

National Screening Solution for NBSP

Business Case

This business case:

This business case seeks approval of the joint Ministers of Health and Finance to release the \$13.969 million balance of the tagged National Bowel Screening Programme capital contingency established in Budget 2016. The \$13.969 million, together with previously approved operating funding and reprioritisation of existing baselines within Vote Health, will fund the development, implementation and operation of the end-to-end IT solution to support the National Bowel Screening Programme (NBSP). This solution will:

- enable the safe, robust and timely nationwide implementation of bowel screening;
- ensure the end-to-end bowel screening pathway is supported, with fit-for-purpose functionality and integrations to ensure a reliable distribution of clinical and operational data across all screening participants (Ministry, DHBs and contracted third party service providers); and
- provide the Ministry with a foundational solution that can accommodate other screening programmes and wider population health initiatives in the long term.

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1 Executive Summary

1.1 Purpose of this Business Case

This business case seeks approval of the joint Ministers of Health and Finance to release the \$13.969 million balance of the tagged National Bowel Screening Programme (NBSP) capital contingency established in Budget 2016. The \$13.969 million, together with previously approved operating funding and reprioritisation of existing baselines within Vote Health, will fund the development, implementation and operation of the IT solution now known as the National Screening Solution (NSS).

The investment in this technology solution will:

- enable the safe, robust and timely nationwide implementation of bowel screening;
- ensure the end-to-end bowel screening pathway is supported, with fit-for-purpose functionality and integrations to ensure a reliable distribution of clinical and operational data across all screening participants (Ministry, DHBs and contracted third party service providers); and
- provide the Ministry with a foundational solution that can accommodate other screening programmes and wider population health initiatives in the long term.

The National Screening Solution programme encompasses:

- a procured new solution (NSS Core);
- a range of NSS implementation enablers (interfaces and integration points with Ministry and Sector systems); and
- change integration and programme management capability to ensure a well-coordinated and controlled nationwide implementation across all screening programme participants.

1.2 The Case for Change

National Bowel Screening Programme

New Zealand has one of the highest rates of bowel cancer in the developed world. The absence of a national bowel screening programme is one contributor to why New Zealanders with bowel cancer are more likely to be diagnosed at more advanced stages than people in Australia, the United States and the United Kingdom. This translates directly to mortality rates, which are 35 percent higher in New Zealand than Australia for women and 24 percent higher for men.

The primary objective of bowel screening is to reduce the mortality rate from bowel cancer by diagnosing and treating bowel cancer at an early, curable stage. An additional objective is to identify and remove precancerous advanced adenomas from the bowel before they become cancerous, which can, over time, lead to a reduction in bowel cancer incidence. The NBSP is expected to detect between 500 and 700 cancers annually during early rounds of screening, resulting in a long-term reduction in mortality from bowel cancer and a significant improvement in quality of life.

As part of Budget 2016, Cabinet approved the implementation of the NBSP and rollout commenced in mid-2017.

IT Support to NBSP

The IT solution established to support the Bowel Screening Pilot (BSP) was developed within the context, costs and timeliness constraints of the relatively small original Pilot. The Pilot IT System lacked the flexibility in its core components to adapt as required over time. As the NBSP is rolled out nationally, the Pilot IT system and supporting processes cannot be scaled to meet the needs of all DHBs and a fully functional National Coordination Centre (NCC).

To enable the deployment of the NBSP, a staged approach to the IT support to the NBSP has been developed:

- **Enhanced Pilot:** Enhancement of the Pilot IT system to accommodate the first two additional DHBs (Hutt Valley and Wairarapa) from July 2017.
- **Interim IT Solution:** Critical enhancements to the Enhanced Pilot IT System are being implemented on the Interim IT Solution. These are being complemented by manual processes, to accommodate a small number of additional DHBs and the NCC. (This interim solution is referred to as BSP+.)
- **National Screening Solution:** The NSS will support the NBSP across all 20 DHBs and the fully functional NCC. The NSS will provide a fit for purpose solution that can support the end-to-end clinical pathway and service delivery for screening participants.

The National Screening Unit's (NSU) business vision is for the NSS to support programme operations for NBSP owners, providers, participants and the NCC. Initially, the NSS should support the NBSP service delivery process, as well as facilitate easy management of the bowel screening pathway, support planning and management of informed participation, monitor safety and quality, and enable evaluation of outcomes and identification of best practice within the NBSP.

In the longer term, the NSU envisages that the NSS will be the IT solution that enables the nationwide delivery of a wider range of screening programmes. The Ministry views the NSS as a long-term strategic solution which will (over time and subject to approval and funding for extension) contribute to an improved consumer experience for participants of all the New Zealand screening programmes. The expanded NSS will support a consistent look and feel across the programmes for both providers and consumers.

The end-to-end NSS will contribute to the delivery of the NBSP benefits by ensuring robust and high-quality information is available in a timely manner to support service delivery and clinical decision making. Audit, quality and performance reporting enabled by the NSS will contribute to the identification and reduction in operational risk. The NSS will assist in minimising disbenefits by ensuring that all eligible participants are identified and managed effectively throughout their journey through the NBSP.

The NSS is expected to be ready for initial implementation by the end of March 2019 to support the NBSP nationwide rollout. The deployment process will start with two DHBs ready to commence NBSP screening services. This will be followed by the first eight DHBs, which commenced bowel screening using the Interim IT Solution, migrating to the NSS in 2019/20. The remaining 10 DHBs will be able to utilise the NSS from the time that they are ready to commence bowel screening under the NBSP.

IT Solution Requirements

The final end-to-end IT solution to support NBSP has two main requirements:

- a. **NBSP Core Solution:** Support for the NBSP activities and NSU operations, including enabling integration with Ministry and critical third-party IT systems (e.g. laboratory systems).
- b. **NBSP Data Mart and Business Intelligence:** Monitoring and management of NBSP, including operational reporting will be supported by the NSS Core Solution. The NBSP data mart and business intelligence components will support Ministry business intelligence and analytics requirements and are not a component of the NSS Core Solution.

To fully support the NBSP, this investment also includes:

- ProVation, to standardise national solution for clinical data to support NBSP; and
- the Interim IT Solution, to enable a period of coexistence, followed by the decommissioning process, including data migration to the NSS.

1.3 The Preferred Option

- **Core Functionality:** Based on qualitative and quantitative assessment, the preferred strategic IT Solution Option for the NSS Core solution component is to enhance and extend a procured Commercial Off The Shelf (COTS) solution. This approach would meet the needs of the NBSP and could (subject to approval and funding) support a wider range of population health initiatives. The COTS solution would readily support the majority of the core NBSP screening requirements, and would be further configured, customised and potentially extended through additional components, to meet the full requirements of NBSP.
- **Integration Capability:** The preferred integration option is to leverage the NSS integration capability, as it offers the lowest cost and risk approach to achieve the NSS outcome for the NBSP nationwide implementation, especially in respect of impact on the eight DHBs migrating from the BSP+ solution to the NSS. The use of the NSS's native integration capability will de-risk the NSS development for NBSP rollout whilst allowing the NSS to utilise the Ministry's strategic integration services, once these are available. The Ministry has therefore elected to remove the strategic integration work from the NBSP scope, and will seek a wider strategic, enterprise integration solution independent of NBSP rollout.
- **Reporting and Business Analytics:** The preferred NSS Core technology solution provides a range of operational reporting and real-time monitoring capability for its users. Therefore, all operational reporting is anticipated to be developed and delivered through the NSS Core. The NBSP Data Mart will be used for NBSP programme evaluation, and the wider business intelligence and analytics that the Ministry may undertake for health initiatives which will benefit from the inclusion of NBSP information. The preferred option for the NBSP Data Mart and Business Intelligence Reports is a single-stage build, initially for the Interim IT Solution and then for the NSS.

1.4 Economic and Financial Analysis

The estimated cost of the end-to-end NSS, as implemented by the preferred vendor using the preferred solution option, delivered over the 10-year (17/18 is for less than two months) modelled period of the NBSP is \$ 9(2)(b)(ii). The impact on the Crown’s operating balance and debt totals \$ 9(2)(b)(ii), after accounting for the impact of capital charge of \$ 9(2)(b)(ii). The Ministry intends to repay capital from funds generated through depreciation. This will further reduce the impact on the Crown’s operating balance and debt from \$ 9(2)(b)(ii) to \$ 9(2)(b)(ii).

As part of the IT Options Analysis, the examination of indicative costs for the different approaches to the NSS Core identified that the enhanced and extended COTS had one of the lowest estimated costs and smallest estimated range of costs (and was the only shortlisted approach to meet the NBSP assessment criteria).

The response to the RFP, based on this preferred approach, resulted in two vendors being shortlisted. Detailed analysis and comparison of the two shortlisted vendors included cost clarification. The evaluation process resulted in a single preferred vendor that presented the least costly solution of the two shortlisted, as well as consistently evidencing that they had the strongest qualitative response.

The NSS costs are summarised in Table 1.

Table 1: NSS Costs Summary

	17/18	18/19	19/20	20/21	21/22	22/23	23/24	24/25	25/26	26/27	27/28	Total
	\$'M	\$'M	\$'M	\$'M	\$'M	\$'M	\$'M	\$'M	\$'M	\$'M	\$'M	\$'M
Capital	1.96	10.89	2.06	0.73								15.65
NDE - DHBs	\$ 9(2)(b)(ii)											
Ministry DE	\$ 9(2)(b)(ii)											
Direct NSS Expenditure	\$ 9(2)(b)(ii)											
Depreciation	\$ 9(2)(b)(ii)											
Capital Charge	\$ 9(2)(b)(ii)											
Total Depreciation & Capital Charge	\$ 9(2)(b)(ii)											
Total NSS Expenditure	\$ 9(2)(b)(ii)											

Funding

Current funding allocated or tagged as a contingency for the NSS programme totals \$ 9(2)(b)(ii), with an additional \$ 9(2)(b)(ii) across the 10-year period required to be met from within the Vote Health baseline. The additional costs arise from a mix of capital charge and depreciation, resulting from further clarity on the accounting treatment to be applied to the proposed IT solution.

Funding for the NSS programme will be met from:

- a call on the existing capital contingency funding of \$15.969 million, allocated to the national IT solution in the NBSP Programme Business Case, of which \$2 million has already been drawn down [CBC-17-MIN-0081 refers];
- a call on the existing operating funding allocation of \$2.5 million per annum (\$25 million for the 10-year period) allocated in the August 2016 NBSP Programme Business Case;
- new operating funding of \$ 9(2)(b)(ii), agreed as part of Budget 2018; and
- reprioritisation of existing baselines within Vote Health.

As illustrated in the table below, due to the phasing of the Programme and where costs lie, some baseline funding will need to be spread across a number of years, and also transfers between Non Departmental Expenditure (NDE) and Departmental Expenditure (DE) baselines as appropriate.

DHB implementation and migration dates, and hence the timings of funding drawdowns, are dependent on the DHBs concerned achieving the required state of readiness as planned. The final solution design (currently in progress through the NSS Design Phase) may also affect these dates.

Any final recommendations from the Independent Assurance Review that have a material financial impact on the NSS Programme will be required to go through Change Control involving the Central Agencies and Joint Ministers of Health and Finance.

The Ministry proposes meeting the cost of the NSS through a mix of calls on the existing contingency and reprioritisation across Vote Health baselines across the next 10 years. Table 2 shows the indicative profile of funding including surpluses and shortfalls by fiscal year. Ministry Officials will work with the Treasury to agree on the most appropriate mechanisms to reflect baseline changes to address the shortfalls in 2019/20 and 2020/21 and surpluses in the outyears.

Table 2: NSS Funding Summary

	17/18	18/19	19/20	20/21	21/22	22/23	23/24	24/25	25/26	26/27	27/28	Total
	\$'M	\$'M	\$'M	\$'M	\$'M	\$'M	\$'M	\$'M	\$'M	\$'M	\$'M	\$'M
NSS Funding												
Budget 16 Capital	2.00	13.96										15.96
Budget 16 IT DE budget	0.50	2.50	2.50	2.50	2.50	s 9(2)(b)(ii)						
Budget 18 IT DE budget		4.00	4.00	2.50	2.50							
Total NSS Funding	2.50	20.46	6.50	5.00	5.00							
MoH Baseline						s 9(2)(b)(ii)						
Capex - datawarehouse												
DE for datawarehouse depreciation												
National Health IT NDE reprioritised												
NBSP NDE C/F												
Total Funding		2.50				s 9(2)(b)(ii)						
Surplus/(Deficit)												

1.5 Procurement, Management and Assurance

Procurement

The Ministry undertook a two-phase procurement for the NSS Core (no procurement process was undertaken for the NBSP Data Mart as this will be sourced from the Ministry). An open Registration of Interest phase was followed by a closed Request for Proposals phase with the shortlisted vendors, resulting in a preferred solution approach and vendor being identified and recommended for the NSS.

The contract negotiation and award process with the identified preferred vendor is being progressed through a two-stage process:

1. A Planning and Universal Design Phase agreement, enabling the completion of the NSS universal design and solution blueprint; and
2. A full contract award (subsequent to Business Case approval), which enables the development and delivery of the end-to-end NSS in support of NBSP implementation, including the establishment of the ongoing vendor relationship for the operation, management and maintenance of the solution.

On the basis of the first stage of RFP evaluation, two respondents were selected to move through to the second stage of presentations and due diligence/clarification. A Value for Money analysis was conducted to determine which proposal offered the best value for money for the whole-of-life of the goods/services.

The evaluation process recommended that Deloitte and the Salesforce product were taken through to the negotiation stage. Deloitte consistently evidenced that they had the strongest qualitative response and presented the least costly solution of the two shortlisted options. Salesforce represents a strong foundational technology from which additional screening programmes could be added (subject to business case approval).

The negotiation with the preferred Respondent will be completed in two stages:

- **Stage One (March-April 2018):** Negotiation and agreement of a contract for the planning and design stage process with Deloitte and Salesforce.
- **Stage Two (May – July 2018):** Negotiation and agreement of Master Services Agreement for the Build, Deploy and Support elements of the ongoing agreement for delivery of the NBSP; negotiation of licensing and support elements of the Salesforce Licencing Agreement; and negotiation and agreement of an Operational Level Agreement between the Ministry, the NCC and Deloitte/Salesforce.

Management

The robust management and governance arrangements for the overarching NBSP provide a framework for the management and governance arrangements for the NSS. These will ensure successful delivery of the NSS programme for the NBSP.

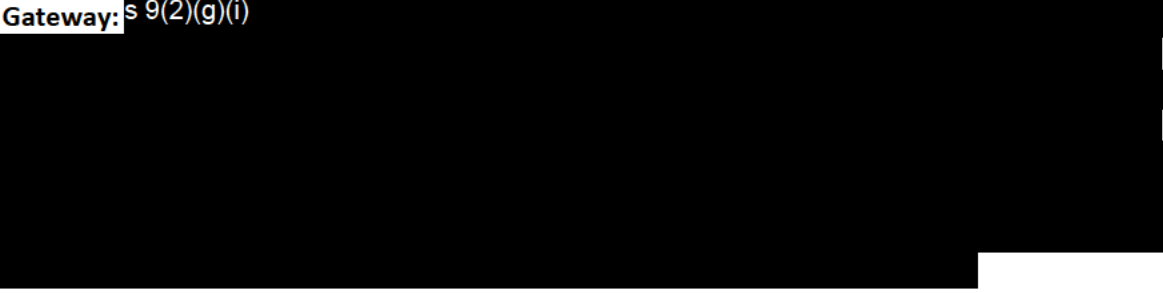
The programme management framework is based on Managing Successful Programmes (MSP) and PRINCE2 methodologies, and leverages lessons learned from numerous sources. These include the Ernst & Young (EY) Review of the Bowel Screening Pilot solution, the NSS Implementation Partner (Deloitte) and their drawing upon international best practice, and additional sources noted by the GCDO and other central agencies. The NSS development will be consistent with an MSP/PRINCE2 approach but is expected to be delivered using the phased technology delivery methodology indicated by the Implementation Partner as most suitable for the underlying solution and their deliverables.

The NSS will be delivered through a programme team, comprising Ministry staff (including those specially employed with the specific skills and depth of experience required), the Implementation Partner and Ministry contractors. External stakeholder input, including from clinicians, will be obtained for all stages of the NSS development and delivery process, as appropriate.

Change management and communications will be managed by the NSS programme and will be fully aligned with the wider NBSP processes. The Change Strategy and Approach leverages the best of breed Change Management expertise of the Implementation Partner. In addition, the Change Strategy and Approach will build on the NBSP's already proven DHB readiness assessment and change support structure and processes. The Strategy and Approach has informed the deployment approach – the existing Bowel Screening Pilot system (BSP+) will run alongside the NSS solution and be interfaced only at a national level. The DHBs running the existing BSP+ will switch from the BSP+ to the NSS with no parallel running; this will minimise change impact on those DHBs and their staff, and hence risk to the NSS programme.

Assurance

NSS assurance is through Gateway, Major Projects Assurance, the NBSP's continuous IQA of the NSS programme, technical quality assurance, privacy and security impact assessment and cloud risk assessment. An independent assurance review of systems and processes was undertaken March-June 2018.

- **Major Projects Monitoring:** The Corporate Centre delivery confidence assessment for the NBSP is currently Amber. Treasury continues to be closely engaged with the NBSP, through regular meetings including business case clinics.
- **Gateway:** s 9(2)(g)(i)

- **Independent Assurance Review:** An independent assurance review was undertaken in April - June 2018 to consider how well positioned the NBSP is for successful delivery, what changes might be required and what the Ministry can learn to support the design and roll out of further national initiatives. The review concluded that “[t]he panel is fully supportive of the National Bowel Screening Programme and endorses its continued roll-out as planned. The National Bowel Screening Programme is in a good position and has considerable strengths.” A summary of the key findings from the review, and actions being undertaken in response, is attached as Appendix 1.

Timeline

The NSS will be developed over 11 months, commencing in May 2018. The key NSS milestones and approximate timings are shown in Table 3. A key milestone at the end of July 2018 are the deliverables of the Design Phase – the NSS Solution Design, the updated Change Strategy, Change Management Plan and the Communications Plan – and will involve acceptance and approval by the IQA, Programme Governance Group, GCDO and Treasury.

Table 3: Key NSS Milestones

Key NSS Milestones	Approximate Completion Date
Start of Design Phase	1 May 2018
Business Case Approval	July 2018
Design Phase Assurance (IQA, Technical QA, Security and Privacy Assurance & Privacy Impact Assessment)	July 2018
Completion of Design Phase	July 2018
Approval of Design, including updated Change Strategy, Change Management Plan and Communications Plan, by Ministry, GCDO Assurance and Treasury	August 2018
Build & Test Phase (Sprints 1-4) Complete	End November 2018
Sprint Unit and Acceptance Testing Complete	Mid December 2018
Integration testing Complete	Mid December 2018
System Integration testing Complete	End Feb 2019
UAT Complete	End March 2019
NSS Launch (No active screening)	End March 2019
Wanganui DHB On-boarding	May 2019
Mid Central DHB On-boarding	June 2019
BSP Supported DHBs Migration to NSS Complete	December 2019
BSP decommissioning	End Feb 2019
NSS Rollout complete	NBSP Completion

1.6 Next Steps

This business case seeks approval of the Joint Ministers of Health and Finance to develop and implement the end-to-end IT solution to support the NBSP.

2 Introduction

2.1 Purpose of this Business Case

This business case seeks approval of joint Ministers to release the \$13.969 million balance of the tagged NBSP capital contingency established in Budget 2016. Originally established with \$15,969 million, \$2 million was released from the capital contingency to meet the costs of discovery and solution design for the IT solution now known as the National Screening Solution (NSS) [CBC-17-MIN-0081 refers]. The \$13.969 million, together with previously approved operating funding and reprioritisation of existing baselines within Vote Health, will fund the NSS development, implementation and operation.

The NSS, implemented by the preferred vendor using the preferred solution option and delivered over the 10-year (17/18 is for less than 2 months) modelled period of the NBSP, is estimated to cost \$9(2) million.

This business case builds on the NBSP Programme Business Case and the linked Tranche 1 Business Case which was approved by Cabinet in August 2016, and the 2017/18 business case approved by the Joint Ministers of Health and Finance in August 2017.

Figure 1 depicts the relationship between this business case (highlighted) and the other NBSP business cases.

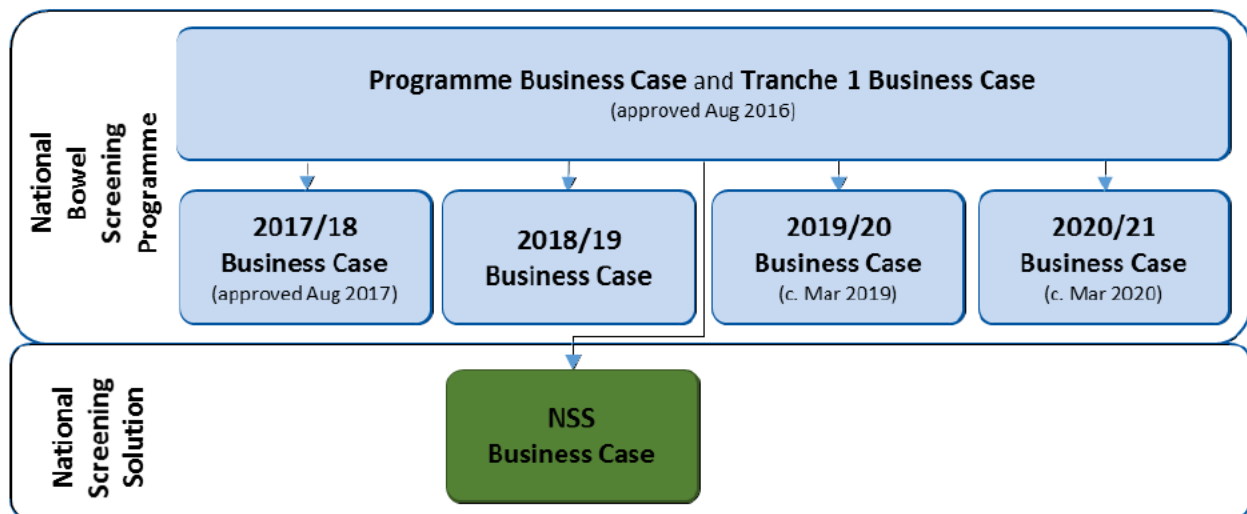


Figure 1: NBSP Business Cases

The New Zealand Treasury, Government Chief Digital Officer (GCDO) and Ministry of Business, Innovation and Employment (MBIE) have been kept informed throughout the development of this business case. The format and approach are as agreed with the Central Agencies and meet the requirements of the New Zealand Treasury Better Business Case process.

Approval for this business case is sought from Joint Ministers, with support from the Central Agencies.

2.2 Background to this Business Case

Bowel Cancer in New Zealand

New Zealand has one of the highest rates of bowel cancer in the developed world and, prior to the recent launch of the NBSP, was one of the few countries in the Organisation for Economic Co-operation and Development (OECD) not to have such a programme in place.

The absence of a bowel screening programme is one contributor to why New Zealanders with bowel cancer are more likely to be diagnosed at more advanced stages than people in Australia, the United States and the United Kingdom. This translates directly to mortality rates, which are 35 percent higher in New Zealand than Australia for women and 24 percent higher for men.

The primary objective of bowel screening is to reduce the mortality rate from bowel cancer by diagnosing and treating bowel cancer at an early, curable stage. Cancer diagnosed at an earlier stage is associated with lower treatment costs compared to the cost of treating more advanced cancer. An additional objective is to identify and remove precancerous advanced adenomas from the bowel before they become cancerous, which can, over time, lead to a reduction in bowel cancer incidence.

The NBSP will have an eligible population of around 700,000 men and women aged 60-74, who will be invited for free screening for bowel cancer during every two-year period (a screening round). The first year at full capacity will result in approximately:

- 380,000 people being invited to participate.
- 236,000 people returning a completed faecal immunochemical test (FIT) kit (based on 62 percent participation).
- 9,000 people having a colonoscopy.
- 500-700 cancers detected annually during early rounds.

Programme Approval

As part of Budget 2016, Cabinet approved the NBSP Business Case to implement the NBSP over four financial years [CAB-16-MIN-0189.14 refers], subject to a re-stated Programme Business Case. The Programme Business Case was approved by Cabinet in August 2016 [SOC-16-MIN-0108], including delegating the approval of future business cases to the Minister of Health and the Minister of Finance (the joint Ministers).

In mid-2017 the Ministry of Health commenced the roll-out of the NBSP, using a phased approach and applying lessons learned from the Bowel Screening Pilot, which has been operational in Waitemata District Health Board (DHB) since 2011.

2.3 Funding

The Programme funding is allocated through budget bids, supported by the respective business cases. Budget 2016 approved \$39.3 million over four years to fund the design, planning and set-up phases of the NBSP and allocated contingency capital funding of \$15.969 million for the IT development and infrastructure needed for a national Programme (see Table 4).

This contingency is subject to approval of this business case for the NBSP long term, end-to-end IT solution (now referred to as the National Screening Solution, NSS). The contingency was originally due to expire on 1 February 2017 but was extended to 1 February 2018 [SOC-17-MIN-003 refers]. The contingency was further extended to December 2018 [CBC-17-MIN-0081 refers]. The 2017 extension

request noted that the business case for the NSS would be informed by the IT options assessment, which was undertaken by Ernst & Young (EY) and the subsequent procurement process (detailed in Section 4.2).

