of developing and costing projects. The adjustment for optimism bias/contingency is a requirement to make explicit, upward adjustments to the costs to counteract this known tendency.

In this business case contingency adjustments have been applied to both internal resource costs and supplier licence, implementation and annual support costs, to cover residual uncertainty at the time of writing.

For the purposes of this OBC, a single **optimism bias figure of 30%** has been applied to all cost items including supplier costs and internal NHS costs. This equates to an additional c.£1-4m depending on Board size. This was calculated using the optimism bias calculator recommended in the Scottish Capital Investment Manual (SCIM). The level of optimism applied has been influenced by a number of factors, including:

- the Specification has yet to be finalised;
- capability and capacity of supplier is not yet confirmed and will be confirmed through the procurement process;
- work has not yet been undertaken to confirm whether there is sufficient capacity and skills for implementation at each Board level; and
- There is uncertainty in the policy environment from potential classification of LIMS as a medical device, as well as COVID19 response.

It is important to note that as this is an Outline Business Case, the level of optimism bias is significant, and should be reviewed following procurement and included in local business cases.

Further detail behind the optimism bias calculation can be found in Appendix C.

2.5.6. Total Economic Costs

The estimated economic cost of each shortlisted option has been calculated based on the assumptions outlined in the previous section. These are full 10 year costs for each short-listed option for all Consortium Boards.

Table 13 : Total Economic Option cost comparison (£m)

Cost (£m)	Cost Type	Option 3a: Core LIMS, Genetics and Blood Transfusion	Option 3b: Core LIMS and Genetics	Option 3c: Core LIMS and Blood Transfusion	Option 3d: Core LIMS only
LIMS Software Licence	NRC	1.60	1.53	1.46	1.39
Annual Support	RR	33.74	33.74	33.74	33.74
Supplier Implementation	NRC	10.45	10.45	10.45	10.45
Design	NRR	0.33	0.30	0.30	0.25
Build & Local Configuration	NRR	3.67	3.31	3.31	2.68
Rollout	NRR	2.70	1.96	2.04	1.25
BAU	RR	5.82	5.87	5.87	5.92
LIMS Interface Build	NRC	1.34	1.34	1.20	1.20
LIMS Interface Support	RR	1.29	1.29	0.92	0.92
Additional Interface Build	NRC	2.07	2.07	2.07	2.07
Additional Interface Recurring	RR	2.54	2.54	2.54	2.54
Downstream Interfaces	NRC	0.44	0.44	0.44	0.44
Hosting Hardware	RR	4.40	4.40	4.40	4.40
Optimism Bias (30%)	-	21.08	20.74	20.59	20.15
Total with Optimism Bias		**91.36**	**89.88**	**89.23**	**87.30**
Non Recurring Capital (NRC)		20.58	20.49	20.22	20.14
Non Recurring Revenue (NRR)		8.70	7.24	7.34	5.43
Recurring Revenue (RR)		62.08	62.15	61.66	61.73
Total		**91.36**	**89.88**	**89.23**	**87.30**
Net Present Cost - 10 Year		82.06	80.61	80.02	78.13

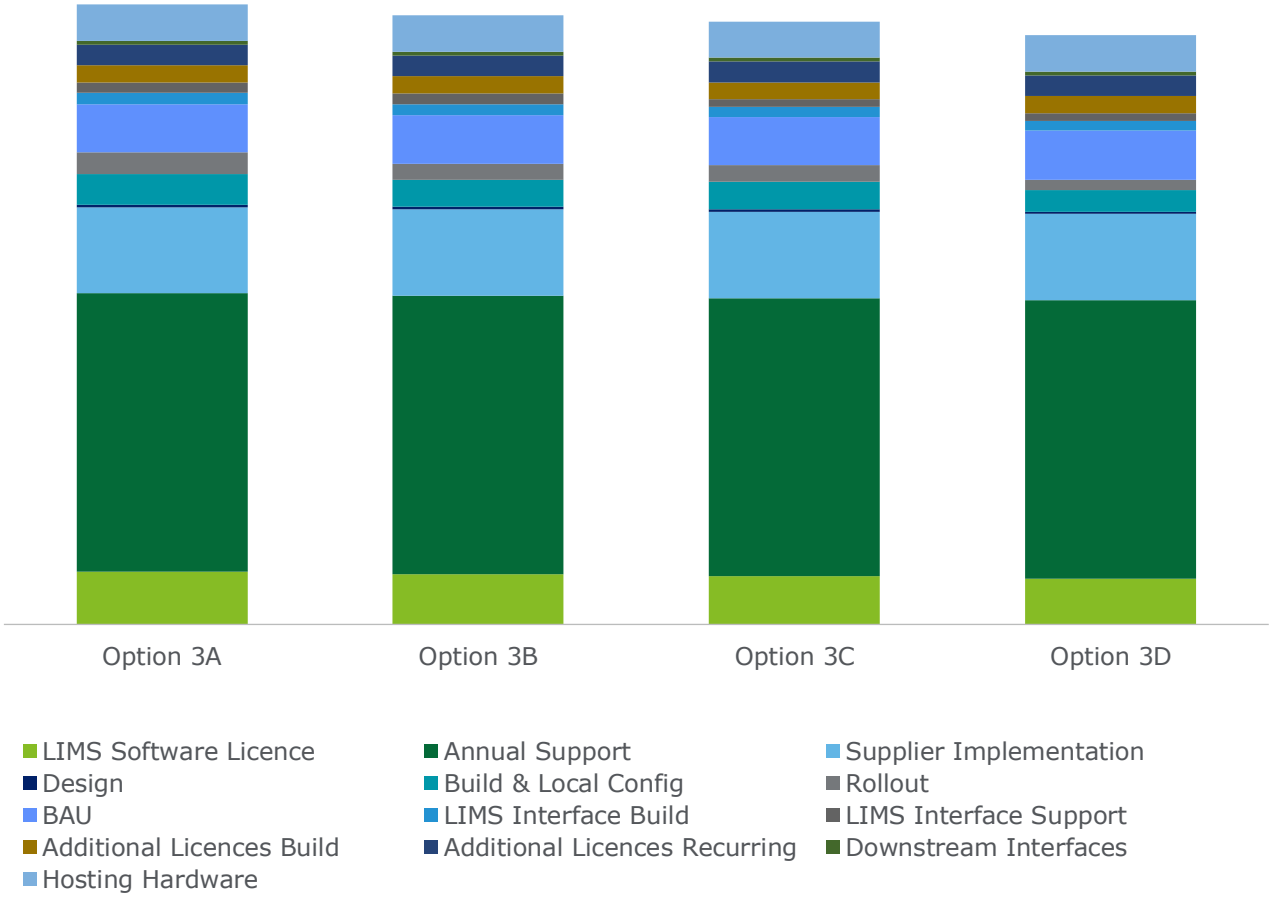
The table shows that the option with the lowest economic cost is option 3D: Core LIMS only, with a Net Present Cost (NPC) of c£78m. This is unsurprising as each shortlisted option is comprised of variation of discipline scope, which is directly related to cost.

Option 3A (Core LIMS, Genetics and Blood Transfusion) has a total NPC of c£82m over the 10 year, with option 3B (Core LIMS and Genetics) and 3C (Core LIMS and Blood Transfusion) being similar in cost at £81m and £80m respectively.

The greatest cost over the 10 year period is Supplier Annual Support – this is due to each Board having their own supplier annual support cost included. This cost is expected to be driven down following supplier

engagement, procurement, and regional collaboration opportunities identified and taken forward as part of local business cases. Figure 2 below visually emphasises that each option does not greatly vary from one another

Figure 2 : Economic cost comparison for each Short-Listed Option



While all costs for all options are within 10% of each other, Option 3A (Core LIMS, Genetics and Blood Transfusion) has the highest economic cost. The primary difference in costs comes from the LIMS User Licences by option (less discipline in scope results in less users), interfaces required per discipline (less disciplines in scope results in less interface requirements) and the internal NHS resources costs (also based on discipline numbers).

2.5.7. Option 1: 'Do Nothing' Costs

Option 1 has not been included in the above cost analysis as the implementation costs items do not apply.

The Project Team did not have access to complete recurring BAU costs for each Board therefore it has not been possible to accurately state what the recurring costs are under Option 1. Analysis should be carried out on comparing recurring revenue costs when the costs associated to the selected solution are more fully understood and further investigation on Board's BAU costs have been determined.

2.6. Option Appraisal and Preferred Option

Taking the shortlisted options benefit and risk weighting and including the NPC in Table 14 below provides an overall cost per benefit score. This evaluation process aligns with the approach followed in the NHS Lothian Initial Agreement and provides a balanced view of cost in relation to weighted benefit.

Table 14: Economic Appraisal Summary

Option Appraisal	Option 3a: Core LIMS, Genetics and Blood Transfusion	Option 3b: Core LIMS and Genetics	Option 3c: Core LIMS and Blood Transfusion	Option 3d: Core LIMS only
Weighted Benefits Points	931	805	673	558
Weighted Risk Points	1578	1406	1236	1167
Risk Per Benefit Point	1.69	1.74	1.84	2.09
Option Rank	1.00	2.00	3.00	4.00
NPC Per Option (£k)	82,060	80,610	80,020	78,130
Cost Per Benefit Point (£k)	88	100	119	140
Option Rank	1.00	2.00	3.00	4.00

Following the inclusion of NPC per option, Option 3A (Core LIMS, Genetics and Blood Transfusion) shows the lowest cost per benefit point (while having the highest NPC) and as such has been identified as the preferred option for Consortium Boards. Option 3B has a relatively similar cost per benefit point evidencing the importance of Genetics inclusion in LIMS Replacement.

2.6.1. NHS Scotland Consortium Boards Preferred Option

The preferred option, Option 3a (Core LIMS, Genetics and Blood Transfusion) has been profiled over a 10 year period as shown in Table 15 below.

Table 15: Option 3A: Core LIMS with Genetics & Blood Transfusion – Total Economic Cost (£m)

Cost (£m)	Cost Type	Year										Total
		1	2	3	4	5	6	7	8	9	10	
LIMS Software Licence	NRC	1.60	-	-	-	-	-	-	-	-	-	6.38
Supplier Annual Support	RR	-	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	33.74
Supplier Implementation	NRC	10.45	-	-	-	-	-	-	-	-	-	10.45
Design	NRR	0.33	-	-	-	-	-	-	-	-	-	0.33
Build & Local Configuration	NRR	3.35	0.32	-	-	-	-	-	-	-	-	3.67
Rollout	NRR	0.17	2.53	-	-	-	-	-	-	-	-	2.70
BAU	RR	-	0.40	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	5.82
LIMS Interface Build	NRC	1.34	-	-	-	-	-	-	-	-	-	1.34
LIMS Interface Support	RR	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	1.29
Additional Interface Build	NRC	2.07	-	-	-	-	-	-	-	-	-	2.07
Additional Interface Recurring	RR	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2.54

Downstream Interfaces	NRC	0.44	-	-	-	-	-	-	-	-	-	0.44
Hosting Hardware	RR	2.04	0.04	0.04	0.04	0.04	2.04	0.04	0.04	0.04	0.04	4.40
Optimism Bias		**6.63**	**2.22**	**1.45**	**1.45**	**1.45**	**2.05**	**1.45**	**1.45**	**1.45**	**1.45**	**21.08**
Total		**28.72**	**9.64**	**6.30**	**6.30**	**6.30**	**8.90**	**6.30**	**6.30**	**6.30**	**6.30**	**91.36**
Non Recurring Capital (NRC)		20.58	-	-	-	-	-	-	-	-	-	20.58
Non Recurring Revenue (NRR)		5.0	3.70	-	-	-	-	-	-	-	-	8.70
Recurring Revenue (RR)		3.15	5.94	6.30	6.30	6.30	8.90	6.30	6.30	6.30	6.30	62.08
Total		**28.72**	**9.64**	**6.30**	**6.30**	**6.30**	**8.90**	**6.30**	**6.30**	**6.30**	**6.30**	**91.36**
Discount Factor	3.5%	*1.00*	*0.97*	*0.93*	*0.90*	*0.87*	*0.84*	*0.81*	*0.79*	*0.76*	*0.73*	
Net Present Cost		28.72	9.31	5.88	5.68	5.49	7.49	5.12	4.95	4.78	4.62	**82.06**

The Design activity and the majority of local Build and Configuration is assumed to complete in Year 1, with Rollout finishing within 18 months. The yearly annual cost is c£6m for all Consortium Boards, except for in Year 1 where the cost is c.£29m, Year 2 at c.£10m and then in Year 6 at c£9m (due to 5 year hardware refresh cycle). The total NPC for the 10 year period is c.£82m for all Consortium Boards.

2.6.2. Consortium Board Preferred Option Economic Cost

The preferred option, Option 3a (Core LIMS, Genetics and Blood Transfusion) has been profiled over a 10 year period for each Consortium Board as shown in Table 16 below.

As outlined in the preceding Economic Case sections, the Design phase is the only shared cost line item as this assumes a national team approach. All other cost line items are incurred by each Board and do not take into account potential collaboration approaches to implementation – as this are not agreed at this stage - and would provide an opportunity for Boards to reduce costs further. Therefore, the costing approach assumes a potential 'worst case' cost for each individual Board. These costs are expected to be driven down following supplier engagement, procurement, and regional collaboration opportunities identified and taken forward as part of local business cases.

Table 16: Economic Costs (£m) by Consortium Board for Option 3a (Core LIMS, Genetics and Blood Transfusion)

Option 3A - 10 Year Cost (£m)	NHS Borders	NHS D&G	NHS Fife	NHS Forth Valley	NHS Golden Jubilee	NHS Gram-pian	NHS GGC	NHS Lothian	NHS Orkney	NHS Shet-land	NHS Tayside
LIMS Software Licence	0.04	0.05	0.12	0.07	0.01	0.19	0.67	0.27	0.00	0.00	0.17
Supplier Annual Support	2.06	2.06	2.29	2.29	2.06	3.16	6.27	6.27	2.06	2.06	3.16
Supplier Implementation	0.58	0.58	0.80	0.80	0.58	0.97	2.00	2.00	0.58	0.58	0.97
Design	0.01	0.01	0.03	0.02	0.00	0.04	0.11	0.06	0.00	0.00	0.04
Build & Local Config	0.07	0.08	0.24	0.18	0.01	0.43	1.44	0.79	0.01	0.01	0.40
Rollout	0.05	0.06	0.19	0.14	0.01	0.35	1.01	0.55	0.01	0.01	0.33
BAU	0.19	0.21	0.49	0.36	0.03	0.71	2.02	1.11	0.03	0.03	0.66
LIMS Interface Build	0.06	0.06	0.09	0.09	0.07	0.22	0.23	0.20	0.09	0.09	0.13
LIMS Interface Support	0.03	0.03	0.04	0.04	0.05	0.33	0.36	0.29	0.03	0.03	0.08
Add. Licences Build	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
Add. Licences Recurring	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23
Downstream Interfaces	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04

Hosting Hardware	0.22	0.22	0.33	0.33	0.22	0.44	0.88	0.88	0.22	0.22	0.44
Optimism Bias	**1.13**	**1.14**	**1.52**	**1.43**	**1.05**	**2.18**	**4.64**	**3.86**	**1.04**	**1.04**	**2.05**
Total with OB	**4.88**	**4.96**	**6.60**	**6.21**	**4.53**	**9.46**	**20.09**	**16.73**	**4.52**	**4.52**	**8.86**
Non Recurring Capital (NRC)	1.17	1.20	1.61	1.55	1.15	2.08	4.07	3.50	1.16	1.16	1.93
Non Recurring Revenue (NRR)	0.18	0.20	0.60	0.44	0.03	1.06	3.33	1.83	0.03	0.03	0.99
Recurring Revenue (RR)	3.53	3.56	4.40	4.22	3.36	6.32	12.69	11.41	3.33	3.33	5.94
Total with Optimism Bias over 10 years	**4.88**	**4.96**	**6.60**	**6.21**	**4.53**	**9.46**	**20.09**	**16.73**	**4.52**	**4.52**	**8.86**
NPC over 10 years	4.36	4.43	5.95	5.59	4.04	8.51	18.14	15.02	4.03	4.03	7.97

The table above shows the total NPC for each Consortium Board. NHS GGC and NHS Lothian have the highest cost (c£20m and £16m respectively over 10 years), as both are defined as Very Large Boards, while the smaller Boards including NHS Borders and NHS D&G have a similar total cost of c.£4m

For each Board the highest costs are those associated with supplier support and implementation. **Optimism Bias also adds 30%** onto the total costs, equating to an additional c£1-4m, depending on Board size, over the 10 year period.

3. Financial Case

In this section the financial appraisal of LIMS is set out. It illustrates additional financial charges could significantly increase the cost of the solution.

3.1. Financial Appraisal – Total Consortium

A financial appraisal has been undertaken to illustrate the affordability of the Preferred Option. The appraisal has been prepared over an initial ten year period as shown in Table 17 and is based on the following assumptions regarding the accounting and VAT treatment of the solution:

- **Accounting Treatment.** It has been assumed that the initial purchase of software licences, supplier implementation, and additional interface build will be treated as capital expenditure. All other services have been assumed to be revenue, including the Board's internal resource costs for implementation.
- **VAT Position.** It has been assumed that VAT will be payable at the standard rate of 20% on all supplier costs (upfront licence costs, supplier implementation, interface build, and annual support), and that VAT is not recoverable. It is likely that VAT can be recovered, although this is subject to the specification and procurement outcomes (such as potential bespoke nature of the solution, or Managed Service provision).
- **Indexation.** External supplier costs have been adjusted for inflation at 2% in line with the Bank of England CPI target. Internal Board resource costs have also been adjusted for inflation at 2% in line with current guidance on public sector salaries. As previously outlined in the economic case, 2020/21 prices have been used.
- **Existing Resources In Post.** While the Economic Case calls out the total required resource and cost to replace LIMS across Consortium Boards, it is assumed that 60% of eHealth resource requirements will be absorbed within existing team structures across each Board. As such, this cost (including Optimism Bias & Indexation) has been deducted from the total cost outlined in the tables below. This assumption should be revisited following the procurement exercise and further local business case work, as if Boards were able to utilise further resource already in post to undertake the implementation the overall financial cost would reduce. It is important to note that utilising this internal resource will be achievable only if Boards make a commitment to realign priorities to ensure these resources can focus purely on LIMS implementation for the required time period. As implementation begins, there is also potential for buying resource time from other Boards that have already replaced their LIMS and as such have the experience from their implementations.
- **Capital Depreciation.** Capital expenditure has been depreciated using the straight-line method over ten years. Depreciation will start in the year of purchase, depreciating the full Capital costs until being fully written down at the end of year ten, which is the anticipated useful life of the LIMS solution. This is accounted for as Non-Core costs to Boards, and as such is shown as a separate line item below the Total Financial Cost.

These assumptions have been agreed in collaboration with the NHS Lothian VAT and finance team. It is recommended that these issues are considered further as part of the subsequent procurement exercise and local business cases.

Table 17: Total Financial Cost (£m) for Option 3a (Core LIMS, Genetics and Blood Transfusion)

Cost (£m)	Year										Total
	1	2	3	4	5	6	7	8	9	10	
Consolidated Financial Considerations											
NRC (Incl. VAT & Indexation)	24.69	-	-	-	-	-	-	-	-	-	24.69
NRR (Incl. VAT & Indexation)	5.0	3.78	-	-	-	-	-	-	-	-	8.78
RR (Incl. VAT & Indexation)	3.24	7.13	7.63	7.76	7.89	10.90	8.17	8.31	8.45	8.60	78.08
Total (Incl. VAT & Index.)	32.94	10.90	7.63	7.76	7.89	10.90	8.17	8.31	8.45	8.60	111.55
Existing Resources In Post	(0.56)	(0.42)	-	-	-	-	-	-	-	-	(0.99)
Total Financial Cost	**32.37**	**10.48**	**7.63**	**7.76**	**7.89**	**10.90**	**8.17**	**8.31**	**8.45**	**8.60**	**110.57**

Capital Depreciation	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	20.58

The financial appraisal illustrates that implementation of LIMS will cost in the region of £111m for all Consortium Boards over a ten year period and given the current constraint on public sector funding it will be important to establish the most appropriate funding mechanism.

It has been assumed that the majority of funding, other than shared resources, for LIMS will come from individual Consortium Board budgets. However, as the project progresses, further discussions will be required to agree the most appropriate funding model.

The shared resources as part of the Design phase will be comprised of Consortium Board resources, and as such the cost will be shared. The current assumption is this cost will be divided based on relative Board size, however this should be clarified at FBC stage. Furthermore the timescales of when this cost is to be incurred, relative to the specification and procurement should also be clarified, with any potential national capital funding through the Scottish Government Digital stream identified and included.