Table 4: NBSP Budget 2016 and Budget 2017

National Bowel Screening Programm	2016/17 \$'M	2017/18 \$'M	2018/19 \$'M	2019/20 \$'M	2020/21 \$'M	2021/22 \$'M	Total 6 Years to 2021/22 \$'M
Total Ministry DE	2.945	2.645	2.415	2.340	s 9(2)(b)(ii)		
Information System Costs DE	2.500	2.500	2.500	2.500	s 9(2)(b)(ii)		
National Co-ordination Centre	s 9(2)(b)(ii)						
National FIT Laboratory	s 9(2)(b)(ii)						
Bowel Screening Regional Centre	s 9(2)(b)(ii)						
DHBs	s 9(2)(b)(ii)						
Training, Quality & Communication	s 9(2)(b)(ii)						
Waitemata 50-60 transition cost	s 9(2)(b)(ii)						
Total Budget 16	11.901	11.761	7.987	7.660	6.961	6.961	53.231
National Co-ordination Centre	-	s 9(2)(b)(ii)					
National FIT Laboratory	-	s 9(2)(b)(ii)					
Bowel Screening Regional Centre	-	s 9(2)(b)(ii)					
DHBs	-	s 9(2)(b)(ii)					
Training, Quality & Communication	-						-
Total Budget 17	-	9.054	9.995	9.286	10.198	10.198	48.731
Total Operating Cost	11.901	20.815	17.982	16.946	17.159	17.159	101.962
Total Capital Funding		2.000	13.969				15.969
Total NBSP Funding as at 17/18	11.901	22.815	31.951	16.946	17.159	17.159	117.931

In December 2017, a drawdown of \$2 million was approved in the 2017/18 financial year [CBC-17-MIN-0081 refers] as a charge against the NBSP capital contingency. This drawdown was to meet the anticipated costs for the discovery and solution design phase of the project, prior to the submission of this NSS business case to complete the discovery and solution design phase.

The NBSP Programme Business Case also sought a s 9(2)(b)(ii) annual operating expenditure funding allocation. The change in approach to the development of the NSS (i.e. from in-house build to a procured Commercial Off The Shelf (COTS) solution, as recommended by the Accenture Report and described in this business case, see Section 2.4) will impact the annual operating expenditure required. Consequently, as part of the Budget 2018 funding bid this figure was revised from s 9(2)(b)(ii) per annum, to s 9(2)(b)(ii) per annum for 2018/19 and 2019/20, reducing to s 9(2)(b)(ii) per annum thereafter. To date, the annual operating expenditure has been used to support the strengthening and maintaining of the Interim IT Solution, as well as funding the early costs of the NSS programme stream establishment. Once the NSS is implemented, the operating funding will be fully allocated to the support and management of the NSS.

Budget 2018 (Table 5 below) approved \$13 million over four years to 2021/22 [CAB-18-MIN 0158.14 refers] for the NSS, as well as ongoing funding for the NCC, Regional Centres and the National Faecal Immunochemical Test (FIT) Laboratory and the rollout of the NBSP to Hawke's Bay, Lakes, MidCentral, Nelson Marlborough and Whanganui DHBs. Further funding was approved to support Waitemata DHB with the additional costs of providing screening to participants aged 50 to 60 who had been part of the Waitemata Bowel Screening Pilot.

The full breakdown of NSS costs and funding sources, including the proposed drawdown of the balance of NBSP Capital Contingency, is detailed in Section 5 NBSP NSS Financial Case.

Budget 2018 is summarised in Table 5.

Table 5: NBSP Budget 2018

National Bowel Screening Programme	2018/19 \$'M	2019/20 \$'M	2020/21 \$'M	2021/22 \$'M	Total 4 Years to 2021/22 \$'M
Information System Costs DE	4.000	4.000	2.500	2.500	13.000
National Co-ordination Centre	s 9(2)(b)(ii)				
National FIT Laboratory					
Bowel Screening Regional Centre					
DHBs					
Training, Quality & Communication					
Waitemata 50-60 transition cost					
Total Budget 18					

2.4 IT Support to NBSP

Approach to IT Support for NBSP

In late 2011, a four-year Bowel Screening Pilot (the Pilot) commenced in Waitemata DHB. The Pilot was subsequently extended for two further years, to December 2017. The IT solution established to support the Pilot was specifically developed for the Pilot, within constraints of costs and timeliness and within the context of the relatively small nature of the Pilot. Numerous enhancements to the Pilot IT system have since been applied in response to new requirements being identified.

Learning from other jurisdictions indicates a strong need for flexibility within elements of the application, such as the ability to change the test technology and associated clinical pathway. The IT system which supported the Pilot (the Pilot IT system) lacks the flexibility in its core components to adapt as required over time. As the NBSP is rolled out nationally, the Pilot IT system and supporting processes cannot be scaled to meet the needs of all DHBs and a fully functional NCC.

The Ministry's initial approach for meeting the technology support needs of the fully implemented NBSP was to develop a bespoke solution, built in-house by the Ministry's Technology & Digital Services Group (T&DS). The technology-related funding request in the NBSP Programme Business Case reflected the initial, high level costings developed by the T&DS, and with the expectation that an updated costing would be provided by the T&DS once the solution analysis and design activity was underway.

However, this in-house build was not progressed further than these indicative costings, as the NBSP Programme Business Case received feedback that a wider technology options analysis activity would be strongly recommended to test the delivery approach. The Programme undertook initial reviews with Caravel and Accenture, then engaged EY for the detailed IT Options Analysis work. The findings of this analysis, detailed in section 3.1, resulted in the decision to proceed with a procured solution.

As a result of the decision to undertake a solution procurement process, a staged approach to the IT support to the NBSP has been developed, to meet both the immediate and long-term needs of the Programme. The approach is depicted in Figure 2 and described further below.

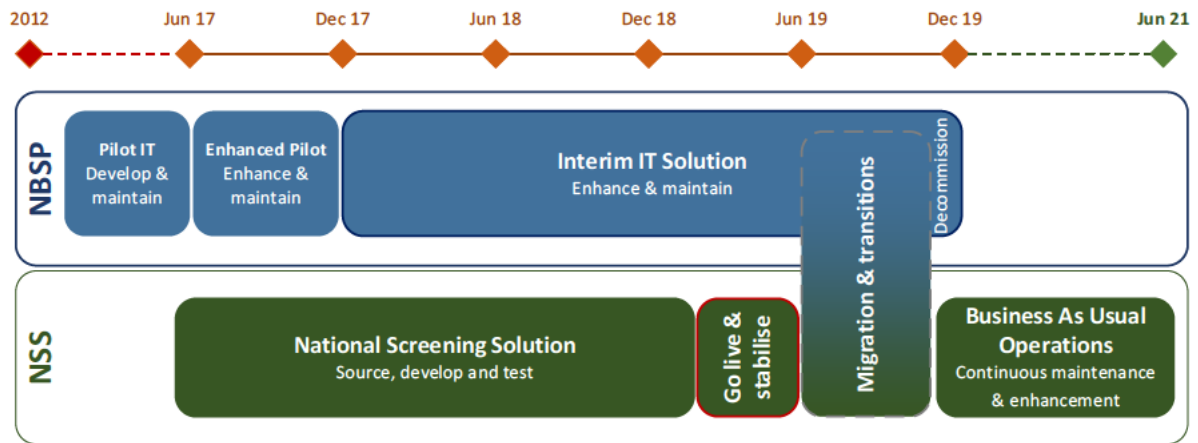


Figure 2: Staged Approach for IT Solution to Support NBSP

Interim IT Solution

The interim IT solution is comprised of two phases:

- **Enhanced Pilot:** Enhancement of the Pilot IT system to accommodate the first two additional DHBs (Hutt Valley and Wairarapa) from July 2017.
- **Interim IT Solution:** EY were engaged to review the Pilot IT system to identify opportunities for technical and process-related enhancements, to ensure that the NBSP implementation can continue in a safe and robust manner. The Interim IT Solution is not expected to support the nationwide implementation of bowel screening, rather it is envisaged that it will support the progressive implementation of NBSP whilst the NSS is being developed.
- Critical enhancements have been required to the Enhanced Pilot IT System to create the Interim IT Solution, which will be complemented by manual processes, to accommodate a small number of additional DHBs and the NCC from mid-2018. As the addition of further DHBs will increase the volume of screening participants, the Interim IT Solution must be robust and able to manage the additional volumes safely.
- The Interim IT Solution does not enable a nationally integrated NBSP and therefore a national IT solution is still required. The DHBs on the Interim IT Solution will be migrated to the NSS at an appropriate stage of the NBSP implementation process.
- Assurance on the Interim IT solution has been provided through EY Due Diligence on the Interim IT Solution.

National Screening Solution

The NSS will support the NBSP across all 20 DHBs. The NSS will provide a fit for purpose solution that can support the end-to-end clinical pathway and service delivery for screening participants. It will be able to issue invitations for initial screening, recall individuals for repeat screening, follow those with identified abnormalities, correlate with morbidity and mortality results, monitor and evaluate the NBSP and its impact, and have the capacity to support programme audits. The NSS is not designed for clinical decision making, and clinicians have other systems to support this.

The staged approach has allowed for analysis, decisions and lessons learned during the Interim Solution stages to be incorporated into the NSS development and delivery process. Some of the key themes from the Pilot Solution, including from the EY review¹, already included in the NSS programme scope and delivery approach include:

- **Robust support for change implementation and stabilisation:** This includes the need for strong engagement and communication during the solution development and change preparation phases, as well as support from the NBSP for change readiness, and reliable advice and support for a number of weeks after the change implementation.
- **Strong input from key user and stakeholder groups:** The two primary user groups (NCC and DHB colonoscopy staff) have compatible but different needs when using the system. Engaging these user groups during the NSS design and development activities will help ensure that the new solution can provide for these user groups' markedly differing needs.
- **Critical information feeds:** The Pilot Solution has allowed for the capture of only the most critical clinical and operational information sets required in support of the screening programme delivery. Some of these information sets are currently entered and managed manually. The Bowel Screening Pilot has highlighted the need for automation to ensure required information is collected and stored in a robust and reliable manner.
- **Value of readily available, real-time reporting:** Both NCC and DHB-based service leaders require up-to-date information to help ensure their teams are able to perform their activities to the required timeframes and quality standards, whereas the Bowel Pilot Solution's operational and performance reporting is generated manually and only at set intervals.

Population Health Initiatives

The Ministry of Health has a range of population health initiatives in place, aimed at reducing the incidence and severity of conditions and diseases within the New Zealand population. These initiatives include screening programmes, immunisation and health checks.

The NSU is responsible for the development, management and monitoring of nationally-organised population-based screening in New Zealand. The NSU has six screening programmes and one quality improvement programme in place: NBSP, NCSP, BreastScreen Aotearoa, Universal Newborn Hearing Screening Programme, Newborn Metabolic Screening Programme, Antenatal HIV Screening, Antenatal screening for Down syndrome and other conditions (quality improvement).

Robust, fit-for-purpose information systems are vital to ensure the optimal, safe and ethical delivery of population health activities. Comprehensive and efficient information systems are also pivotal to the successful identification and invitation of eligible people to participate in screening, as well as underpinning failsafe mechanisms and adequate safety provisions for individual participants.

Each population health programme currently has its own set of business processes, information and IT platforms to support programme delivery and the monitoring of activity. Initiative-specific, siloed IT platforms and approaches do not readily support coordination of wider screening participation, development and information sharing. Significant resources are required to maintain and develop the business capacity and ability to deliver and manage each screening programme. Reporting across silo applications can also be problematic and time-consuming.

¹ "Ministry of Health: BSP Due Diligence Interim IT Solution Assessment", 12 May 2017, EY. Summarised in Appendix 10.

It is envisaged that using one IT solution across all population health initiatives (subject to business case approval and subsequent funding) would increase efficiency, support information sharing across programmes and the use of standardised business processes and practices. It would also enable greater flexibility when targeting, delivering, and monitoring current and future population health programmes. As noted in Table 6, any further extension of the NSS beyond NBSP is out of scope for this business case. Subject to further business case approval and subsequent funding, the NSS may extend to other population register-dependent programmes.

Vision for NSS

The National Screening Unit (NSU) business vision is for the NSS to support programme operation for bowel screening programme owners, providers, participants and the NCC. Initially, the NSS should facilitate easy management of the bowel screening pathway, support planning and management of informed participation, monitor safety and quality, and enable evaluation of outcomes and identification of best practice within the NBSP.

Whilst this business case is seeking funding to implement the National Screening Solution for the NBSP, it is important that the Ministry ensures that the functional capabilities of the selected system are extensible for future requirements of other screening programmes and population health initiatives. Therefore, subject to further business case approval and subsequent funding, this solution, and subsequent contract, may be extended to other population health initiatives and programmes.

In the longer term, the NSU envisages that the NSS will be the IT solution that enables the nationwide delivery of screening programmes. The Ministry views the NSS as a long-term strategic solution which will (over time and subject to approval and funding for extension):

- Support optimal, safe, ethical and equitable delivery of screening activities.
- Enable the successful identification and invitation of eligible people to participate in screening.
- Underpin failsafe mechanisms and adequate safety provisions for individual participants.
- Provide the workflow checks and processes to support robust and reliable business practice and ensure follow up with quality diagnostic testing and treatment for detected bowel cancers.
- Gather the appropriate Treatment data from other sources.
- Integrate with Ministry, screening service and other health sector provider systems, e.g. National Health Index (NHI), Health Provider Index (HPI), Clinical Systems, Gynaecology Plus colposcopy product, electronic endoscopy reporting systems (such as ProVation) and histology systems.
- Provide direct access to systems for a range of health care providers and professionals involved in the care of screening programme participants, for example for the National Cervical Screening Programme (NCSP) approximately 8,000 sample takers, 20 laboratories and 20 DHB colposcopy clinics.
- Allow the management of surveillance for participants in the bowel screening and other programmes.
- Have the potential to be scaled to support the wider NSU and population health outcomes.

This strategic direction for the NSS is supported by the Central Agencies, who have been key stakeholders throughout the development of the NSS concept and vision, the procurement process and the development of this business case.

If the NSS is extended over time as envisaged, it will contribute to an improved consumer experience for participants of all the New Zealand screening programmes. The expanded NSS will support a consistent look and feel across the programmes for both providers and consumers.

NSS Scope

The scope defines the boundaries of this investment proposal. The minimum scope includes all essential service requirements, with items that are determined to be out of scope for this investment specified for clarity. The scope and key service requirements are summarised in Table 6 and a more detailed summary of NSS scope is attached as Appendix 2.

Table 6: NSS Scope and Key Service Requirements

Service Requirements	Scope Assessment			
	Minimum Scope	Inter-mediate Scope	Maximum Scope	Out of Scope
NBSP NSS – Solution including integration capability	✓			
NBSP Data Mart and Business Intelligence	✓			
ProVation – standardised national solution	✓			
Interim IT solution - coexistence and decommissioning	✓			
Other NSU Screening Programmes				✓
Immunisation				✓

In assessing the scope, no intermediate or maximum scope items were identified. The proposed investment is for the absolute minimum requirement to achieve a fit-for-purpose end-to-end IT solution to support the NBSP.

The agreed scope of the investment is therefore those listed as **Minimum Scope**.

IT Solution Requirements

The end-to-end IT solution to support the NBSP has four main requirements:

- **NBSP Solution:** Support for the NBSP activities and NSU operations, including enabling integration with Ministry and critical third-party IT systems (e.g. laboratory systems).²
- **NBSP Data Mart and Business Intelligence:** Monitoring and management of NBSP, including operational reporting will be supported by the NSS Core Solution. The NBSP data mart and business intelligence components will support Ministry business intelligence and analytics requirements and are not a component of the NSS Core Solution.
- **ProVation:** Standardised national solution for clinical data to support NBSP.
- **Interim IT Solution:** Enabling a period of coexistence, followed by the decommissioning process, including data migration to the NSS.

² The Ministry is also seeking a wider strategic, enterprise integration solution. In order to de-risk the NSS development and NBSP rollout, the strategic integration work has been removed from NBSP scope. This will be progressed by the Ministry T&DS team, at a slower pace than the NSS.

The NSS solution components are depicted in Figure 3.

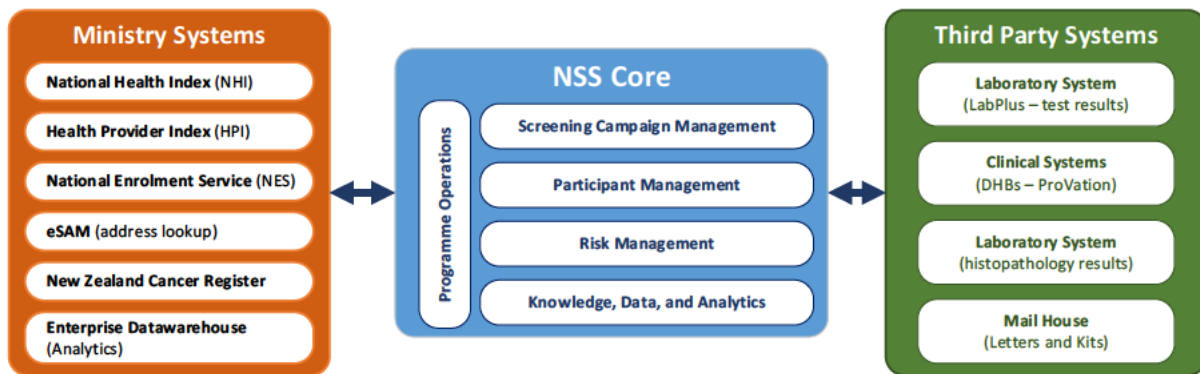


Figure 3: NBSP IT Solution Requirements

NBSP Existing IT Arrangements and Business Needs

The existing IT arrangements and business needs for the NBSP are summarised in Table 7.

Table 7: NBSP Existing IT Arrangements and Business Needs

NBSP Solution	
Existing Arrangements	<ul style="list-style-type: none"> The Interim IT system is the Bowel Screening Pilot IT system with enhancements to allow the NBSP to be rolled out to accommodate eight DHBs (Counties Manukau, Hutt Valley, Hawke’s Bay, Lakes, Nelson Marlborough, Southern, Wairarapa, Waitemata). The system has limited functionality and is heavily reliant on manual processes and procedures to support NBSP. It is not readily extensible to support future requirements and is not able to support other population health initiatives. Participant safety is a critical priority for NBSP. The risk relating to NBSP quality will increase as the NBSP is rolled out across the DHBs. Limited integration with Lab+. High reliance on manual data entry for clinical data.
Business Needs	<ul style="list-style-type: none"> An IT solution which is robust, flexible and sufficiently scalable to accommodate the expected demand for the NBSP safely. Solution must integrate with appropriate IT systems within the Ministry, and third-party systems in the wider sector, to ensure robust, automated information sharing for NBSP to enable safe and effective programme operation. Provide the capability to support future integration requirements for the NSS. Ability to be further scaled/adapted to accommodate additional national screening programmes over time.
NBSP Reporting, Business Intelligence and Data Mart	
Existing Arrangements	<ul style="list-style-type: none"> A simple reporting database was created for the Pilot IT/Interim IT Solution, to allow key indicators to be reported and for analysts to query data. This was a labour-intensive effort and involved analysts primarily using Excel. This model is not sustainable for the NBSP and is not scalable for reporting from twenty DHBs.
Business Needs	<ul style="list-style-type: none"> Ability to monitor NBSP efficiency, effectiveness and safety. Without appropriate monitoring and evaluation of the operational and clinical aspects of the NBSP, goals may not be achieved, and benefits may not be realised. There is also increased clinical and reputational risk and the potential for adverse publicity. More reporting and indicators, to ensure the ongoing safety of the NBSP and its participants. Capability for monitoring the NBSP, storing programme information, and reporting.

- Monitoring programme efficiency and effectiveness against standards.
- Supporting failsafe processes and troubleshooting capability.
- Managing the risks associated with NBSP.
- Monitoring the quality of clinical treatment.

Note: it is envisaged that some of these requirements will be met via the NSS Core Solution, and others by the dedicated NBSP Datamart

2.5 NSS Programme Delivery Approach and Timeline

NBSP Implementation Timeline

The NBSP Programme Business Case described the planned roll-out of the NBSP across four years, commencing in 2016 and concluding in 2020 with handover to business as usual. In March 2017, a re-baselined timetable was presented to Cabinet [SEC-17-SUB-0016 refers]. This indicated a six-month delay to implementation of DHBs 9 to 14, and a subsequent six-month delay for DHBs 15-20, with the final completion date moving from December 2019 to June 2020.

At the Cabinet Business Committee Meeting in December 2017, a further change was approved to the planned implementation timeline to allow more time to develop the National Screening Solution (NSS) technology required to support the NBSP and provide greater flexibility in the event of NSS or DHB readiness-related timeline changes [CBC-17-MIN-0081 refers]. Under the revised timeline, five additional DHBs will commence bowel screening in 2018 as planned, however several others will be later than originally scheduled. The remaining DHBs will commence bowel screening over the next two financial years (2019/20 and 2020/21), using the NSS. The revision means the final five DHBs will start screening by the end of June 2021 and the full roll-out will now be completed a year later than originally planned. The extended timeline provides greater surety of delivering a safe and high-quality Programme, given the proposed deployment date for the NSS, and the capacity and capability pressures being experienced by DHBs, including managing colonoscopy wait times.

Nelson Marlborough DHB, Lakes DHB³ and Hawke's Bay DHB are planned to go live in August, September and October 2018 respectively.

NSS Implementation Timeline

The NSS is expected to be ready for initial implementation by the end of March 2019 to support the NBSP rollout to the remaining twelve DHBs. Whanganui and MidCentral DHBs are expected to commence screening from May and June 2019 respectively, once the NSS is fully functional.

The first eight DHBs (Hutt Valley, Wairarapa, Waitemata, Southern, Counties Manukau⁴, Nelson Marlborough, Lakes and Hawke's Bay), which commenced bowel screening using the Interim IT Solution, are expected to migrate to the NSS in 2019/20. The timing of the transitions will be finalised once there is greater certainty on the development timeline for the NSS.

The remaining DHBs which will commence screening in 2019/20 and 2020/21 will utilise the NSS from the time that they commence screening under the NBSP.

The implementation, transition and deployment approach and timeline for the NSS is attached as Appendix 3.

³ Following Waikato DHB's request in September 2017 to delay to 2019/20 as a result of a number of pressures facing the DHB, it was agreed that implementation at Lakes DHB would be brought forward to 2018/19.

⁴ Assuming go-live as planned in June 2018.

2.6 NSS Key Stakeholders - Engagement

Stakeholder engagement is critical for the successful delivery of the NSS. Stakeholders have been identified and analysed to determine the extent to which they are engaged directly in the development and implementation of the NSS. The NBSP key stakeholders were used as a starting point and were refined to reflect the level of interest and impact the stakeholders would have in the NSS.

As key stakeholders, Treasury, MBIE and GCDO have been engaged throughout the NSS design process and through the development of this business case.

To date, the following activities have ensured appropriate engagement of critical stakeholders:

- **Central Agencies:** Treasury, MBIE and GCDO were involved at key points of the Technical Options Analysis and the development of the procurement approach for a new NSS. GCDO was also engaged for the evaluation of the responses received during the NSS procurement activities. The NBSP has also provided regular updates about the NSS to the agencies as part of the recurring, monthly NBSP – Central Agencies meeting.
- **Clinical Leadership and Guidance:** The NSS Programme established a dedicated Clinical Reference Group in July 2017, with members including screening programme clinical leads and specialists (such as pathologists) involved in screening service delivery. The Group has met at key points of the procurement and evaluation process to provide input and guidance from the clinical practitioner perspective. This Group will continue providing valuable guidance and insights throughout the NSS design and development work.
- **DHB engagement:** In response to the perceived disconnect between the Ministry and the DHBs, a number of measures have been/are being implemented. The Governance Group membership will be expanded to include a DHB Chief Executive Officer, and there will be a DHB representative on the NSS Steering Group. The Bowel Steering Advisory Group (BSAG) will increase clinical partnership with those with operational knowledge. The NBSP is also enhancing its engagement with DHBs and PHOs through the Regional Centres. As the rollout continues, more artefacts are complete and are available and are easily accessible through the shared workspace. As the NSS is developed, opportunities for wider sector engagement are being sought.
- **DHB Technology Representatives:** The Technical Options Analysis and subsequent NSS concept development processes engaged a number of DHBs for input and advice, including anticipated future bowel screening-related technology needs as well as the experience of the DHBs with the NBSP Interim Solution. During the NSS procurement activities, a DHB Chief Information Officer (CIO) was nominated by the DHB CIO Forum to act as an advisor for the process. The Ministry's T&DS Group Manager National Digital Services also provided regular updates to the DHB CIO Forum as part of the Forum's regular meeting.

The key internal and external stakeholders for the NSS are summarised in Figure 4. and further detailed in Table 22: Key Stakeholder Impact Assessment (page 66)

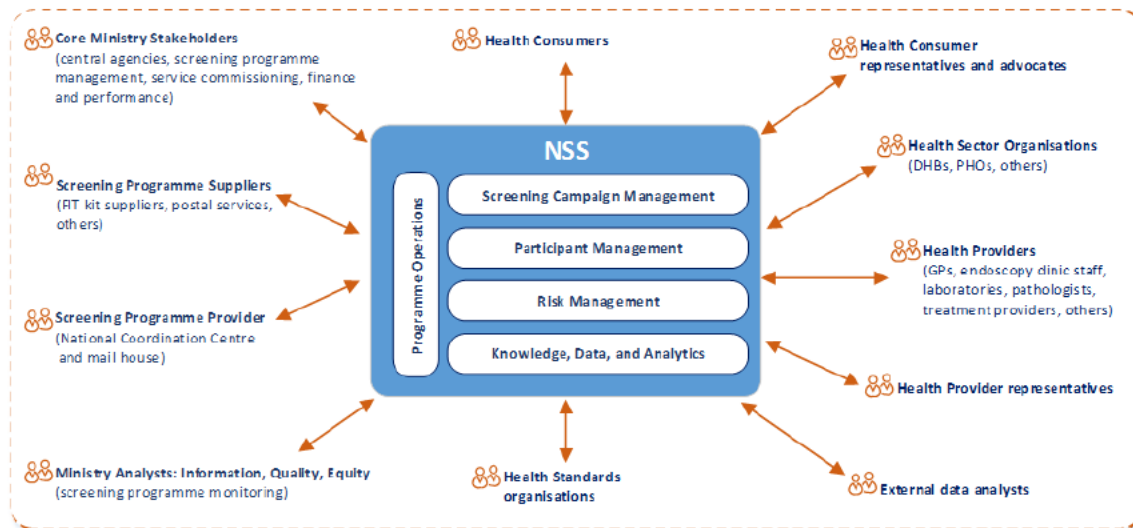


Figure 4: Key Stakeholders - NSS

2.7 NSS Key Benefits and Disbenefits

The Programme benefits and disbenefits are detailed in the NBSP Programme Business Case and are summarised in Table 8.

Table 8: NBSP Benefits and Disbenefits

		Screened Population	Total Population	Future Evaluation
Benefits	Improved health outcomes	Maximise detection of bowel cancers within the NBSP parameters	Reduction in bowel cancer mortality	Decrease in total bowel cancer treatment costs
		Increase in the proportion of screening-detected bowel cancers detected at TNM Stages I and II	Increase in 5-year relative survival rate for bowel cancer	Contribution to society (estimated at \$ 9(2)(f)(iv) modelled period)
	Cost effective healthcare	Appropriate rate of screening-detected advanced adenomas	Benchmarking improvement with international comparisons (smaller variance from OECD average)	Quality improvements to DHB endoscopy unit services
			Reduction in bowel cancer incidence	Quality improvements to DHB endoscopy unit services
Disbenefits	Health Outcomes	Anxiety arising from participation in the NBSP (for some participants)	Widening of equity gap for bowel cancer mortality, incidence and survival rates	Quality of Life Years (QALYs) saved (estimated at \$ 9(2)(f)(iv))
		Adverse physical health outcomes from the screening process (for some participants)		

The end-to-end NSS will contribute to the benefits by ensuring a robust and high-quality information is available in a timely manner to support NBSP service delivery and clinical decision making. Audit, quality and performance reporting enabled by the NSS will support the identification of problems and issues in the NBSP. The NSS will facilitate their resolution and as such will contribute to the identification and reduction in operational risk.

The NSS will assist in minimising disbenefits by ensuring that all eligible participants are identified and managed effectively throughout their journey through the NBSP. The infrastructure contributes to minimising disbenefits, through fail-safe reporting.

2.8 NSS Key Risks

The key risk areas for the NSS are captured in the NBSP Risk Register and are monitored regularly. The highest rated risks and issues are reviewed weekly by the NBSP Leaders Group and monthly by the Governance Group. The current key NSS risks, and the actions being taken to address these risks, are summarised in Table 9 and a more detailed summary is attached as Appendix 4.

Table 9: Key NSS Risks

Risk	Risk Management Strategy
<p>End-to-end solution does not meet the needs of a clinically safe and operationally robust NBSP service</p> <p>(Refer Appendix 4, risks NSS01, NSS02, NSS05, NSS06, NSS07, NSS08, NSS09, NSS10, NSS19, NSS20, NSS21, NSS23)</p>	<ul style="list-style-type: none"> • Consistent engagement of operational and clinical stakeholders of the NSS-NBSP development, including within the Ministry and Sector. • Dedicated project streams and robust project management for NSS implementation enablers, including all integration points into Ministry and Sector Systems. • Comprehensive technical, end-to-end integration, and business acceptance testing of the solution with strong stakeholder engagement throughout. • Robust technical implementation and DHB deployment approach, jointly developed and executed across the Ministry, NSS vendor and Wider Sector.
<p>Implemented solution does not comply with the required regulatory, legislative and Ministry/All of Government policies</p> <p>(Refer Appendix 4, risk NSS12)</p>	<ul style="list-style-type: none"> • Early identification and assessment of all relevant compliance requirements to inform solution design and development. • Engagement of Central Agency and specialist stakeholders for input and guidance on complying with requirements. • Inclusion of compliance testing in the NSS technical (e.g. penetration testing) and business acceptance (e.g. privacy and security) testing activities. • Inclusion of compliance test results as a factor in the NSS implementation go / no go decision.
<p>Implemented solution is not accepted by and used as intended by intended users and the solution's direct stakeholders</p> <p>(Refer Appendix 4, risks NSS04, NSS13, NSS18, NSS21, NSS22, NSS23, NSS24)</p>	<ul style="list-style-type: none"> • Early development of stakeholder engagement strategy and supporting communication plan to ensure appropriate, consistent and fit-for-purpose communication and engagement with all stakeholder groups. • Robust technical change integration and business change management planning for NSS deployment phases. • Intensive, targeted early life support, stabilisation support and formal transition to business-as-usual for each deployment step. • Dedicated change management approach and plan for DHBs transitioning from the Interim Solution to the NSS.
<p>Implemented solution does not meet quality or delivery timeframe requirements due to issues with vendor capability / capacity, or their commercial relationship with the Ministry</p> <p>(Refer Appendix 4, risks NSS11, NSS18)</p>	<ul style="list-style-type: none"> • Clear definition of roles, responsibilities, deliverables, quality factors, milestones and monitoring/management approach for each phase of the NSS design, development and deployment process. • Robust decision making and escalation process to support all levels of the NSS Programme and vendor relationship. • Appropriate legal, commercial and project specialist input for relationship and contract development and management.

Risk	Risk Management Strategy
<p>Solution is not able to be developed and delivered in the available budget due to issues with or changes to scope, technical requirements, decision making timeframes and NBSP alignment</p> <p>(Refer Appendix 4, risks NSS16, NSS17)</p>	<ul style="list-style-type: none"> • Clear prioritisation and management of solution capability and business requirements as defined during procurement process and elaborated during the Design Phase. • Management of requirements and quality considerations within the prioritisation and strong scope and change control practices. • Strong engagement of NBSP Sector Deployment team and wider Sector for solution validation.
<p>Data integrity and service quality issues during technology coexistence: Interim Solution and NSS joint operation</p> <p>(Refer Appendix 4, risks NSS03, NSS25)</p>	<ul style="list-style-type: none"> • Detailed impact assessment and technical analysis of coexistence approach options, with a suitable technology or manual process-based resolution of each potential clinical, operational or data integrity risk. • Inclusion of each agreed resolution in technology solution development, technology service development and user training (process/practice). • Dedicated monitoring practice and reporting to ensure any risks or issues are identified and rapidly resolved once coexistence is underway.
<p>Contract with vendor not signed within the 12-month validity period i.e. by 31 October 2018</p> <p>(Refer Appendix 4, risk NSS26)</p>	<ul style="list-style-type: none"> • Approval of the NSS Business Case, as planned • Ministry and Central Agency familiarity with Crown-Vendor contract and terms • Minister of Health regularly informed on status and progress • Contract signed on time

2.9 NSS Key Constraints and Dependencies

The key constraints and dependencies for the NSS are summarised in Table 10.

Table 10: NSS Key Constraints and Dependencies

Constraints	Notes
Business case approval	<ul style="list-style-type: none"> • In order for the full contract with the NSS vendor to be awarded, and for the development of the NSS to commence, the business case must be approved.
Critical stakeholder availability	<ul style="list-style-type: none"> • Critical stakeholders (clinical, operational, technical and sector) have other competing demands on their availability, limiting their capacity to provide required support to the development and implementation of the NSS.

Dependencies	Notes
Laboratory system integration	<ul style="list-style-type: none"> • Sector systems (for FIT results, colonoscopy information and post-colonoscopy pathology) must meet NSS standards. <ul style="list-style-type: none"> ○ Due: prior to System Integration Testing.
Third party systems and capabilities	<ul style="list-style-type: none"> • The achievement of an effective end-to-end solution may be constrained by the ability of third party systems (e.g. ProVation, laboratory systems) to align with NSS requirements and functionality. <ul style="list-style-type: none"> ○ Due: Prior to System Integration Testing.
Changes to NCC operating model	<ul style="list-style-type: none"> • Change to the NCC operating model is required, to align with the service delivery approach facilitated by the NSS and run a co-existence model for up to 9 months. <ul style="list-style-type: none"> ○ Due: Prior to NSS technical implementation.
DHB operational readiness	<ul style="list-style-type: none"> • DHBs must be operationally ready to go-live. This includes both technical and clinical/quality requirements (e.g. waiting times for colonoscopy must be at target, resources must be in place, and facilities must meet quality standards). <ul style="list-style-type: none"> ○ Due: Prior to NSS deployment phase for each DHB.
Ministry system preparedness	<ul style="list-style-type: none"> • The NSS will need to interact with multiple existing Ministry systems (e.g. NHI). These systems must be able to interface with the NSS in the agreed manner. <ul style="list-style-type: none"> ○ Due: prior to System Integration Testing.

3 NBSP NSS Economic Case

In developing the NBSP Programme Business Case, the existing IT solution was assessed, and an initial options analysis was undertaken to determine a proposed way forward for a strong IT solution to support NBSP.

Independent quality assurance (IQA) of the IT solution options analysis undertaken for the NBSP Programme Business Case was carried out by Caravel and Accenture New Zealand. The Ministry accepted the recommendations to investigate the wider use of the Enhanced Pilot IT system, and committed to undertaking a further options analysis, to include a market scan [SOC-16-MIN-0108 refers]. The Ministry partnered with EY to complete this work.

The EY IT options analysis and market scan was completed in March 2017. A summary of the process and findings is attached as Appendix 5. This analysis concluded that there may be several different IT solutions that meet the NBSP technology needs, with technology partners in the market able to offer these solutions. A procurement process was therefore required, to secure the national information technology solution, NSS, and associated technology partner. This process is detailed in Section 4.

3.1 NSS

Options Identification Process

The responses from the Market Sounding engagement were combined with the Desktop Research. This provided strong support for the Ministry to adopt a risk management capability-based approach for the solution and helped define a number of possible IT solution options for the NBSP.

The process to inform the NBSP IT options assessment included:

- **Requirement definition and refinement:** Based on existing content (including clinical content) and workshops with key Ministry resources, capability requirements (reflecting the need for a future-proofed delivery of the NBSP IT solution) were identified to inform the Market Sounding pack. Whilst these capability requirements were not exhaustive, they were provided to suppliers during the Market Sounding to encourage innovative responses. The requirements were drafted in relation to the NBSP and at a high level would be comparable for other screening programmes. This would enable the identification of a solution capable of supporting the wider population health ecosystem.
- **Desktop research and analysis:** Desktop research was conducted to understand relevant global case studies, and the approaches taken by those programmes to deliver screening.
- **Market Sounding:** Following the capability requirements refinement, and in parallel to the desktop research, the market was invited to share their insights on innovative IT solutions to support the NBSP. The responses from the Market Sounding provided a number of possible IT solution options.
- **Hypothesis testing and refinement:** Three broad solution approaches were identified:
 - Risk-centric.
 - Campaign-centric.
 - Participant-centric.

The NBSP market scan requirements, investment objectives, benefits and wider strategic goals associated with public health meant that a risk-centric approach would potentially offer the most value in terms of core screening capability and re-use across other screening programmes.

- **Assessment Criteria refinement:** The assessment criteria used to identify the preferred IT Option was refined to provide a fair comparison of IT Options relative to one another. Changes to the criteria were incorporated following feedback from key stakeholders. These were then socialised and agreed prior to the IT Options Assessment Workshop (the Workshop) and included removal of duplication of criteria and amendments to align criteria to the wider outcomes of the NBSP.
- **IT Options workshop (10 March 2017):** Socialisation of workshop material was undertaken to ensure the Workshop primarily focused on the identification of a preferred IT Option.

Long List Options

Seven options were identified as potential solutions for the IT needs of the NBSP. These ranged from fully bespoke solutions through to Commercial Off The Shelf (COTS) solutions requiring minimal configuration.

The Ministry considers a COTS solution to be an established, ready-made or packaged IT solution that can be readily integrated with other systems and processes across the health sector to meet the NSS requirements. COTS solutions may include:

- Established products that fully meet the NBSP requirements, with some configuration.
- Ready-made solutions that meet the majority of the NBSP requirements with some configuration and may be customised or extended to fully meet these requirements.
- Packaged solutions that use a single technology stack to form the core COTS solution and are developed by integrating, extending, customising and/or configuring multiple components to fully meet the NBSP requirements.

COTS solutions must have a pre-defined future product development roadmap that the National Screening Solution would be able to leverage and benefit from, as part of the solution development and implementation. COTS solutions must also be supported by case studies and customer references as evidence of their ability to support similar solution requirements. Commissioning a custom-made or bespoke solution that does not align with the parameters outlined above would not be considered.

An overview of the IT options for the NBSP NSS solution is shown in Figure 5.

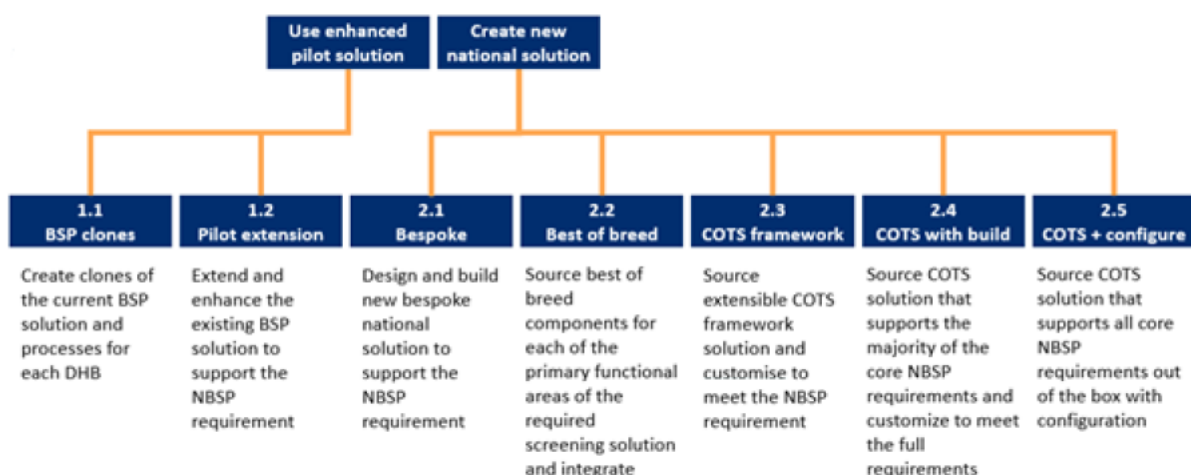


Figure 5: High Level IT Long List Options Overview. Note: in this diagram BSP refers to the Pilot IT Solution.

The long list options for the NSS are summarised in Table 11.

Table 11: NBSP NSS Core – Long List Options Summary

Option		Summary
1.1	Clone Pilot IT Solution	Each DHB would be supported by their own instance of the current Pilot IT Solution, with associate application instances, processes and infrastructure duplicated. A centralised solution would be required to manage and coordinate multiple instances of the same Pilot IT Solution to create a 'national viewpoint' of the NBSP.
1.2	Enhance and extend Pilot IT Solution	All aspects of the existing Pilot IT solution architecture (application, data and technology) would be scaled to meet NBSP functional and non-functional requirements, including availability and disaster recovery. This would be a single solution instance to meet national requirements. Enhancement would remove dependencies and workarounds acquired through Enhanced Pilot development and deliver a generic instance for all DHBs.
2.1	Bespoke	A new, single-instance end-to-end screening solution would be designed, built and implemented to support NBSP and wider public health outcomes. The solution would be designed and built from the ground up, potentially reusing components of the existing Pilot IT Solution where it makes sense to do so.
2.2	Best of Breed	Source best of breed solution components for each of the primary functional areas of the required screening solution (e.g. campaign, participant and risk management). Solution components would be customised and extended to ensure they operate as part of a cohesive/integrated end-to-end solution and to avoid tactical and manual workarounds.
2.3	COTS Framework	Design and implement solution based on integrated COTS framework, using a single technology stack. Whilst the components may be pre-integrated, they would not support the screening requirement out of the box and a significant level of customisation would be required to meet the NBSP needs.
2.4	Enhance and Extend COTS	A COTS solution would be sourced that supports the majority of the core NBSP screening requirements. This would be configured, customised and potentially extended through additional components to meet the full requirements and scope of the NBSP.
2.5	COTS with configuration	A COTS solution would be sourced that supports all the core NBSP screening requirements. The solution would be configurable to support specific NBSP/population health requirements and would not require any level of customisation to support core functionality across all major focus areas.

Assessment and Recommendation

The long list options were assessed against five Critical Success Factors (CSFs):

- Potential affordability.
- Potential achievability.
- Strategic fit and the extent to which the option meets business needs.
- Potential value for money.
- Supplier capacity and capability.

Each CSF consists of a high-level criterion and associated detailed criteria, used to describe the attributes of that criteria. The detailed assessment criteria for the NSS Core component are detailed in Appendix 6.

Long List Options Analysis Summary

The NBSP NSS Core IT Options workshop assessed the long list options and debated the merits of each approach. The outcome of the long list options analysis process is summarised in Table 12 and detailed further in Appendix 7.

Table 12: NSS Core - Long List Options Analysis

Option		Summary	Shortlist
1.1	Clone Pilot IT Solution	Not considered viable as an approach for the NBSP, primarily because it does not meet any of the strategic fit and business needs criteria.	✗
1.2	Enhance and extend Pilot IT Solution	Failed to meet a sufficient number of the strategic fit and business needs criteria but was shortlisted to provide a base line comparator	✓
2.1	Bespoke	Not considered viable as an approach for the NBSP, as it does not meet whole of life cost and programme cost within the Potential Value for Money criteria.	✗
2.2	Best of Breed	Not considered viable as an approach for the NBSP, as it does not meet whole of life cost, programme cost and programme risk within the Potential Value for Money criteria. It also failed to meet the support and maintenance within the supplier capacity and capability criteria.	✗
2.3	COTS Framework	Aligns with the Government Information Communications Technology (ICT) Strategy outcomes and Ministry on the Move principles and was insufficiently differentiated from 2.5.	✓
2.4	Enhance and Extend COTS	Meets the greatest number of Critical Success Factors. This option meets the needs of the NBSP and would support a wider population health ecosystem.	✓
2.5	COTS with configuration	Meets the achievability criteria and would deliver a national solution within the required timeframes and was insufficiently differentiated from 2.3.	✓

The Workshop confirmed that the Ministry would not seek to extend or enhance the existing pilot system as the strategic solution. Further, a bespoke system (including one that may reflect best of breed components requiring integration) would not be sought from the market.

The Ministry did not constrain the procurement process beyond the COTS requirement, so that responses proposing IT solutions ranging from solutions based on an extensible COTS framework to COTS solutions with minor configuration would be considered and assessed fairly.

Economic Evaluation

Cost range estimates for each option were developed, based on estimates provided by participants in the Market Sounding and supported by EY's industry experience. These cost estimates are indicative only and were developed solely to support the assessment process. Table 13 provides a view of how programme costs may vary across the options, based on key cost areas.

Table 13: Comparative Cost Model

	1.1 Pilot clones	1.2 Pilot extension	2.1 Bespoke	2.2 Best of breed	2.3 COTS framework	2.4 COTS with build	2.5 COTS with configure
External build	Medium	High	High	Medium	Medium	Medium	Low
Programme delivery	High	High	High	High	Medium	Low	Low
Application integration	High	Medium	High	High	Medium	Low	Low
Rollout	High	Medium	High	High	Medium	Medium	Low
DHB integration	High	High	High	Medium	Low	Low	Medium
Migration	Low	Low	High	High	Medium	Medium	Medium
Hosting	High	Medium	Medium	Medium	Medium	Medium	Medium
Licencing	None	None	Low	High	Medium	High	High
Support and maintenance	High	High	Medium	High	Medium	Low	Low
Upgrades and enhancements	High	High	Medium	High	Medium	Medium	Low

Source: NBSP IT Options Assessment Outcome Report, Ministry of Health March 2017

Figure 6 shows indicative implementation costs for each option (including build, rollout, integration, and migration costs and one year of run costs). It also provides a view of the potential over-/under-spend risk profile associated with each proposed option.

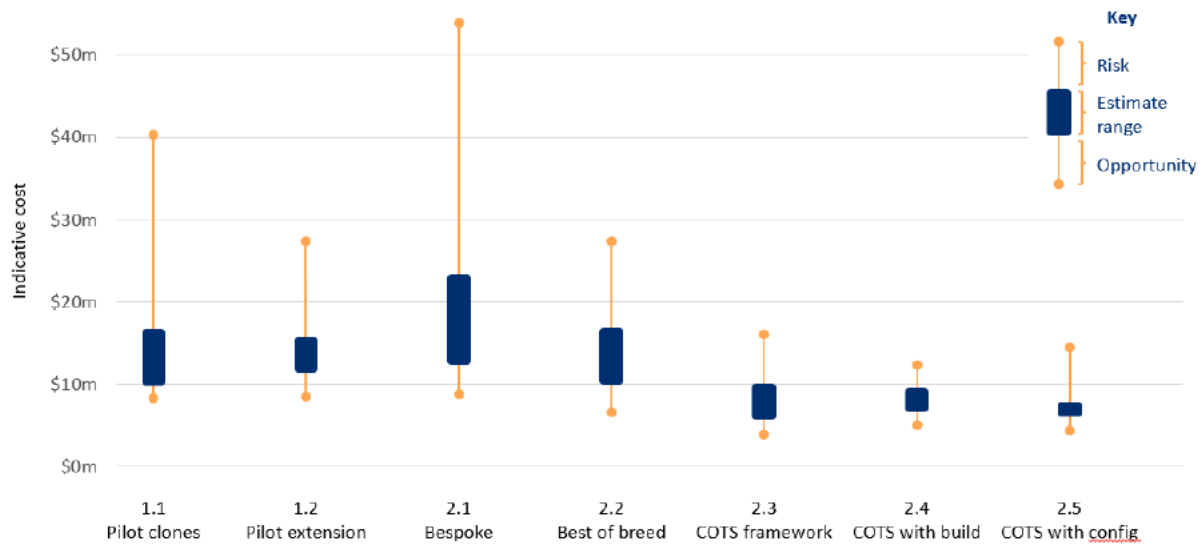


Figure 6: Indicative One Year Cost Estimates with Risk⁵

Source: NBSP IT Options Assessment Outcome Report, Ministry of Health March 2017

The analysis of indicative costs identified that Options 2.3, 2.4 and 2.5 had the lowest estimated costs and the smallest estimated range of costs. This analysis supported the shortlisting of these three options (along with Option 1.2 as a comparator).

⁵ Note: Application integration and programme delivery costs were not included as part of the calculation, as there was insufficient information available to estimate these figures.

Short List Options Analysis

The short-listed options were evaluated by the key stakeholders against the CSFs and their associated detailed criteria. The outcome of the analysis is summarised in Table 14 and a more detailed analysis is attached as Appendix 8.

Table 14: NSS - Short List Options Analysis Summary

Option		Summary – Assessment Against 37 Criteria	Outcome
1.2	Enhance and extend Pilot IT Solution	<p>Met: 23 Partially met: 9 Failed to meet: 5</p> <ul style="list-style-type: none"> Adoption of information and technology innovations is accelerated, and value is being created. Investment in innovative digital services is being prioritised and benefits are being realised. Complex problems are being solved and innovative solutions are being adopted. Provides a foundation capability that can be used across multiple health screening programmes without excessive change. Readily supports interoperability across the sector through the use of defined standards. <p>This option was not preferred due to the high number of criteria which were either partially or not met.</p>	✘
2.3	COTS Framework	<p>Met: 25 Partially met: 11 Failed to meet: 1</p> <ul style="list-style-type: none"> Readily supports interoperability across the sector through the use of defined standards. <p>This option was not preferred as it failed to meet a key criterion.</p>	✘
2.4	Enhance and Extend COTS	<p>Met: 36 Partially met: 1</p> <ul style="list-style-type: none"> Sourcing activities may not be completed in time to meet Programme delivery timescales. <p>Failed to meet: 0</p> <p>This option was preferred as it met all but one criteria, which was partially met.</p>	✓ Preferred
2.5	COTS with configuration	<p>Met: 23 Partially met: 14 Failed to meet: 0</p> <p>This option was not preferred due to the number of criteria which were only partially met.</p>	✘

Preferred Option

The preferred strategic IT Solution Option for the NSS Core, to meet the needs of the NBSP and support the wider population health ecosystem, is **Option 2.4: Enhance and Extend COTS**.

3.2 NSS Integration Capability

Options Identification Process

The NSS will be required to integrate with both internal Ministry systems and third-party organisations' systems. This integration will ensure that the NSS is able to receive and deliver information across multiple systems concurrently in support of NBSP, transforming data from one technology standard or pattern to another, without impacting the performance of those systems. It protects against compromises to the confidentiality, integrity, and availability of the information it processes and supports non-repudiation to provide confidence that messages have been received.