As outlined above, existing resources in post have been assumed to include 60% of eHealth resources for implementation. While there may also be existing resources to fill roles identified in the Project & Lab teams, these have not been included in the above Financial Case as at this point there are significant unknowns on specific resource requirements.

The full capital cost will depreciate over a 10 year period, resulting in a yearly depreciation cost of £2.06m. As this is a Non-Core cost, and not an implementation cost, it has been shown as a separate cost item.

Further breakdown of specific cost types is included in Table 18 – 20 below (not including existing resources / deprecation). These tables provide further clarity for Consortium Board Finance networks.

Table 18: Non-Recurring Capital Financial Cost Breakdown

Cost (£m)	Year										Total
	1	2	3	4	5	6	7	8	9	10	
Non Recurring Capital											
NRC – LIMS Software Licence	1.60	-	-	-	-	-	-	-	-	-	1.60
NRC – Supplier Implementation	10.45	-	-	-	-	-	-	-	-	-	10.45
NRC – LIMS Interface Build	1.34	-	-	-	-	-	-	-	-	-	1.34
NRC – Additional Interface Build	2.01	-	-	-	-	-	-	-	-	-	2.01

NRC – Downstream Interfaces	0.44	-	-	-	-	-	-	-	-	-	0.44
NRC – Optimism Bias	4.75	-	-	-	-	-	-	-	-	-	4.75
VAT	4.12	-	-	-	-	-	-	-	-	-	4.12
Indexation	-	-	-	-	-	-	-	-	-	-	-
Total NRC Financial Cost	**24.69**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**24.69**

Table 19: Non-Recurring Revenue Financial Cost Breakdown

Cost (£m)	Year										Total
	1	2	3	4	5	6	7	8	9	10	
Non-Recurring Revenue											
NRR – Design	0.33	-	-	-	-	-	-	-	-	-	0.33
NRR – Build & Local Configuration	3.35	0.32	-	-	-	-	-	-	-	-	3.67
NRR – Rollout	0.17	2.53	-	-	-	-	-	-	-	-	2.70
NRR – Optimism Bias	1.15	0.85	-	-	-	-	-	-	-	-	2.00
VAT	-	-	-	-	-	-	-	-	-	-	-
Indexation	-	0.07	-	-	-	-	-	-	-	-	0.07
Total NRR Financial Cost	**5.00**	**3.78**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**8.78**

Table 20: Recurring Revenue Financial Cost Breakdown

Cost (£m)	Year										Total
	1	2	3	4	5	6	7	8	9	10	
Recurring Revenue											
RR – Supplier Annual Support	-	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	33.74
RR – BAU	-	0.40	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	5.82
RR – LIMS Interface Support	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	1.29
RR – Additional Interface Recurring	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2.51
RR – Hosting Hardware	2.04	0.04	0.04	0.04	0.04	2.04	0.04	0.04	0.04	0.04	4.40
RR – Optimism Bias	0.73	1.37	1.45	1.45	1.45	2.05	1.45	1.45	1.45	1.45	14.33
VAT	0.10	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	9.76
Indexation	-	0.12	0.25	0.39	0.52	0.93	0.79	0.94	1.08	1.23	6.25
Total RR Financial Cost	**3.24**	**7.13**	**7.63**	**7.76**	**7.89**	**10.90**	**8.17**	**8.31**	**8.45**	**8.60**	**78.08**

3.2. Financial Appraisal – By Consortium Board

The financial appraisal illustrates the total financial cost of LIMS by Consortium Board over the ten-year period. As with costs outlined in the Economic Case, the costs in Table 21 below are estimates based on the key assumptions within this OBC. The costs per Board will be further refined during subsequent business cases.

Table 21: Total 10 Year Financial Cost by Consortium Board

Option 3A - 10 Year Cost (£m)	NHS Borders	NHS D&G	NHS Fife	NHS Forth Valley	NHS Golden Jubilee	NHS Grampian	NHS GGC	NHS Lothian	NHS Orkney	NHS Shetland	NHS Tayside
Consolidated Financial Considerations											
NRC (Incl. VAT & Indexation)	1.41	1.44	1.93	1.86	1.38	2.50	4.88	4.20	1.39	1.39	2.32
NRR (Incl. VAT & Indexation)	0.18	0.20	0.60	0.44	0.03	1.07	3.36	1.84	0.03	0.03	1.00
RR (Incl. VAT & Indexation)	4.49	4.52	5.50	5.31	4.30	7.92	15.76	14.32	4.26	4.26	7.44
Total (Incl. VAT & Index.)	**6.07**	**6.16**	**8.03**	**7.61**	**5.71**	**11.48**	**24.0**	**20.36**	**5.68**	**5.69**	**10.76**
Existing Resources In Post	(0.02)	(0.02)	(0.07)	(0.05)	(0.00)	(0.12)	(0.38)	(0.21)	(0.00)	(0.00)	(0.11)
Total Financial Cost	**6.05**	**6.14**	**7.96**	**7.56**	**5.70**	**11.36**	**23.63**	**20.16**	**5.68**	**5.68**	**10.64**
Capital Depreciation	1.17	1.20	1.61	1.55	1.15	2.08	4.07	3.50	1.16	1.16	1.93

*Due to rounding, '0.00' costs are less than £10k

Table 18 illustrates that VAT & Depreciation considerations increase the total Financial Cost to each Board over the 10 year period. Each Board has a minimum VAT cost of c£800k, and indexation of c£300k over the 10 year period, with the larger Boards having higher costs as expected. Further breakdown of financial considerations by Board is shown in the below tables (not including existing resources / deprecation), with yearly costs included in the Appendix.

Table 22: Non-Recurring Capital Financial Breakdown by Board

Option 3A - 10 Year Cost (£m)	NHS Borders	NHS D&G	NHS Fife	NHS Forth Valley	NHS Golden Jubilee	NHS Grampian	NHS GGC	NHS Lothian	NHS Orkney	NHS Shetland	NHS Tayside
Non-Recurring Capital											
NRC – LIMS Software Licence	0.04	0.05	0.12	0.07	0.01	0.19	0.67	0.27	0.0	0.0	0.17
NRC – Supplier Implementation	0.58	0.58	0.80	0.80	0.58	0.97	2.0	2.0	0.58	0.58	0.97
NRC – LIMS Interface Build	0.06	0.06	0.09	0.09	0.07	0.22	0.23	0.20	0.09	0.09	0.13
NRC – Additional Interface Build	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
NRC – Downstream Interfaces	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
NRC – Optimism Bias	0.27	0.28	0.37	0.36	0.26	0.48	0.94	0.81	0.27	0.27	0.45
VAT	0.23	0.24	0.32	0.31	0.23	0.42	0.81	0.70	0.23	0.23	0.39
Indexation	-	-	-	-	-	-	-	-	-	-	-
Total NRC Financial Cost	**1.41**	**1.44**	**1.93**	**1.86**	**1.38**	**2.50**	**4.88**	**4.20**	**1.39**	**1.39**	**2.32**

Table 23: Non-Recurring Revenue Financial Breakdown by Board

Option 3A - 10 Year Cost (£m)	NHS Borders	NHS D&G	NHS Fife	NHS Forth Valley	NHS Golden Jubilee	NHS Grampian	NHS GGC	NHS Lothian	NHS Orkney	NHS Shetland	NHS Tayside
Non-Recurring Revenue											
NRR – Design	0.01	0.01	0.03	0.02	0.02	0.04	0.11	0.06	0.0	0.0	0.04
NRR – Build & Local Configuration	0.07	0.08	0.24	0.18	0.01	0.43	1.44	0.79	0.01	0.01	0.40
NRR – Rollout	0.05	0.06	0.19	0.14	0.01	0.35	1.01	0.55	0.01	0.01	0.33
NRR – Optimism Bias	0.04	0.05	0.14	0.10	0.01	0.24	0.77	0.42	0.01	0.01	0.23
VAT	-	-	-	-	-	-	-	-	-	-	-
Indexation	0.0	0.00	0.00	0.00	0.00	0.01	0.03	0.02	0.00	0.00	0.01
Total NRR Financial Cost	**0.18**	**0.20**	**0.60**	**0.44**	**0.03**	**1.07**	**3.36**	**1.84**	**0.03**	**0.03**	**1.00**

Table 24: Recurring Revenue Financial Breakdown by Board

Option 3A - 10 Year Cost (£m)	NHS Borders	NHS D&G	NHS Fife	NHS Forth Valley	NHS Golden Jubilee	NHS Grampian	NHS GGC	NHS Lothian	NHS Orkney	NHS Shetland	NHS Tayside
Recurring Revenue											
RR – Supplier Annual Support	2.06	2.06	2.29	2.29	2.06	3.16	6.27	6.27	2.06	2.06	3.16
RR – BAU	0.19	0.21	0.49	0.36	0.03	0.71	2.02	1.11	0.03	0.03	0.66
RR – LIMS Interface Support	0.03	0.03	0.04	0.04	0.05	0.33	0.36	0.29	0.03	0.03	0.08
RR – Additional Interface Recurring	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23
RR – Hosting Hardware	0.22	0.22	0.33	0.33	0.22	0.44	0.88	0.88	0.22	0.22	0.44
RR – Optimism Bias	0.81	0.82	1.01	0.97	0.78	1.46	2.93	2.63	0.77	0.77	1.37
VAT	0.60	0.60	0.67	0.67	0.61	0.97	1.78	1.76	0.60	0.60	0.90
Indexation	0.36	0.36	0.44	0.42	0.34	0.63	1.29	1.15	0.33	0.33	0.60
Total RR Financial Cost	**4.49**	**4.52**	**5.50**	**5.31**	**4.30**	**7.92**	**15.76**	**14.32**	**4.26**	**4.26**	**7.44**

4. Commercial Case

4.1. Introduction

This section outlines the proposed procurement in relation to the preferred option outlined in Section 3. It considers a range of procurement elements required to deliver LIMS - scope, procurement procedure, approach and timetable. Following approval of this Business Case these considerations should be further developed and detailed in a Procurement Strategy.

4.2. Procurement Approach

4.2.1. Required Services

At time of drafting this Business Case a detailed national LIMS specification is under development. At this stage the procurement scope is envisaged to include the following key components:

- a core LIMS solution and additional optional modules providing functionality for Genetics and Blood Transfusion;
- integration with a suite of existing national and local solutions;
- future proofing of upgrades and updated releases; and
- a range of optional support and implementation services: project management, data migration, configuration, testing, integration and business change support.

This scope of services will be finalised as part of the national LIMS specification.

4.2.2. Hosting

Consideration should be given to asking bidders for costed proposals for hosting LIMS as part of the procurement process without any commitment to buy these services. This would provide an alternative route to securing hosting services and will provide a comparison to local hosting costs in the event that Boards choose not to host the solution locally or as part of a wider shared arrangement with other Boards.

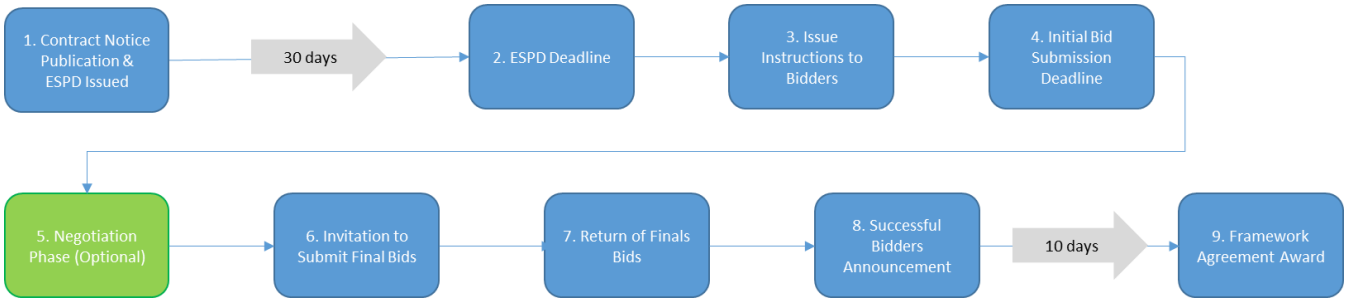
4.2.3. Procurement Procedure

NHS Scotland procurement advisors has advised that the Competitive Procedure with Negotiation (CPN) is the preferred procurement procedure. This procurement procedure has been assessed as suitable for LIMS for the following reasons:

- provides flexibility to reduce the number of suppliers to be invited to negotiate;
- provides NHS Scotland and the supplier the opportunity to negotiate to help ensure the optimum solution is procured;
- provides flexibility around what element to negotiate on (not possible with the Competitive Dialogue process);
- provides the opportunity to not negotiate and move straight to contract award if bids submitted at the start of the process are deemed sufficient to meet all the requirements without further discussion; and
- generally quicker than Competitive Dialogue process;

CPN is a relatively new procedure but NHS Scotland has used this procurement route previously including on the GP IT and CHI procurements. This has provided valuable lessons to support the LIMS procurement including the need for strong governance, being clear on the points of negotiation upfront and the need for dedicated resource on the procurement team.

Figure 3 : Key Stages of CPN Process



The items to be negotiated will need to be defined and documented as part dialogue planning. At this stage it is envisaged that dialogue is likely to focus on areas such as Genetics functionality, hosting, and managed service proposition.

An indicative timeline for the procurement process is outlined at Table 25.

Table 25: Indicative procurement timetable based on CPN procedure

Milestone	**Date**
Contract Notice Publication & ESPD Issued	September 2020
ESPD Deadline	October 2020
Issue Instructions to Bidders	November 2020
Initial Bid Submission Deadline	December 2020
Initial Bid evaluation	January 2021
Initial Negotiation	April 2021
Negotiation Phase (Optional)	June 2021
Invitation to Submit Final Bids	July 2021
Return of Final Bids	July 2021
Successful Bidders Announcement	August 2021
Framework Agreement Award	August 2021

It should be noted that the procurement timeline is ambitious and dependent on a number of factors including: the number of suppliers taken through to the final stages and the number and complexity of dialogue topics; the need to achieve buy-in to the process from each group of stakeholders; and a significant reliance on NHS Scotland making timely decisions and approvals at key milestones in the procurement process.

Having well-defined requirements in all areas is important to help expedite the process. Further consideration and detail of the procurement timelines will be undertaken when developing the Procurement Strategy.

4.2.4. Form of Tender

NHS Scotland procurement advisors has advised that they are seeking to establish a single supplier National Framework to secure the services required to provide LIMS. This will provide flexibility in dealing with uncertainty over deployment phasing and timing and commitment of funding whilst also delivering a route to a national solution. As each Board becomes ready, it can call off its deployment.

Some services required may vary by Board given differences in scope, for example Genetics and Pathology is not required for all Boards and there may be local requirements in areas such as hosting and business change.

However, it is anticipated the core requirements will be common across all Boards in order to realise the full benefits of a national solution.

It should be noted that that a framework agreement is not a commitment contract; a 'call off' from a framework agreement is a commitment contract. Given that two of the largest health boards in Scotland (NHS GGC and NHS Lothian) are committed to this procurement should act as incentive to attract sufficient market interest to ensure a competitive procurement.

4.2.5. Framework Duration

The maximum duration of a framework agreement is typically four years.

Boards would be required to exit or give appropriate notice to existing LIMS contract. Within four years it is envisaged that all Consortium Boards will be in a position to issue termination to their current vendor, however, there is a risk that implementation within four years may not be realistic. NHS Scotland has recent experience under the GPIT procurement where a longer Framework agreement was established on the basis that Year 1 was focussed on development of the solution and therefore there was insufficient time for all boards to complete implementation. The LIMS procurement could adopt a similar position to agree a longer framework agreement period. This should be reviewed as part of the procurement strategy alongside Board preparedness for LIMS.

5. Management Case

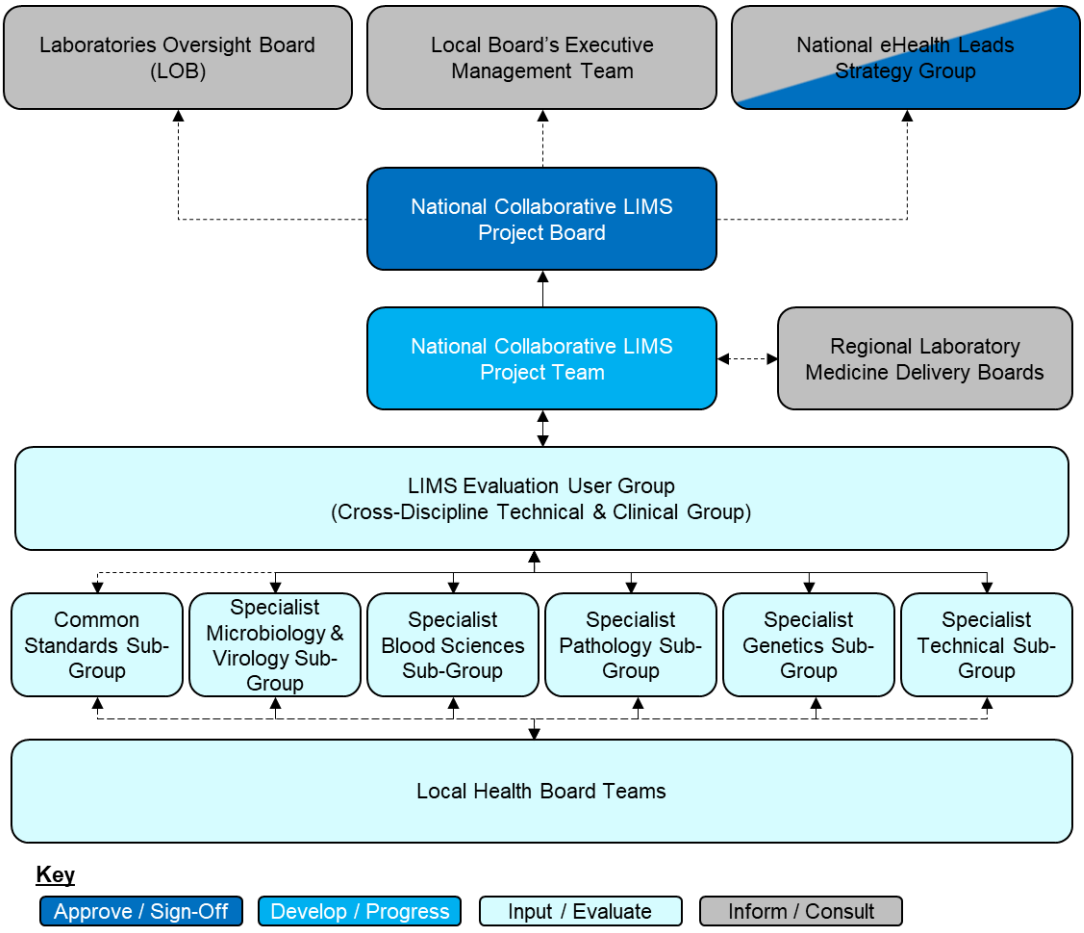
This section outlines the proposed governance approach for the procurement phase of the project.

5.1. Governance

To realise the benefits of a common solution, the PMS project highlights the need for strong governance that supports a common approach, for example to agree national standards, sharing of resources and managing suppliers as a consortium to drive positive supplier behaviour.

Figure 6 shows the proposed governance arrangements for the procurement phase. These governance arrangements will need to be further reviewed and updated following the procurement phase based on the selected solution and implementation approach agreed.

Figure 4: Project Governance



The Project Board is responsible for approving the procurement strategy, shortlisting of vendors and selection of the preferred solution. The eHealth Leads Strategy Group is responsible for approving the Full Business Case (FBC).

The Project Team will be supported by a LIMS Evaluation User Group comprising of Subject Matter Experts (SMEs) and consortium board representatives. The Project Team may seek additional advice and support from the Regional Laboratory Medicine Delivery Boards as required however no formal reporting into these boards will be put in place.

The Laboratories Oversight Board (LOB) and Local Board Executive Management Teams will be kept informed however will not provide approval / sign-off of any of the procurement artefacts.

5.2. Key Responsibilities

5.2.1. National Collaborative LIMS Project Board

The prime purpose of the Project Board is to drive the project forward and deliver the project outcomes. The Project Board will empower a Project Lead to run the project on a day-to-day basis. The Project Lead is accountable for the successful delivery of the project and reports to the Project Board.

The Board is comprised of senior stakeholders from across NHS Scotland Consortium Boards, with authority to make decisions within either their individual Board or region they represent. The following should be considered as standing members of the Project Board.

- Project Board Chairman
- Project Lead
- Consortium Health Board & Region Representatives
- Procurement Lead
- Discipline Specific Representatives
- National Labs Programme Representatives
- eHealth Lead Representatives

The full membership of the Project Board and Terms of Reference (ToR) is provided in Appendix A. This board will continue to have existing responsibilities as outlined in the ToR however specifically for the procurement phase this board will have responsibility for:

- sign off key procurement documents including the procurement strategy and requirements specification;
- shortlisting / evaluation decisions;
- approval of the preferred solution; and
- updating stakeholder groups of key decisions and outcomes including the National eHealth Leads Strategy Group, LOB and Local Board Executive Management Teams.

5.2.2. National Collaborative LIMS Project Team

The National Collaborative LIMS Project Team is responsible for managing the project and ensuring that project outcomes are delivered. This cross functional team, working in collaboration with the LIMS Evaluation User Group, will be responsible for:

- ensuring that the project is maintaining the strategic direction set by the Project Board;
- ensuring the necessary levels of project governance are in place to support project day-to-day operations;
- reporting progress to the Project Board;
- leading the development of the procurement strategy;
- conducting and managing all dialogue with potential suppliers;
- planning and managing the procurement process including developing the evaluation strategy, model, and overseeing the negotiations;
- development of all key procurement documentation i.e. ESPD, ITT, and framework contract; and
- development of the full business case

The Project Team is comprised of nominated representatives from Consortium Boards. The full membership of the Project Team is provided in Appendix A.

5.2.3. LIMS Evaluation User Group

The LIMS Evaluation User Group is responsible for the development of the overarching specification for LIMS, the review and evaluation of supplier responses (including supplier demonstrations and ITT scoring), and for ensuring that solutions reviewed and ultimately procured meet the need of NHS Scotland Consortium Boards. Final sign-off will come through the Project Board, via the Project Team.

This group is comprised of nominated representatives from each Laboratory discipline sub-group, nominated representatives from clinical networks, financial / commercial SMEs and technical SMEs from the Consortium Boards.

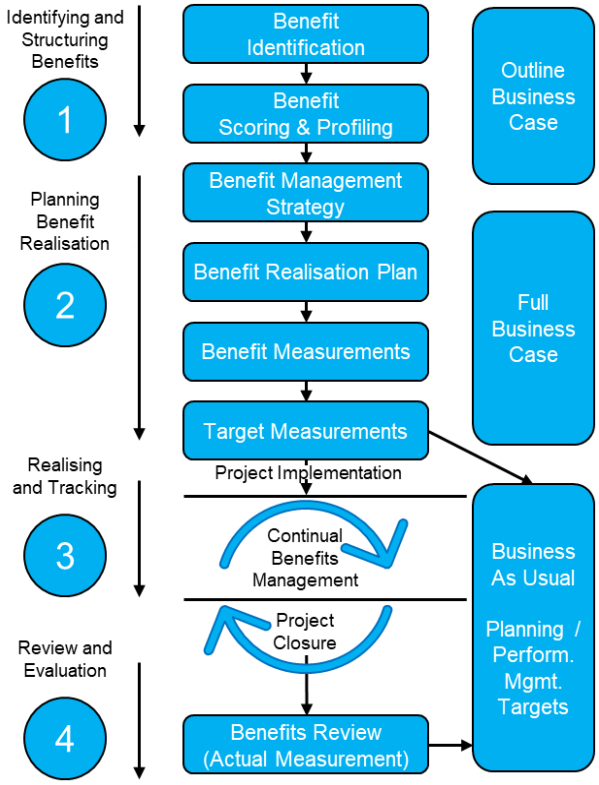
5.3. Benefits Realisation & Measurement

The economic section identified a number of non-financial benefits to be delivered by the implementation of LIMS. It is important that a benefits management approach is adopted by each board that enables benefits realisation to be monitored and benefits to be proactively managed across all Consortium Boards.

Prior to implementation it is recommended that further analysis of current processes is carried out in order to develop detailed baseline measures against which to monitor and assess LIMS benefits.

A proposed approach for benefits realisation is shown in the Figure 7 below.

Figure 5: Potential Benefits Realisation Approach



A number of key metrics will need be developed to track the delivery of benefits post implementation. It is recognised that post implementation benefit realisation activities are difficult to resource; however it will be important to drive value out of the LIMS system and have specified metrics. These should focus on key benefit areas and provide a realistic basis on which to monitor and assess benefits realisation.

As the project progresses the details for the strategy, framework and plan for the management delivery and evaluation of benefits should be developed and documented as part of local cases.

5.4. Risk Management Process

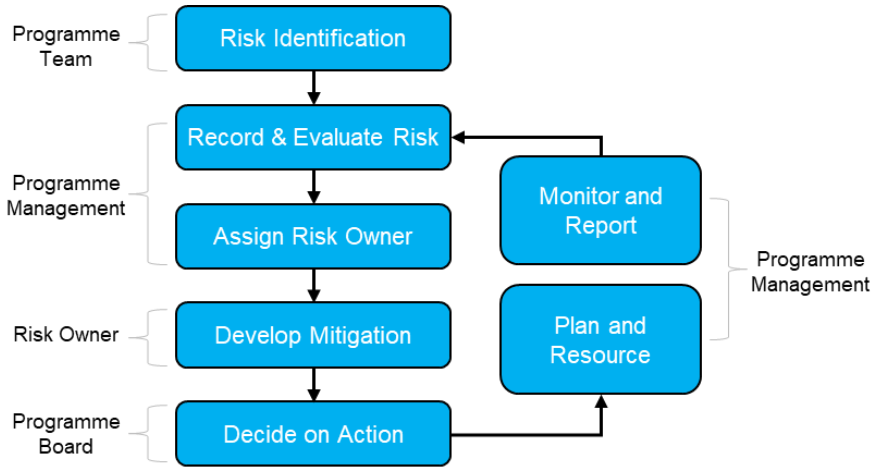
Risk identification and management will be a continual process to monitor the level of exposure to risk at any point and keep unwanted outcomes to a minimum. The National Collaborative LIMS Project will approach risk definition, initial risk identification, management and resolution; and Issue identification, management and resolution in line with the eHealth Risk and Issue Management guidelines.[10]

It is important to ensure that the following risk processes are established at a national and Board level:

- up-to-date risks register. It is recommended formal updates are made by designated individuals only;
- all risks should be reviewed regularly and key risks escalated to the LIMS Project Board for management by exception;
- significant risks must have mitigation plans which are formally reviewed by the LIMS Project Board; and
- processes should be put in place to monitor risk.

It will be the responsibility of all Project Team members to identify risks as and when they become aware of them, and to use the risk management processes. These processes ensure that the risks are logged and assigned to owners to manage and continually review the individual risks.

Figure 6: Risk Management Approach



5.5. Change Management

Effective change management and visible leadership will be critical to the success of the project in order to:

- achieve buy-in across stakeholder groups from various Laboratory disciplines;
- gain commitment from users, recognising potential disruption to services and additional effort required of laboratory staff during the implementation period;
- support the changes in working practices that the new arrangements will require (depending on collaboration approach; and

[10] http://www.healthscotland.scot/media/1177/24561-health-scotland-management-of-risk-policy.pdf

- realise the benefits of LIMS replacement, as outlined in the section 5.3.

It is recommended Boards develop the following artefacts as part of their local planning activities:

- Change Management Strategy: to include an assessment of the potential impact of the proposed change on the culture, systems, processes and people. An underpinning communication strategy for affected disciplines and staff will also need to be defined;
- Change Management Framework: this sets out the organisational structure and personnel required to direct, manage, implement and evaluate the change, along with details of roles and responsibilities, and to support staff through the change; and
- Change Management Plans: this defines the communication required for the implementation phase.

Appendix A: Project Membership

National Collaborative LIMS Project Board

Member Name	NHS Health Board	Functional Area	Role in Host Board
William Edwards	NHS Greater Glasgow & Clyde	Board Co-Chair / eHealth	Director of eHealth
Mike Gray	NHS Lothian	Board Co-Chair / Laboratories Service Manager Representative	Service Manager for Laboratory Medicine
Jackie Wales	Golden Jubilee National Hospital	Golden Jubilee National Hospital Representative	Head of Laboratories
Sally Smith	Golden Jubilee National Hospital	Golden Jubilee National Hospital Representative	Head of eHealth
Bill Bartlett	National Services Scotland	National Labs Programme Representative	Clinical Lead
George Futcher	National Services Scotland	Procurement	Senior Business & Procurement Advisor
Jackie Stephen	NHS Borders	eHealth	Head of IM&T
Martyn McAdam	NHS Dumfries & Galloway	NHS Dumfries & Galloway Representative	Blood Science Service Manager
Donna Galloway	NHS Fife	NHS Fife Representative	Head of Laboratory Services
Richard Bell	NHS Forth Valley Representative	Service Manager	Ambulatory, Diagnostics and Theatres
James Allison	NHS Grampian	NHS Grampian Representative	Unit Clinical Director – Laboratory Medicine Unit
Gareth Bryson	NHS Greater Glasgow & Clyde	West Region Representative	Head of Service for Pathology
Arwel Williams	NHS Greater Glasgow & Clyde	Diagnostics Management Representative	Director - Diagnostic Services
Carol Thomson	NHS Lothian	East Region Representative	Labs IM&T Service Manager
Carol Thomson	NHS Lothian	Laboratories Systems Manager Representative	Labs IM&T Service Manager
Elizabeth Furrie	NHS Tayside	NHS Orkney Representative	Consultant Clinical Scientist and Clinical Lead

Elizabeth Furrie	NHS Tayside	NHS Shetland Representative	Consultant Clinical Scientist and Clinical Lead
Ellie Dow	NHS Tayside	North Region Representative	Consultant in Biochemical Medicine
Susie Buchanan	Scottish National Blood Transfusion Service	Blood Transfusion Representative	Associate Director
Stephen McGlashan	NHS Fife	SMVN Representative	Microbiology Service Manager
Debbie Crohn	NHS Orkney	NHS Orkney Representative	Head of Digital Transformation and Information Technology
Scott Douglas	NHS Greater Glasgow and Clyde	Programme Manager	Programme Manager

Responsibilities include (extract from the ToR):

- Establishing a forum for effective links and engagement between senior stakeholders from across Scotland to provide delivery assurance, support and guidance to the National Collaborative LIMS Project
- Taking a holistic view and making decisions on what is best for NHS Scotland as a whole and not individual Boards, whilst recognising that some Boards may have more predominant prevailing need than others for a replacement system
- Ensure alignment with broader NHS Scotland strategy ambitions including The National Clinical Strategy, Scotland's Digital Health and Care Strategy and Beating Cancer: Ambition and Action.
- Ensure a viable and achievable Business Case exists for the National Collaborative LIMS Project
- The resourcing, management and monitoring of the delivery of the National Collaborative LIMS Project plan and its individual component projects / workstreams / deliverables
- Use the opportunity to critically evaluate existing services and how these can be redesigned and improved, taking account of changing population needs, demographics and patterns of service usage
- Ensuring the individual component projects / workstreams produce deliverables that provide the desired outcomes and meet the user requirements
- Issue resolution at the appropriate level associated with National Collaborative LIMS Project plan and individual component projects
- Providing guidance and suggestions on the strategic direction, prioritisation and associated timelines of the plan deliverables in conjunction with interested stakeholders
- Allocation of a Senior Responsible Officer (SRO) for the National Collaborative LIMS Project
- Ensuring appropriate and proportionate project management products are in place to manage, monitor and control the output of the National Collaborative LIMS Project plan and individual component projects / workstreams / deliverables
- Acting as forum for sharing knowledge and best practice across NHS Scotland
- Acting upon any matters referred to it from executive governance authorities or escalated to it from underlying component projects / workstreams

LIMS Evaluation User Group

Name	Board	Role	Role on Project
Mike Gray	NHS Lothian	Lab service Manager	Co-Chair of Project Board
James Allison	NHS Grampian	Unit Clinical Director – Laboratory Medicine Unit	NHS Grampian rep on Project Board
Bill Bartlett	NSS	Clinical Lead National Laboratory Programme	National Laboratory Programme rep on Project Board
Nick Bradbury	NHS Lothian	Capital Finance Manager	Project Finance lead
Gareth Bryson	NHS GGC	Head of Service (Pathology)	West Region rep on Project Board
Paul Docherty	NHS GGC	Applications Architecture Manager	Technical lead
Scott Douglas	NHS GGC	Programme Manager	Programme Manager
Ellie Dow	NHS Tayside	Consultant biomedical medicine	NHS Tayside rep on Project Board
George Futcher	NSS	Business and Procurement advisor	Procurement Lead
Ian Godber	NHS GGC	Consultant Clinical Scientist (Biochemistry)	Technical and Clinical User Group
Jackie Stephen	NHS Borders	eHealth Lead	NHS Borders rep on Project Board
Carol Thomson	NHS Lothian	Labs IM&T Service Manager	Laboratory lead
Moray Saville	NHS Grampian	Labs IM&T Service Manager	Laboratory lead
Paul Westwood	NHS GGC	Consultant Clinical Scientist (Genetics)	Chair of Genetics subgroup
Daniel Wood	NHS GGC	Senior Business Analyst/Project lead	Senior Business Analyst/Project lead

Responsibilities include (extract from the ToR):

- Review the specifications presented by the subgroups to ensure that the specifications from the area they represent have been considered and are being met
- Make decisions that will used to inform the overarching LIMS specification
- Set specifications and standards
- Horizon scan, future proof where possible and build innovation into the specification
- Where possible and if appropriate rationalise and reduce variation
- Advise on the range of goods and services to be included as part of this procurement
- Participate in Tender evaluation
- Take responsibility for the deliverables relating to their assigned work stream
- Undertake tasks related to their assigned work stream
- Provide updates on the progress of their work stream and their assigned tasks

- Where required Escalate any issues that arise to the Project leads\Chair of the subgroup or to the appropriate local Board governance group where required in a timeous manner
- Identify risks and exceptions and recommend the appropriate course of action
- Act as a point of contact for their respective locations/teams in relation to the project – liaising with the project leads/other subgroups as appropriate
- Proactively share information with colleagues
- Be Change Champions for the LIMS re-procurement project within their respective locations/teams.
- Undertake project activities as directed by the Project Leads and LIMS Consortium Project Board and Team.

National Collaborative LIMS Project Team

Name	Board	Role	Role on Project
Mike Gray	NHS Lothian	Lab service Manager	Co-Chair of Project Board
Scott Douglas	NHS GGC	Programme Manager	Programme Manager
Daniel Wood	NHS GGC	Senior Business Analyst/Project lead	Project Manager
Project Manager – *To be Confirmed*	-	-	Project Manager
Mike Gray	NHS Lothian	Lab service Manager	Co-Chair of Project Board
Carol Thomson	NHS Lothian	Labs IM&T Service Manager	LIMS Systems Manager Lead
Moray Saville	NHS Grampian	Labs IM&T Service Manager	LIMS Systems Manager Lead
Paul Docherty	NHS GGC	Application Architect	Technical/ eHealth Lead
George Futcher	NHS NSS	Senior Business & Procurement Advisor	Procurement Lead
Nick Bradbury	NHS Lothian	Capital Finance Manager	Finance Lead
Maxine Marr	NHS Lothian	Assistant Accountant	Finance Support
Legal Lead – *To Be Confirmed*	-	-	Legal Lead
Clinical Lead – *To Be Confirmed*	-	-	Clinical Lead
Wendy Regan	Deloitte	OBC Support Lead	OBC Support Lead
Andy Fleming	Deloitte	OBC Support Manager	OBC Support Manager
David Smith	Deloitte	OBC Support Consultant	OBC Support Consultant

Responsibilities include (extract from the ToR):

- Undertaking project activities as directed by the National Collaborative LIMS Project Board.
- Take responsibility for all activities required to ensure the successful procurement of a new LIMS.

- Managing and where required escalate project Risks via appropriate governance channels.
- Establishing and managing the Evaluation User Group / Technical & Clinical User Group whose primary role will be to advice the procurement team on the clinical, technical, and commercial aspects associated with the procurement of the LIMS.
- Ensuring discipline specific subgroups are established.
- Develop a viable and achievable Business Case for the National Collaborative LIMS Project.
- The resourcing, management and monitoring of the delivery of the National Collaborative LIMS Project plan and its individual component projects / workstreams / deliverables
- Use the opportunity to critically evaluate existing services and how these can be redesigned and improved, taking account of changing population needs, demographics and patterns of service usage
- Ensuring the individual component projects / workstreams produce deliverables that provide the desired outcomes and meet the user requirements
- Issue resolution at the appropriate level associated with National Collaborative LIMS Project plan and individual component projects
- Ensuring appropriate and proportionate project management products are in place to manage, monitor and control the output of the National Collaborative LIMS Project plan and individual component projects / workstreams / deliverables
- Acting upon any matters referred to it from executive governance authorities or escalated to it from underlying component projects / workstreams

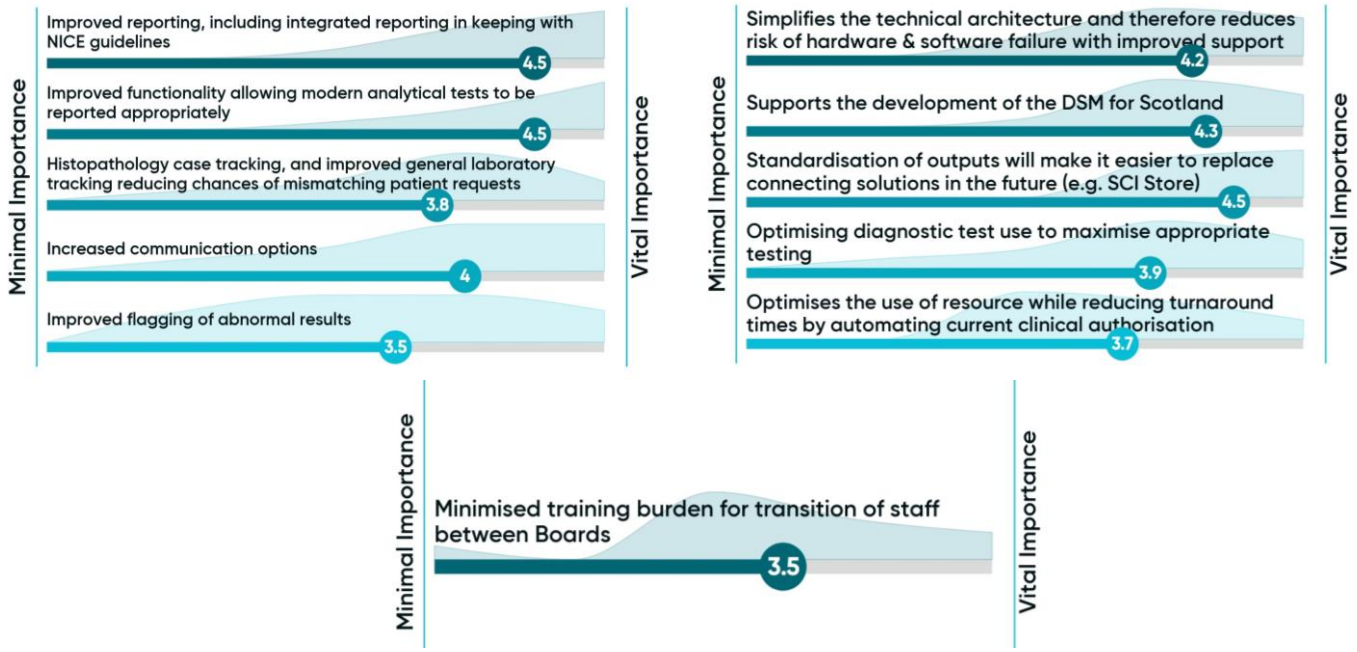
Appendix B: Workshop Exercise Outputs

Benefits Workshop

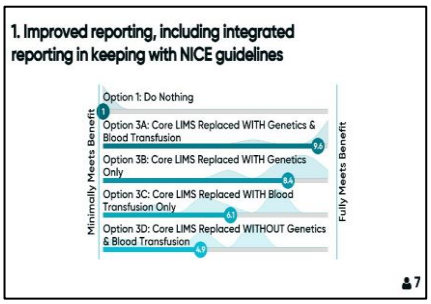
Attendees utilised digital collaboration tool *Mentimeter* to vote on each benefit, both in terms of importance weighting and against each short-listed option.

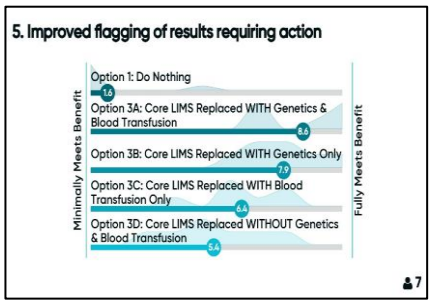
The graphics below show the average across all attendees, with the shaded graph above the line showing the spread of responses.