By enabling integrations with Ministry internal and external third-party systems, the NSS will allow:

- Access participant and health provider identity information and validate addresses.
- Identify eligible individuals so that they can be invited to participate in a screening programme.
- Distribute communications to potential and current screening participants through multiple channels (including mail, email, mobile, and messaging).
- Provide invite lists, screening history information and notifications to primary health providers and enable them to make invitation requests.
- Receive screening and histology test results from laboratories and enable them to view provider and screening history information.
- Receive diagnostic test information from diagnostic clinics, including pre-assessment information, and provide diagnostic clinics with notifications and participant screening history information.
- Receive treatment and outcome data from treatment providers.
- Provide operational, monitoring and management reports and support the provision and management of complete audit trails.
- Identify and authenticate users and systems.
- Integrate with future health sector systems in a reliable manner without encountering technical complexities.

These information flows and associated integration functionality are critical for achieving a suitable solution that can support a safe and robust NBSP service delivery nationwide.

The integration landscape for the NSS, including some long-term strategic requirements, is illustrated in Figure 7.

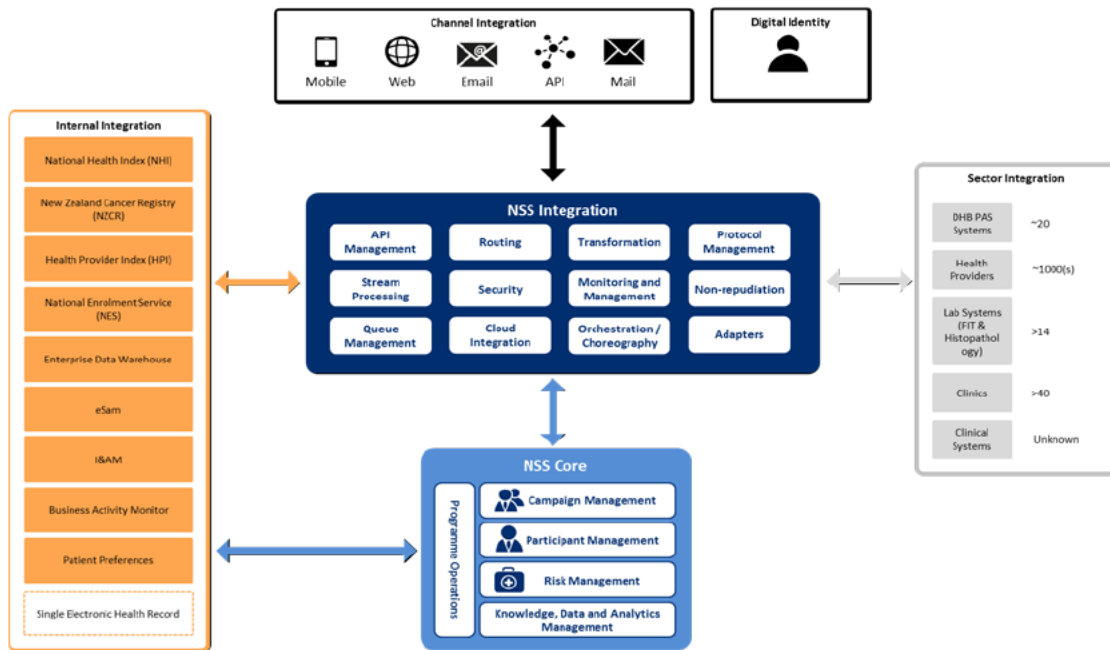


Figure 7: NSS Integration landscape

Whilst the NSS will integrate with internal Ministry systems such as the National Health Index (NHI) through existing services available on the Ministry Enterprise Service Bus⁶ supported by WS02⁷, it was identified through the NSS procurement that the current integration capability within the Ministry would not be able to readily support the integration with third party systems such as laboratory and clinical systems.

Two options were identified for integration capability: to source and implement strategic Ministry implementation capability (see Figure 8); or to leverage NSS integration capability (see Figure 9).

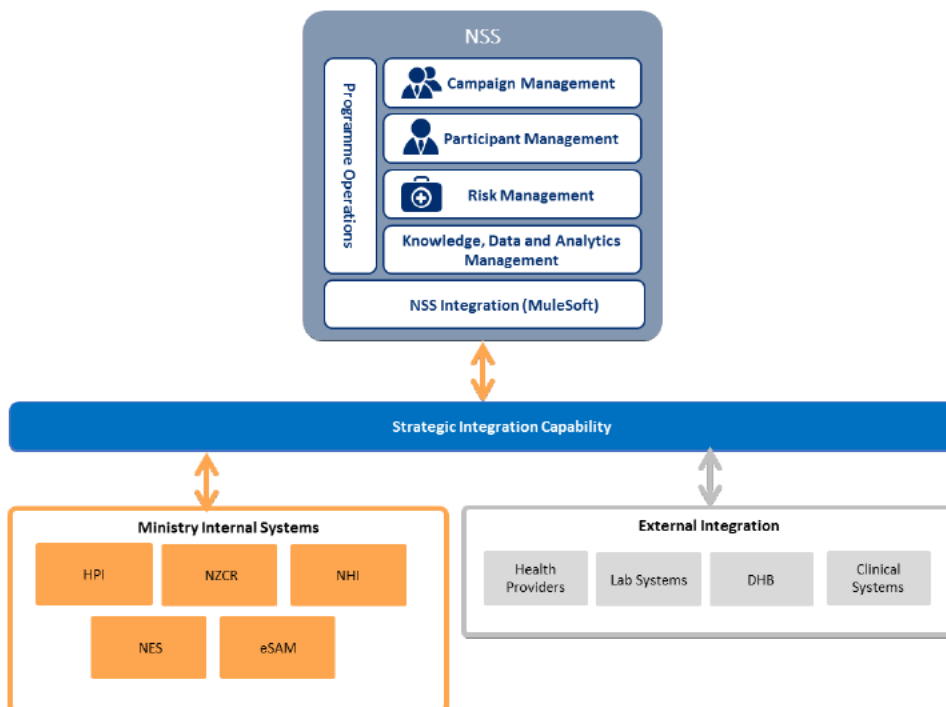


Figure 8: Source and implement strategic Ministry Integration Capability

⁶ A component of the Ministry's enterprise architecture, acting as a communication channel between systems.

⁷ WS02 is an open source provider of integration <https://wso2.com>

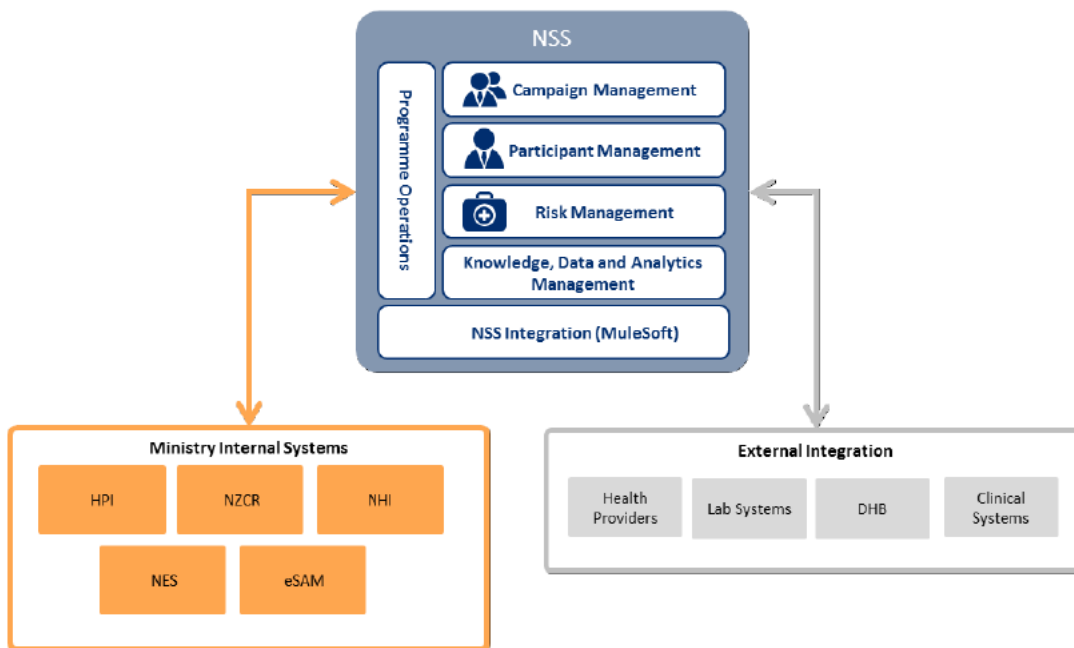


Figure 9: Leverage NSS Integration Capability

Assessment and Recommendation on Preferred Option

During the initial development of the end-to-end NSS solution concept, the more traditional Option 1, the use of a strategic integration capability, was expected to be required. Further analysis of this option identified that the current integration platform and capability within the Ministry would not be able to support the strategic integration requirements for the NSS, and potentially other Ministry-managed systems. It was therefore determined that Option 1 would require an integration strategy to be defined and the procurement of technology to support that strategy. It was also determined that this work did not fit into the scope of the NSS, or the NBSP.

When the preferred technology solution was identified during the NSS procurement process, it was noted that the proposed solution incorporated a market leading integration solution (MuleSoft⁸), which could be leveraged to support direct integration between the NSS, Ministry systems and third-party systems such as the laboratory and clinical systems. During negotiation with the preferred NSS supplier it was confirmed that this approach to integration would add no additional risk and cost to the design and delivery of the end-to-end NSS solution.

It was therefore decided that the preferred integration option for the NSS is **Option 2: Leverage NSS integration capability**, as it offers the lowest cost and risk approach to achieve the NSS outcome for the NBSP nationwide implementation and will allow the NSS to use the Ministry's strategic integration services once they are available.

⁸ <https://www.mulesoft.com>

3.3 NBSP Data Mart and Business Intelligence Reports

The preferred NSS Core technology solution provides a range of operational reporting and monitoring capability real-time for its users, therefore all operational reporting is anticipated to be developed and delivered through the NSS Core. The NBSP Data Mart will be used for NBSP programme evaluation and Ministry business intelligence and analytics that require NBSP information.

Three options for the NBSP Data Mart and Business Intelligence Reports were identified. The outcome of the analysis of these options is summarised in Table 15.

Table 15: NBSP Data Mart and BI Reports - Options Analysis Summary

Option		Summary	Outcome
1	Do Nothing	<p>Utilise the operational reporting capability that is part of the procured NSS solution to undertake all necessary NBSP, operation and clinical/safety monitoring and reporting.</p> <ul style="list-style-type: none"> No additional funding required for establishing the data feed from NSS to the Ministry's enterprise data mart, and no funding or resourcing allocation within the Ministry's data mart team for the development of new reports. However, this option removes the Ministry's ability to use bowel screening programme and clinical data in conjunction with other datasets for more extensive analytics, including in support of any screening programme improvement initiatives. 	x
2	Single-stage build – Interim IT Solution source first and NSS later	<p>Start development of NBSP data mart only once an NSS environment is available with usable data.</p> <ul style="list-style-type: none"> Lower risk of rework/redesign if NSS operation and data structures or field definitions are different from the Interim IT Solution. Will result in design which better accommodates data from both systems. Reduces time available for implementation as option requires a near-go-live version of NSS to be available before NBSP data mart design and development can start. Allows for integrated design and lower build cost, but only if project team can gain access to a usable copy of NSS in a timely manner prior to go-live. 	✓ Preferred
3	Two-stage build for separate Interim IT Solution and NSS sources	<p>Develop NBSP data mart based on the Interim IT Solution data initially, then integrate NSS data when NSS is available with usable data.</p> <ul style="list-style-type: none"> Allows development to start before NSS details are known. Rework of stage one build will be required. The extent of rework will depend on how different BSP+ and NSS systems differ in terms of data, data structures, and operation. A two-stage build will be more costly than a single stage build. Option to be considered if the NSS core system implementation does not allow sufficient visibility of data, data structures and operation to build a stable NBSP data mart in timely manner. 	x

Preferred Option

The preferred option for the NBSP Data Mart and Business Intelligence Reports is **Option 2: Single-Stage Build**.

The Programme's preferred approach ensures that all reporting critical to operational and clinical safety monitoring and management will be available within the NSS for all approved users to access from the first day of NSS being available. This will also de-risk the NBSP Data Mart deliverables and will allow for the Data Mart components to be implemented only after suitable testing against the fully implemented NSS. The ability to use this data and other data marts to do more than detailed analysis is a key advantage to be noted, as it is the synergy realised by using multiple reporting marts which delivers the added value.

4 NBSP NSS Commercial Case

4.1 NSS Procurement Process

Procurement Approach

The Programme has taken a mixed approach to sourcing two elements of the NBSP IT solution: the NSS and the NBSP Data Mart and Business Intelligence reports.

The approach included an open Registration of Interest (ROI) and closed Request for Proposal (RFP) approach for the NSS. The NBSP Data Mart and Business Intelligence Reports element did not go through formal procurement, as these are being delivered by the Ministry in-house.

For the NSS to support the NBSP, integration will be required between the NSS and some DHB and NCC systems. Outside of NBSP, the Ministry has a requirement for effective integration capability and originally it was envisaged that a separate process would be undertaken to procure an integration service which would be used initially for NBSP and then extended to other programmes as required. However, in procuring the NSS it has become apparent that the NSS will be able to provide the relatively low level of integration needed for NBSP nationwide implementation. No separate procurement was undertaken, and the integration capability will be provided as an integral element of the NSS.

The sourcing strategy and process for the NSS (including integration capability) and NBSP Data Mart and Business Intelligence Reports are described in sections 4.2 and 4.3.

Procurement Stakeholders

The key internal and external stakeholders engaged in the procurement process for the NSS are depicted in Figure 10.

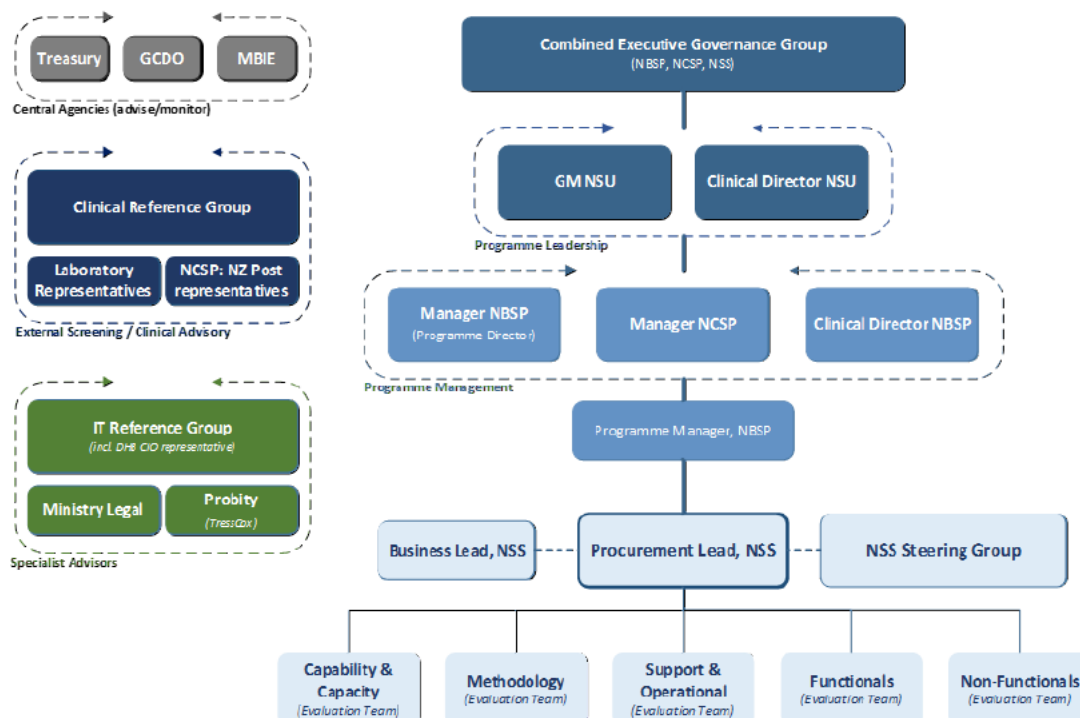


Figure 10: Internal and External Stakeholders for the National Screening Solution

The Clinical Reference Group and Technology Reference Group have representatives from both within the Ministry and the wider health sector. These groups provided further input and advice into the NSS Closed RFP content, from both a NBSP and NCSP perspective. The NCSP was a key stakeholder in the procurement process, as although the NCSP requirements are not included within this business case, they are a key element of the final NSS model and their requirements are factored into the procurement and design.

Probity

The procurement process for all elements of the procurement followed the Government Rules of Sourcing and Ministry policy, including adherence to:

- Code of Conduct.
- Conflicts of Interest Rules and Guidelines.
- Official Information Act 1982.
- Public Records Act 2005.

All project members, influencing stakeholders and Evaluation Panel members, signed a Conflict of Interest Declaration. The NSS Procurement Lead ensured that the Ministry maintained a probity register. All declarations have agreed management plans which were updated at each stage of the procurement process.

Tresscox was appointed as an independent probity advisor.

The Ministry's Procurement Team was involved in checking all key documents and overseeing the procurement process. The Independent (non-voting) Chair for both the ROI and RFP Evaluation Panels was a senior member of the Procurement Team.

4.2 NSS Core and Integration Service

Procurement Strategy

As detailed in Section 3.1, the preferred IT solution for the NSS Core is a COTS with customisation. This would involve the delivery of five main areas of capability: Programme Operations, Campaign Management, Participant Management, Risk Management and Knowledge, Data and Analytics Management.

Two options were considered for the preferred delivery model:

- a) The Ministry contracts a single primary supplier delivering all areas of capability (prime supplier).
- b) The Ministry operates as prime integrator and contracts for a single, or multiple toolsets depending on the responses to the RFP (Ministry Integrator).

When considering the pros and cons of the two approaches, the Programme Steering Group recommended that the Ministry pursues Option a) Prime Supplier. This was because:

- The Ministry does not have the capacity or capability to manage (the potential) multiple suppliers required to deliver a complete solution. This position does acknowledge that there is increased risk in the event of supplier failure.
- A prime supplier model allows a single point of control, whilst also relying on the supplier to manage (often) scarce resource.

Two approaches to market were considered:

1. A single stage RFP.
2. A two-stage process, where an ROI is used as an initial capability stage-gate and then a subsequent closed RFP is issued to selected respondents.

The recommended approach to market was an open and competitive process using a two-stage process of ROI/closed RFP. The reasons for this approach included:

- The procurement was expected to attract significant interest and response, but there was uncertainty about how many providers would be sufficiently credible.
- A two-stage process would enable a fair and transparent process for selecting a qualified shortlist of potential prime suppliers
- The shortlisting of providers generated from the ROI would make the RFP evaluation process more manageable.

The procurement process is depicted in Figure 11.



Figure 11: Procurement Approach - NSS Core

Procurement Process

During 2017, the Ministry undertook a two-phase procurement process:

- An open Registration of Interest phase, resulting in a shortlist of potential solution vendors and solution approaches for the NSS; and
- A closed Request for Proposals phase with the shortlisted vendors, resulting in a preferred solution approach and vendor being identified and recommended for the NSS.

The contract negotiation and award process with the identified preferred vendor is also being progressed through a two-stage process:

- A Design Phase agreement, enabling the completion of the NSS universal design and solution blueprint, and
- A full contract award subsequent to Business Case approval, which enables the development and delivery of the end-to-end NSS in support of NBSP implementation, including the establishment of the ongoing vendor relationship for the operation, management and maintenance of the solution.

The procurement timeline for the NSS Core is summarised in Table 16.

Table 16: Procurement Timeline - NSS Core

Procurement Milestone	Indicative Date
Phase One: Preparation	
<ul style="list-style-type: none"> • Procurement Plan signed off • Open ROI issued to market 	9 May 2017
Phase Two: Registration of Interest	
<ul style="list-style-type: none"> • Registration of Interest responses returned • Evaluation commences 	2 June 2017
<ul style="list-style-type: none"> • Evaluation concludes • Responses shortlisted 	July 2017
Phase Three: Request for Proposal	
<ul style="list-style-type: none"> • Elaboration of solution and vendor requirements 	July – August 2017
<ul style="list-style-type: none"> • Request for Proposal released to shortlisted vendors 	14 September 2017
<ul style="list-style-type: none"> • Receive in Request for Proposal • Commence RFP response evaluation 	24 October 2017
<ul style="list-style-type: none"> • Complete Stage 1 of RFP evaluation (shortlist for presentations) 	27 November 2017
<ul style="list-style-type: none"> • Complete Stage 2 of RFP evaluation (shortlisted vendor presentations) 	20 December 2017
<ul style="list-style-type: none"> • Complete Stage 3 of RFP evaluation (shortlisted vendor due diligence) 	23 February 2018
<ul style="list-style-type: none"> • RFP evaluation completed – preferred vendor identified 	20 March 2018
Phase Four: Negotiation for Design Phase	
<ul style="list-style-type: none"> • Complete negotiation of Design Phase agreement • Design Phase commences 	30 April 2018
<ul style="list-style-type: none"> • Complete negotiation of Design Phase agreement 	30 June 2018
<ul style="list-style-type: none"> • Preferred supplier named 	Subject to Business Case approval

Evaluation of Proposals

The key factors for selection of suppliers are:

- Capability, capacity and ability to execute (Supplier quality).
- Programme management approach (Management quality).
- Delivery of a capable solution (Ability to meet requirements).
- Value for money (Pricing and commercial approach).

Evaluation was undertaken in two stages; Stage One – Registration of Interest (following receipt of ROI responses) and Stage Two - Request for Proposal (closed) (following receipt of RFP responses).

Stage One – Registration of Interest

The ROI stage was undertaken to pre-qualify respondents for receipt of the RFP, by determining whether a respondent had a base level of capability to be considered further. It was not intended as a full assessment of capability.

In order to pre-qualify, suppliers were required to demonstrate that they could offer a COTS solution, would be prepared to act as a prime supplier and they had provided the Due Diligence Disclosure. Respondents were also required to provide evidence that they could deliver the functional and non-functional requirements and that they have sufficient capability and capacity to deliver. Whilst pricing was not sought at this stage, suppliers were asked for their pricing mechanism (licensing, subscriptions) and how they anticipated delivering value for money through the agreement.

The Ministry received 11 responses to the ROI. Initial evaluation was undertaken by members of the Ministry’s Procurement Team, to determine that the respondents met the initial criteria. Further evaluation was then undertaken by three groups with separate remits: Capability and Capacity; Functional Requirements; and Non-Functional Requirements. Respondents were assessed as Acceptable (Pass) or Unacceptable. Respondents receiving an ‘unacceptable’ grade on one or more criteria were not shortlisted to receive the RFP. Final assessment was done by consensus, facilitated by an independent Chair. The outcomes were presented to the NBSP Steering Group for review and endorsement. The evaluation identified seven respondents who would proceed to the RFP phase of the procurement, as noted in Table 17.

Table 17: Respondents to NSS Core ROI

ROI Respondents	Proceed to RFP Stage
█ s 9(2)(b)(ii)	✓
█	✗
█	✗
Deloitte	✓
█ s 9(2)(b)(ii)	✓
█	✓
█	✗
█	✓
█	✓
█	✓
█	✗

The unsuccessful respondents received a letter to this effect from the Senior Responsible Officer (SRO) and were provided with the opportunity to request a debrief.

Stage Two – Request For Proposal

This stage was undertaken to evaluate the responses and identify the preferred respondent.

Six of the seven respondents selected at the ROI stage submitted a response to the RFP. █ s 9(2)(b)(ii) did not respond to the RFP.

The evaluation approach used a gated/pass mark, for five criteria: Capability and Capacity, Methodology, Support and Operational Delivery, the Solution (functional and non-functional capability). Respondents were notified of the criteria and weightings as part of the RFP process.

Following individual evaluation, final assessment was done by consensus, facilitated by an independent Chair and attended by the probity adviser. All scores were reviewed collectively to ensure that a consensus view was held by the evaluation panel. Clarifications were required for the Functional aspects. Following clarification, consensus was reached by the Panel on scores for all five criteria.

On the basis of the evaluation, two respondents were selected to move through to the second stage of presentations and due diligence/clarification:

- Deloitte;
- s 9(2)(b)(ii)

A Value for Money analysis was conducted, focussing on the qualitative differences between the proposals and the cost implications of the different options put forward by the respondents. This analysis was to determine which proposal offers the best value for money for the whole-of-life of the goods/services. Comparisons on price were via a Total Cost of Ownership (TCO) model. This included (but is not limited to) respondent costs, Ministry and client-side costs, contingency, capital charge and net present value calculations.

Both respondents recommended hosting on Cloud Infrastructure with Deloitte being a fully “cloud native” solution⁹. Both respondents recommended solutions which will be jurisdictionally distant. Both Solutions are hosted out of Australia with Deloitte also having a component resident, Marketing Cloud, in the USA. No significant or material security risks have been identified at this point which may cause the Ministry to alter its approach to this project. Further detail on security is attached as Appendix 9.

The NSS Steering Group requested a working group be formed to ensure that security and privacy concerns are robustly investigated and mitigated with any solution that is selected. The implications of a cloud-hosted solution have been progressed in the working group, with key discussion and decision points validated with the NSS Steering Group (e.g. establishment of a working group for cloud policy and a review of the cloud risk assessment). A Privacy Impact Assessment will commence towards the end of the design phase, once the design is sufficiently complete to inform this process.