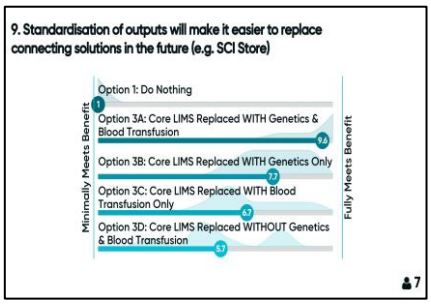
Benefit Weighting

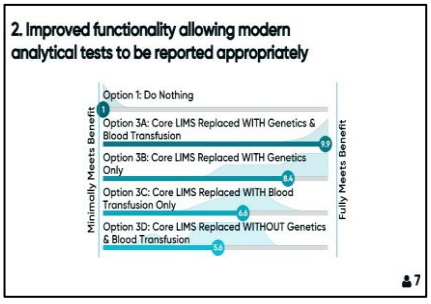


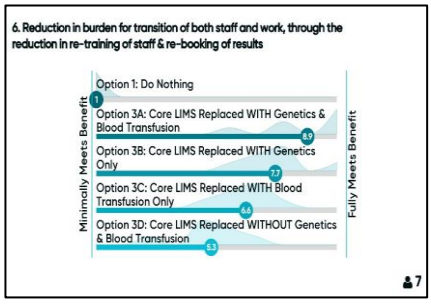
Option Benefit Scores

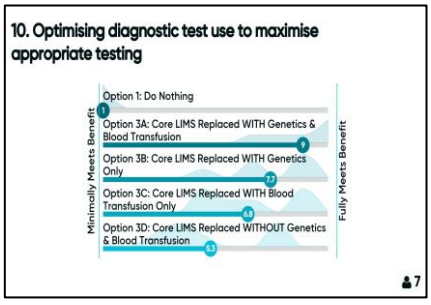


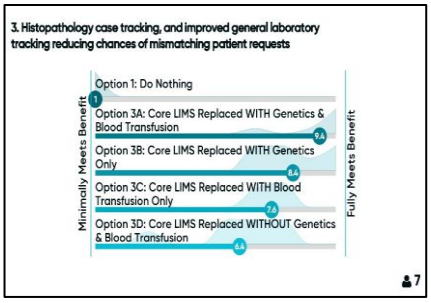


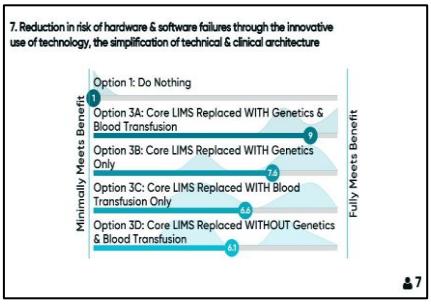


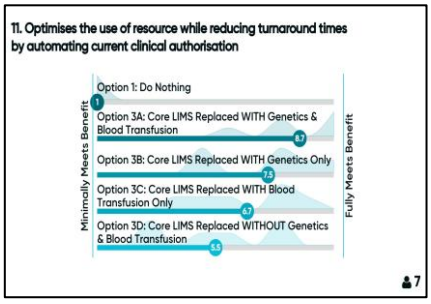


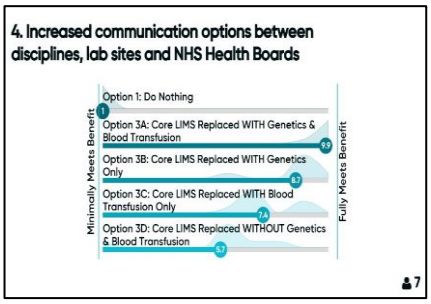


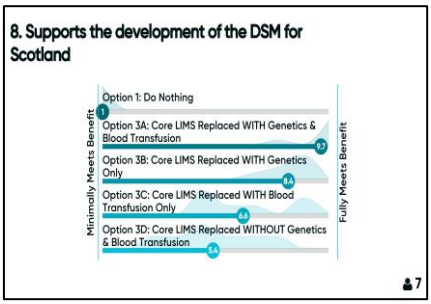










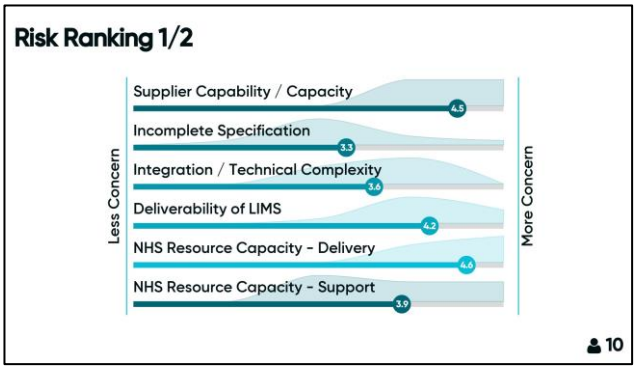


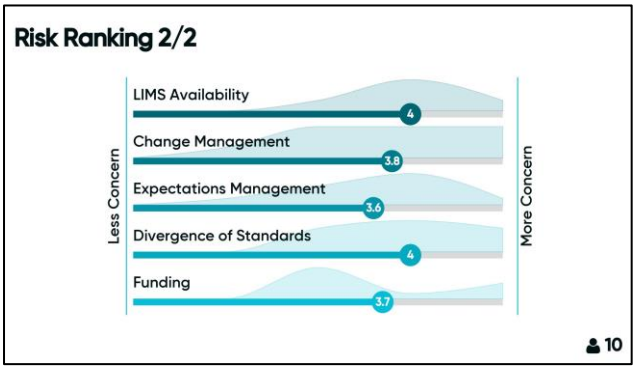
Risks Workshop

Using the same method as within the Benefits Workshop, attendees utilised digital collaboration tool *Mentimeter* to vote on each risk based on level of concern (to identify weighting), and against each short-listed option.

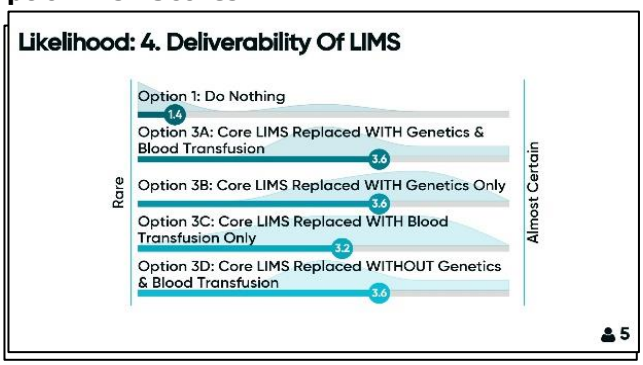
The graphics below show the average across all attendees, with the shaded graph above the line showing the spread of responses.

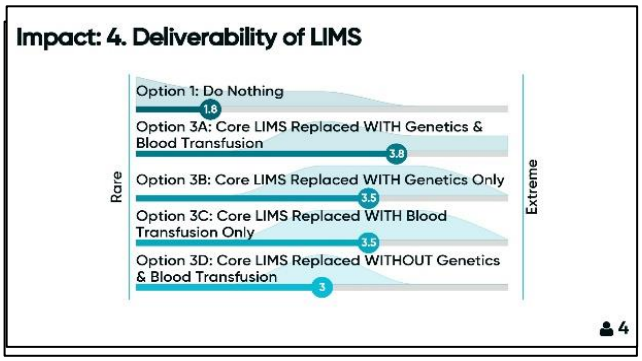
Risk Weighting

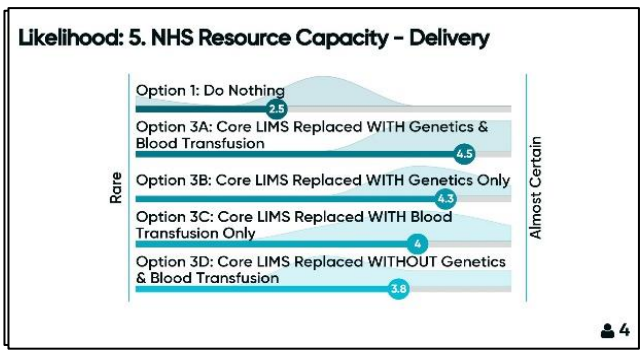


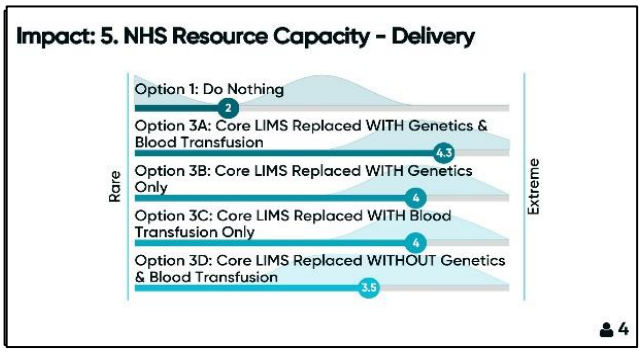


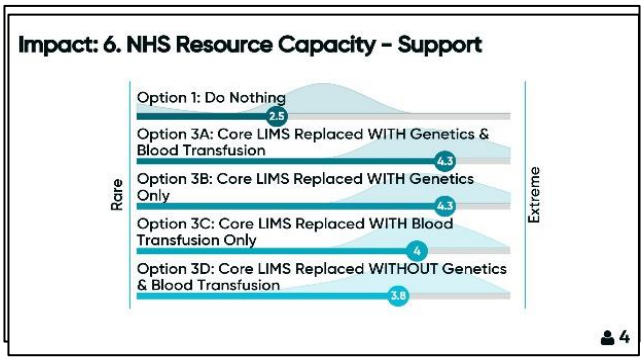
Option Risk Scores

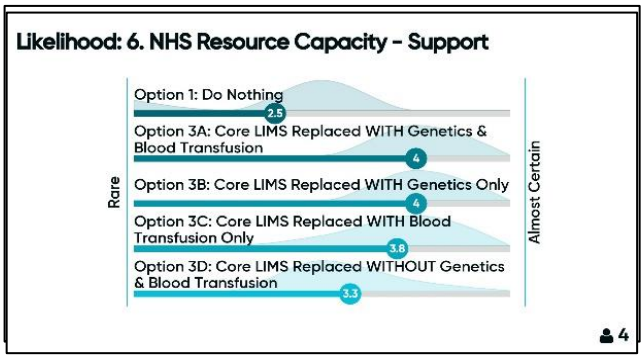


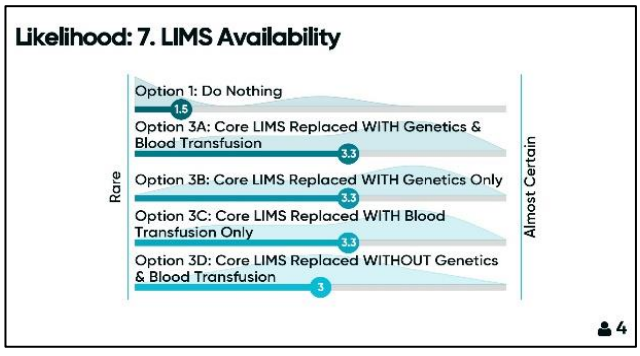


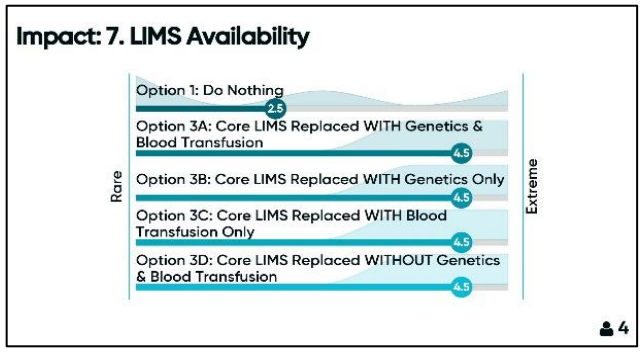




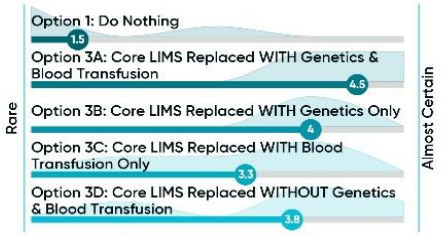








Likelihood: 8. Change Management



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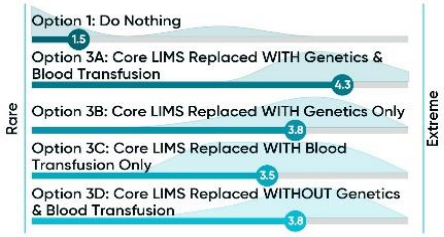
Impact: 8. Change Management



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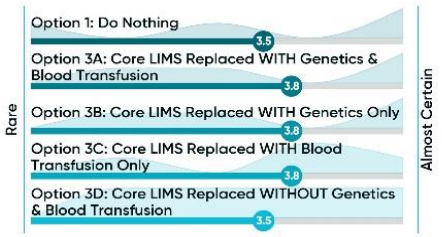
Likelihood: 9. Divergence of Standards



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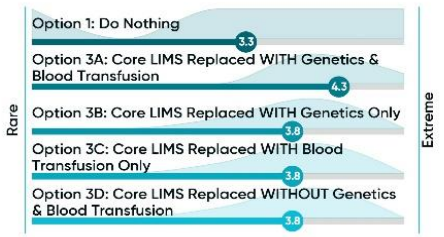
Impact: 9. Divergence of Standards



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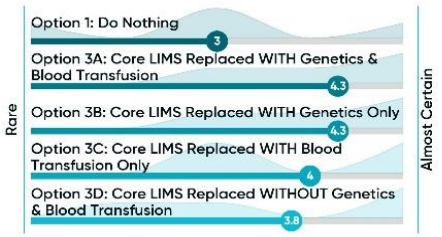
Likelihood: 10. Funding



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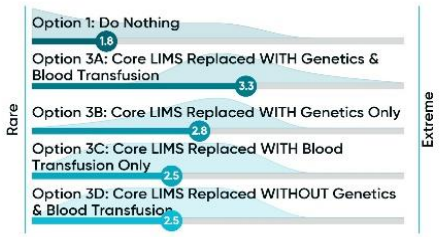
Impact: 10. Funding



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Appendix C: OBC Optimism Bias Calculation

Contributory Factor to Upper Bound	% Factor Contributes	% mitigation of factor possible (0-100%)	Explanation for mitigation	% Factor Contributes after mitigation
Progress with Planning Approval	4%	100%	Not Applicable	0.0%
Progress with other Regulatory approvals	4%	75%	UCAS / MHRA accreditation required. Regulatory approvals are known and understood, however not completed.	1.0%
Depth of surveying of site/ground information	3%	100%	Not Applicable	0.0%
Detail of design	4%	75%	Specification not concluded, anticipated but outline of spec completed.	1.0%
Innovative project/design (i.e. has this type of project/design been undertaken before)	3%	50%	Project has been undertaken before, but not recently in NHS Scotland	1.5%
Design complexity	4%	50%	Complex design and implementation - national complexity around standardisation.	2.0%
Likely variations from Standard Contract	2%	50%	Uncertain until further along the procurement process, however unlikely to be significant variation from standard contract. Inclusion of Genetics service may require variation.	1.0%
Design Team capabilities	3%	75%	Skilled and experienced project team, although time may be a limiting factor. Mitigated by well-resourced project team.	0.8%
Contractors' capabilities (excluding design team covered above)	2%	10%	Uncertain until further along the procurement process. Inclusion of Genetics potentially adds complexity	1.8%
Contractor Involvement	2%	25%	Uncertain until further along the procurement process	1.5%
Client capability and capacity (NB do not double count with design team capabilities)	6%	33%	Skilled and experienced project team nationally, however uncertain if skills and experience available at Board level. Time may be a limiting factor.	4.0%
Robustness of Output Specification / project brief	25%	75%	Clear deliverables and project brief agreed at senior level.	6.3%
Involvement of Stakeholders, including Public and Patient Involvement	5%	80%	Good engagement through Labs / eHealth / Finance. Limited requirement for public involvement.	1.0%
Agreement to output specification / project brief by stakeholders	5%	80%	Project Brief widely agreed by stakeholders	1.0%
New service or traditional	3%	60%	Replacement of existing infrastructure, uncertainty over hosting model and integrated model will required significant integration between disciplines.	1.2%
Local community consent	3%	100%	Not Applicable	0.0%

Stable policy environment	20%	75%	Potential uncertainty around Software, and the classification of LIMS as a medical device (policy delayed until 2022). Potential uncertainty over COVID response.	5.0%
Likely competition in the market for the project	2%	75%	Initial bidder interest, and experience in other health systems, indicates likely competition in the market.	0.5%
TOTAL	**100%**			**29.5%**

The project team completed the optimism bias calculator suggested in the Scottish Capital Investment Manual (SCIM), which indicates an optimism bias of 30% is appropriate. This is driven by a number of factors.

The optimism bias figure will be reviewed at FBC, and potentially ultimately replaced by a costed risk register for specific risks.

Appendix D: OBC Cost Assumptions

Cost Item Assumptions

Cost Item	Unit Cost	Type	Source	Assumption
LIMS Software Licence	c£2,000 Per LIMS User	One Off - NRC	CliniSys Response to National PIN & NHSGGC Clarification Questions	Based on total number of users by discipline, multiplied by licence cost multiplied by concurrency of 25%
Annual Support	£228k (S) / £255k (M) / £351k (L) / £697k (VL)	Annual - RR		Based on relative Board size using supplier costs for each size
Supplier Impl.	£581k (S) / £801k (M) / £970k (L) / £2,000k (VL)	One Off - NRC		Based on relative Board size using supplier costs for each size
Design	Based On NHS Team Resources & 20/21 Salary Bandings + On-Costs	One Off - NRR	Project Team & Evaluation User Group	Based On NHS Team Resources & 20/21 Salary Bandings + On-Costs
Build & Config		One Off - NRR		
Rollout		One Off - NRR		
BAU		Annual - RR		
LIMS Interfaces Build - Analyser Interfaces	£4,800 Per Interface	One Off - NRC	CliniSys Response to National PIN & NHSGGC Clarification Questions	Based on the number of Analyser Interfaces by discipline by Health Board
LIMS Interface Support - Analyser Interfaces	£1,300 Per Interface	Annual - RR		
LIMS Interfaces Build - Data Migration	£15k / £20k / £25k Per Discipline	One-Off - NRC		Single cost per discipline per Board (varies by discipline). Varies based on short-listed option (i.e. including Blood Transfusion / Genetics or not). Included in the Interface Build Total Cost Line in OBC
Additional Interface Build	£46k Per HL7 Interface Per Board	One-off - NRC		Based on additional integration build per Board (assumed 4 HL7 Interfaces per Board)
Additional Interface Recurring	£6k Per HL7 Interface Per Board	Annual - RR		
Downstream Interfaces	£10k Per Interface Per Board	One-off - NRC		TrakCare, SCI Store, ECOSS and the Order Communication Systems (OCS)

Hosting Hardware (5 Year Refresh)	£100k (S) / £150k (M) / £200k (L) / £400k (VL)	One-Off - RR	Project Team & Evaluation User Group	Based On average refresh costs per Board current hardware costs & relative Board size
Hosting Hardware (Annual Support)	£2k (S) / £3k (M) / £4k (L) / £8k (VL)	Annual - RR	Project Team & Evaluation User Group	Based on average of known annual hardware support costs percent of known refresh costs

Financial Assumptions

Cost Item	Optimism Bias	Indexation	VAT	Depreciation
LIMS Software Licence	30%	2.0%	20%	Yes
Annual Support	30%	2.0%	20%	-
Supplier Impl.	30%	2.0%	20%	Yes
Design	30%	2.0%	-	-
Build & Local Config	30%	2.0%	-	-
Rollout	30%	2.0%	-	-
BAU	30%	2.0%	-	-
LIMS Interfaces Build - Analyser Interfaces	30%	2.0%	20%	Yes
LIMS Interface Support - Analyser Interfaces	30%	2.0%	20%	-
LIMS Interfaces Build - Data Migration	30%	2.0%	20%	Yes
Additional Interface Build	30%	2.0%	20%	-
Additional Interface Recurring	30%	2.0%	-	-
Downstream Interfaces	30%	2.0%	20%	Yes
Hosting Hardware (5 Year Refresh)	30%	2.0%	-	-
Hosting Hardware (Annual Support)	30%	2.0%	-	-

CliniSys Supplier Costs

Source	Board Size	Users Assumed	LIMS Software Licence		Supplier Implementation	Annual Support
			Total Quoted Cost	Cost Per User		
National PIN & Clarification Questions	Small	100	£416k	£4k	£582k	£229k
	Medium	200	£508k	£3k	£802k	£255k
	Large	500	£757k	£2k	£967k	£351k
	Very Large	1205	£1,900k	£2k	£2,002k	£697k