Following the shortlist to two respondents, the following actions commenced:

- **Respondent presentations:** Each Respondent presented how their product would work within the screening scenarios outlined in the RFP. The Presentations were specifically required to demonstrate how each proposed solution would address the business / usage scenarios described in the NSS RFP. The core membership of the RFP Evaluation Panel attended the Presentations and completed the formal scoring of each Presentation individually, then finalised the scores via a consensus process.
- **Cost Clarification:** Each shortlisted Respondent attended cost clarification sessions to work through licensing, assumptions and other considerations that underpinned their solution costing. Consideration was given to both the immediate-term cost implications for implementing NSS for NBSP, as well as the Total Cost of Ownership for the solution for the NBSP and NCSP. Some information was also collected in support of the potential long-term use of the NSS by other screening and population health initiatives. Beyond the initial configuration, testing and implementation costs, the process also considered the ongoing annual licensing, maintenance,

⁹ A ‘Cloud Native’ application is one that is designed specifically for a cloud computing architecture.

hosting and other cost components, to develop a full picture of costs over a potential 10-year usage period.

- **Architectural Due Diligence:** The Ministry's T&DS Group provided an enterprise architect to consider each shortlisted Respondent's proposed solution from a number of architectural perspectives. Of particular concern was the identification of any risks and issues that could be mitigated during the negotiation process with the Respondent, or in the early NSS design activities with the preferred vendor. Some high-level considerations were identified relating to areas such as the maintenance process in software-as-a-service solution setting, integrations / interfaces with other services, and aspects of user account management and data migration. Each of these was carried forward into the negotiation process.
- **Security and Privacy Due Diligence:** A critical component of this due diligence activity was security. The Ministry's T&DS security manager completed the due diligence with regards to the proposed security aspects of each shortlisted Respondent's solution. This included Cloud Risk Assessment and the Respondents' responses to the non-functional requirements. Of particular note were the off-shore processing of the data, data encryption, logging and monitoring and patch and vulnerability management.
- **Financial and Supplier Strength Clarification:** Both Respondents were required to provide a range of information relating to financial position, including evidence of recent audits, to demonstrate strength and stability. This due diligence activity was completed by the Ministry's internal Finance and Capability Group, and the observations and potential mitigations noted by the Group were included in the negotiation process with the preferred vendor.
- **Respondent References:** The NSS Commercial Lead coordinated the contact with the reference sites provided by each Respondent, to obtain information about critical aspects of the Respondent's deliverables, delivery approach and methodology, culture and resourcing, client engagement and programme management approaches and for information about successes and lessons learned.

Detailed analysis and comparison was undertaken of the two respondents for each of the areas stated above.

Preferred Supplier

The evaluation process recommended that Deloitte and the Salesforce product were taken through to the Negotiation Stage. Deloitte consistently evidenced that they had the strongest qualitative response and, commercially, presented the least costly solution of those shortlisted from the initial stages of the evaluation.

Salesforce represents a strong foundational technology from which additional screening programmes could be added (subject to business case approval).

All the key components of the solution represent global leaders in their field:

- Salesforce is one of, if not the, leading Customer Relationship Manager in the world. (Source: Gartner).
- MuleSoft is a leading integration solution (recently adopted by Health Alliance).
- Amazon Web Services, the infrastructure on which these key technologies are hosted, is a global leader in infrastructure Services.
- Deloitte have implemented a leading screening solution in Ontario, Canada, to support bowel screening and other population health initiatives. It has been notable right throughout their bid that this global experience will be represented materially in their planned implementation.

- Davanti (supporting Deloitte) are a credible local provider of Salesforce implementation services and a Platinum Salesforce Partner.
- Salesforce have increased their local footprint with several local firms and, increasingly, into government with Salesforce underpinning the 2018 census at the department of Statistics.
- It should be noted:
 - The ROI and subsequent RFP did not specify Software as a Service (SaaS) or cloud hosting. The Ministry did not rule out this approach, in support of the “Cloud First” direction set by the Government Chief Digital Officer (GCDO).
 - The ROI and subsequent RFP did not rule out Free and Open source Software Solutions (FOSS). No bids were received on this basis and the Ministry did not receive any clarifications in that respect.

Negotiated Deal

The negotiation with the preferred Respondent will be completed in two stages:

- **Stage One (March-April 2018):**
 - Negotiation and agreement of a contract for the planning and design stage process for Deloitte and Salesforce.
- **Stage Two (April – June 2018):**
 - Negotiation and agreement of Master Services Agreement (MSA) for the Build, Deploy and Support elements of the ongoing agreement for delivery of the NBSP.
 - Negotiation of licensing and support elements of the Salesforce Licencing Agreement (SLA).
 - Negotiation and Agreement of an Operational Level Agreement between the Ministry, the NCC and Deloitte / Salesforce.

The contract with the preferred vendor has also been split into two phases: **Stage One – Design and Stage Two – Build Implementation and Support**. The latter has yet to be negotiated with the supplier. The approach to contract for these two phases is described below.

Potential Risk Allocation

The proposed apportionment of risk between the parties is summarised in Table 18. The split is indicative at this stage and will be reviewed and confirmed as part of the procurement and negotiation process underway with the preferred vendor. Some changes to this table may be expected as part of this negotiation.

Table 18: NSS Potential Risk Allocation

Risk Category	Potential Risk Allocation	
	Ministry	Supplier
Design risk	90%	10%
Construction and development risk	40%	60%
Transition and implementation risk	80%	20%
Availability and performance risk	20%	80%
Operating risk	60%	40%
Variability of revenue risks	0%	0%

Risk Category	Potential Risk Allocation	
	Ministry	Supplier
Termination risks	90%	10%
Technology and obsolescence risks	0%	0%
Control risks	40%	60%
Residual value risks	0%	0%
Financing risks	100%	0%
Legislative risks	70%	30%
Other project risks	50%	50%

Potential Payment Mechanisms

Stage One – Design Phase

- The payment mechanism is based on a time and materials approach.
- As such payment will be made on a monthly basis determined on the number of hours used by Deloitte personnel.
- Actual vs forecast hour will be tracked on a weekly basis with variance from the forecast being determined as a formal change request (if above the forecasted rate).
- s 9(2)(b)(ii) [REDACTED]

Stage Two – Build Implementation and Support Phase

- Payment will be based on a fixed cost approach.
- Key milestones for each of the phase and sub phases will be agreed and acceptance criteria and payment based on acceptable delivery of each milestone.
- Changes to scope and cost will be agreed via a formal change request.
- s 9(2)(b)(ii) [REDACTED]

[REDACTED]

Payment will be based on the supplier’s successful completion of milestones as detailed in the contract.

¹⁰ Additional licences would be required for other population health initiatives; this would be subject to further business cases.

Type of Contract

The short-listed supplier will be offered a contract for services / supply agreement.

Stage One – Design Phase

- s 9(2)(b)(ii) [Redacted]

Stage Two – Build, Implementation and support phasing (yet to be negotiated with the supplier).

- s 9(2)(b)(i) [Redacted]

The proposed contract term is five years, with five options to extend for two Years.

Quality Standards / Key Performance Indicators

Stage One – Design Phase

s 9(2)(b)(ii) [Redacted]

Stage Two – Build, Implementation and support phasing

s 9(2)(b)(ii) [Redacted]

- **Master Services Agreement** - deliverables will include:

s 9(2)(b)(ii) [Redacted]

- **Service Management** s 9(2)(b)(ii)

Deliverables will include:

s 9(2)(b)(ii)

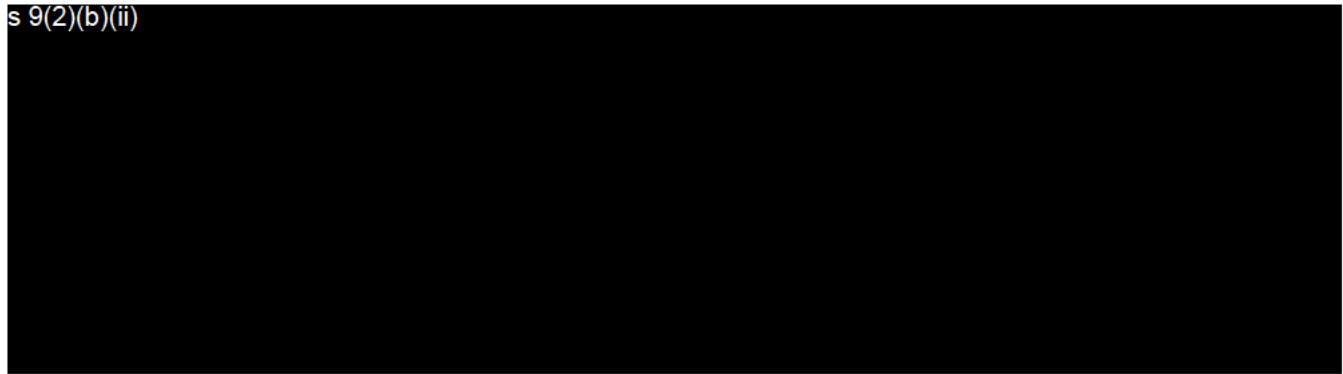
Contract Key Clauses

s 9(2)(b)(ii)

Contract management

The responsibility for managing delivery under the contract as well as supplier relationship management will pass to the Programme Director NBSP on the signing of the contract. The Programme Director will develop a contract and relationship management plan in consultation with the successful supplier:

s 9(2)(b)(ii)



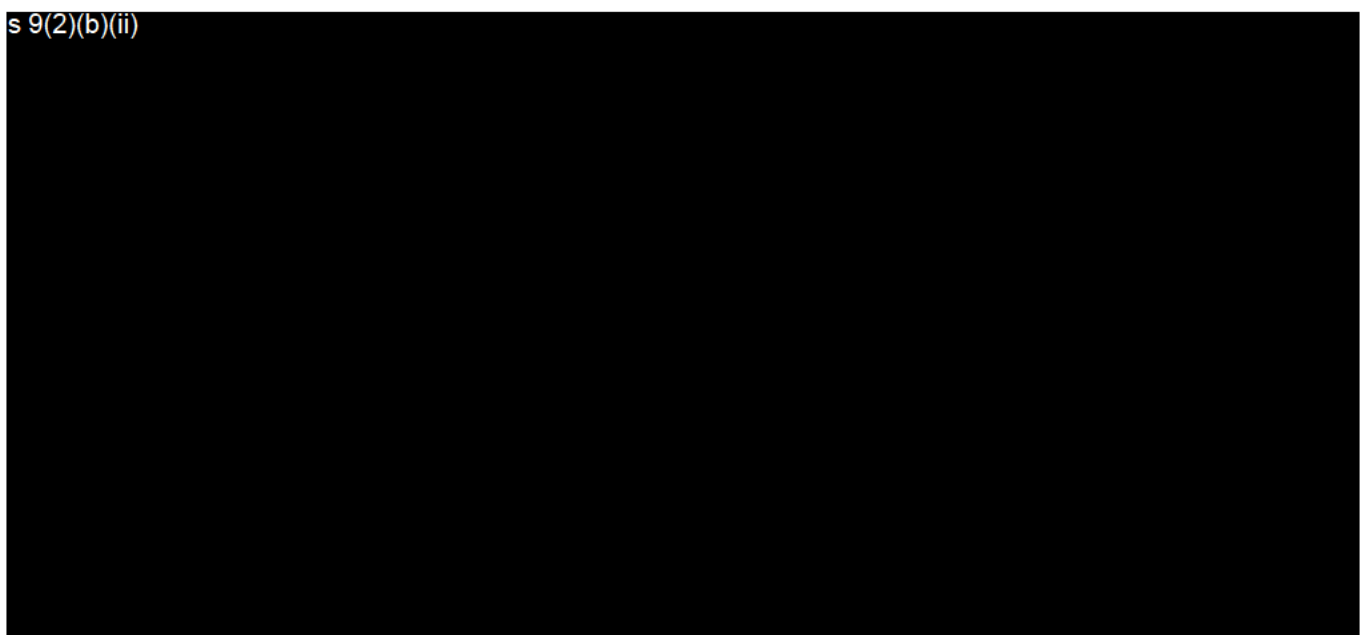
Personnel Implications

The personnel implications are as follows:

- Input from key clinical Subject Matter Experts (SMEs) and business owners.
- Input from key technical and security SMEs.
- Dedicated technical, programme management, commercial, business analysis and Change leads.
- Testers (Technical and User).
- DHB and laboratory lead representatives.

Accounting treatment

s 9(2)(b)(ii)



4.3 NBSP Data Mart and Business Intelligence Reports

Sourcing Strategy

The Ministry has an existing preferred technology solution, tool and service provider for its data mart and business intelligence / analytics needs. This approach is in use with a number of other programme evaluation and other business intelligence requirements, including in support of the National Cervical Screening Programme and Universal Newborn Hearing Unit.

As a result of this existing, enterprise analytics approach, no dedicated sourcing activity was undertaken for the NBSP data mart, and the NBSP will utilise the Ministry's Data Warehouse infrastructure, with support, maintenance and enhancement via the National Collections and Reporting Unit within the Ministry's T&DS Group.

This approach is envisaged to minimise cost and complexity in the programme evaluation analytics capability of the NSS and will ensure that the NBSP is able to be evaluated and monitored in the context of other screening programmes and all of NSU's operations.

5 NBSP NSS Financial Case

5.1 Financial Costing Approach

The financial model is over a 10-year period, reflecting the normal life of Information Technology solutions.

The NSS figures are based on a range of assumptions, including those relating to estimations of risk and estimated distribution of costs. Therefore, the figures, although detailed and robust, may be subject to minor changes. The key assumptions used in the modelling are as follows:

NSS Core:

1. Professional services to develop and implement the solution as detailed in the Functional and Non-Functional requirements presented in the RFP in September 2017. s 9(2)(b)(ii)
[Redacted]
2. Provision of ongoing support to deliver to the Non-Functional requirements as detailed in the RFP in September 2017. This also includes incident and problem management, governance and minor enhancements / system changes. Assumed support commences from the second quarter in 2019.
3. Cost estimates are based on an initial contract term of 5 years. The contract has five options of two-year extensions.
4. Costs assume a “train the trainer” approach in support of NSS deployment to the sector.
5. Software licensing to provide the functionality and scope set out in the RFP advertised in September 2017. This includes:

s 9(2)(b)(ii)

[Redacted]

NSS Delivery Programme (estimated)

6. Costs to reflect internal organisation effort including
 - a. Technical Delivery Manager
 - b. Programme and project management
 - c. Change management
 - d. Business and test analysts
 - e. Commercial management
 - f. Clinical governance
 - g. Commercial management
 - h. Administration
 - i. Training.
7. Provision for Ministry side integration requirements.

NBSP Datamart and Monitoring Reports

8. Costs for a datamart and reports that will enable the Ministry to monitor the quality and safety of NBSP services and outcomes, including:
 - a. Development team to design, specify, develop, test and commission the datamart and associated reports to NBSP and Ministry standards
 - b. Ministry infrastructure costs to supply the tools and hardware required to develop and operate the datamart and reports
 - c. Costs to ensure the functional and non-functional requirements are delivered
 - d. Datamart life of five years before replacement/ renewal
 - e. A “train the trainer” approach for all report user knowledge transfer
 - f. Excludes licensing costs for Business Intelligence tools, which will be covered by existing licences owned by the Ministry
 - g. Excludes integration costs (see Integration Notes below for details)
 - h. Excludes costs of monitoring and operational reports required by NCC, DHBs or others outside the Ministry. Such reports are to be delivered by the NSS and are included in the NSS cost estimates.

Interim Solution Coexistence and Decommissioning (estimated)

9. Estimated cost for ongoing operation and eventual decommissioning in early 2020 of the current NBSP Interim Solution. Allowance has been made for remediation and ongoing support, as well as any decommissioning activities and supplier involvement in NSS design and build.

NCC (estimated)

10. Costs to provision the NCC for the uplift of the NSS. This includes:
 - a. involvement in the NSS design and build activities
 - b. training of NCC staff and
 - c. establishment and use of the NSS as coexistent solution with the current Interim Solution
 - d. transition to NSS as the primary solution (no manual workarounds required).

ProVation (estimated)

11. Establishment of centralised repository for circa 16 instances of ProVation within the DHB's providing a single feed to the NSS. Costs include system establishment as well as estimated cost for assistance with DHB connectivity to central repository.

Security and Quality Assurance

12. Costs to enable the required technical and security quality assurance consistent with GCDO best practice governance.
13. Ongoing costs for annual security reviews.

DHB

14. Cost provision of **§ 9(2)** per DHB for assistance in implementing the NSS as part of NBSP rollout. This provision is divided as **§ 9(2)** to the DHB and **§ 9(2)** for the Ministry for each DHB implementation. Deployment timings are assumed in line with the updated NBSP implementation timeline [CBC-17-MIN-0081 refers].
15. It is assumed that DHBs delivering NBSP services supported by the Interim Solution will migrate from that solution to the NSS during the period of July to December 2019.
16. These DHB implementation and migration dates, and hence the timing of funding drawdowns, are dependent on the DHBs concerned achieving the required state of screening readiness as planned. The final solution design (currently in progress through the NSS Design Phase) may also affect these dates.

Integration Notes

17. Cost to provision all integrations required to support NBSP delivery supported by the NSS. This includes:
 - a. Ministry systems for example the NHI, NES and HPI
 - b. Ministry enterprise data warehouse
 - c. Ministry operational management systems
 - d. FiT test laboratory integration (LabPlus)
 - e. DHB Endoscopy Clinic ProVation integration, through the establishment of a centralised endoscopy data repository
 - f. Laboratory integration for the management of histopathology results.
18. Cost provision to support integration with external registries such as the New Zealand Familial GI Cancer Service.

19. Cost to support the development of general API specifications for the optional Patient Administration Systems and Practice Management System integration. The realisation of these APIs will be dependent on co-design with the relevant PMS providers and the practice community.

Out of Scope

20. Any recommendations from the Independent Assurance Review of the NBSP that have a material financial impact the NSS (but subject to inclusion via a Change Control process involving the Central Agencies and Joint Ministers).
21. Licence costs for broad population access and GP access outside of direct communication with PMS systems. A small allocation has been made for these licences to test and trial functionality.
22. Any enhancement or maintenance required on Ministry-internal systems such as NHI, NES and HPI.
23. Requirements outside the scope of those captured in the RFP in September 2017.
24. Any internal requirements for encryption key stores or System Incident and Event Management tooling.
25. Hosting and datacentre charges (not required) for the NSS Core.

5.2 Financial Costing Model

As outlined in the Economic Case, the preferred option is Option 2.4. The financial case narrative and the analysis below relates to this preferred option offered by the preferred vendor, Deloitte.

The NSS costs comprise a mix of capital and operating costs (DE and NDE) over the 10-year system life period and have been built up through contract negotiations with the preferred vendor, then modelled using the detailed cost model supplied by the Ministry's independent service provider (EY) and the assumptions mentioned above.

Provision for DHB on-boarding was included in the cost model. These costs estimates were derived from estimates provided by DHBs and costs related to the on-boarding of DHBs onto the Interim IT solution. The estimates include a provision for on-boarding costs incurred by the programme to support all required change management activities and anticipated costs incurred by the DHBs, and also allow for risk.

The cost estimates for DHB on-boarding take into account the variability in on-boarding costs across different DHBs and the likelihood of relatively higher costs for the earlier DHBs. These estimates were then standardised across each DHB.

The indicative financial impact of the NSS Programme over the 10-year analysis period is shown in Table 19. A full analysis is attached as Appendix 10.

Table 19: Financial Costing Model

	17/18	18/19	19/20	20/21	21/22	22/23	23/24	24/25	25/26	26/27	27/28	Total
	\$'M	\$'M	\$'M	\$'M	\$'M	\$'M	\$'M	\$'M	\$'M	\$'M	\$'M	\$'M
Capital	1.96	10.89	2.06	0.73								15.65
NDE - DHBs	s 9(2)(b)(ii)											
Ministry DE	s 9(2)(b)(ii)											
Direct NSS Expenditure	s 9(2)(b)(ii)											
Depreciation	s 9(2)(b)(ii)											
Capital Charge	s 9(2)(b)(ii)											
Total Depreciation & Capital Charge	s 9(2)(b)(ii)											
Total NSS Expenditure	s 9(2)(b)(ii)											
Discounted Cashflow (6%, annuity)	s 9(2)(b)(ii)											

At the time of the NBSP Budget 2018 bid, the RFP process had not yet completed, and at that stage it was assumed that since a COTS was being procured, no capital expenditure would be required. Consequently, it was assumed that the NSS Programme would not incur capital charge and depreciation during its life.

However, following the finalisation of the RFP process and with more detail of the NSS Programme and its delivery, there is now greater clarity on the appropriate accounting treatment for the Programme costs. It has been determined that some of the expenditure will need to be capitalised. Consequently, additional operating expenditure is forecast to be incurred for the capital related costs, specifically, capital charge and depreciation. The funds generated from this NSS depreciation will be used to repay the capital. Since this is a COTS approach it is anticipated that the capitalised early implementation and development costs are one-off, and funds from its depreciation are not required to refresh the system at the end of its useful life (as continuous maintenance and solution updates are included within the annual charges).

5.3 Funding

The current funding allocated or tagged as a contingency for the NSS Programme totals s 9(2)(ba)(i) with an additional s 9(2)(ba)(i) across the 10-year period required to be met from within the Vote Health baseline.

The additional costs are mainly driven off a mix of capital charge and depreciation resulting from further clarity on the accounting treatment to be applied with the proposed solution.

Funding for the NSS programme will be met from:

- a call on the existing contingency funding of \$15.969 million capital, allocated to the national IT solution in the NBSP Programme Business Case, of which \$2 million has already been drawn down [CBC-17-MIN-0081 refers refers];
- a call on the existing operating funding allocation of \$2.5 million per annum (s 9(2)(ba)(i)) allocated in the August 2016 NBSP Programme Business Case;
- new operating funding of s 9(2)(ba) over a ten-year period, agreed as part of Budget 2018; and
- reprioritisation of existing baselines within Vote Health.

As illustrated in the table below, due to the phasing of the NSS Programme and where costs lie, some baseline funding will need to be spread across a number of years, with transfers between Non Departmental Expenditure (NDE) and Departmental Expenditure (DE) baselines as appropriate.

DHB implementation and migration dates, and hence the timings of funding drawdowns, are dependent on the DHBs achieving the required state of readiness as planned. The final solution design (currently in progress through the NSS Design Phase) may also affect these dates.

Any recommendations from the Independent Assurance Review of the NBSP that impact the NSS financially are excluded from the scope of this business case.

Table 20: NSS Funding

	17/18 \$'M	18/19 \$'M	19/20 \$'M	20/21 \$'M	21/22 \$'M	22/23 \$'M	23/24 \$'M	24/25 \$'M	25/26 \$'M	26/27 \$'M	27/28 \$'M	Total \$'M
NSS Funding												
Budget 16 Capital	2.00	13.96										15.96
Budget 16 IT DE budget	0.50	2.50	2.50	2.50	2.50	s 9(2)(b)(ii)						
Budget 18 IT DE budget		4.00	4.00	2.50	2.50	s 9(2)(b)(ii)						
Total NSS Funding	2.50	20.46	6.50	5.00	5.00	s 9(2)(b)(ii)						
MoH Baseline												
Capex - datawarehouse		s 9(2)(b)(ii)										
DE for datawarehouse depreciation		s 9(2)(b)(ii)										
National Health IT NDE reprioritised		s 9(2)(b)(ii)										
NBSP NDE C/F												
Total Funding	2.50	s 9(2)(b)(ii)										

The additional s 9(2)(ba)(i) to meet the cost of capital charge and depreciation will be sourced from Ministry baseline funding and NBSP funds carried forward in 2017/18. The Ministry will prioritise its baseline capital and DE funding to contribute funding for the datamart required for the NBSP. In addition, the Ministry will prioritise some of the NDE National Health Information Systems appropriation towards meeting NSS-related costs. As some costs may lie in DE baselines, there may need to be a transfer from the NDE to DE appropriations.

The NBSP is forecasting to be underspent by s 9(2)(ba) in NDE by the end of 2017/18. Changes between 2017/18 and 2018/19 were agreed in the March 2018 Baseline Update, reflecting timing and included a transfer of s 9(2)(ba) and an in-principle transfer of up to s 9(2)(ba)(i).

Due to the changes in timeframes for the roll-out of the NBSP, with the rollout now occurring over four years rather than three years as envisaged in the NBSP Programme Business Case, the funding originally appropriated in Budget 2016 for the DHBs establishment costs was disproportionately phased into the 2017/18 fiscal year, resulting in a requirement to transfer some of this funding forward into the 2018/19 fiscal year to contribute to the roll-out of the NSS programme. Based on the most up-to-date modelling, it is envisaged that the funding profile will see some of those costs incurred in out years, and it is expected that up to s 9(2)(ba)(i) of this funding will need to be re-phased to meet one-off setup costs relating to DHBs, laboratories, NCC and NSS.

Table 20 above shows the indicative profile of funding including surpluses and shortfalls by fiscal year. Ministry Officials will work with the Treasury to agree on the most appropriate mechanisms to reflect baseline changes to address the shortfalls in 2019/20 and 2020/21 and surpluses in the outyears

The capital expenditure of the NSS has been estimated at \$15.65 million (Table 19). The Ministry will contribute \$0.8 million of capital leaving \$14.85 million that will be capital funding from the Crown.