CliniSys Interfaces Costs			
Type	**Detail**	**One-Off**	**Annual Support**
Interface Required	Analyser Interface Connection	£4,800	£1,300
Interface Required	Data Migration - Blood Sciences	£14,066	-
Interface Required	Data Migration - Microbiology	£19,476	-
Interface Required	Data Migration - Histopathology	£19,476	-
Interface Required	Data Migration - Genetics	£19,476	-
Interface Required	Data Migration - Blood Transfusion	£24,866	-
Additional Interface Requirement	HL7 - WinPath Point to Point Analyser Interfacing – Off-the-shelf (Cell Path Only)	£6,800	£1,300
Additional Interface Requirement	HL7 - CliniSys Integration Manager (CIM) ADT Per Connection	£17,600	£1,600
Additional Interface Requirement	HL7 - CIM OCS/RR Per Connection	£10,600	£1,400
Additional Interface Requirement	HL7 - CIM third party data-feed interface	£10,600	£1,400

Appendix E: OBC Board Assumptions

Total User Numbers By Discipline By Board

Health Board	Blood Sciences	Histo-pathology	Micro-biology	Blood Trans.	Genetics	Total
NHS Ayrshire & Arran	70	65	50	50	-	235
NHS Borders*	39	21	-	11	-	71
NHS Dumfries & Galloway*	47	30	23	6	-	106
NHS Fife*	145	45	35	10	-	235
NHS Forth Valley*	70	36	40	-	-	146
NHS Golden Jubilee*	-	7	-	4	-	11
NHS Grampian*	136	72	102	25	45	380
NHS Greater Glasgow & Clyde*	557	285	286	59	140	1,327
NHS Highland	100	90	106	50		346
NHS Lanarkshire	100	90	106	79		375
NHS Lothian*	290	101	80	10	42	523
NHS Orkney*	4	-	-	1	-	5
NHS Shetland*	4	-	-	1	-	5
NHS Tayside*	134	80	72	5	46	337
NHS Western Isles	20	20	20	20	-	80
Total	**1,716**	**942**	**920**	**330**	**273**	**4,181**

*Consortium Board figures provided through project team

**Non-Consortium Board figures based on previous ISD data

Hosting Hardware Assumption

Health Board	Hardware Cost - Refresh	Hardware Cost - Annual	Relative Size
NHS Ayrshire & Arran	£150,000	£3,000	Medium
NHS Borders*	£100,000	£2,000	Small
NHS Dumfries & Galloway*	£100,000	£2,000	Small
NHS Fife*	£150,000	£3,000	Medium
NHS Forth Valley*	£150,000	£3,000	Medium
NHS Golden Jubilee*	£100,000	£2,000	Small
NHS Grampian*	£200,000	£4,000	Large
NHS Greater Glasgow & Clyde*	£400,000	£8,000	Very Large
NHS Highland	£150,000	£3,000	Medium
NHS Lanarkshire	£200,000	£4,000	Large
NHS Lothian*	£400,000	£8,000	Very Large
NHS Orkney*	£100,000	£2,000	Small
NHS Shetland*	£100,000	£2,000	Small
NHS Tayside*	£200,000	£4,000	Large
NHS Western Isles	£100,000	£2,000	Small

*Consortium Boards

Hardware refresh costs are based on average current costs by relative Board size, and are assumed to be required on a 5 year cycle. Annual support costs are calculated at 2% of the total refresh cost, based on the average of known annual hardware support cost percent of known refresh costs.

Appendix F: Financial Costs by Board – 25% Concurrency

NHS Borders

Cost (£m)	Cost Type	Year										Total
		1	2	3	4	5	6	7	8	9	10	
LIMS Software Licence	NRC	0.04	-	-	-	-	-	-	-	-	-	0.04
Annual Support	RR	-	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	2.06
Supplier Implementation	NRR	0.58	-	-	-	-	-	-	-	-	-	0.58
Design	NRR	0.01	-	-	-	-	-	-	-	-	-	0.01
Build & Local Config	NRR	0.07	-	-	-	-	-	-	-	-	-	0.07
Rollout	NRR	0.04	0.02	-	-	-	-	-	-	-	-	0.05
BAU	RR	-	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.19
LIMS Interface Build	NRC	0.06	-	-	-	-	-	-	-	-	-	0.06
LIMS Interface Support	RR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.03
Additional Interface Build	NRC	0.18	-	-	-	-	-	-	-	-	-	0.18
Additional Interface Recurring	RR	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.23
Downstream Interfaces	NRC	0.04	-	-	-	-	-	-	-	-	-	0.04
Hosting Hardware	RR	0.10	0.0	0.0	0.0	0.0	0.10	0.0	0.0	0.0	0.0	0.22
Optimism Bias		0.34	0.09	0.08	0.08	0.08	0.11	0.08	0.08	0.08	0.08	1.13
Total		1.49	0.38	0.36	0.36	0.36	0.49	0.36	0.36	0.36	0.36	4.88
Non-Recurring Capital (NRC)		1.17	-	-	-	-	-	-	-	-	-	1.17
Non-Recurring Revenue (NRR)		0.15	0.02	-	-	-	-	-	-	-	-	0.18
Recurring Revenue (RR)		0.17	0.36	0.36	0.36	0.36	0.49	0.36	0.36	0.36	0.36	3.53
Total Economic Cost		1.49	0.38	0.36	0.36	0.36	0.49	0.36	0.36	0.36	0.36	4.88
Net Present Cost		1.49	0.37	0.34	0.32	0.31	0.41	0.29	0.28	0.27	0.26	4.36
NRC (Incl. VAT & Indexation)		1.41	-	-	-	-	-	-	-	-	-	1.41
NRR (Incl. VAT & Indexation)		0.15	0.02	-	-	-	-	-	-	-	-	0.18
RR (Incl. VAT & Indexation)		0.17	0.43	0.44	0.45	0.46	0.61	0.47	0.48	0.49	0.50	4.49
Financial Cost		1.73	0.45	0.44	0.45	0.46	0.61	0.47	0.48	0.49	0.50	6.07
Assumed Resources In Post		(0.02)	(0.0)	-	-	-	-	-	-	-	-	(0.02)
Total Financial Cost		1.72	0.45	0.44	0.45	0.46	0.61	0.47	0.48	0.49	0.50	6.05

Depreciation (Capital Costs)		0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	1.17

*cost shown as '0.0' are less than £10k a year

NHS Dumfries & Galloway

Cost (£m)	Cost Type	Year										Total
		1	2	3	4	5	6	7	8	9	10	
LIMS Software Licence	NRC	0.05	-	-	-	-	-	-	-	-	-	0.05
Annual Support	RR	-	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	2.06
Supplier Implementation	NRR	0.58	-	-	-	-	-	-	-	-	-	0.58
Design	NRR	0.01	-	-	-	-	-	-	-	-	-	0.01
Build & Local Config	NRR	0.08	-	-	-	-	-	-	-	-	-	0.08
Rollout	NRR	0.04	0.02	-	-	-	-	-	-	-	-	0.06
BAU	RR	-	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.21
LIMS Interface Build	NRC	0.06	-	-	-	-	-	-	-	-	-	0.06
LIMS Interface Support	RR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.03
Additional Interface Build	NRC	0.18	-	-	-	-	-	-	-	-	-	0.18
Additional Interface Recurring	RR	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.23
Downstream Interfaces	NRC	0.04	-	-	-	-	-	-	-	-	-	0.04
Hosting Hardware	RR	0.10	0.0	0.0	0.0	0.0	0.10	0.0	0.0	0.0	0.0	0.22
Optimism Bias		0.35	0.09	0.08	0.08	0.08	0.11	0.08	0.08	0.08	0.08	1.14
Total		1.54	0.39	0.36	0.36	0.36	0.49	0.36	0.36	0.36	0.36	4.96
Non-Recurring Capital (NRC)		1.20	-	-	-	-	-	-	-	-	-	1.20
Non-Recurring Revenue (NRR)		0.17	0.03	-	-	-	-	-	-	-	-	0.20
Recurring Revenue (RR)		0.17	0.36	0.36	0.36	0.36	0.49	0.36	0.36	0.36	0.36	3.56
Total Economic Cost		1.54	0.39	0.36	0.36	0.36	0.49	0.36	0.36	0.36	0.36	4.96
Net Present Cost		1.54	0.37	0.34	0.33	0.32	0.42	0.30	0.29	0.28	0.27	4.43
NRC (Incl. VAT & Indexation)		1.44	-	-	-	-	-	-	-	-	-	1.44
NRR (Incl. VAT & Indexation)		0.17	0.03	-	-	-	-	-	-	-	-	0.20
RR (Incl. VAT & Indexation)		0.17	0.43	0.44	0.45	0.46	0.61	0.48	0.48	0.49	0.50	4.52
Financial Cost		1.78	0.46	0.44	0.45	0.46	0.61	0.48	0.48	0.49	0.50	6.16
Assumed Resources In Post		(0.02)	(0.0)	-	-	-	-	-	-	-	-	(0.02)
Total Financial Cost		1.76	0.46	0.44	0.45	0.46	0.61	0.48	0.48	0.49	0.50	6.14
Depreciation (Capital Costs)		0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	1.20

*cost shown as '0.0' are less than £10k a year

NHS Fife

Cost (£m)	Cost Type	Year										Total
		1	2	3	4	5	6	7	8	9	10	
LIMS Software Licence	NRC	0.12	-	-	-	-	-	-	-	-	-	0.12
Annual Support	RR	-	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2.29
Supplier Implementation	NRR	0.80	-	-	-	-	-	-	-	-	-	0.80
Design	NRR	0.03	-	-	-	-	-	-	-	-	-	0.03
Build & Local Config	NRR	0.24	-	-	-	-	-	-	-	-	-	0.24
Rollout	NRR	0.05	0.14	-	-	-	-	-	-	-	-	0.19
BAU	RR	-	0.04	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.49
LIMS Interface Build	NRC	0.09	-	-	-	-	-	-	-	-	-	0.09
LIMS Interface Support	RR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.04
Additional Interface Build	NRC	0.18	-	-	-	-	-	-	-	-	-	0.18
Additional Interface Recurring	RR	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.23
Downstream Interfaces	NRC	0.04	-	-	-	-	-	-	-	-	-	0.04
Hosting Hardware	RR	0.15	0.0	0.0	0.0	0.0	0.15	0.0	0.0	0.0	0.0	0.33
Optimism Bias		0.52	0.14	0.10	0.10	0.10	0.15	0.10	0.10	0.10	0.10	1.52
Total		2.25	0.61	0.44	0.44	0.44	0.64	0.44	0.44	0.44	0.44	6.60
Non-Recurring Capital (NRC)		1.61	-	-	-	-	-	-	-	-	-	1.61
Non-Recurring Revenue (NRR)		0.41	0.19	-	-	-	-	-	-	-	-	0.60
Recurring Revenue (RR)		0.23	0.42	0.44	0.44	0.44	0.64	0.44	0.44	0.44	0.44	4.40
Total Economic Cost		2.25	0.61	0.44	0.44	0.44	0.64	0.44	0.44	0.44	0.44	6.60
Net Present Cost		2.25	0.59	0.41	0.40	0.39	0.54	0.36	0.35	0.34	0.32	5.95
NRC (Incl. VAT & Indexation)		1.93	-	-	-	-	-	-	-	-	-	1.93
NRR (Incl. VAT & Indexation)		0.41	0.19	-	-	-	-	-	-	-	-	0.60
RR (Incl. VAT & Indexation)		0.24	0.51	0.53	0.54	0.55	0.78	0.57	0.58	0.59	0.60	5.50
Financial Cost		2.58	0.70	0.53	0.54	0.55	0.78	0.57	0.58	0.59	0.60	8.03
Assumed Resources In Post		(0.05)	(0.02)	-	-	-	-	-	-	-	-	(0.07)
Total Financial Cost		2.54	0.67	0.53	0.54	0.55	0.78	0.57	0.58	0.59	0.60	7.96
Depreciation (Capital Costs)		0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	1.61

*cost shown as '0.0' are less than £10k a year

NHS Forth Valley

Cost (£m)	Cost Type	Year										Total
		1	2	3	4	5	6	7	8	9	10	
LIMS Software Licence	NRC	0.07	-	-	-	-	-	-	-	-	-	0.07
Annual Support	RR	-	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2.29
Supplier Implementation	NRR	0.80	-	-	-	-	-	-	-	-	-	0.80
Design	NRR	0.02	-	-	-	-	-	-	-	-	-	0.02
Build & Local Config	NRR	0.18	-	-	-	-	-	-	-	-	-	0.18
Rollout	NRR	0.03	0.10	-	-	-	-	-	-	-	-	0.14
BAU	RR	-	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.36
LIMS Interface Build	NRC	0.09	-	-	-	-	-	-	-	-	-	0.09
LIMS Interface Support	RR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.04
Additional Interface Build	NRC	0.18	-	-	-	-	-	-	-	-	-	0.18
Additional Interface Recurring	RR	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.23
Downstream Interfaces	NRC	0.04	-	-	-	-	-	-	-	-	-	0.04
Hosting Hardware	RR	0.15	0.0	0.0	0.0	0.0	0.15	0.0	0.0	0.0	0.0	0.33
Optimism Bias		0.48	0.13	0.10	0.10	0.10	0.14	0.10	0.10	0.10	0.10	1.43
Total		2.08	0.55	0.42	0.42	0.42	0.62	0.42	0.42	0.42	0.42	6.21
Non-Recurring Capital (NRC)		1.55	-	-	-	-	-	-	-	-	-	1.55
Non-Recurring Revenue (NRR)		0.30	0.14	-	-	-	-	-	-	-	-	0.44
Recurring Revenue (RR)		0.23	0.41	0.42	0.42	0.42	0.62	0.42	0.42	0.42	0.42	4.22
Total Economic Cost		2.08	0.55	0.42	0.42	0.42	0.62	0.42	0.42	0.42	0.42	6.21
Net Present Cost		2.08	0.53	0.39	0.38	0.37	0.52	0.34	0.33	0.32	0.31	5.59
NRC (Incl. VAT & Indexation)		1.86	-	-	-	-	-	-	-	-	-	1.86
NRR (Incl. VAT & Indexation)		0.30	0.14	-	-	-	-	-	-	-	-	0.44
RR (Incl. VAT & Indexation)		0.24	0.49	0.51	0.52	0.53	0.76	0.55	0.56	0.57	0.58	5.31
Financial Cost		2.40	0.63	0.51	0.52	0.53	0.76	0.55	0.56	0.57	0.58	7.61
Assumed Resources In Post		(0.03)	(0.02)	-	-	-	-	-	-	-	-	(0.05)
Total Financial Cost		2.37	0.61	0.51	0.52	0.53	0.76	0.55	0.56	0.57	0.58	7.56
Depreciation (Capital Costs)		0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	1.55

*cost shown as '0.0' are less than £10k a year

NHS Golden Jubilee

Cost (£m)	Cost Type	Year										Total
		1	2	3	4	5	6	7	8	9	10	
LIMS Software Licence	NRC	0.01	-	-	-	-	-	-	-	-	-	0.01
Annual Support	RR	-	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	2.06
Supplier Implementation	NRR	0.58	-	-	-	-	-	-	-	-	-	0.58
Design	NRR	0.0	-	-	-	-	-	-	-	-	-	0.0
Build & Local Config	NRR	0.01	-	-	-	-	-	-	-	-	-	0.01
Rollout	NRR	0.01	0.0	-	-	-	-	-	-	-	-	0.01
BAU	RR	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.03
LIMS Interface Build	NRC	0.07	-	-	-	-	-	-	-	-	-	0.07
LIMS Interface Support	RR	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.05
Additional Interface Build	NRC	0.18	-	-	-	-	-	-	-	-	-	0.18
Additional Interface Recurring	RR	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.23
Downstream Interfaces		0.04	-	-	-	-	-	-	-	-	-	0.04
Hosting Hardware	RR	0.10	0.0	0.0	0.0	0.0	0.10	0.0	0.0	0.0	0.0	0.22
Optimism Bias		0.31	0.08	0.08	0.08	0.08	0.11	0.08	0.08	0.08	0.08	1.05
Total		1.34	0.34	0.34	0.34	0.34	0.47	0.34	0.34	0.34	0.34	4.53
Non-Recurring Capital (NRC)		1.15	-	-	-	-	-	-	-	-	-	1.15
Non-Recurring Revenue (NRR)		0.02	0.0	-	-	-	-	-	-	-	-	0.03
Recurring Revenue (RR)		0.17	0.34	0.34	0.34	0.34	0.47	0.34	0.34	0.34	0.34	3.36
Total Economic Cost		1.34	0.34	0.34	0.34	0.34	0.47	0.34	0.34	0.34	0.34	4.53
Net Present Cost		1.34	0.33	0.32	0.31	0.30	0.40	0.28	0.27	0.26	0.25	4.04
NRC (Incl. VAT & Indexation)		1.38	-	-	-	-	-	-	-	-	-	1.38
NRR (Incl. VAT & Indexation)		0.02	0.0	-	-	-	-	-	-	-	-	0.03
RR (Incl. VAT & Indexation)		0.18	0.41	0.42	0.43	0.43	0.59	0.45	0.46	0.47	0.47	4.30
Financial Cost		1.57	0.42	0.42	0.43	0.43	0.59	0.45	0.46	0.47	0.47	5.71
Assumed Resources In Post		(0.0)	(0.0)	-	-	-	-	-	-	-	-	(0.0)
Total Financial Cost		1.57	0.42	0.42	0.43	0.43	0.59	0.45	0.46	0.47	0.47	5.70
Depreciation (Capital Costs)		0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	1.15

*cost shown as '0.0' are less than £10k a year

NHS Grampian

Cost (£m)	Cost Type	Year										Total
		1	2	3	4	5	6	7	8	9	10	
LIMS Software Licence	NRC	0.19	-	-	-	-	-	-	-	-	-	0.19
Annual Support	RR	-	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	3.16
Supplier Implementation	NRR	0.97	-	-	-	-	-	-	-	-	-	0.97
Design	NRR	0.04	-	-	-	-	-	-	-	-	-	0.04
Build & Local Config	NRR	0.43	-	-	-	-	-	-	-	-	-	0.43
Rollout	NRR	-	0.35	-	-	-	-	-	-	-	-	0.35
BAU	RR	-	0.05	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.71
LIMS Interface Build	NRC	0.22	-	-	-	-	-	-	-	-	-	0.22
LIMS Interface Support	RR	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.33
Additional Interface Build	NRC	0.18	-	-	-	-	-	-	-	-	-	0.18
Additional Interface Recurring	RR	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.23
Downstream Interfaces	NRC	0.04	-	-	-	-	-	-	-	-	-	0.04
Hosting Hardware	RR	0.20	0.0	0.0	0.0	0.0	0.20	0.0	0.0	0.0	0.0	0.44
Optimism Bias		0.70	0.24	0.15	0.15	0.15	0.21	0.15	0.15	0.15	0.15	2.18
Total		3.02	1.05	0.64	0.64	0.64	0.90	0.64	0.64	0.64	0.64	9.46
Non-Recurring Capital (NRC)		2.08	-	-	-	-	-	-	-	-	-	2.08
Non-Recurring Revenue (NRR)		0.61	0.45	-	-	-	-	-	-	-	-	1.06
Recurring Revenue (RR)		0.34	0.60	0.64	0.64	0.64	0.90	0.64	0.64	0.64	0.64	6.32
Total Economic Cost		3.02	1.05	0.64	0.64	0.64	0.90	0.64	0.64	0.64	0.64	9.46
Net Present Cost		3.02	1.01	0.60	0.58	0.56	0.76	0.52	0.50	0.49	0.47	8.51
NRC (Incl. VAT & Indexation)		2.50	-	-	-	-	-	-	-	-	-	2.50
NRR (Incl. VAT & Indexation)		0.61	0.46	-	-	-	-	-	-	-	-	1.07
RR (Incl. VAT & Indexation)		0.35	0.71	0.77	0.79	0.80	1.10	0.83	0.84	0.86	0.87	7.92
Financial Cost		3.45	1.18	0.77	0.79	0.80	1.10	0.83	0.84	0.86	0.87	11.48
Assumed Resources In Post		(0.07)	(0.05)	-	-	-	-	-	-	-	-	(0.12)
Total Financial Cost		3.39	1.12	0.77	0.79	0.80	1.10	0.83	0.84	0.86	0.87	11.36
Depreciation (Capital Costs)		0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	2.08