Given that the capitalised implementation costs are one-off in nature, the need for this capital is required for a finite period. Unlike an on-premise investment where depreciation will be reinvested over time for future asset replacement, downstream capital reinvestment for the NSS is not required. Accordingly, the assumption is that as future depreciation flows occur, a capital repayment will be made to the Crown from 2022/23. The capital flows are shown in Table 21 below.

Table 21: Capital Funding Flows

Proposed Capital profile	17/18	18/19	19/20	20/21	21/22	22/23	23/24	21/25	21/26	26/27	27/28	Total 10 year horizon	2028/29 to 31/32	Total
	\$'M	\$'M	\$'M	\$'M	\$'M	\$'M	\$'M	\$'M	\$'M	\$'M	\$'M	\$'M		
Capital contribution	2.00											2.00	-	2.00
Capital contingency		13.96										13.96	-	13.96
Respread capital injections	s 9(2)(ba)(i)													
CAPEX - OPEX Swap	s 9(2)(ba)(i)													
Capital Repayment	s 9(2)(ba)(i)													
Total	s 9(2)(ba)(i)													

The phasing of the capital profile and repayment of much of the initial capital contribution to the Ministry, alongside a capital operating swap, are reflected in the capital charge assumptions in Table 19 above.

5.4 Appropriations

Given the nature of the NSS Programme and greater clarity on where costs lie (both between capital and operating and between DE and NDE outyear baselines), to ensure funding is correctly allocated some transfers between NDE and NDE appropriations will be required, as well as a capital to operating swap. The appropriate changes will be sought from Cabinet alongside the request to approve this NSS Business Case.

6 NBSP NSS Management Case

6.1 Governance and Management

NSS Governance

Governance of the NSS is part of the governance arrangements for the wider NBSP. The NBSP continues to be governed alongside the NCSP-HPV project, to ensure consistency and alignment of the service delivery models and associated technology requirements.

The governance structure for the delivery of NSS has been developed to provide assurance on the delivery of this element of the NBSP. The governance structure for the NSS delivery project is depicted in Figure 12.

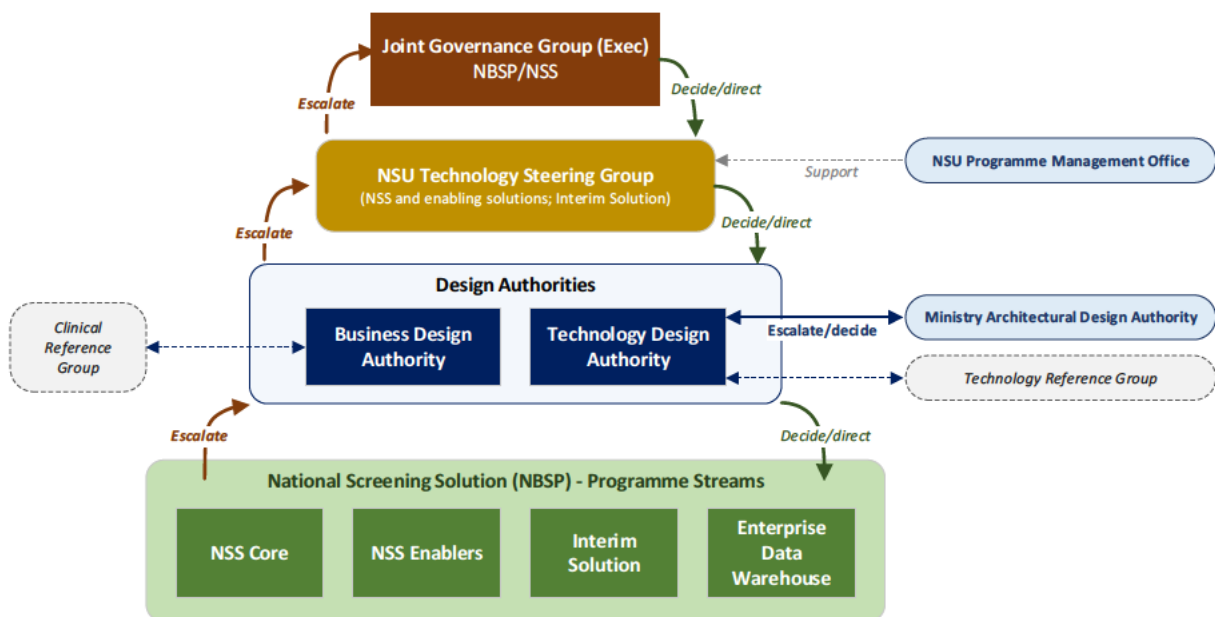


Figure 12: NSS Governance Structure

- Governance Group:** The existing governance body overseeing the development and nationwide deployment of the NBSP is comprised of five members of the Ministry Executive Leadership Team, supported by NBSP leadership and clinical leaders. The Governance Group has overseen the procurement activities for the NSS and will continue to make all critical decisions, as well as ensure progress and benefit realisation, for the NSS technical development and delivery activities.
- Steering Group:** The Steering Group provides oversight and decision-making for all technology solutions used within the NSU. The Group has supported the NSS procurement activities and will remain the primary governance body for the NSS delivery process. It will provide guidance and decision making for matters escalated (within agreed tolerance levels) and will oversee the achievement of key milestones and deliverables within the scope of this agreement.

- **Design Authorities:** The Ministry's two subject matter expert groups (technology and business) provide advice, guidance and in-scope decision making for the end-to-end NSS and its deployment. In-scope decision making is defined as all decisions that are able to be made within the pre-defined and agreed scope, deliverables, timeframes, costings and constraints applicable for the NSS and its components. All decisions that constitute a variation in any of these factors will be considered by the Design Authorities for endorsement but will be decided by the formal governance structure of the NSS.
- **Technology Streams:** The NSS delivery will be broken down into workstreams to achieve each critical component of the end-to-end solution. At a high level this will include:
 - Core solution development and testing with the new NSS vendor;
 - NSS enablers, including Ministry and sector-based integrations with critical NBSP-related systems;
 - NBSP Interim Solution management and decommissioning, including data migration and technical transition for the anticipated 8 DHBs using the system by NSS implementation
 - Enterprise Data Warehousing, including ensuring the necessary information flows; and screening programme evaluation reporting is available in the long term.
- **Specialist Inputs:** NSS delivery will be supported by a number of advisory and reference groups, ensuring that specialist technical and clinical experience and inputs are included in the end to end solution.

Lessons Learned

In designing the NSS programme, lessons were sought from a range of sources: internal to the Ministry and NBSP, such as Gateway Reviews and other Independent Reviews; best practice from across government, e.g. GCDO Assurance; and best international practice made available by the NBSP's advisors and partners, for example the change management methodology from the NSS Implementation Partner.

The staged approach has allowed for analysis, decisions and lessons learned during the Interim Solution stages to be incorporated into the NSS development and delivery process. Some of the key themes from the Bowel Screening Pilot Solution already included in the NSS programme scope and delivery approach include:

- **Robust support for change implementation and stabilisation:** This includes the need for strong engagement and communication during the solution development and change preparation phases, as well as support from the Programme for change readiness, and reliable advice and support for a number of weeks after the change implementation (particularly for DHBs who may only receive their first colonoscopy referrals some weeks after the screening invitations having been issued).
- **Strong input from key user and stakeholder groups:** The two primary user groups (NCC and DHB colonoscopy staff) have compatible but different needs when using the system. NCC staff require an efficient user experience to enable them to work effectively with large case volumes. The DHB-based user groups require an intuitive, easy-to-use solution that minimises administrative activities and allows them to focus on the clinical services provided to participants. Engaging these user groups during the NSS design and development activities will help ensure that the new solution can provide for these user groups' needs.

- **Critical information feeds:** The Pilot Solution has allowed for the capture of only the most critical clinical and operational information sets required in support of the screening programme delivery. Some of these information sets are currently entered and managed manually. The Screening Pilot has highlighted the need for automated interfaces/integrations to ensure the full set of required information is able to be collected and stored in a robust and reliable manner.
- **Value of readily available, real-time reporting:** Both NCC and DHB-based service leaders require up-to-date information to help ensure their teams are able to perform their activities to the required timeframes and quality standards. The Pilot Solution's operational and performance reporting is generated at set intervals by NBSP Programme staff, however being able to access and work with a wider range of such reports would support NCC and DHB teams better and would reduce the dependency on manual processing of reports by NBSP Programme staff.

The EY review of the suitability of the Bowel Screening Pilot for rolling out to further DHBs¹¹ also provided advice that has been applied in the design of the NSS, with the four critical lessons being; having Business Continuity/Disaster Recovery in place, technology environments that support changes to the production solution, ensuring underlying infrastructure technology is always current, and having in place suitable and well-functioning governance supported by clearly documented management processes (The advice from the EY review is summarised in Appendix 11.)

The lessons learned and applied have been grouped into the following categories, and are detailed in Appendix 11:

- Governance, including Business Case
- Programme & Project Planning and Management
- Sourcing Strategy and Procurement
- Stakeholder Engagement including Central Agencies
- Risks and Issues
- Resourcing
- Financial Management
- Methodology
- Dependency Management
- Management of Change, including Transition into Service
- NBSP Rollout to Hutt, Wairarapa & Southern DHBs
- Cloud Services, especially Salesforce, Amazon, and Mule Integration service
- Reuse
- Social Licence
- Data Management
- Quality and Assurance
- Supplier Management

¹¹ "Ministry of Health: BSP Due Diligence Interim IT Solution Assessment", 12 May 2017, EY. Summarised in Appendix 10

Programme and Project Management Approach

NBSP is being managed in line with standard programme and project methodologies, including the key principles from Managing Successful Programmes (MSP) and PRINCE2 (for projects). The NSU has a Programme Management Framework based on these methodologies.

The NSS development will be consistent with Prince2 and MSP principles, but is expected to be delivered using the vendor phased delivery methodology.

NSS Programme Structure and Staffing

The NSS programme structure is shown in Figure 13. The team includes both vendor and Ministry staff and contractors. The key roles and responsibilities are defined further in Appendix 12.

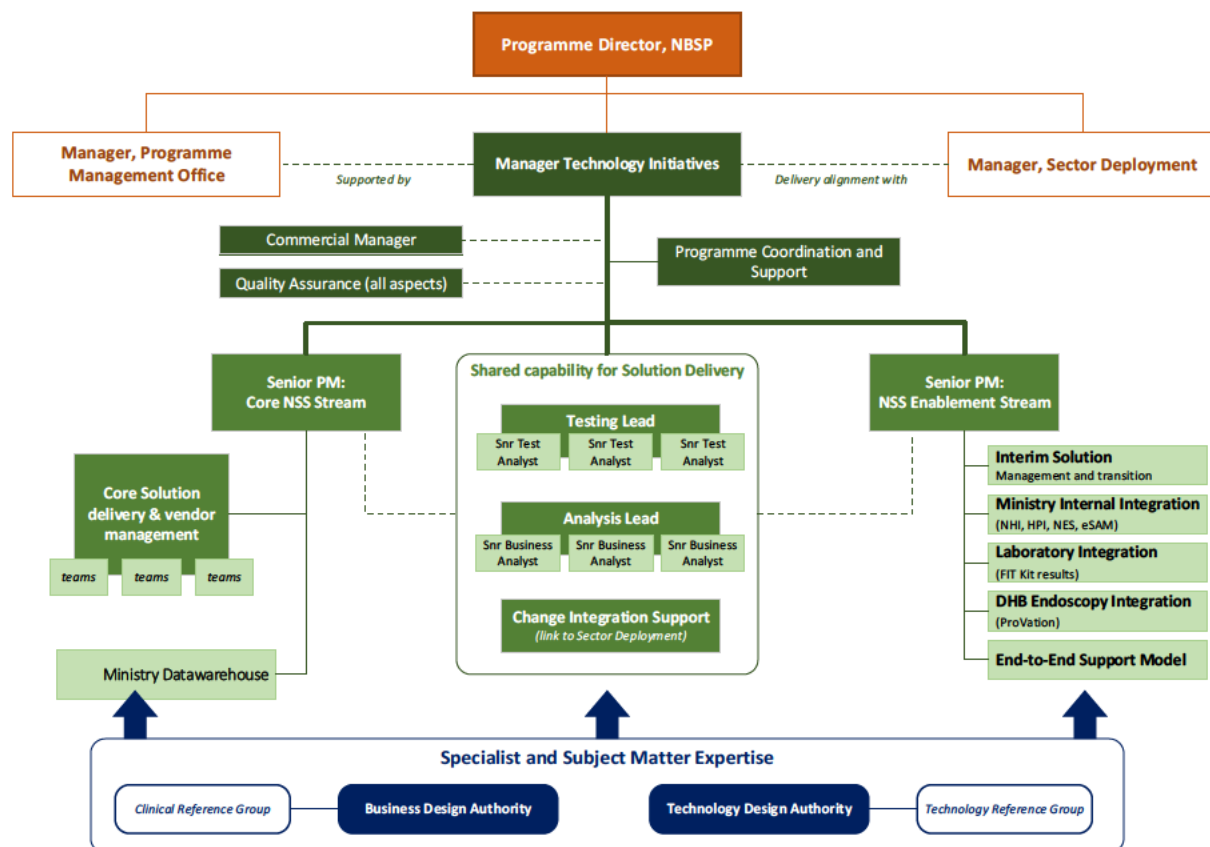


Figure 13: NSS Programme Structure

6.2 Change Management

Deployment Approach

The NSS implementation and deployment approach is a component of the NSS Change Management Strategy. Further implementation and deployment planning is required and will be completed through the design phase of the project.

In principle the following has been determined in relation to the NSS implementation and deployment approach:

- The NSS will be ready for implementation at the end of March 2019 as a fully functioning screening solution, the population data set will be complete and actively managed and maintained. The eligible population will be identified and recorded as inactive participants

within the NSS. The Inactive status will record multiple states e.g. Non Servicing DHB, Withdrawn, BSP Supported Servicing DHB.

- The Ministry will be able to use the register to manage population management and reporting, including quality reporting as defined through business requirements.
- Whanganui will be the first DHB to register and enrol active participants onto the NSS; it has been agreed in principle that the Programme will be able to issue invitations prior to Whanganui DHB's NBSP launch in May 2019. Noting that there is an approximately 4-week turnaround from invitations being sent to individuals to colonoscopy demand in the DHB.
- The rollout will continue with Mid Central DHB in June 2019.
- Consideration will be given to using licenses for circa 2,000 NSS logons per month for assessing demand in Whanganui and MidCentral Districts for "real time" integration of screening history with Primary Care Systems in the future.
- DHBs servicing the NBSP through BSP+ will be migrated to the NSS between July 2019 and Dec 2019, with a view to fully decommissioning BSP+ by March 2020.
- The rollout to full national coverage will be managed from August 2019 on the NSS through to completion in 2020/2021, subject to DHB readiness.
- The same, proven NBSP Sector Deployment team within the NBSP will assess readiness and support DHBs moving on to the NSS, including those migrating from the Pilot BSP+ system. However, they will be working with NSS-based technology, processes and training materials.
- The architecture of the NSS and the use of its integration capabilities allows the legacy BSP+ system to be interfaced with it allowing DHBs using BSP+ to cutover from BSP+ to NSS at their go live, obviating the need for a DHB to use both systems in parallel.
- The NCC will need to work with both systems until all DHBs are migrated from the BSP+ system.

Third Party Integration

The primary third-party integration requirements for the NSS are limited in scope and hence relatively straightforward from a functional perspective. The NSS will receive data created by laboratories (FiT and histopathology results) and endoscopy clinics (ProVation).

The NSS will reuse the existing laboratory interfaces for FiT and histopathology data, with the laboratories requested to update their HL7-formatted messages to include NSS specific information requirements and coding.

It is proposed that the NSS will receive ProVation data by implementing a ProVation Data Centralisation DataBase. Integrating the NSS with multiple instances of ProVation across the DHBs would be complex and increase quality and operational risk for the NBSP. The ProVation vendor (Wolter Kluwer) has advised that the data centralisation features of the product can be used to simplify the integration process and allow the NSS to receive data from a single source.

Strategy and Framework

The NSS Change Management Strategy and Framework builds on the existing NBSP change management strategy, approach, and structures while incorporating best practice change management from the NSS Implementation Partner. The NSS Strategy and Framework have been designed to ensure that stakeholder expectations of the NSS can be managed carefully.

Figure 14 provides an overview of the Change Management Framework that is being established to support all change activities across the NSS project.

	Plan and Analyse	Design and Build		Test and Deliver
Leadership alignment and stakeholder engagement	Conduct stakeholder analysis (as per scope agreed)	Develop Clinical, Physician and Operational Engagement plan		Initiate and monitor action plans
		Design Physician Champion Network	Build Physician Champion Network	Deliver and Support Physician Champion Network
Change management planning	Develop Change Management approach	Develop Change Management strategy & mitigation plan		Deliver change impact mitigation plan
	Understand current change environment	Conduct initial change impact assessment	Conduct detailed change impact assessment	
Communications	Develop Communication strategy/plan	Deliver Vision and Value Communications	Develop and deliver targeted audience specific communications	
Organisation and talent		Assess operating model and org structure	Design new organisation structure and roles	Implement organisation structure / role changes
Clinician and patient readiness	Develop change readiness approach	Conduct initial change readiness assessment – first 2 deployments	Build action plan – first 2 deployments	Conduct follow up change readiness assessments – first 2 deployments
		Conduct initial change readiness assessment – subsequent deployments	Build action plan - subsequent deployments	Conduct follow up change readiness assessments - subsequent deployments
Learning and knowledge transfer	Develop learning strategy	Conduct training needs analysis	Build training materials	Deliver end-user training
			Develop knowledge transfer plan	Evaluate training and conduct follow-ups
			Transfer knowledge and capability (for the first two deployments)	

Figure 14: Change Management Framework

Particular attention is being paid to:

- Leadership Alignment, e.g. between clinicians and leadership;
- Stakeholder Engagement including identification of key stakeholder groups (e.g. Laboratories, Practice Nurses);
- Change Impacts for the key stakeholder groups, including an estimate of the degree and complexity of the change;
- Change Readiness, including the approach and an estimate of how receptive stakeholder groups are expected to be to the change;
- Communications (detailed in section 6.3 below), including how best to engage those impacted; and
- Training and Capability Transfer, including the training approach and an indication of the effort required based on the upskilling required.

The change management strategy and framework will be built out during the design phase of the NSS to define the approach to supporting rollout, adoption and sustainability of change related to the NSS across technology, business and operations/service management in the materially impacted stakeholder groups.

The updated NSS Change Strategy and resulting Change Management Plan (and its associated Communications Plan) are key deliverables of the NSS Design Phase. Along with the NSS Solution Design these comprise a key milestone subject to IQA and approval by the NBSP/NSS Governance Group, GCDO and Treasury.

The NSS Change Management Plan will provide the basis for the development and execution of a detailed change plan for each deployment cycle of the new NSS. Each change plan will reflect the requirements of its deployment phase and will be fully aligned with the sector deployment commitments of the NBSP.

The deployment phase change plans will establish and drive:

1. The **activities** required for each phase of the change implementation process:
 - Technical implementation approach and supporting activities.
 - Business and technical readiness assessment.
 - Technical and operational go live/cut-over.
 - Implementation/deployment support, including communications, early life support, stabilisation support, and a suitable risk and issue escalation / resolution framework.
 - Transition to sustainable business-as-usual operations.
2. The **sequencing and timing** of these activities to ensure:
 - A suitable implementation rate is achieved and maintained by the NSS Programme in support of the NBSP Sector deployment process.
 - The NSS programme team, wider Ministry technology staff, external technology partners and Sector participants are jointly able to maintain a robust and safe technical change process for the duration of each deployment phase.
3. **Resourcing needs**, including clear and agreed roles and responsibilities across all participants of the technical change implementation preparation and execution process.
4. The key **collateral** underpinning the change implementation process, including:
 - *Stakeholder analysis* to identify and capture the needs, interests, criticality, involvement and change support needs of each NSS stakeholder group.
 - *Change impact assessment*, for each stakeholder group and each technology component that is part of the end-to-end NSS required for NBSP service implementation.
 - *Stakeholder detailed communication plan*, which will clearly describe the mode, content and timing for all stakeholder messaging.
 - *Learning and capability development*, including needs analysis, learning and capability development strategy and plan, training content development and training delivery.
 - *Business and technical readiness assessment* including the strategy, criteria and collateral to support the capture of the assessment results.
 - *Change implementation and stabilisation support*; including the necessary frameworks, decision model, and detailed resource planning and scheduling to ensure the required support is available at each stage of the technical change execution process.
 - *Success measures and exit criteria* for each deployment phase (initial implementation, deployment to new DHBs and deployment to DHBs transitioning from the Interim Solution).

Led by the NSS programme team, the change plan for each deployment phase will be developed and agreed by all key participants and stakeholders across the NSS Programme team, the wider NBSP team (particularly Sector Deployment resources), Ministry technology resources, third party solution providers, and sector participants, in particular the DHBs and their technical staff.

Input from the DHB Technology Reference Group

The NSS programme has actively engaged with the DHB CIO group through the Technology reference group, where the DHB CIO lead representative for the NSS project was the CIO from Counties Manakau DHB then the Mid Central DHB CIO. As the design phase progresses the programme anticipates obtaining feedback on the proposed deployment approach from the Wanganui DHB and Mid Central DHB clinical and technical leadership teams.

The technology reference group did not meet through the latter stages of the NSS procurement process, but it is intended that it is re-established in July 18 and will meet every month for the duration of the project.

Sector Readiness

The NBSP has a dedicated Sector Deployment team, responsible for working with DHBs, the NCC and service providers such as the laboratories, to prepare them for and support them through the NBSP implementation process.

During the development of the NSS, the NSS and Sector Deployment teams will work together to develop a comprehensive and cohesive change implementation package in support of both:

- **DHBs newly implementing bowel screening with NSS support:** which will include detailed service, process and practice-related training as well as training on the new NSS; and
- **DHBs transitioning to the full service delivery model and NSS:** focusing on the differences in the full service delivery model (no manual workarounds required without the NSS providing support) as well as the full information sets and functionality provided by the NSS.

This change implementation package will then be tailored for each DHB.

New DHB Implementations

It is anticipated that the change implementation package for new DHBs will be tested and validated during the initial implementation of the NSS with the first two DHBs, Whanganui and MidCentral. There is also a 4-6 week preparation and technical contingency period between the anticipated technical implementation of the NSS in late March 2019, and the first DHB commencing use of the solution in mid-May 2019. During this time additional testing and refinement of the change management process and change implementation collateral will be possible to ensure the subsequent implementations occur smoothly. The NBSP-NSS service implementation with the second DHB, MidCentral, anticipated in June 2019, will validate and confirm the final change implementation package to be used for the remaining 10 new DHBs.

Beyond this point the change implementation process for new DHBs will be able to be guided and managed by the Sector Deployment team, as each DHB deployment is expected to have only minimal technology support needs beyond NSS training.

DHB Transitions

The change implementation process for DHBs transitioning from Interim Solution to NSS with full service delivery model will have a strong involvement from both the NSS and Sector Deployment teams, to ensure that the readiness assessment, implementation activity and post implementation stabilisation are well supported from both a service delivery and technology perspective.

As each DHB transition will require technology support for a small data migration component and validation of integration points, it is expected that both the Sector Deployment and NSS teams will work with each of the transitioning DHBs.

Issues Arising During Development of NSS Solution

Should any issues arise such that additional effort is required to keep NSS development to the timeline, then the Implementation Partner is able to draw upon a considerable pool of talent on-shore as well as off-shore.

Despite additional resourcing, should slippage occur, this should be able to be accommodated in the 4-6 week technical contingency period prior to the first new DHB implementation. Should the timeline slip further, then impacts on DHBs can be minimised by reprioritising so that on-boarding new DHBs to the NBSP is given priority, allowing more time to develop the functionality to support DHB Transitions. The downside of this fall-back is that the BSP-based manual processes (and additional staffing) in the National Coordination Centre will be required for longer.

A final option is to pause the whole rollout, if necessary. None of the options described are mutually exclusive.

Stakeholder Impact Assessment

As part of the developing the Change Management Strategy and Framework, the NSS programme has undertaken a high-level assessment of possible impacts on each key stakeholder group, described in Table 22.

Table 22: Key Stakeholder Impact Assessment

Group	Role/ Function	Impact	Impact Comment	Programme Support
General public	Participants	None	Participants will not have access to the NSS as part of the NBSP implementation.	None required
General Practice	Practice Managers and Nurses	None	Practices will receive test and referral details electronically, with no direct NSS access required for staff in support of their day-to-day work.	NBSP service introduction will include high-level information about test and referral information.
Laboratories	Scientists	None	Laboratories will submit test results electronically, with no direct NSS access required for staff during their day-to-day work.	Implementation will include information to all NBSP laboratories regarding their systems' interfaces into NSS, and approach for support and resolution for any integration issues.
DHB	Endoscopy Nurses and Administrators	Medium	Receive and action new NBSP colonoscopy referrals via NSS. Colonoscopy information, including results, will be captured in DHB systems and provided electronically to NSS.	Implementation will include training on the relevant NSS functionality as part of DHB's NBSP service implementation. Change stabilisation support will be provided to staff and the DHB's NSS change champion for the first 6 weeks after service implementation. Information about support for and resolution of any integration issues, will also be provided.
	Service Manager	Medium	Monitors endoscopy suite performance for NBSP via NSS, including monitoring progress with individual referrals.	

Group	Role/ Function	Impact	Impact Comment	Programme Support
	Clinical Lead	Low/none	May access NSS to review and monitor individual cases and consider service impact on clinical service delivery.	Introductory training will be offered, with potential additional support via change stabilisation and local change champion.
	Endoscopist	None	Not expected to require direct access to NSS (all work completed via DHB systems).	Introductory information will be provided as part of NBSP service implementation in the DHB.
NCC	Service Coordinator	High	Power users of the new system: high proportion of duties will require NSS use.	Intensive training will be provided prior to NSS implementation and on-site support post go-live. Targeted information will be provided for coexistence (dual Interim Solution – NSS use) and active support during Interim Solution decommissioning.
	Service and Quality Managers	Medium	Regular users of the new system: high proportion of duties will require NSS use.	
Ministry	NBSP Programme Staff	Low	Ad hoc use of NSS, particularly for operational reporting/monitoring.	Targeted introductory training, with additional information on coexistence period. Training and information will also be provided on support model and guiding sector stakeholders to assistance.
	Evaluation and Reporting Team	Low	Ad hoc use of NSS for operational monitoring / reporting. Note: Programme evaluation will occur via Ministry datamart.	Targeted introductory training, with additional information on coexistence period.

6.3 Communications

The development of a comprehensive stakeholder communications plan is a key part of the NSS Design Phase. The plan will be informed by the detailed stakeholder analysis for the NSS Programme as a whole, and also for each NSS deployment phase. The NSS Programme will utilise the communications specialist and sector relationships managers to facilitate information sharing from an NBSP perspective, complemented by dedicated and targeted communications driven from the NSS Programme space.

At a high level, a targeted communication plan will be developed for each critical stakeholder group, including:

- Executive external stakeholders, such as the Ministers, and Central Agencies;
- Sector-based NBSP service delivery partners, including DHBs, laboratories, and other medical professionals such as GPs;
- Third party solution providers for Sector partners, such as ProVation for DHB colonoscopy clinics;
- Contracted NBSP service suppliers, particularly the NCC;
- Ministry-internal stakeholders, particularly the wider NSU and T&DS teams.

6.4 Benefits Management

The benefits of NSS are primarily to support the effective implementation and ongoing delivery of the NBSP. No separate benefits reporting will be undertaken for the NSS.

6.5 Risk Management

Standard risks and issues management methodologies would be used through the delivery of the NSS. This would assure stakeholders and monitoring agencies that NSS risks are being proactively identified, mitigated and monitored as the project progresses.

The Senior Project Managers for the NSS Core and NSS Enabler workstreams will have direct responsibility for the tracking and reporting of risks and issues to the Programme leadership, Senior Responsible Owner and the NBSP Governance Group, with further escalation where required. Issues would have a deviation plan.

Each Senior Project Manager will be responsible for the risks pertinent to their own workstreams, including capturing and managing these via risk registers dedicated to their area of responsibility. The two Senior Project Managers will be jointly responsible for identifying and managing risks arising from the dependencies across the NSS Core and NSS Enabler delivery processes.

Risks and issues management will follow and comply with the NBSP Risk and Issue Management Plan.

The key risks and issues identified for the NSS are summarised in Table 7 in section 2.8 and detailed further in Appendix 4.

6.6 Monitoring and Evaluation

Gateway

The NSS is subject to Gateway review as part of the NBSP assurance requirements. ^{s 9(2)(g)(i)}

[Redacted]

[Redacted]

Major Projects Monitoring

Major Projects Monitoring on the NSS element of the NBSP will be through the overarching NBSP assurance process. Updates on progress of the NSS are provided through the regular scheduled meetings with central agencies, and in writing via the monthly Governance reports.

An NSS Assurance Plan has been developed for the NSS, aligned to the wider Assurance Plan for the NBSP. The NSS Assurance Plan is supported by GCDO and has been reviewed and endorsed by the NSU

¹² ^{s 9(2)(g)(i)}

Technology Steering Group and NSS Governance Group. The NSS programme is engaging with the Systems Assurance team of the GCDO for revisions and updates to the Plan, occurring as a minimum at each major milestone.

The overarching NBSP assurance plan is expected to be updated by end of July 2018.

Continuous Independent NBSP Programme Quality Assurance

In addition to the review points through Gateway and Major Projects Monitoring, the NBSP also has in place ongoing IQA through KPMG, who advise the Governance Group.

NSS Programme Evaluation

The Ministry is in the process of engaging the necessary internal and external professional service providers and advisors for the NSS, to obtain quality assurance and NSS programme health evaluation across the considerations summarised in Table 23.

Table 23: NSS Programme Evaluation

Quality Aspect	Evaluation Approach and Timing
Project Assurance Plan	<ul style="list-style-type: none"> Reviewed with the GCDO Assurance Team at each major milestone and, if required, updated.
Independent Quality Assurance of NSS Programme, its execution and deliverables	<ul style="list-style-type: none"> End of Solution Design Phase. End of Solution Development, as part of technical implementation readiness (Deployment Phase 0). Deployment Phase 1: at the end of first deployment cycle (2 new DHBs). Deployment Phase 2: at the end of DHB transitions from Interim Solution to NSS, including confirmation of nationwide deployment readiness. As part of Deployment Phase 5: post implementation review (May 2021).
Technical Quality Assurance	<ul style="list-style-type: none"> Critical deliverables during the design, development and delivery phases of the Programme.
Privacy Impact Assessment	<ul style="list-style-type: none"> End of Solution Design Phase. End of Solution Development, as part of technical implementation readiness (Deployment Phase 0).
Security Impact Assessment	<ul style="list-style-type: none"> End of Solution Design Phase. End of Solution Development, as part of technical implementation readiness (Deployment Phase 0).
Cloud Risk Assessment	<ul style="list-style-type: none"> Solution Procurement (completed as part of RFP phase). Solution Design. At the end of Solution Development, as part of technical implementation readiness (Deployment Phase 0).

Independent Review of NBSP Systems and Processes

The Ministry appointed Kate MacIntyre Consulting to undertake a review relating specifically to the withdrawal incident within the Bowel Screening Pilot. Whilst this review relates to the BSP, the findings have been taken into account in the ongoing planning and implementation of the NBSP. The review was tasked with ascertaining the circumstances surrounding the adverse event(s); identifying systems and process failures that may have led to, or contributed to, the adverse events in the Bowel Screening Pilot; and recommending action that should be undertaken as a result of the review. Pertinent points are being included in the scope of interim solution enhancements and the NSS design.

Independent Assurance Review of NBSP

An independent assurance review was undertaken in April-June 2018 to consider how well positioned the NBSP is for successful delivery, what changes might be required and what the Ministry of Health can learn to support the design and roll out of further national initiatives. Professor Gregor Coster led the review team that included Dr William Rainger, Professor Graeme Young and Dr Mary Seddon. The review team also included input from a Public Health Medicine Specialist, to provide expertise on population health systems and the impacts of these systems on the quality and safety of the roll out with a focus on future improvements.

The Independent Assurance Review reported formally in July 2018. The review concluded that “[t]he panel is fully supportive of the National Bowel Screening Programme and endorses its continued roll-out as planned. The National Bowel Screening Programme is in a good position and has considerable strengths.” The key recommendations from the Review, and the actions being taken to address these findings, are summarised in Appendix 1.

As noted elsewhere, any final recommendations from the Independent Assurance Review that have a material financial impact on the NSS Programme will be required to go through Change Control involving the Central Agencies and Joint Ministers of Health and Finance.

6.7 Key Milestones

The NSS delivery plan has been developed based on the proposed implementation approach summarised in Section 2.4. The NSS will be developed over 11 months, commencing in May 2018.

The key NSS milestones and approximate timings are shown in Table 24 and a high level NSS delivery plan (Gantt chart) is included as Appendix 13.

The implementation timeframes are indicative only and reflect the intended timeline based on NSS availability. The specific timings of DHB implementation of NBSP-NSS will depend on the service readiness of each DHB

Table 24: Key NSS Milestones

Key NSS Milestones	Approximate Completion Date
Start of Design Phase	1 May 2018
Business Case Approval	July 2018
Design Phase Assurance (IQA, TQA, Security and Privacy Assurance & Privacy Impact Assessment)	July 2018
Completion of Design Phase	July 2018
Approval of Design, including updated Change Strategy, Change Management Plan and Communications Plan, by Ministry, GCDO Assurance and Treasury	August 2018
Build & Test Phase (Sprint 1) Complete	End August 2018
Build & Test Phase (Sprint 2) Complete	End September 2018
Build & Test Phase (Sprint 3) Complete	End October 2018
Build & Test Phase (Sprint 4) Complete	End November 2018
Sprint Unit and Acceptance Testing Complete	Mid December 2018
Integration testing Complete	Mid December 2018
System Integration testing Complete	End Feb 2019
UAT Complete	End March 2019

Key NSS Milestones	Approximate Completion Date
NSS Launch (No active screening)	End March 2019
Wanganui DHB On-boarding	May 2019
Mid Central DHB On-boarding	June 2019
BSP Supported DHBs Migration to NSS Complete	December 2019
BSP decommissioning	End Feb 2019
NSS Rollout complete	NBSP Completion

6.8 Transition to Sustainable Operations

Once the solution development and delivery activities have completed and the NSS is fully implemented from a technical perspective, the NBSP will transition the solution to a joint ownership model:

- Technical Owner: T&DS.** The National Digital Services (NDS) Group within the Ministry's T&DS Unit will be responsible for the day-to-day management, maintenance and operations of the new NSS. This includes monitoring the performance of the solution and ensuring all exceptions (issues and problems) are resolved in the required manner and within agreed timeframes. NDS will also have responsibility for all NSS vendor and licensing relationships, including monitoring vendor performance and attending regular relationship and solution management meetings. The ongoing maintenance of Operating Level Agreements and Service Level Agreements will also sit with the NDS Group.
- Business Owner: NSU.** The NSU will continue to provide leadership on the clinical and screening programme operation components of the NSS, and will identify, describe and prioritise all potential business enhancement requirements in support of the NBSP. The NSU will depend on the NDS Group in T&DS for managing the solution and associated vendors on a day-to-day basis. The NDS Group will ensure agreed NSU stakeholders receive pertinent information about solution and associated vendor performance, and NSU representatives will attend a quarterly vendor relationship management meeting.
- Financial Owner: Joint NSU/NDS.** The annual licensing, maintenance and hosting costs will be managed by the NDS Group, while NSU will be responsible for the prioritisation and management of the annual enhancement budget.

The NBSP will complete the transition to NSS business-as-usual operations through a two-stage process:

- 1. Business-as-usual with NBSP oversight:** In the initial transition phase, the NDS Group will assume responsibility for the day-to-day operations of the NSS, with the NBSP retaining formal oversight to ensure the final 10 DHB implementations are well supported and managed using the solution. The entry criteria for this transition are:
 - the successful implementation of the NSS,
 - the successful deployment of the NSS to the first 2 new DHBs (Whanganui and MidCentral),
 - the successful transition of the first 8 DHBs from the Interim Solution to the NSS, and
 - the establishment and full operationalisation of the end-to-end support model for the NSS.

- 2. Business-as-usual with operational ownership:** This transition is expected to commence once all 20 DHBs have commenced bowel screening using the NSS, and the NBSP is preparing for programme close-out.

Appendix 1: Independent Assurance Review - Summary Recommendations

Critical: within six months. Essential: within twelve months.

High level recommendation	Priority	Action Plan / Comment
<p>1 MoH should strengthen the population health governance of the NBSP population register to ensure that every effort is made to avoid a repeat of the issues that led to eligible participants missing out on bowel screening during the pilot.</p>	<p>Critical</p>	<ul style="list-style-type: none"> • A number of activities have been undertaken as a result of the Bowel Screening Pilot register issues these include: <ul style="list-style-type: none"> ○ Any issues arising from the NBSP population register are reported to the Governance Group, Clinical Oversight Group and the National Screening Advisory Committee, as appropriate. ○ The Ministry and National Coordination Centre (NCC) hold monthly clinical and operational meetings to monitor performance. ○ The NCC is supported by a population health clinician and there is oversight from the NCC Clinical Governance Group. ○ The Ministry will continue to act on lessons learned as the NBSP is rolled-out. ○ Extensive fail-safe reporting is in place to identify invitation of pathway issue. This reported and monitored through the NCC operational and clinical governance groups. ○ NBSP has a stringent IQA process in place.
<p>2 MoH should review the functionality and operation of the population register, to increase its accuracy and completeness.</p>	<p>Critical</p>	<ul style="list-style-type: none"> • The Ministry will undertake a further risk assessment of the interim IT solution, this will be completed by the end of October 2018. • To ensure NBSP is using a comprehensive dataset, data for the preceding 36 months is mined from the following sources: <ul style="list-style-type: none"> ○ National Health Index database, Mental Health database, National Minimum Dataset for Hospital Events, National Non Admitted Patient Data Collection, Pharmaceutical Claims Datamart, Laboratory Claims Collection, Cancer Registry, National Maternity Collection, PHO Data Warehouse and latest visit date in General Medical Services. • The NCC Standard Operating Procedures document the use of any manual overrides and failsafe reporting.

High level recommendation	Priority	Action Plan / Comment
		<ul style="list-style-type: none"> Any learning points from issues arising with the NBSP population register are formally notified to and actioned by the other screening programmes within the NSU which may be affected by the same issue. Failsafe processes implemented by the NSU and NCC will be reviewed to ensure that any anomalies identified are investigated immediately and remedial action is taken to resolve the issues and prevent its recurrence.
<p>3 Urgent consideration of 'real-time' integration with primary care IT systems should be given in order to increase participation in the programme through primary care's access to a participant's full screening process.</p>	<p>Critical</p>	<ul style="list-style-type: none"> The requirement to integrate with primary health was identified in the RFP, and is included as part of the current NSS Universal design. Integration between the systems is included in the design of the NSS however is not real-time. The real-time integration with primary care IT systems has been explored as part of the process for the NSS for bowel screening, however this would (potentially) become available where cervical screening is implemented on the NSS. Current processes provide full transparency of screening progress for participants for Primacy Health, other than notification of registration (prior to the completion of the first screening round) This requirement will be revisited through the design phase, where any requirement will be tested against feasibility, quality, time and cost. The NBSP's Primary Care Lead will support this process to ensure there is input and advice from Primary Care into this process Direct real time access is currently out of scope for the NSS, is not funded and would therefore be subject to a further budget bid.
<p>4 MoH needs to continue to monitor and manage carefully the ongoing risk that limited functionality of the BSP+ presents.</p>	<p>Critical</p>	<ul style="list-style-type: none"> Monitoring is in place and ongoing, across both the NSU and NCC. The eight DHBs using the interim IT solution (BSP+) are expected to migrate to the NSS in 2019/20. The timing of the transitions will be finalised once there is greater certainty on the development timeline for the NSS. DHBs implementing screening from March 2019 onwards will utilise the NSS from the time that they commence screening under the NBSP.

High level recommendation	Priority	Action Plan / Comment
<p>5 MoH should continue to strengthen project management during the design, build and implementation of the NSS to ensure deliverables are met within the planned timeframes. It should review IT governance arrangements to ensure they are fit for purpose.</p>	<p>Critical</p>	<ul style="list-style-type: none"> • The project and governance structure are currently under review to ensure appropriate support and skillset is available for the delivery of the NSS and NBSP operations. The recommendations from the Independent Assurance Review and Gateway Review will be incorporated into the structure to be discussed at the July 2018 Governance Group meeting. • The requirement for a Programme Manager, to manage all aspects of the NBSP, has been identified and recruitment of a suitable resource is underway. • Recruitment for a Senior IT Project Manager has been completed with a start date of early August 2018.
<p>6 DHBs, the primary care sector and NCC should be appropriately involved during the design, build and subsequent phases of the NSS.</p>	<p>Critical</p>	<ul style="list-style-type: none"> • The Ministry is actively engaging with DHBs, NCC and other stakeholders as part of NSS design. • Change Management plan developed in support of the NSS business case sets out the stakeholder engagement strategy and approach. This will guide the sector and other stakeholder consultation during the build phase of the NSS and will ensure appropriate engagement during the validation (business acceptance testing). • The NSS Clinical Reference Group (CRG) and Design Authority (DA) are now operational. Terms of reference for the DA are defined and CRG terms of reference is in draft. • A Technical Reference Group is being established to oversee technical governance across the sector. • NCC have been engaged and will continue to be engaged through the design phase of the NSS: <ul style="list-style-type: none"> ○ Budget has been identified within the business specifically to support this engagement. ○ A terms of reference that defined their engagement requirement throughout the whole NSS delivery life cycle has been defined. • Engagement with stakeholders is led by the NBSP Sector Deployment Team to ensure consistent and robust messaging across screening programme and technology rollout. • It is proposed that a DHB CEO is invited on the NBSP Governance Group.

High level recommendation	Priority	Action Plan / Comment
<p>7 To achieve equitable outcomes, NBSP should strengthen its approach to, and accountability for, equity at all levels. This includes increasing leadership and engagement of Māori, Pacific people and consumers. Funding to achieve this outcome should be budgeted for and directed.</p>	<p>Critical</p>	<ul style="list-style-type: none"> • This recommendation will be considered as part of the review of the Governance structure. <ul style="list-style-type: none"> ○ The Executive Lead for Māori Leadership is currently a member of the NBSP Governance Group. She is also the Ministry’s lead on for equity across the health system. ○ Bowel Screening Advisory Group membership includes the Ministry Chief Advisor for Pacific Health, a senior clinical external Pacifica representative, the Chair of the Hei Ahuru Mowai, and a Māori academic. • Further areas to strengthen leadership and equitable outcomes continue to be explored in conjunction with stakeholders. Any funding requirements associated with equity initiatives will be subject to funding approval, and potentially a future budget bid. • Māori and Pacific networks were established in 2017, as part of the Bowel Screening Regional Centres, to support and inform those working in the NBSP. • All written materials, and any significant changes to these materials, have been reviewed and informed by, Māori and Pacifica focus groups. • Māori Hui and Pacifica Fono are ongoing within each DHB area as the programme is being rolled out.
<p>8 MoH should note the health and disability sector’s concern about the current age-range restrictions, in particular in relation to the equity impact for Māori. MoH should continue to closely monitor programme data and review the programme parameters, including age range, as more DHBs join the programme.</p>	<p>Essential</p>	<ul style="list-style-type: none"> • A position paper endorsed by Bowel Screening Advisory Group will shortly be released on the Ministry website which clearly articulates current evidence in relation to the equity impact for Māori. This will be shared with the sector, accompanied by a letter of the Dr John Child, Chair of the Bowel Screening Advisory Group. • The Ministry will continue to monitor programme data and international evidence. This will inform a review of programme parameters, including age range, once the programme has been fully implemented from 2021. • Any changes to programme parameters would be subject to a future budget bid.
<p>9 A workforce development plan needs to be developed to ensure availability (and funding) of a sufficiently skilled workforce into the future.</p>	<p>Essential</p>	<ul style="list-style-type: none"> • The NBSP will work with Health Workforce NZ to review the workforce development plan in collaboration with stakeholders to support a sufficiently skilled workforce. • Assumptions in the 2017 Health Workforce Model (created by Health Workforce New Zealand to plan for the required capacity for full rollout of the NBSP) will be tested to ensure they remain valid. • Funding of workforce development for Nurse Endoscopist training is ongoing

High level recommendation	Priority	Action Plan / Comment
<p>10 The current governance structure for the NBSP should be refined and more clearly articulated, ensuring appropriate pathways exist for escalation of issues and risks.</p>	<p>Essential</p>	<ul style="list-style-type: none"> • The governance structure is currently under review. The recommendations from the Independent Assurance Review will be incorporated into the structure to be discussed at the July 2018 Governance Group meeting. • Membership of the Governance Group is likely to be expanded to include a DHB Chief Executive Officer.
<p>11 Stronger evidence of clinical governance is needed across all aspects of the NBSP and at all levels, including within IT governance arrangements. This includes the programme Clinical Director formally and regularly reporting to the relevant executive governance groups to ensure clinical sector feedback.</p>	<p>Essential</p>	<ul style="list-style-type: none"> • The revised governance structure will clearly articulate how and where clinical governance is provided across the Programme, including: <ul style="list-style-type: none"> ○ Chief Medical Officer membership on the Governance Group will remain, with the NSU Clinical Director and NBSP Clinical Director will continue to attend as ex officio attendees ○ The Clinical Directors have a standard agenda item to discuss clinical matters on the Governance agenda ○ Clinical membership of the Bowel Screening Advisory Group (BSAG), National Screening Advisory Committee, National Bowel Cancer Working Group, National Endoscopy Quality Improvement Programme (NEQIP) ○ National Coordination Centre Clinical Governance Group, plus screening expertise (currently provided by the NSU Clinical Director) on the Homecare Medical Ltd Clinical Leadership Group ○ Clinical oversight at the NSU operational level through the Clinical Oversight Group (COG) ○ Clinical oversight and input in the NSS through clinical membership of the Design Authority and the Clinical Reference Group. ○ Ongoing liaison between the NBSP Clinical Director and the clinical leads for the DHBs to ensure any clinical issues are identified and reported back into the NBSP.
<p>12 The NBSP must use robust programme management to ensure all aspects of this complex programme, including risk, stakeholder engagement and quality assurance, are closely monitored and well managed.</p>	<p>Essential</p>	<ul style="list-style-type: none"> • Project structure is currently being reviewed and this recommendation will be incorporated into changes being considered. • The NBSP is using adapted PRINCE2 and MSP methodologies

High level recommendation	Priority	Action Plan / Comment
<p>13 A full set of protocols and policies supporting the readiness and roll-out of the NBSP should be developed as a matter of urgency, to provide greater support and clarity to the sector.</p>	<p>Essential</p>	<ul style="list-style-type: none"> • The NBSP deployment team have developed a full set of protocols and policies supporting readiness have been finalised and are available on the shared workspace. This is accessible by the relevant DHB staff. • This has been developed based on feedback from DHBs and the deployment team's knowledge developed as part of the deployment process.
<p>14 The MoH and NSU should strengthen partnerships with external agencies and organisations, to ensure effective knowledge sharing. This includes partnerships with the Corporate Centre (State Services Commission, Treasury, and Department of Prime Minister and Cabinet), Waitemata DHB (WDHB), Bowel Cancer New Zealand and Hei Āhuru Mowai (Māori Cancer Leadership Group).</p>	<p>Essential</p>	<ul style="list-style-type: none"> • High profile nature of the NBSP requires careful risk management across the corporate centre as well as its regular reviews. • Ongoing engagement is underway with the Corporate Centre. Engagement with Treasury is through the Vote Health team, the Better Business Case process, Gateway Reviews and the Major Projects Team. The NBSP is in regular contact with MBIE regarding procurement. Engagement with GCDO provides assurance on the IT elements of the NBSP. Regular meetings are held with central agencies, the SRO and the NBSP team to share information and seek advice. The Ministry will explore with central agencies how this could be further enhanced. • The need to strengthen relationships with key stakeholders will be incorporated into the NBSP structure review as well as through the Sector Deployment team including the Stakeholder Engagement role currently being recruited. • The Ministry and the NSU are working with the Ministry of Education and the Ministry of Social Development on social licence issues. These discussions are within the framework set by GCDO. • The Deputy Chair of the NSUs Māori Monitoring and Equity Group is also a member of Hei Āhuru Mowai and opportunities are being explored for these groups to be closer connected. • Membership of the Governance Group is likely to be expanded to include a DHB Chief Executive Officer
<p>15 A single set of national quality assurance standards for colonoscopy (including colonoscopy units) should be endorsed, with clear agreement on accountability. This involves bringing together the Endoscopy Governance Group for NZ's (EGGNZ) quality</p>	<p>Essential</p>	<ul style="list-style-type: none"> • The NBSP Interim Quality Standards are currently being reviewed to ensure that the EGGNZ standards are adopted as a minimum. (In some instances Screening requires a higher standard than that recommended by EGGNZ). • NBSP is working with EGGNZ to develop a sustainable delivery model for colonoscopy going forward. This includes continued financial support to NEQIP which will ensure the clinical safety of all colonoscopy procedures undertaken in the public health system.