*cost shown as '0.0' are less than £10k a year

NHS Greater Glasgow & Clyde

Cost (£m)	Cost Type	Year										Total
		1	2	3	4	5	6	7	8	9	10	
LIMS Software Licence	NRC	0.67	-	-	-	-	-	-	-	-	-	0.67
Annual Support	RR	-	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	6.27
Supplier Implementation	NRR	2.0	-	-	-	-	-	-	-	-	-	2.0
Design	NRR	0.11	-	-	-	-	-	-	-	-	-	0.11
Build & Local Config	NRR	1.23	0.21	-	-	-	-	-	-	-	-	1.44
Rollout	NRR	-	1.01	-	-	-	-	-	-	-	-	1.01
BAU	RR	-	0.12	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	2.02
LIMS Interface Build	NRC	0.23	-	-	-	-	-	-	-	-	-	0.23
LIMS Interface Support	RR	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.36
Additional Interface Build	NRC	0.18	-	-	-	-	-	-	-	-	-	0.18
Additional Interface Recurring	RR	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.23
Downstream Interfaces	NRC	0.04	-	-	-	-	-	-	-	-	-	0.04
Hosting Hardware	RR	0.41	0.01	0.01	0.01	0.01	0.41	0.01	0.01	0.01	0.01	0.88
Optimism Bias		1.48	0.63	0.30	0.30	0.30	0.42	0.30	0.30	0.30	0.30	4.64
Total		6.43	2.72	1.30	1.30	1.30	1.82	1.30	1.30	1.30	1.30	20.09
Non-Recurring Capital (NRC)		4.07	-	-	-	-	-	-	-	-	-	4.07
Non-Recurring Revenue (NRR)		1.75	1.57	-	-	-	-	-	-	-	-	3.33
Recurring Revenue (RR)		0.61	1.15	1.30	1.30	1.30	1.82	1.30	1.30	1.30	1.30	12.69
Total Economic Cost		6.43	2.72	1.30	1.30	1.30	1.82	1.30	1.30	1.30	1.30	20.09
Net Present Cost		6.43	2.63	1.22	1.17	1.13	1.53	1.06	1.02	0.99	0.96	18.14
NRC (Incl. VAT & Indexation)		4.88	-	-	-	-	-	-	-	-	-	4.88
NRR (Incl. VAT & Indexation)		1.75	1.61	-	-	-	-	-	-	-	-	3.36
RR (Incl. VAT & Indexation)		0.62	1.37	1.55	1.58	1.61	2.21	1.66	1.69	1.72	1.75	15.76
Financial Cost		7.26	2.97	1.55	1.58	1.61	2.21	1.66	1.69	1.72	1.75	24.0
Assumed Resources In Post		(0.20)	(0.18)	-	-	-	-	-	-	-	-	(0.38)
Total Financial Cost		7.06	2.79	1.55	1.58	1.61	2.21	1.66	1.69	1.72	1.75	23.63
Depreciation (Capital Costs)		0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	4.07

*cost shown as '0.0' are less than £10k a year

NHS Lothian

Cost (£m)	Cost Type	Year										Total
		1	2	3	4	5	6	7	8	9	10	
LIMS Software Licence	NRC	0.27	-	-	-	-	-	-	-	-	-	0.27
Annual Support	RR	-	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	6.27
Supplier Implementation	NRR	2.0	-	-	-	-	-	-	-	-	-	2.0
Design	NRR	0.06	-	-	-	-	-	-	-	-	-	0.06
Build & Local Config	NRR	0.68	0.11	-	-	-	-	-	-	-	-	0.79
Rollout	NRR	-	0.55	-	-	-	-	-	-	-	-	0.55
BAU	RR	-	0.07	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	1.11
LIMS Interface Build	NRC	0.20	-	-	-	-	-	-	-	-	-	0.20
LIMS Interface Support	RR	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.29
Additional Interface Build	NRC	0.18	-	-	-	-	-	-	-	-	-	0.18
Additional Interface Recurring	RR	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.23
Downstream Interfaces	NRC	0.04	-	-	-	-	-	-	-	-	-	0.04
Hosting Hardware	RR	0.41	0.01	0.01	0.01	0.01	0.41	0.01	0.01	0.01	0.01	0.88
Optimism Bias		1.17	0.45	0.27	0.27	0.27	0.39	0.27	0.27	0.27	0.27	3.86
Total		5.06	1.93	1.15	1.15	1.15	1.67	1.15	1.15	1.15	1.15	16.73
Non-Recurring Capital (NRC)		3.50	-	-	-	-	-	-	-	-	-	3.50
Non-Recurring Revenue (NRR)		0.96	0.86	-	-	-	-	-	-	-	-	1.83
Recurring Revenue (RR)		0.60	1.07	1.15	1.15	1.15	1.67	1.15	1.15	1.15	1.15	11.41
Total Economic Cost		5.06	1.93	1.15	1.15	1.15	1.67	1.15	1.15	1.15	1.15	16.73
Net Present Cost		5.06	1.87	1.08	1.04	1.0	1.41	0.94	0.91	0.88	0.85	15.02
NRC (Incl. VAT & Indexation)		4.20	-	-	-	-	-	-	-	-	-	4.20
NRR (Incl. VAT & Indexation)		0.96	0.88	-	-	-	-	-	-	-	-	1.84
RR (Incl. VAT & Indexation)		0.61	1.28	1.39	1.42	1.44	2.04	1.49	1.52	1.55	1.57	14.32
Financial Cost		5.77	2.17	1.39	1.42	1.44	2.04	1.49	1.52	1.55	1.57	20.36
Assumed Resources In Post		(0.11)	(0.10)	-	-	-	-	-	-	-	-	(0.21)
Total Financial Cost		5.67	2.07	1.39	1.42	1.44	2.04	1.49	1.52	1.55	1.57	20.16
Depreciation (Capital Costs)		0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	3.50

*cost shown as '0.0' are less than £10k a year

NHS Orkney

Cost (£m)	Cost Type	Year										Total
		1	2	3	4	5	6	7	8	9	10	
LIMS Software Licence	NRC	0.0	-	-	-	-	-	-	-	-	-	0.0
Annual Support	RR	-	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	2.06
Supplier Implementation	NRR	0.58	-	-	-	-	-	-	-	-	-	0.58
Design	NRR	0.0	-	-	-	-	-	-	-	-	-	0.0
Build & Local Config	NRR	0.01	-	-	-	-	-	-	-	-	-	0.01
Rollout	NRR	0.01	0.01	-	-	-	-	-	-	-	-	0.01
BAU	RR	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.03
LIMS Interface Build	NRC	0.09	-	-	-	-	-	-	-	-	-	0.09
LIMS Interface Support	RR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.03
Additional Interface Build	NRC	0.18	-	-	-	-	-	-	-	-	-	0.18
Additional Interface Recurring	RR	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.23
Downstream Interfaces	NRC	0.04	-	-	-	-	-	-	-	-	-	0.04
Hosting Hardware	RR	0.10	0.0	0.0	0.0	0.0	0.10	0.0	0.0	0.0	0.0	0.22
Optimism Bias		0.31	0.08	0.08	0.08	0.08	0.11	0.08	0.08	0.08	0.08	1.04
Total		1.35	0.34	0.34	0.34	0.34	0.47	0.34	0.34	0.34	0.34	4.52
Non-Recurring Capital (NRC)		1.16	-	-	-	-	-	-	-	-	-	1.16
Non-Recurring Revenue (NRR)		0.02	0.01	-	-	-	-	-	-	-	-	0.03
Recurring Revenue (RR)		0.17	0.34	0.34	0.34	0.34	0.47	0.34	0.34	0.34	0.34	3.33
Total Economic Cost		1.35	0.34	0.34	0.34	0.34	0.47	0.34	0.34	0.34	0.34	4.52
Net Present Cost		1.35	0.33	0.31	0.30	0.29	0.39	0.27	0.26	0.26	0.25	4.03
NRC (Incl. VAT & Indexation)		1.39	-	-	-	-	-	-	-	-	-	1.39
NRR (Incl. VAT & Indexation)		0.02	0.01	-	-	-	-	-	-	-	-	0.03
RR (Incl. VAT & Indexation)		0.17	0.41	0.42	0.42	0.43	0.58	0.45	0.45	0.46	0.47	4.26
Financial Cost		1.59	0.42	0.42	0.42	0.43	0.58	0.45	0.45	0.46	0.47	5.68
Assumed Resources In Post		(0.0)	(0.0)	-	-	-	-	-	-	-	-	(0.0)
Total Financial Cost		1.59	0.42	0.42	0.42	0.43	0.58	0.45	0.45	0.46	0.47	5.68
Depreciation (Capital Costs)		0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	1.16

*cost shown as '0.0' are less than £10k a year

NHS Shetland

Cost (£m)	Cost Type	Year										Total
		1	2	3	4	5	6	7	8	9	10	
LIMS Software Licence	NRC	0.0	-	-	-	-	-	-	-	-	-	0.0
Annual Support	RR	-	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	2.06
Supplier Implementation	NRR	0.58	-	-	-	-	-	-	-	-	-	0.58
Design	NRR	0.0	-	-	-	-	-	-	-	-	-	0.0
Build & Local Config	NRR	0.01	-	-	-	-	-	-	-	-	-	0.01
Rollout	NRR	0.01	0.01	-	-	-	-	-	-	-	-	0.01
BAU	RR	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.03
LIMS Interface Build	NRC	0.09	-	-	-	-	-	-	-	-	-	0.09
LIMS Interface Support	RR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.03
Additional Interface Build	NRC	0.18	-	-	-	-	-	-	-	-	-	0.18
Additional Interface Recurring	RR	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.23
Downstream Interfaces		0.04	-	-	-	-	-	-	-	-	-	0.04
Hosting Hardware	RR	0.10	0.0	0.0	0.0	0.0	0.10	0.0	0.0	0.0	0.0	0.22
Optimism Bias		0.31	0.08	0.08	0.08	0.08	0.11	0.08	0.08	0.08	0.08	1.04
Total		1.35	0.34	0.34	0.34	0.34	0.47	0.34	0.34	0.34	0.34	4.52
Non-Recurring Capital (NRC)		1.16	-	-	-	-	-	-	-	-	-	1.16
Non-Recurring Revenue (NRR)		0.02	0.01	-	-	-	-	-	-	-	-	0.03
Recurring Revenue (RR)		0.17	0.34	0.34	0.34	0.34	0.47	0.34	0.34	0.34	0.34	3.33
Total Economic Cost		1.35	0.34	0.34	0.34	0.34	0.47	0.34	0.34	0.34	0.34	4.52
Net Present Cost		1.35	0.33	0.31	0.30	0.29	0.39	0.27	0.26	0.26	0.25	4.03
NRC (Incl. VAT & Indexation)		1.39	-	-	-	-	-	-	-	-	-	1.39
NRR (Incl. VAT & Indexation)		0.02	0.01	-	-	-	-	-	-	-	-	0.03
RR (Incl. VAT & Indexation)		0.17	0.41	0.42	0.42	0.43	0.58	0.45	0.45	0.46	0.47	4.26
Financial Cost		1.59	0.42	0.42	0.42	0.43	0.58	0.45	0.45	0.46	0.47	5.69
Assumed Resources In Post		(0.0)	(0.0)	-	-	-	-	-	-	-	-	(0.0)
Total Financial Cost		1.59	0.42	0.42	0.42	0.43	0.58	0.45	0.45	0.46	0.47	5.68
Depreciation (Capital Costs)		0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	1.16

*cost shown as '0.0' are less than £10k a year

NHS Tayside

Cost (£m)	Cost Type	Year										Total
		1	2	3	4	5	6	7	8	9	10	
LIMS Software Licence	NRC	0.17	-	-	-	-	-	-	-	-	-	0.17
Annual Support	RR	-	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	3.16
Supplier Implementation	NRR	0.97	-	-	-	-	-	-	-	-	-	0.97
Design	NRR	0.04	-	-	-	-	-	-	-	-	-	0.04
Build & Local Config	NRR	0.40	-	-	-	-	-	-	-	-	-	0.40
Rollout	NRR	-	0.33	-	-	-	-	-	-	-	-	0.33
BAU	RR	-	0.04	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.66
LIMS Interface Build	NRC	0.13	-	-	-	-	-	-	-	-	-	0.13
LIMS Interface Support	RR	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.08
Additional Interface Build	NRC	0.18	-	-	-	-	-	-	-	-	-	0.18
Additional Interface Recurring	RR	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.23
Downstream Interfaces	NRC	0.04	-	-	-	-	-	-	-	-	-	0.04
Hosting Hardware	RR	0.20	0.0	0.0	0.0	0.0	0.20	0.0	0.0	0.0	0.0	0.44
Optimism Bias		0.65	0.23	0.14	0.14	0.14	0.20	0.14	0.14	0.14	0.14	2.05
Total		2.81	0.98	0.60	0.60	0.60	0.86	0.60	0.60	0.60	0.60	8.86
Non-Recurring Capital (NRC)		1.93	-	-	-	-	-	-	-	-	-	1.93
Non-Recurring Revenue (NRR)		0.57	0.42	-	-	-	-	-	-	-	-	0.99
Recurring Revenue (RR)		0.30	0.56	0.60	0.60	0.60	0.86	0.60	0.60	0.60	0.60	5.94
Total Economic Cost		2.81	0.98	0.60	0.60	0.60	0.86	0.60	0.60	0.60	0.60	8.86
NPC (10 years discounting)		2.81	0.95	0.56	0.54	0.52	0.73	0.49	0.47	0.46	0.44	7.97
NRC (Incl. VAT & Indexation)		2.32	-	-	-	-	-	-	-	-	-	2.32
NRR (Incl. VAT & Indexation)		0.57	0.43	-	-	-	-	-	-	-	-	1.0
RR (Incl. VAT & Indexation)		0.31	0.67	0.73	0.74	0.75	1.05	0.78	0.79	0.80	0.82	7.44
Financial Cost		3.20	1.10	0.73	0.74	0.75	1.05	0.78	0.79	0.80	0.82	10.76
Assumed Resources In Post		(0.06)	(0.05)	-	-	-	-	-	-	-	-	(0.11)
Total Financial Cost		3.14	1.05	0.73	0.74	0.75	1.05	0.78	0.79	0.80	0.82	10.64
Depreciation (Capital Costs)		0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	1.93

*cost shown as '0.0' are less than £10k a year

Appendix G: Alternate User Concurrency Costing

Total 10 Year Economic Cost for Consortium Boards – 50% User Concurrency

Option 3A - 10 Year Cost (£m)	NHS Borders	NHS D&G	NHS Fife	NHS Forth Valley	NHS Golden Jubilee	NHS Gram-pian	NHS GGC	NHS Lothian	NHS Orkney	NHS Shet-land	NHS Tayside
LIMS Software Licence	0.07	0.11	0.24	0.15	0.01	0.39	1.35	0.53	0.00	0.00	0.34
Supplier Annual Support	2.06	2.06	2.29	2.29	2.06	3.16	6.27	6.27	2.06	2.06	3.16
Supplier Implementation	0.58	0.58	0.80	0.80	0.58	0.97	2.00	2.00	0.58	0.58	0.97
Design	0.01	0.01	0.03	0.02	0.00	0.04	0.11	0.06	0.00	0.00	0.04
Build & Local Config	0.07	0.08	0.24	0.18	0.01	0.43	1.44	0.79	0.01	0.01	0.40
Rollout	0.05	0.06	0.19	0.14	0.01	0.35	1.01	0.55	0.01	0.01	0.33
BAU	0.19	0.21	0.49	0.36	0.03	0.71	2.02	1.11	0.03	0.03	0.66
LIMS Interface Build	0.06	0.06	0.09	0.09	0.07	0.22	0.23	0.20	0.09	0.09	0.13
LIMS Interface Support	0.03	0.03	0.04	0.04	0.05	0.33	0.36	0.29	0.03	0.03	0.08
Add. Licences Build	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
Add. Licences Recurring	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23
Downstream Interfaces	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Hosting Hardware	0.22	0.22	0.33	0.33	0.22	0.44	0.88	0.88	0.22	0.22	0.44
Optimism Bias	**1.14**	**1.16**	**1.56**	**1.46**	**1.05**	**2.24**	**4.84**	**3.94**	**1.04**	**1.04**	**2.10**
Total with OB	**4.93**	**5.03**	**6.76**	**6.31**	**4.54**	**9.71**	**20.96**	**17.08**	**4.52**	**4.52**	**9.08**
Non Recurring Capital (NRC)	1.22	1.27	1.76	1.64	1.15	2.33	4.94	3.85	1.17	1.17	2.16
Non Recurring Revenue (NRR)	0.18	0.20	0.60	0.44	0.03	1.06	3.33	1.83	0.03	0.03	0.99
Recurring Revenue (RR)	3.53	3.56	4.40	4.22	3.36	6.32	12.69	11.41	3.33	3.33	5.94
Total with Optimism Bias over 10 years	**4.93**	**5.03**	**6.76**	**6.31**	**4.54**	**9.71**	**20.96**	**17.08**	**4.52**	**4.52**	**9.08**
NPC over 10 years	4.40	4.50	6.10	5.68	4.05	8.76	19.02	15.37	4.03	4.03	8.19

Total 10 Year Financial Cost for Consortium Boards – 50% User Concurrency

Option 3A - 10 Year Cost (£m)	NHS Borders	NHS D&G	NHS Fife	NHS Forth Valley	NHS Golden Jubilee	NHS Grampian	NHS GGC	NHS Lothian	NHS Orkney	NHS Shetland	NHS Tayside

Consolidated Financial Considerations											
NRC (Incl. VAT & Indexation)	1.46	1.52	2.11	1.97	1.38	2.80	5.93	4.61	1.40	1.40	2.59
NRR (Incl. VAT & Indexation)	0.18	0.20	0.60	0.44	0.03	1.07	3.36	1.84	0.03	0.03	1.00
RR (Incl. VAT & Indexation)	4.49	4.52	5.50	5.31	4.30	7.92	15.76	14.32	4.26	4.26	7.44
Total (Incl. VAT & Index.)	**6.13**	**6.24**	**8.22**	**7.72**	**5.71**	**11.79**	**25.05**	**20.78**	**5.69**	**5.69**	**11.02**
Existing Resources In Post	0.02	0.02	0.07	0.05	0.00	0.12	0.38	0.21	0.00	0.00	0.11
Total Financial Cost	**6.11**	**6.22**	**8.15**	**7.67**	**5.71**	**11.67**	**24.68**	**20.57**	**5.68**	**5.69**	**10.91**

Capital Depreciation	1.22	1.27	1.76	1.64	1.15	2.33	4.94	3.85	1.17	1.17	2.16

Total 10 Year Economic Cost for Consortium Boards – 100% User Concurrency

Option 3A - 10 Year Cost (£m)	NHS Borders	NHS D&G	NHS Fife	NHS Forth Valley	NHS Golden Jubilee	NHS Gram-pian	NHS GGC	NHS Lothian	NHS Orkney	NHS Shet-land	NHS Tayside
LIMS Software Licence	0.14	0.22	0.48	0.30	0.02	0.77	2.69	1.06	0.01	0.01	0.68
Supplier Annual Support	2.06	2.06	2.29	2.29	2.06	3.16	6.27	6.27	2.06	2.06	3.16
Supplier Implementation	0.58	0.58	0.80	0.80	0.58	0.97	2.00	2.00	0.58	0.58	0.97
Design	0.01	0.01	0.03	0.02	0.00	0.04	0.11	0.06	0.00	0.00	0.04
Build & Local Config	0.07	0.08	0.24	0.18	0.01	0.43	1.44	0.79	0.01	0.01	0.40
Rollout	0.05	0.06	0.19	0.14	0.01	0.35	1.01	0.55	0.01	0.01	0.33
BAU	0.19	0.21	0.49	0.36	0.03	0.71	2.02	1.11	0.03	0.03	0.66
LIMS Interface Build	0.06	0.06	0.09	0.09	0.07	0.22	0.23	0.20	0.09	0.09	0.13
LIMS Interface Support	0.03	0.03	0.04	0.04	0.05	0.33	0.36	0.29	0.03	0.03	0.08
Add. Licences Build	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
Add. Licences Recurring	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23
Downstream Interfaces	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Hosting Hardware	0.22	0.22	0.33	0.33	0.22	0.44	0.88	0.88	0.22	0.22	0.44
Optimism Bias	**1.16**	**1.19**	**1.63**	**1.50**	**1.05**	**2.36**	**5.24**	**4.10**	**1.04**	**1.04**	**2.20**
Total with OB	**5.02**	**5.17**	**7.07**	**6.50**	**4.55**	**10.21**	**22.71**	**17.77**	**4.53**	**4.53**	**9.53**
Non Recurring Capital (NRC)	1.31	1.41	2.07	1.84	1.17	2.83	6.70	4.54	1.17	1.17	2.60
Non Recurring Revenue (NRR)	0.18	0.20	0.60	0.44	0.03	1.06	3.33	1.83	0.03	0.03	0.99
Recurring Revenue (RR)	3.53	3.56	4.40	4.22	3.36	6.32	12.69	11.41	3.33	3.33	5.94
Total with Optimism Bias over 10 years	**5.02**	**5.17**	**7.07**	**6.50**	**4.55**	**10.21**	**22.71**	**17.77**	**4.53**	**4.53**	**9.53**
NPC over 10 years	4.50	4.64	6.41	5.87	4.06	9.26	20.77	16.06	4.04	4.04	8.64

Total 10 Year Financial Cost for Consortium Boards – 50% User Concurrency

Option 3A - 10 Year Cost (£m)	NHS Borders	NHS D&G	NHS Fife	NHS Forth Valley	NHS Golden Jubilee	NHS Grampian	NHS GGC	NHS Lothian	NHS Orkney	NHS Shetland	NHS Tayside
Consolidated Financial Considerations											
NRC (Incl. VAT & Indexation)	1.58	1.69	2.49	2.20	1.40	3.40	8.03	5.44	1.41	1.41	3.12
NRR (Incl. VAT & Indexation)	0.18	0.20	0.60	0.44	0.03	1.07	3.36	1.84	0.03	0.03	1.00
RR (Incl. VAT & Indexation)	4.49	4.52	5.50	5.31	4.30	7.92	15.76	14.32	4.26	4.26	7.44
Total (Incl. VAT & Index.)	**6.24**	**6.41**	**8.59**	**7.96**	**5.73**	**12.39**	**27.16**	**21.60**	**5.70**	**5.70**	**11.56**
Existing Resources In Post	0.02	0.02	0.07	0.05	0.00	0.12	0.38	0.21	0.00	0.00	0.11
Total Financial Cost	**6.22**	**6.39**	**8.52**	**7.91**	**5.73**	**12.27**	**26.78**	**21.40**	**5.69**	**5.69**	**11.45**

Capital Depreciation	1.31	1.41	2.07	1.84	1.17	2.83	6.70	4.54	1.17	1.17	2.60

Appendix I: Hosting Comparison

Cloud Vs On-Premise

While costing purposes assume local hosting hardware, the advantages and limitations of cloud-based hosting has been included in this section for reference.

Three types of hosting have been included below, on premise / local data centre hosting, Infrastructure-as-a-Service (Cloud Hosting), and Software-as-a-Service (Managed Service).

On-Premise (Local Hosting)

Description:

On-premise involves all software being stood up and hosted on local hardware which is owned and managed by the organisation in question, who has both full control and full responsibility of security and upkeep. This requires in-house server hardware, software licences, integration capabilities and IT staff on hand to support and manage any potential issues that arise.

Advantages:

- Organisations are fully in control of their own hardware
- Data is fully owned and managed within internal infrastructure
- No reliance on 3rd party service providers

Limitations:

- **Capital Costs.** On-premise environments often have higher associated capital expenditure costs as all hardware and software is needed to be purchased and managed.
- **Maintenance**. Can be further costly to maintain and keep up-to-date as full responsibility of organisation.
- **Scaling Difficulty.** Difficult to scale as required as further physical would be needed.

Infrastructure-as-a-Service (Cloud Hosting)

Description:

Cloud infrastructure services, known as Infrastructure as a Service (IaaS), are made of scalable and automated compute resources. IaaS is fully self-service for accessing and monitoring computers, networking, storage, and other services. IaaS allows businesses to purchase resources on-demand and as-needed instead of having to buy hardware outright.

Advantages:

- The most flexible cloud computing model
- Easy to automate deployment of storage, networking, servers, and processing power
- Hardware purchases can be based on consumption
- Clients retain complete control of their infrastructure
- Resources can be purchased as-needed
- Highly scalable

Limitations:

- **Security.** While control of the applications, data, middleware, and the OS platform, security threats can still be sourced from the host or other virtual machines (VMs).
- **Legacy systems operating in the cloud**. While legacy apps can run in the cloud, the infrastructure may not be designed to deliver specific controls to secure the legacy apps.
- **Internal resources and training**. Additional resources and training may be required for the workforce to learn how to effectively manage the infrastructure.
- **Multi-tenant security**. Since the hardware resources are dynamically allocated across users as made available, organisations must rely on the vendor to ensure that VMs are adequately isolated within the multitenant cloud architecture.

Software-as-a-Service (Managed Service)

Description:

Software as a Service, also known as cloud application services, represents the most commonly utilized option for businesses in the cloud market. SaaS utilizes the internet to deliver applications, which are managed by a third-party vendor, to its users. A majority of SaaS applications run directly web browsers, which means they do not require any downloads or installations on the client side.

Advantages:

- Typically significantly reduced deployment time
- No requirement for installing, managing, and upgrading software
- No hardware costs, beyond existing hardware
- Updates are typically pushed directly to end-user

Limitations:

- **Interoperability.** Integration with existing apps and services can be an issue if the SaaS app is not designed to follow open standards for integration.
- **Vendor lock-in.** Vendors may make it easy to join a service and difficult to get out of it. For instance, the data may not be portable–technically or cost-effectively–across SaaS apps from other vendors without incurring significant cost or in house engineering rework. Not every vendor follows standard APIs, protocols, and tools, yet the features could be necessary for certain business tasks.
- **Lack of integration support**. Many organizations require deep integrations with on premise apps, data, and services. The SaaS vendor may offer limited support in this regard, forcing organizations to invest internal resources in designing and managing integrations.
- **Data security.** Large volumes of data may have to be exchanged to the backend data centres of SaaS apps in order to perform the necessary software functionality.
- **Lack of control.** SaaS solutions involves handing control over to the third-party service provider. These controls are not limited to the software–in terms of the version, updates, or appearance–but also the data and governance.
- **Performance and downtime.** The vendor controls and manages the SaaS service, including security and performance. Planned and unplanned maintenance, cyber-attacks, or network issues may impact the performance of the SaaS app despite adequate service level agreement (SLA) protections in place.

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NHS Borders

Meeting:	**Borders NHS Board**
Meeting date:	**15 June 2022**
Title:	**Earlston Medical Practice**
Responsible Executive/Non-Executive:	**June Smyth & Andrew Bone**
Report Author:	**Carly Lyall, Planning & Performance Officer**

1 Purpose

This is presented to the Board for:

- Decision

This report relates to a:

- NHS Board/Integration Joint Board Strategy or Direction

This aligns to the following NHS Scotland quality ambition(s):

- Safe
- Effective

2 Report summary

2.1 Situation

In September 2021 the Resources & Performance Committee noted that the current Earlston Health Centre is no longer fit for purpose and approved in principle, the reprovision of the Earlston Medical Practice to the proposed Earlston Community Campus, subject to confirmation of a suitable funding source.

This paper aims to provide the Board with information regarding the options to progress with the development opportunity in partnership Scottish Borders Council (SBC).

The Board are recommended approve the new Medical Practice build within Earlston Community Campus, on a lease agreement from SBC for 30 years, details of which are outlined in the paper.

2.2 Background

In February 2016 Earlston Heath Centre was earmarked as a future capital project, with plans to extend the existing building and undertake some internal reconfiguration to provide additional GP consulting rooms and a safe room. The proposed scheme aimed to "future-proof" as far as possible the health centre facilities, bearing in mind the projected population figures and patient activity trends which were used to inform the review and prioritisation process.

In July 2018 the Scottish Government published the Primary Care Improvement Plan (PCIP) which outlined a number of changes to the way in which primary care services would be delivered. In particular, it identified additional workforce roles to support the delivery of the General Medical Services (GMS) 2018 contract, which would require accommodation in primary care premises in future.

Towards the end of the 2018/19 financial year SBC approached NHS Borders informally to ask if there would be interest in moving the Health Centre to be part of a proposed development for a new Primary School in Earlston. Early discussions were held between the practice, NHS Borders staff and Council staff but no definitive decision to progress was made.

At the end of Quarter 2 2020/21 Buchan + Associates were commissioned by Hub South East on behalf of NHS Borders to conduct a review of GP primary care services and premises, taking account of the implementation of PCIP and new housing developments with the objective of identifying investment priorities within primary care premises.

2.3 Assessment

The work carried out by Buchan + Associates highlighted that the current Earlston Medical Practice has insufficient space with no option to redevelop and is a building in need of investment. It is unfit for modern healthcare delivery and does not provide adequate space for the range of services offered within primary care.

Within Earlston, SBC have continued planning work to develop Earlston Community Campus which will primarily accommodate Earlston Primary School. In 2020 NHS Borders were again approached to assess if this would be of interest for the Health Centre.

Since then a considerable amount of time has been allocated to this project from Primary & Community Services staff, practice staff and the Planning & Performance team, as well as invited stakeholders at various points in the process. Through the discussions the practice, the Primary Care Management Team and PCIP staff, have contributed to the confirmation of space requirements, for both now and the future.

NHS Borders has commissioned independent technical advisors to ensure the health centre element of the build is fit for purpose and in line with healthcare standards and regulations throughout each stage of the design. SBC have given assurance once the technical advisors have completed their review any recommendations that are absolutely essential will be accommodated in the design.

2.3.1 Quality/ Patient Care

The current Earlston Medical Practice now has insufficient space, it is unfit for modern healthcare delivery and does not provide adequate space for the range of services offered within primary care.

The development of a new Medical Practice would provide an environment for high quality patient care in an appropriate setting with a focus on health improvement, partnership working and be at the heart of the community.

2.3.2 Workforce

Currently staff within Earlston Medical Practice do not have adequate space. The new Medical Practice would provide a new, purpose build work space for staff, a large staff room with dedicated staff toilets and shower facilities, along with a terraced area so staff can enjoy some outdoor space during lunch and break times. The layout and rooms are being designed to ensure staff can do their jobs both effectively and efficiently. This also allows for a flexible workforce morning forward along with working close with the school.

2.3.3 Financial

All financial information is included within the Business Case.

2.3.4 Risk Assessment/Management

Currently there is reputational risk to practice if unable to access the range of services within primary care.

Operational risk associated with need to provide appropriate space for increased multi-disciplinary team

Staffing risk associated with recruitment, retention if unable to access appropriate spaces to undertake their role.

2.3.5 Equality and Diversity, including health inequalities

This option would not have a negative impact on the practice population and given the partnership working opportunities within the community space and the school, it may lead to improved outcomes for the community.

2.3.6 Other impacts

There are no other relevant impacts identified in relation to the matters discussed in this paper.

2.3.7 Communication, involvement, engagement and consultation

The Board has carried out its duties to involve and engage external stakeholders where appropriate:

- **September 2019 -** 1st public consultation for new Primary School and Community Facilities
- **28.09.21 -** 2nd public consultation which brought in the Health Centre part of the project
- **May 2021 -** First session with Earlston Practice Team
- Monthly catch ups with project team followed this until planning submission in November 2021
- **13.01.22 -** Review of plans and brief with GP Practice
- **20.01.22 -** Primary & Community Services Management Team Briefing
- **22.02.22 -** Workshop with wider NHS technical team
- **02.03.22 -** On site meeting with GP practice and approval of layout
- **23.03.22 -** Primary & Community Services Management Team, approval of layout
- **20.06.22 -** Further Public Consultation Event planned

2.3.8 Route to the Meeting

This has been previously considered by the following groups as part of its development. The groups have either supported the content, or their feedback has informed the development of the content presented in this report.

- Primary & Community Services Management Team – 7th June 2022

2.4 Recommendation

- **Decision** – Reaching a conclusion after the consideration of options outlined in the paper.

3 List of appendices

The following appendices are included with this report:

- Appendix 1, Business Case
- Appendix 2, Current Site Plan
- Appendix 3, Proposed landscape visuals

BUSINESS CASE TO APPROVE THE LEASE AGREEMENT FOR THE DEVELOPMENT OF A NEW EARLSTON HEALTH CENTRE WITHIN EARLSTON COMMUNITY CAMPUS

June 2022

1. Executive Summary

1.1 In February 2016 Earlston Heath Centre was earmarked as a future capital project, with plans to extend the existing building and undertake some internal reconfiguration to provide additional GP consulting rooms and a safe room. The proposed scheme aimed to "future-proof" as far as possible the health centre facilities, bearing in mind the projected population figures and patient activity trends which were used to inform the review and prioritisation process.

1.2 In July 2018 the Scottish Government published the Primary Care Improvement Plan (PCIP) which outlined significant changes to the way in which primary care services would be delivered. It identified a number of additional workforce roles to support the delivery of the General Medical Services (GMS) 2018 contract, which would require accommodation in primary care premises in future.

1.3 Towards the end of the 2018/19 financial year Scottish Borders Council (SBC) approached NHS Borders informally to ask if there would be interest in moving the Health Centre to be part of a proposed development for a new Primary School in Earlston. Early discussions were held between the practice, NHS Borders staff and SBC staff but no definitive decision to progress was made.

1.4 At the end of Quarter 2 2020/21 Buchan + Associates were commissioned by Hub South East on behalf of NHS Borders to conduct a review of GP primary care services and premises, taking account of the implementation of PCIP and new housing developments with the objective of identifying investment priorities within primary care premises.

1.6 The work carried out by Buchan + Associates highlighted that the current Earlston Health Centre now has insufficient space with no option to redevelop and is a building in need of investment. It is unfit for modern healthcare delivery and does not provide adequate space for the range of services offered within primary care as part of the new GMS contract.

1.7 Within Earlston, SBC have continued planning work to develop Earlston Community Campus which will primarily accommodate Earlston Primary School. In 2020 NHS Borders were again approached to assess if this would be of interest for the Health Centre.

1.8 In September 2021 the Resources & Performance Committee noted that the current Earlston Health Centre is no longer fit for purpose and approved in

principle, the reprovision of the Earlston Health Centre to the proposed Earlston Community Campus, subject to confirmation of a suitable funding source.

1.9 A considerable amount of time has been allocated to this project from Planning & Performance and the practice staff, as well as invited stakeholders at various meetings in the process.

1.10 Discussions have been ongoing with the practice, the Primary Care Management Team and PCIP staff, who have contributed to the development of the space requirements, for both now and the future.

1.11 The architects have been able to accommodate the Health Centre needs into the overall design of the campus and the practice is keen to progress subject to confirmation that NHS Borders is committed to the proposal. Where possible seeking to maximise the opportunities to share and have flexible use of space.

1.12 The current plan along with the proposed landscape plans can be viewed in Appendices 1 and 2.

2. Strategic Case

2.1 *Current Arrangements*

2.1.1 The current Earlston practice serves 3,200 patients from a multi-disciplinary team based at the practice including:

- 5 GPs - 3 Partners, 1 Salaried GP and 1 Retainer (3.7 wte)
- 1 trainee GP (0.8 wte)
- 2 Practice Nurses
- 1 Healthcare Assistant

2.1.2 The team are supported by a range of visiting Health Board services both in practice and within patients' homes including: District Nursing, Health Visiting, Speech and Language Therapy, and the Wellbeing advice service.

2.1.3 A range of additional services have been provided as part of PCIP including: Pharmacotherapy, Vaccination Services, First Contact Practitioner Physiotherapy (FCP), Mental Health services and Allied Health Professionals.

2.1.4 Allowances have been made to accommodate current PCIP staff as well as allow space for PCIP staffing to be increased in the future. A total of 13 sessions have been allocated for the following PCIP services:

- Pharmacy - 6 sessions (currently 4)
- Mental Health - 2 sessions (currently 2)
- First Contact Physio - 2 sessions (currently 1)
- Advanced Practice Nurse - 3 sessions (based on rate 1 per 11,000)
- Community Treatment and Care (CTAC) Service - 1 x Treatment Room

2.1.5 The existing facilities are unfit for modern healthcare delivery; built over 35 years ago they comprise a single storey building of circa 400 square metres providing an entrance, reception, waiting area, consulting / treatment rooms, staff accommodation and various support spaces. The premises are owned by NHS Borders. The building has a poor layout and flow, a number of rooms are too small and there are difficulties in implementing one-way flow as a result of working during the pandemic.

2.2 *Case for Change*

2.2.1 There are a number of areas which support the case for change; these are summarised below setting out the effect and why action is required at this point in time.

Figure 1: Summary of Case for Change

What is the cause of the need for change?	What effect is it having, or likely to have on the organisation?	Why action now?
Facilitating the delivery of the new GMS contract • development of the Expert Medical Generalist role • appropriately scoping a "Manageable Workload" • shift from delivery of primary care services by GPs and Practice nurses, to delivery by a more varied and broader multi-disciplinary team	Recruitment challenges across general practice. High level of registrations per GP Unable to meet demand	Unable to fully implement new GMS contract
Leveraging the Benefit from our Primary Care Improvement Plan • vision is for enhanced and expanded multi-disciplinary teams, made up of a variety of professionals • person-centred care and support that improves outcomes for individuals and local communities	Earlston practice were unable to take Advance Nurse Practitioner roles to support Urgent Care due to space constraints	Unable to fully implement PCIP roles
Inability to meet future service demand: • The SBC Local Development Plan identified circa 260 housing units; potential for over 500 new registrations • Growing, aging population e.g. 15% growth in over 60s in 10 years	Increasing pressures on workforce and premises Unable to get timely access to primary care services	Unable to meet future demand

Inadequate facilities: most recent 6-facet review indicated need for change: • Physical condition: • Statutory Compliance: • Environmental Management • Space Utilisation: overcrowded • Functional Suitability: not satisfactory • Quality: less than satisfactory	Unable to provide all services Additional costs to maintain old building	Additional costs associated with poor building.
Opportunity to improve integration, flexible use of public sector services. Current arrangements are disparate within small village with opportunity to better share facilities.	Financial pressures associated with duplication	Timely opportunity with SBC to be part of community campus project.

2.2.2 In addition there are significant opportunities for improvement within the current arrangements underpinned by a number of national and local drivers outlined below:

Figure 2: National, Regional & Local Strategies

Policy	Key Themes	Impact
NHS Recovery Plan, August 2021	£1 billion of targeted investment over the next 5 years to increase NHS capacity, deliver reforms in the delivery of care, and get everyone the treatment they need as quickly as possible. Focus on all parts of the pathway including primary and community-based care. Overall an increase in primary care spending of at least 25% by the end of this parliament.	Further increase in the workforce within primary and community-based care, all of whom require facilities from which to deliver health and care services.
Health and Social Care Delivery Plan for Scotland (2016)	Community based treatments. Integrated, holistic health and care. Reduce duplication and delays.	Maximise the opportunity created through integration from service delivery, staffing and infrastructure
General Medical Services (2018) Contract	Development of an expanded Health Board provided Primary Care workforce. Reduction of risk to GPs, and	The aim is to enable GPs to be able to work to the top of their license as Expert Medical Generalists.

	improvements in associated infrastructure.	More resilient Primary Care. Recruitment of more staff to deliver these additional services, requiring additional infrastructure
Digital Health and Care Strategy	Access range of digital tools to maintain and improve health and wellbeing	Latest digital technologies to support person-centred care, improve the use of resources and offer increased co-production
Renewing Scotland's Public Services	Prevention Place Performance People	Place principles at centre of design concept.
2020 Vision "Achieving sustainable quality in Scotland's healthcare"	Longer, happier lives at home / homely setting. Prevention, anticipation and supported self-management.	Increase range of services to support community and primary care
HSCP Strategic Plan (2018 – 2022)	Transforming the way in which health and social care services are delivered in the Scottish Borders. Shift towards more community-based NHS and social care services.	Improve the health of the population, reduce the number of hospital admissions and improve the flow of patients into, through and out of hospital
Place Standard & 20 minute neighbourhood	20 minute neighbourhoods are a concept of urban development that has ascended rapidly in the minds of policymakers, politicians and the general public across the world because of Covid-19. Supports a move toward to a sustainable, resilient and inclusive recovery. This includes an accelerated progress to a zero-carbon economy, increased resilience to risk, and creation of fair, healthy and prosperous communities.	This programme presents an opportunity to implement place making principles and co-location and integration of services to support 20-minute neighbourhoods.
Planning Guidance for Mental Health and Wellbeing in Primary	Mental Health & Wellbeing in Primary Care (MHWPC) should be established within a group of GP practices (cluster/locality) and should be multi-agency. Every GP	Opportunity to provide capacity to deliver MHWPC services

Care Services; January 2022	practice should have access to a Community Link Worker. MHWPC services can be either fully embedded in practice teams and employed by the practice or aligned whereby employed by the health board to a group of GP practices or alternatively a hybrid model of both embedded and aligned.	
Fit for the Future: a Vision for General Practice July 2021	Developed by the Royal College of General Practitioners, this report sets out the vision for the future of General Practice in the UK. It explores 6 key enablers which the report concludes are essential to the realisation of the vision: Funding, Workforce, Modernised premises, Training and Education, Digital Technology and Research and Innovation.	This project explores many of the same themes in the local context as drivers for change and enablers for future service delivery, demonstrating alignment with the core themes.

2.3 *Benefits, Risks, Constraints & Dependencies*

2.3.1 The following have been identified as benefits of addressing the need for change:

- Improving the access to primary care services; reducing acute hospital referrals and attendances
- Increasing the range of services available to the population
- Facilitating the reduction in GP workload in line with new GMS contract
- Improving the physical environment
- Deliver economies of scale through sharing appropriate spaces within wider community campus, examples for this are listed below:
    - $80m^2$ of shared bookable multipurpose space
    - Additional community toilets and changing space
    - Community kitchen
    - Gym hall which could be used for mass vaccination clinics
    - Community library for health promotion and information sharing

2.3.2 The current situation poses a number of key risks including:

- Reputational risk to practice if unable to access the range of services within primary care
- Operational risk associated with need to provide appropriate space for increased multi-disciplinary team
- Staffing risk associated with recruitment, retention if unable to access appropriate spaces to undertake their role.

2.3.3 The following issues have been identified as constraints - limitations on the

options available:

- Access to GP services within catchment area for practice (Earlston)
- Availability of land for new build within catchment area for practice
- Potential requirement to deliver the project in line with the community campus

2.3.4 Financial constraints will be considered within the financial case.

2.3.5 The following areas have been identified as dependencies - actions which are required from others to ensure the success of the future option:

- Agreement of contractual terms and financial model for a Scottish Borders Council built facility

3 Economic Case

3.1 Options

3.1.1 A list of options have been considered for the reprovision of Earlston Health Centre, they are as follows:

1. Do nothing – maintain existing facilities only
2. Extend and refurbish existing premises
3. New build on a green site within Earlston
4. New build within Earlston Community Campus

3.2 Non-Financial Appraisal

3.2.1 An initial assessment was undertaken within the project team to assess the viability of each option. Options have been ranked based on an initial assessment against 3 broad criteria:

Suitability – will this option meet stakeholder requirements
Feasibility – is this option achievable within the scope of the project deliverables
Acceptability – is this option likely to be acceptable to relevant stakeholders

3.2.2 Scoring on each of the above is applied as follows:

Fully meets criteria	2
Partly meets criteria	1
Does not meet criteria	0

3.2.3 Assessment

Option	Description	Suitability	Feasibility	Acceptability	Total	Rank
1	Do Nothing	0	2	0	2	4
2	Expand existing facilities	2	0	1	3	3
3	New Build – Green site	2	0	2	6	2
4	New Build – Earlston Community Campus	2	2	2	6	1

3.2.4 The strengths / weaknesses of each option are described further below:

	Option 1	Option 2	Option 3 / 4
Strengths	Site is already NHS owned and has a significant useful economic life remaining. The facility meets access and location criteria.	Site is already NHS owned and has a significant useful economic life remaining. The facility meets access and location criteria.	New build will support optimal design, including healthcare guidance (e.g. room sizes, net zero and appropriate level of provision to deliver all services. Option 3 will allow for sharing of spaces and provide community focal point Option 4 – site is available
Weaknesses	Facility is unable to meet space requirements.	Expansion of facility is not easily achievable due to proximity of neighbouring buildings and lack of accessible land for construction work/base. Any adaptation of existing building will require compromise to optimal design. It is likely that expansion of existing facility would not be able to fully achieve requirements in	Limited options for location due to geographic constraints. Option 3 – no suitable site identified

		relation to healthcare building guidance and net zero.	

3.2.5 A full non-financial option appraisal has not been conducted due to the clear outcome of initial assessment.

3.2.6 The results of the net present cost analysis are shown below:

Figure 5: Economic appraisal - NPC analysis

Option	NPC
1. Do nothing (maintain existing building)	£479,082
2. Extend and refurbish existing premises	£2,300,372
3. New build green site	£3,183,536
4. New build within Earlston Community Campus	£3,426,567

3.2.7 Net present cost is modelled on the following assumptions:

- Discount Factors are calculated based on UK treasury Green book.
- Costs are modelled over 30 years to provide comparison with Option 3.
- For options 1&2, no residual value is assumed at end of this period.
- Option 3 has an ongoing value at end of period which has not been included within the model.
- For option 4, it is assumed that asset ownership remains with Scottish Borders Council. Costs are modelled based on a 30 year lease.
- Costs include relevant costs only, i.e. exclude costs which do not directly impact on comparison between models.
- All cost models include estimated life cycle maintenance (Hard FM) over the period.

3.3 Preferred Option

3.3.1 Option 4 would allow NHS Borders to strategically link with SBC in the development of the Earlston Community Campus. In line with “Place” principles, the new Campus presents the opportunity to re-provide the existing Earlston Health Centre and be co-located with a range of education and early years provision and wider community facilities. This approach would avoid the need for up front NHS capital investment through the use of a lease arrangement funded through revenue contributions. The shared space within the campus would benefit NHS Borders to deliver vaccination clinics, mother &

baby groups, public health groups and various other opportunity for collaborative working. The onsite community library would allow an ideal opportunity for health information to be shared with the general public.

3.3.2 The proposed lease between SBC and NHS Borders for the new build solution within Earlston Community Campus would be based on the following:

- A notional capital allowance of £2,820,000 covering all up front capital costs, carpets and decoration
- Lease duration is expected to be 30 years
- Smoothed annual lease payment would be £186,307 p.a. over 30 years
- Lease covers costs associated with Hard FM and building lifecycle

3.3.3 Out with the lease NHS Borders will be responsible for up-front costs associated with specialist fit out, loose furniture and equipment and IT. Any capital / equipment costs for the re-provided Health Centre will need to be included in NHS Borders capital plan for 2023/24. See financial case, below.

3.3.4 The Board will be responsible for cleaning and any on-going decoration.

3.3.5 Full Heads of Terms will be developed to include all the commercial arrangements and the responsibilities of the relevant parties.

3.3.6 NHS Borders have commissioned independent technical advisors to ensure the health centre element of the build is fit for purpose and in line with healthcare standards and regulations throughout each stage of the design.

3.3.7 SBC have given assurance once the technical advisors have completed their review any recommendations that are absolutely essential will be accommodated in the design.

4 Commercial Case

4.1 Agreed scope & services

4.1.1 It is intended that the new Earlston community campus will be procured and delivered via the hub initiative, in partnership with hub South East Scotland Ltd (hubco). The hub route has been established to provide a strategic long-term programme approach to the procurement of community-based development through joint local venture arrangements.

4.1.2 The hub contract with Scottish Borders Council will be a Design & Build Development Agreement (DBDA) form of contract.

4.2 Agreed Charging Mechanism

4.2.1 The project will upon completion be owned by Scottish Borders Council to manage and operate.

4.2.2 NHS Borders will contract directly with Scottish Borders Council on terms of the lease.

4.2.3 It is worth noting that during the design & construction process cognisance shall be given to the whole life costs of the facility in order that the project achieves a sensible balance between Capital and Lifecycle costs to provide best value.

4.3 Agreed Key Contractual Arrangements

4.3.1 SBC intends to procure the works using Hub South East and a formal joint statement will be issued at a suitable date.

4.3.2 NHS Borders contract to lease the building will be with SBC.

5 Financial Case

5.1 Relevant Costs

5.1.1 The financial case describes the expected costs related to property and running costs for the preferred option. This expenditure is set against the existing funding available to NHS Borders in relation to the existing Earlston Health Centre, together with current and projected levels of income recovered from the GP practice in line with GMS contract arrangements. This includes reimbursement of practice rental costs together with costs chargeable to the practice in relation to utilities and Soft FM services.

5.1.2 Disposal of the existing facility is required in order to release existing funding for transfer to offset the running costs of the new building. A key assumption is that the existing health centre will be disposed of within one year of occupancy of the new building and that costs of disposal will be fully met from sale proceeds.

5.1.3 The financial case does not consider any additional staffing costs which may be incurred through changes to the existing service provision. It is expected that any such costs will be subject to separate business case and/or service agreement and are deemed out of scope for the project.

5.2 Recurring Costs

5.2.1 Figure 8, below, summarises the current and projected future operating costs associated with the existing and proposed new building. The financial model includes relevant costs only and does not consider any costs where there is not expected to be material change between current and future costs.

Figure 8: Summary Recurring Revenue Costs

	Current costs	Future costs
Non-pay		
Lease Repayment	£0	£186,307
Hard FM Life Cycle	£8,120	£0
Rates	£7,165	£8,625
Utilities	£15,378	£23,000
Soft FM	£9,767	£14,500
Total Non-Pays	**£40,430**	**£232,432**
Depreciation	£19,108	£40,000
Total Revenue Costs	**£59,538**	**£272,432**
Offset by:		
Practice Income		
Rent	£28,985	£60,080
Services	£12,357	£23,963
	£41,342	**£84,044**
Net Costs	**£18,196**	**£188,388**
Additional Revenue Cost		**£170,192**

5.2.2 The net additional revenue cost (recurring) to NHS Borders is expected to be c.£170,000. The Health Board will need to include this investment within its three Year Financial Plan.

5.2.3 The revenue cost includes additional depreciation costs based on estimated capital value with the new lease expected to be on balance sheet in line with IFRS16.

5.2.4 Practice income is expected to increase in proportion to the additional floor area designated to the practice as a share of the revised costs. GP practices are responsible for service charges and practice rent is financed through GP contract on the basis of reimbursement at a market valuation.

5.2.5 Estimated practice rental income is predicated on the basis that the market valuation of the new building will match the capital build cost. The practice will require to be valued at point of handover and any change to valuation will require adjustment to the capitalisation value, depreciation and cost rent.

5.3 Non Recurring Costs

5.3.1 All non-recurring costs related to decant and transfer, together with costs of disposal for the existing facility, are expected to be met from sale proceeds on the current building. No detailed work has yet been undertaken to determine the expected actual costs of these elements.

5.4 Capital Costs

Figure 9: Summary Capital Costs

	Current costs	Future costs
Building	£5-10k p.a. (variable)	£328k
Equipment	£0	
IT	£0	
Total	**£5-10k**	**£328k**

5.4.1 Existing capital costs are those associated with routine building maintenance only and vary in relation to annual backlog maintenance plans. The future cost is estimated at 10% of build cost. Actual costs will be refined based on expected cost of fixture & fittings, including IT, etc. at point of occupancy. No detailed work has yet been undertaken to establish these figures and estimate is based on costs associated with similar projects within other health board areas. It should be noted that an element of this cost would be incurred through routine life cycle maintenance and replacement of existing equipment and therefore the main issue is capital affordability within a single period (i.e. point of occupancy).

5.4.2 The health board will seek additional capital funding for equipment & IT costs through Scottish Government. Should this funding not be available then capital costs will be met through reprofiling of the health board's five year capital plan. This impact, although modest, will require a review of the board's existing rolling equipment, minor works and building maintenance programmes.

6 Recommendation

6.1 The recommendation made is for NHS Borders Board to approve the new Earlston Health Centre within Earlston Community Campus, on a lease agreement from SBC for 30 years with the financial costs associated to be included in the Health Board's three year revenue and five year capital plan. Estimated financial values are as follows:

Revenue (recurring)	£170,000
Capital	£328,000

7 Appendices

7.1 Appendix 1 - Current site plan

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7.2 Appendix 2 - proposed landscape visuals

Earlston Business Case Visuals.pdf

By Department Legend

- AUXILIARY
- CC Library
- CC Sanitary
- CC shared multi purpose
- CIRCULATION
- ED BREAKOUT
- ED CLASSROOM
- ED Kitchen
- ED Nursery
- ED SANITARY
- ED SPORTS
- HC admin
- HC Board Services
- HC GP Patient Services
- HC interview admin
- HC patient interface
- HC staff
- PLANT
- SC Admin & Staff

1 Level 0
1 : 100

3
00400

Notes:
Do not scale off this drawing
All dimensions are in mm unless otherwise stated
This drawing is to be read in conjunction with all relevant Architectural, Civil/Structural and Service Engineer's drawings & specifications.
Secondary steel i.e. cladding rails and purlins not surveyed - positions are indicative only

Rev.	Date	Description
A	22.02.28	
B	22.03.29	Updated Layout / Roofs to reflect Planner/Client comments
C	22.04.01	UPDATED TO REFLECT DETAILED DESIGN

Issue Status: INFORMATION

Project Title: EARLSTON COMMUNITY CAMPUS
SCOTTISH BORDERS COUNCIL

Drawing Title: Ground Floor Plan

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Scale @ A0	Date	Drawn	Checked	Approved	Drawing No.	Revision
1 : 100	21/02/22	SH	AG	SB	1025.45-SBA-ZZ-00-DR-A-00100	C

NHS Borders

Meeting:	**Extraordinary Borders NHS Board**
Meeting date:	**16 June 2022**
Title:	**External Review – Benchmarking & Efficiency**
Responsible Executive/Non-Executive:	**Andrew Bone, Director of Finance**
Report Author:	**Andrew Bone, Director of Finance**

1 Purpose

This is presented to the Board for:

- Decision

This report relates to a:

- Annual Operational Plan/Remobilisation Plan

This aligns to the following NHSScotland quality ambition(s):

- Effective

2 Report summary

2.1 Situation

The Health Board is requested to approve consultancy costs of £45,000 in relation to the proposed Benchmarking & Efficiency review.

2.2 Background

Section F of the Board's Code of Corporate Governance outlines the delegation of powers within the Scheme of Delegation. Within the Scheme, Section 4.2(e) describes the process for procurement and approval of external consultancy with a value greater than £25,000 for the board.

This requires that a competitive tender is undertaken with a minimum of three tenders, and that final approval is reserved for the board where value of the bid exceeds £25,000.

As part of the remobilisation of the board's Financial Improvement programme the Director of Finance and Director of Planning & Performance have jointly commissioned a benchmarking and efficiency review. The purpose of this review is to highlight potential productive opportunities for financial improvement and/or service efficiency gain. It is expected that the review will provide an initial desktop assessment with a second stage to be taken forward separately to fully validate findings and prioritise opportunities and develop plans for actions in response to these findings.

The specification of this work is attached as an appendix to this paper.

Options for resourcing this work have included consideration of internal analyst capacity and other NHS or public sector support. The board's Information Services team is currently recruiting to additional capacity to support improvement work however this will not be in place within timescales required.

Public Health Scotland host the national information analytics functions for NHS Scotland, including the NSS Discovery tool which contains much of the required information on benchmarking. This resource is prioritised nationally against existing workstreams and it has not been possible to secure any additional support to a local benchmarking review within the required timescales.

2.3 Assessment

In order to deliver a benchmarking review by September 2022 a procurement exercise has been undertaken to seek external consultancy support to this work. This was undertaken through Crown Commercial Services Framework RM6187 (Lot 3). Bids were requested from all relevant providers with experience of healthcare analytics.

Only one bid has been received in response to the procurement exercise. The scheme of delegation requires that three tenders are considered. It is proposed that this requirement is waived and that the tender is accepted.

Response from other potential bidders has indicated that lack of capacity and/or capability is a determinant for their non-response. The single bid received is from Deloitte LLP. The bid has been assessed by PMO and Finance Business partners and recommended as meeting the required specification.

The lead consultant for Deloitte is known to colleagues within the board and has delivered similar engagements with other Health Boards and Scottish Government in the past five years. Until recently this individual was on a long term secondment to NHS Lothian in a senior operational role.

The cost of the Deloitte submission is £45,000 and it is proposed that work will be conducted over a three month period to report by end August 2022. This timescale is subject to confirmation of data access requirements and approval by the Board's Caldicott Guardian.

2.3.1 Quality/ Patient Care

Any recommendations arising from this review will be impact assessed prior to implementation. At this stage there are no identified implications for this domain.

2.3.2 Workforce

Any recommendations arising from this review will be impact assessed prior to implementation. At this stage there are no identified implications for this domain.

2.3.3 Financial

Funding of £50,000 was set aside within the board reserves at end March 2022 following agreement in principle at the Board Development session in February 2022. This funding will be released following approval of the contract.

2.3.4 Risk Assessment/Management

Any risks identified will be described within the review.

2.3.5 Equality and Diversity, including health inequalities

An impact assessment has not been prepared because it is not required at this stage.

2.3.6 Other impacts

No other impacts have been identified.

2.3.7 Communication, involvement, engagement and consultation

The Board has carried out its duties to involve and engage external stakeholders where appropriate: No engagement required.

2.3.8 Route to the Meeting

This has been previously considered by the following groups as part of its development. The groups have either supported the content, or their feedback has informed the development of the content presented in this report.

- Quality & Sustainability Board, 14th June 2022

2.4 Recommendation

- **Decision** – Reaching a conclusion after the consideration of options.

3 List of appendices

The following appendices are included with this report:

- Appendix 1 – Benchmarking Review Specification

Appendix 1

Specification for data analysis to support identification of financial savings opportunities

NHS Borders is a small territorial health board in Scotland. The population served by NHS Borders is approximately 120,000. The geography is largely rural, and the population is elderly and ageing when compared with the national average population across Scotland.

A comparison is required between the population needs and service offerings in the NHS Borders board and those of the Scottish average, as well as a comparison against similar other health boards, e.g. NHS Dumfries and Galloway and others (including non-Scottish), which has a similar population make up and geography. This is required to assist in the identification of unwarranted variation which may indicate potential savings and efficiency opportunities.

Activities to identify savings should consider all available sources of benchmarking and performance indicators, both financial and non-financial, in order to assess potential opportunities. Opportunities will include actions which impact on both structural and performance issues.

Structural issues will encompass evidence that suggests the design of services is sub-optimal and can be improved leading to a future benefit.

Performance issues are where there is evidence of variation from agreed standards or expected levels of efficiency.

This exercise is required to support development of the NHSB Financial Plan and remobilisation of the Financial Improvement Programme.

The objectives of this exercise are to:

- Identify areas where NHSB has significant unwarranted variation at
    - Population level
    - Cost base
    - Workforce
    - Demand
    - Activity
    - Efficiency indicators

- Identify where variances may indicate service requirements to meet the needs of the population

- Baseline to understand where inefficiencies are and potential areas for improvement opportunities

The analysis should be undertaken of the following areas:

1. Acute Unscheduled, inc. specialties
2. Acute Scheduled, inc. specialties
3. Cancer & Oncology
4. Maternity
5. Paediatrics
6. Mental Health

7. Primary Care
8. Community Services
9. Diagnostics
10. Older people
11. Corporate – infrastructure and overheads

The first stage will come from a desktop exercise of nationally available data, e.g. Discovery and Cost Book to give high level contextual information.

A second stage may be commissioned including targeted assessment of locally available data on areas of greatest opportunity.

As a minimum, the following comparisons are required for the financial year 2019/20 set as the pre-COVID baseline with comparator to the three year average to March 2020:

Category
Population size
Population profile – gender, age, depravation and rurality
% population > 65 years old
% population > 80 years old
Number of acute hospitals per head population and by size of geography
Number of community hospitals per head population and by size of geography
Number of GP practices per head population and by size of geography – to understand optimum size and how many square miles a GP practice should serve
Number of GPs per GP practice
Number of patients registered per GP practice
Operating costs – segmental analysis of corporate expenditure and overheads to assess whether there are any economies or diseconomies of scale
Segmental analysis by specialty of operating costs – acute surgery, acute medical, mental health, maternity and paediatrics etc
Segmental analysis of beds, number of medical posts, activity per head population, length of stay

Specialty level analysis
% surgical interventions delivered as day cases compared to BADS (British Association of Day Surgery) data
% surgical interventions delivered as inpatients
% surgical interventions delivered as outpatients
Average inpatient length of stay
Number of hospital beds used
Number of acute hospital beds available (elective, scheduled, unscheduled, trauma) per head of population
Number of community hospital beds available by type of provision (health, residential and nursing care) per head of population
Average number of beds per community hospital
Number of community hospitals per 10,000 sq miles?? And compare with likes of Grampian/Highland – what is average disbursement of community hospitals across Scotland
Number of medical beds available
Number of MH beds
Number of DME beds
Delayed discharge rate
Number of outpatient appointments
Number of new vs review outpatient appointments
Rate of appointment Did Not Attends
Outpatient specialities
Face to face vs virtual appointments
Numbers of different staff groups
Number of community district nurses
Average caseloads of community district nurses

Specialty level analysis
Number of community MH nurses
Average case loads of community MH nurses
GP referrals
Radiology data
Cost book data
Actual cost data
Actual vs Expected activity
Primary care drug costs by chapter
NHS services provided locally to understand which services are non-core to service provision and identify whether there are any gaps.
Identification of any specialist or non-core service provision where NHSB appears to be an outlier against other health boards nationally.
NHS services outsourced to neighbouring health boards
NHS services outsourced to private health providers

Analysis above needs to include activity within the board, i.e. board of treatment, and also by board of residence where available.