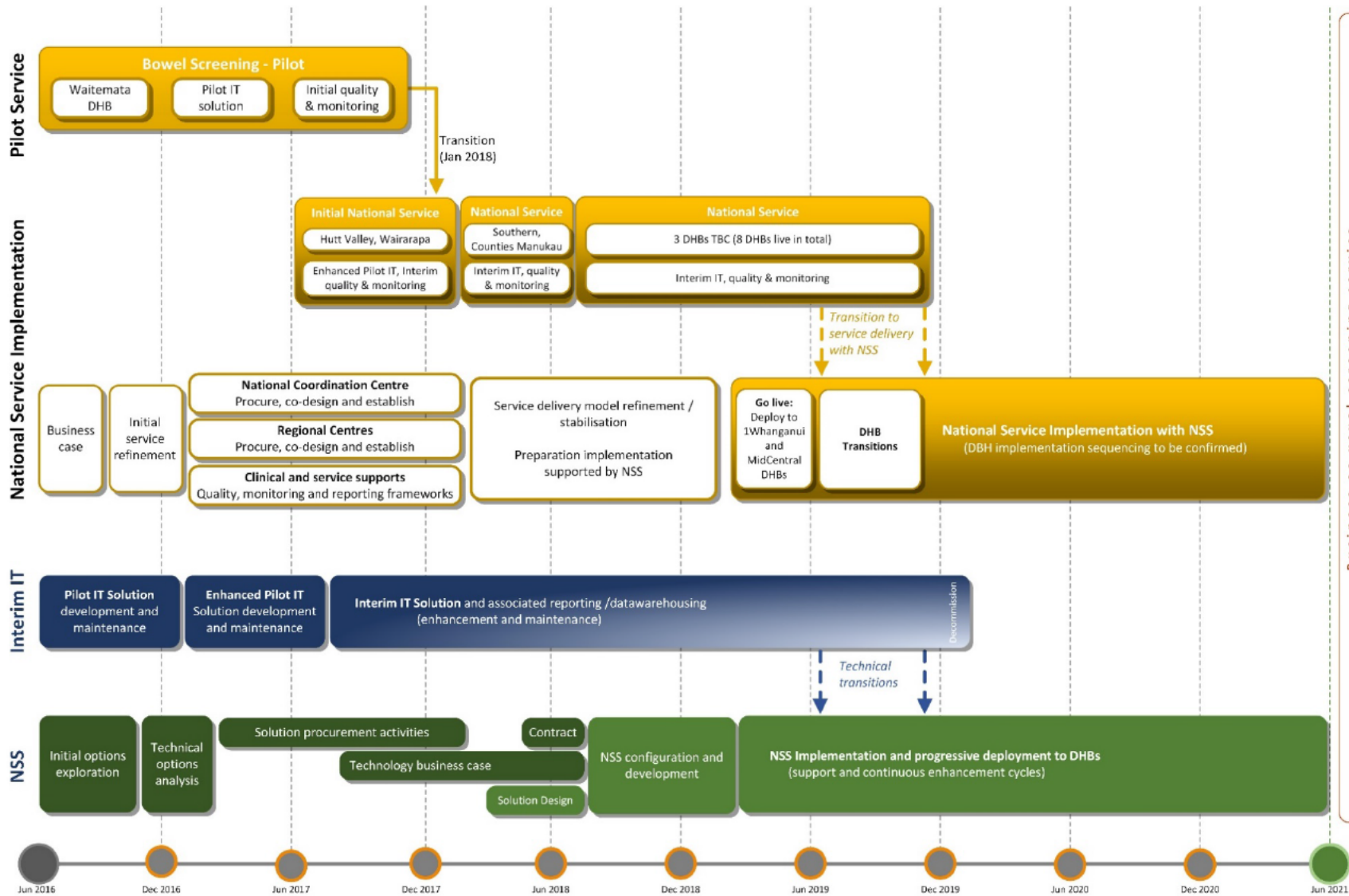
High level recommendation	Priority	Action Plan / Comment
assurance standards and the NBSP interim quality standards.		
16 A comprehensive multi-year funding pathway should be developed to help embed the programme throughout the sector.	Essential	<ul style="list-style-type: none"> ● Programme funding was sought in 2016 for the full implementation. The Cabinet decision was to fund the NBSP incrementally. ● Operational funding is provided for multiple years for those DHBs implementing the NBSP in each financial year.
17 MoH should provide regular written communication to all parties involved in the roll-out. This would include a technical section updating issues related to the IT systems (BSP+ and NSS), as well as reports on clinical standards development, performance measures and learnings from other DHBs during the roll-out.	Essential	<ul style="list-style-type: none"> ● NBSP will review its quarterly stakeholder update to implement this recommendation <ul style="list-style-type: none"> ○ The NBSP newsletter is produced as an e-letter. This is available to all DHBs, including those who have not yet implemented NBSP. It is publically available on the Ministry website and subscribers are automatically notified of each new issue. ● The NBSP will work with stakeholders on opportunities for sharing of information across DHBs and the NBSP Regional Networks.
18 A strong learning culture at the MoH and across the NBSP needs to be promoted. This includes an openness to feedback, involvement of external expertise, transparency in decision-making and shared ownership of issues.	Essential	<ul style="list-style-type: none"> ● Opportunities for learning will be reviewed to give effect to this recommendation, including: <ul style="list-style-type: none"> ○ Continued engagement with colleagues in other agencies to receive feedback and identify any learning opportunities from other programmes. ○ Greater use of Bowel Screening Regional Centres to share and disseminate learnings ○ Continued use of external expertise to inform the NBSP both national and international. Bowel Screening in NZ has been supported by a range of international advisors, including the NHS lead and the lead for the Canadian bowel screening programme. In addition, the NSU through its Clinical Director and Group Manager has ongoing engagement with screening in Australia. ○ Proactive release, on the Ministry/NSU website, of Health Reports, Cabinet Papers, business cases and research papers on NBSP, as well as the minutes of BSAG. ○ Greater use of the Time to Screen website for sharing with participants.

High level recommendation		Priority	Action Plan / Comment
19	Innovation and continuous quality improvement should be encouraged to achieve equitable access. This includes the provision of additional resources to develop, test and disseminate this learning.	Essential	<ul style="list-style-type: none"> • The NBSP continues to consider ways of improving quality and equity of access as outlined in recommendation 7 • The Ministry will continue to work with DHBs, NCC and stakeholders on developing plans to support equity within current resources.

Appendix 2: NSS Scope

Service Requirements	Scope Assessment			
	Minimum Scope	Inter- mediate Scope	Maximum Scope	Out of Scope
NSS Core				
Screening campaign management	✓			
Participant management	✓			
Risk Management	✓			
Knowledge, data and analytics, including a range of real-time monitoring reports	✓			
Programme operations	✓			
Operational reporting for DHBs, NCC	✓			
NSS Enablers				
Integration with FIT laboratory system	✓			
Integration with clinical system (DHB colonoscopy - ProVation)	✓			
Integration with Ministry systems for participant, health care provider and address information (NHI, NES, HPI, eSAM)	✓			
Integration with histopathology laboratory system	✓			
Integration with mail house (screening campaign letters and FIT kits)	✓			
Data Mart and Business Intelligence Reporting				
A data mart that combines data from different sources to support evaluation for the NBSP, including evaluation of Programme effectiveness and benefits realisation, and inform its development	✓			
Advanced analytics for quality standards monitoring	✓			
Support for supplier / provider contract and outcome evaluation	✓			
Availability of accurate and complete data in a timely manner	✓			
Secure data that is only accessible to those who have legitimate and authorised access to it	✓			
Reporting, query and analytics access for DHBs			✓	

Appendix 3: NBSP Implementation Timeline



Appendix 4: NSS Key Risks

Risk Details and Rating						Mitigation and Residual Rating			
#	Title	Description	Likelihood	Consequence	Rating	Mitigation	Likelihood	Consequence	Rating
NSS01	Functional Suitability	<p>If: Due to limitations in the functional capability of the underlying solution platform, Then: the NSS solution is unable to meet all functional requirements, correctly and in a manner that is appropriate without reliance on external solutions, customisation or extension. Resulting in:</p> <ul style="list-style-type: none"> Additional cost to the project to extend, customise or the need to procure additional third party solutions Increased complexity of the end to end solution, resulting in increased operational risk 	Rare	Severe		<ul style="list-style-type: none"> The Design Phase for the Project will identify any functional gaps and the appropriate solutions for those gaps Design governance will determine what level of functional compliance is required for the solution to be considered complete 	Rare	Moderate	
NSS02	Performance Efficiency	<p>If: there are unexpected limitations in the architecture, design and capability of the underlying platform architecture, Then: The NSS solution is unable perform efficiently and effectively in order to meet performance requirements in relation to time behaviour, resource utilisation and capacity, Resulting in:</p> <ul style="list-style-type: none"> An inability of the solution components to meet the performance requirements of the NSS The need to re-architect the NSS solution impacting cost and time and a potential return to market The provision of further capacity in terms of physical capacity and software licencing to address issues with performance efficiency 	Rare	Severe		<ul style="list-style-type: none"> The software platform the solution will be built on is licenced based on user accounts and the underlying infrastructure will dynamically scale to meet the resource needs of the solution Resource performance will be continuously monitored across all components of the solution 	Rare	Moderate	
NSS03	Compatibility	<p>If: there is an incompatibility of the solution platform and capability to coexist and integrate with other solutions. Then: the NSS cannot meet compatibility requirements as it is unable to coexist with other solutions through the use of shared resources and/or cannot integrate without detrimental impact on itself or the other solutions. Resulting in:</p> <ul style="list-style-type: none"> The NSS will be unable to operate effectively and efficiently within a shared environment The NSS may have detrimental impact in terms of capacity and performance on the systems it integrates to e.g. the NHI The complexity of the NSS will increase the cost (investment and ongoing operational) of the end-to-end solution Additional investment will be required for the NSS and across third party systems (laboratories, clinics and DHBs) support interoperability standards 	Possible	Moderate		<ul style="list-style-type: none"> Remove coexistence constraints from the end-to-end solution through the Design Phase The underlying solution technology and application architecture is mature and the ability of the solution to coexist has been proven globally Specific coexistence risks in relation to health IT systems and platforms will be managed through the design and build phase 	Rare	Moderate	

Risk Details and Rating						Mitigation and Residual Rating			
#	Title	Description	Likelihood	Consequence	Rating	Mitigation	Likelihood	Consequence	Rating
NSS04	Usability	<p>If: there is poor user interface design and lack of appropriate and acceptable learning and training. </p> <p>Then: the NSS may be unusable and not meet operability and learnability requirements, and/or may not meet the needs of the end user</p> <p>Resulting in a:</p> <ul style="list-style-type: none"> Lack of user satisfaction Introduction of manual processes and workarounds to accommodate the inadequacies of the solution Ineffective and inefficient operating processes and procedures Reduction in quality of the screening programme 	Rare	Significant	High	<ul style="list-style-type: none"> Usability of the solution will be tested thoroughly during the Design and Build phases Key stakeholders and users will be invited to actively participate in the design process and have input onto the usability of the solution 	Rare	Moderate	High
NSS05	Error Protection (User)	<p>If: there is poor user interfaces design, lack of protection and controls for data at the point of entry for users, or lack of data quality and integrity management within the NSS</p> <p>Then: The solution will not protect the user of the system from entering incorrect data, and does not enforce the quality and integrity of the data</p> <p>Resulting in a:</p> <ul style="list-style-type: none"> Reduction in data quality and integrity of the solution Reduction in safety of the screening programme Reduction in quality of the screening programme 	Likely	Severe	High	<ul style="list-style-type: none"> User Error protection will be a specific consideration across all aspects of the solution design and build Complete independent quality assurance across the NSS design 	Possible	Minimal	High
NSS06	Error Protection (Solution)	<p>If: there is inadequate integration and end-to-end design, inadequate interface design and specification, and/or lack of data quality and integrity management within the NSS</p> <p>Then: The solution will not be able to protect itself through the enforcement of strict data quality and integrity rules across all system and data interfaces</p> <p>Resulting in a:</p> <ul style="list-style-type: none"> Reduction in data quality and integrity of the solution Reduction in safety of the screening programme Reduction in quality of the screening programme 	Likely	Severe	High	<ul style="list-style-type: none"> The solution's error protection will be a specific consideration across all aspects of the NSS Design and Build Complete independent quality assurance across the NSS design 	Possible	Minor	High

Risk Details and Rating						Mitigation and Residual Rating			
#	Title	Description	Likelihood	Consequence	Rating	Mitigation	Likelihood	Consequence	Rating
NSS07	Maturity	<p>If: key maturity considerations are missing, including:</p> <ul style="list-style-type: none"> The solution does not meet and cannot operate against the required business and technology standards for the Ministry and NBSP The solution cannot be maintained effectively and efficiently The solution is not supported by technical and operational documentation and cannot be maintained to meet business and operational change needs. <p>Then: The NSS has not been proven to operate and support similar business requirements at the scale required to meet the requirements of the NBSP, and potentially other population health initiatives</p> <p>Resulting in:</p> <ul style="list-style-type: none"> A lack of trust in the solution The need further investment (beyond budget), to remediate reliability issues Delays to the NBSP rollout Increased NBSP operational risk 	Rare	Significant	High	<ul style="list-style-type: none"> The maturity of the NSS and underlying solution platform have been tested during the procurement process through the validation against the RFP requirements The Health Connect product, while supported by reference sites, will be further validated through the Project's Design Phase The maturity of the solution will continue to be tested through the NSS Design Phase 	Rare	Minimal	Low
NSS08	Availability	<p>If there are</p> <ul style="list-style-type: none"> Conflicting service levels agreements across major solution components Solution maintenance that cannot be completed within agreed service level agreements. Inadequate operating processes and procedures Ineffective architecture and design Insufficient resources <p>Then: The solution cannot meet the availability requirements for the NSS</p> <p>Resulting in:</p> <ul style="list-style-type: none"> The inability of the NSS to meet the availability requirements of the NBSP Reduced quality of the NBSP service and a reduction in trust on the service The need for further investment to ensure the system can meet the availability requirements for the NBSP 	Likely	Severe	High	<ul style="list-style-type: none"> While availability of each component of the end-to-end solution can be verified, the availability of the end-to-end solution across different geographies (USA, Australia) has to be tested The primary vendor of the solution will be asked to warrant the end-to-end solution from an availability perspective Complete independent quality assurance across the NSS Design 	Likely	Moderate	Medium

Risk Details and Rating						Mitigation and Residual Rating			
#	Title	Description	Likelihood	Consequence	Rating	Mitigation	Likelihood	Consequence	Rating
NSS09	Fault Tolerance	<p>If there is:</p> <ul style="list-style-type: none"> Ineffective architecture and design Low quality of design and/or build Inadequate testing (effort or quality) Poor end-to-end implementation Insufficient resources <p>Then: the solution is not fault tolerant and cannot be recovered in the event of a hardware or software failure.</p> <p>Resulting in:</p> <ul style="list-style-type: none"> The NSS being prone to error and not able to be readily recovered Data will be lost or corrupted The solution cannot be relied upon to support the NBSP 	Rare	Severe		<ul style="list-style-type: none"> Ensure that the design and resulting solution meets defined fault tolerance requirements and that the end-to-end solution is fully fault tolerant, including data being protected and the solution verified as being able to be recovered in the event of a failure. Define and execute tests specifically design to test the fault tolerance of the end-to-end solution. 	Rare	Moderate	
NSS10	Recoverability	<p>If there is:</p> <ul style="list-style-type: none"> Ineffective data management capability of the technology platform Ineffective availability and recovery architecture of the technology platform and application Blocking architecture across solution components; <p>Then: the solution cannot be recovered in the event of a system failure and/or disaster with zero data loss.</p> <p>Resulting in:</p> <ul style="list-style-type: none"> The failure of the NBSP to operate The loss of participant and clinical data A reduction in safety for the NBSP 	Likely	Severe		<ul style="list-style-type: none"> Ensure that the design enables the solution to be fully recoverable in the event of a major system failure and/or disaster Define and execute tests specifically to test the recoverability of the end to end solution in the event of a major system failure and / or disaster 	Likely	Minimal	

Risk Details and Rating						Mitigation and Residual Rating			
#	Title	Description	Likelihood	Consequence	Rating	Mitigation	Likelihood	Consequence	Rating
NSS11	Operations	<p>If there is:</p> <ul style="list-style-type: none"> Immature / inadequate service management capability at the Ministry, NCC or vendor Incompatibility of the solution service management processes and procedures with Ministry and NCC processes and procedures No defined NBSP operating model <p>Then: the solution operations cannot be integrated into Ministry and NCC Service, Incident and Problem Management processes and procedures.</p> <p>Resulting in:</p> <ul style="list-style-type: none"> Increased complexity across service management processes and procedures No clarity on responsibility and accountability for service management related events SLAs not being achieved for service provisioning, incident and problem management 	Rare	Moderate	High	<ul style="list-style-type: none"> Define the NBSP NSS operating model through the Project's Design Phase Ensure OLAs and SLAs are clearly defined and implemented across all interested parties 	Rare	Moderate	High
NSS12	Compliance	<p>If: regulatory and compliance requirements are not fully addressed during the NSS Design and Build Phases,</p> <p>Then: the NSS and, as a consequence the NBSP, is not compliant to meet all regulatory requirements (including security and privacy).</p> <p>Resulting in: the NSS and NBSP being unable to operate</p>	Possible	Severe	Critical	<ul style="list-style-type: none"> Early identification and requirement assessment of all relevant compliance requirements to inform solution design and development Engagement of Central Agency and specialist stakeholders for input and guidance on complying with requirements Inclusion of compliance testing in the NSS technical (e.g. penetration testing) and business acceptance (e.g. privacy and security) testing activities Inclusion of compliance test results as a factor in the NSS implementation go / no go decision 	Likely	Minimal	Critical
NSS13	Stakeholder	<p>If there is: A lack of planning, communication and collaboration with stakeholders,</p> <p>Then: the NBSP programme cannot actively and effectively engage with internal and external stakeholders.</p> <p>Resulting in:</p> <ul style="list-style-type: none"> Stakeholders being disengaged in the NBSP resulting in programme delays and impacts to quality and performance. Reduced sponsorship and support from internal stakeholders and senior leadership 	Rare	Severe	High	<ul style="list-style-type: none"> Early definition of stakeholder management plan Early and continuous engagement with stakeholders, with specific focus on external stakeholders through the initial planning and design phase of the Project 	Rare	Moderate	High

Risk Details and Rating						Mitigation and Residual Rating			
#	Title	Description	Likelihood	Consequence	Rating	Mitigation	Likelihood	Consequence	Rating
NSS16	Cost (Investment)	<p>If:</p> <ul style="list-style-type: none"> The required funding is not / cannot be made available Cost estimates created through the RFP prove to be invalid Cost to deliver increases, <p>Then: the solution cannot be delivered within available budget.</p> <p>Resulting in:</p> <ul style="list-style-type: none"> A significant shortfall in funding for the NSS (or the need to substantially revise the scope and/or quality of the solution) The need to raise further investment funding to complete the delivery of the NSS The failure of the NSS Project to deliver 	Almost Certain	Severe		<ul style="list-style-type: none"> Transparent presentation of cost estimates with senior leadership / executives and Central Agencies Clear prioritisation and management of solution capability and business requirements as defined during procurement process and elaborated during the Design Phase Management of requirements and quality considerations within the prioritisation and strong scope and change control practices Strong engagement of NBSP Sector Deployment team and wider Sector for solution validation 	Likely	Moderate	
NSS17	Cost (Operational)	<p>If: the full range of operational costs estimates for the solution have been underestimated / not been identified / considered as part of the budget,</p> <p>Then: the solution cannot be delivered within available budget.</p> <p>Resulting in:</p> <ul style="list-style-type: none"> An inability to operate the NSS and NBSP in a sustainable way, within the available budget Increased pressure on operational budgets The need to request additional funding to support NSS and NBSP operations 	Likely	Significant		<ul style="list-style-type: none"> Clear prioritisation and management of solution operational requirements during the Design Phase Continued monitoring and management of operational costs, ensuring that solution licences are optimised to meet operational demand Strong engagement of NBSP Sector Deployment team and wider sector for solution validation 	Rare	Moderate	
NSS18	Quality	<p>If:</p> <ul style="list-style-type: none"> There is a lack of planning, communication and collaboration with stakeholders The NSS project does not complete mandated independent quality assurance and technical assurance activities, <p>Then: the NBSP cannot operate in alignment with the required quality standards (HISO, NSU Quality Standards)</p> <p>Resulting in:</p> <ul style="list-style-type: none"> The quality and safety of the NBSP being compromised Increased operational risk for the NBSP Increased investment once the solution has gone live to address quality issues 	Likely	Moderate		<ul style="list-style-type: none"> Early definition of quality standards and requirements, including quality framework, to continually monitor adherence to quality standards Ensure IQA is completed across all aspects of the NBSP Implementation Programme / NSS Project 	Rare	Moderate	

Risk Details and Rating						Mitigation and Residual Rating			
#	Title	Description	Likelihood	Consequence	Rating	Mitigation	Likelihood	Consequence	Rating
NSS19	Social Licence	<p>If:</p> <ul style="list-style-type: none"> There is a lack of/limited public knowledge on cloud computing An experience of compromised service performance and quality The country in which data is being stored and managed does not have equivalent privacy laws The service provider responsible for the capture, storage, management, use and retrieval of data is not liable under New Zealand Law and therefore New Zealand law's application cannot be directly enforced for the data <p>Then: the Ministry will be unable to hold the service provider accountable under New Zealand law.</p> <p>Resulting in:</p> <ul style="list-style-type: none"> The privacy of the individuals' data being at risk The Ministry will be limited in its ability to take effective legal action against a provider 	Likely	Moderate		<ul style="list-style-type: none"> T&DS and NSU will jointly develop, and appropriately consult with, a set of trust requirements that specifically address this aspect of data sovereignty (and the NSS Social Licence aspect). Formal project stream established in support of this work, and will be managed within the scope of the NSS Project 	Rare	Moderate	
NSS20	Data Sovereignty	<p>If:</p> <ul style="list-style-type: none"> The country in which data is being stored and managed does not have equivalent privacy law The service provider responsible for the capture, storage, management, use and retrieval of data is not liable under New Zealand Law and therefore New Zealand law's application cannot be directly enforced for the data <p>Then: data sovereignty cannot be maintained by the cloud service provider for the service(s) they are providing, and the Ministry will be unable to hold the service provider accountable under New Zealand law.</p> <p>Resulting in:</p> <ul style="list-style-type: none"> The privacy of the individuals' data being at risk The Ministry will be limited in its ability to take effective legal action against a provider 	Likely	Significant		<ul style="list-style-type: none"> T&DS and NSU will jointly develop, and appropriately consult with, a set of trust requirements that specifically address this aspect of data sovereignty (and the NSS Social Licence aspect). Formal project stream established in support of this work, and will be managed within the scope of the NSS Project 	Unlikely	Moderate	

Risk Details and Rating						Mitigation and Residual Rating			
#	Title	Description	Likelihood	Consequence	Rating	Mitigation	Likelihood	Consequence	Rating
NSS21	Social Licence (Equity)	<p>If:</p> <ul style="list-style-type: none"> Iwi and Treaty partners have not been sufficiently engaged and provided the opportunity to state their requirements and expectations of the bowel screening programme <p>Then: the NBSP will not be able to gain social licence for the NBSP, and organisations and groups may refuse to participate in the service.</p> <p>Resulting in:</p> <ul style="list-style-type: none"> The NBSP will be unable to provide the service in an equitable way that ensures the absence of avoidable or remediable differences among groups of people There may be a reluctance for Iwi to support participation in the bowel screening programme placing the equity of the programme at risk 	Likely	Significant		<ul style="list-style-type: none"> T&DS and NSU will jointly develop, and appropriately consult with, a set of trust requirements that specifically address this aspect of data sovereignty (and the NSS Social Licence aspect). Formal project stream established in support of this work, and will be managed within the scope of the NSS Project 	Unlikely	Moderate	
NSS22	Social Licence (Cultural Licence)	<p>If: there is a failure to engage with Iwi and Treaty partners on cultural licence, and the requirements of Maori in relation to cultural licence,</p> <p>Then: the NBSP cannot provide the NBSP in a culturally acceptable way, with confidence from Maori Treaty Partners and Iwi,</p> <p>Resulting in:</p> <ul style="list-style-type: none"> The NBSP will not be able to legitimately capture, manage and use Maori data for the purposes of bowel screening. Increased risk of significant delays to the design and build of the NSS and may place the NBSP outcome in jeopardy 	Likely	Significant		<ul style="list-style-type: none"> T&DS and NSU will jointly develop, and appropriately consult with, a set of trust requirements that specifically address this aspect of data sovereignty (and the NSS Social Licence aspect). Formal project stream established in support of this work, and will be managed within the scope of the NSS Project 	Unlikely	Moderate	
NSS23	IT Infrastructure	<p>If: DHB IT infrastructure is not fully understood in the NSS Project planning and initial NSS design processes,</p> <p>Then: there are likely to be gaps and challenges in the DHBs ability to integrate with NSS</p> <p>Resulting in:</p> <ul style="list-style-type: none"> The NSS and NBSP roll out being delayed Need for adjustments to the NSS design / build, and resulting potential negative impacts on cost, time and quality aspects of the solution 	Likely	Moderate		<ul style="list-style-type: none"> Robust environmental scanning for each DHB as part of NSS Design Phase Active engagement of DHBs representatives to validate NSS design and build 	Unlikely	Moderate	
NSS24	Change Management	<p>If: there is insufficient change management planning and coordination across the Sector.</p> <p>Then: sector constraints and conflicting priorities preventing successful on boarding.</p> <p>Resulting in: the sector being unable to accommodate the required change within the required timescales to on board onto the NSS / NBSP.</p>	Likely	Moderate		<ul style="list-style-type: none"> Early engagement of the NBSP Sector Deployment team in the NSS Project Engagement of a change manager to own and manage the delivery of change across the technology and business concerns of the project 	Unlikely	Moderate	

Risk Details and Rating						Mitigation and Residual Rating			
#	Title	Description	Likelihood	Consequence	Rating	Mitigation	Likelihood	Consequence	Rating
NSS25	Business Coexistence	<p>If there is an inability:</p> <ul style="list-style-type: none"> to maintain the integrity of the programme while DHBs are operating on different screening platforms of the NCC to operate NBSP against two solutions until all active DHBs are operating on the NSS <p>Then: the Interim Solution and NSS cannot operate in a coexistence state through the roll out of the NBSP</p> <p>Resulting in:</p> <ul style="list-style-type: none"> A need to redefine the deployment strategy and approach Increased funding requirement to manage the coexistence state for a period of time 	Likely	Moderate		<ul style="list-style-type: none"> Ensure the end-to-end design, migration and deployment approach includes coverage of the coexistence of Interim Solution and NSS Early engagement of the NBSP Sector Deployment team in the NSS Project Engagement of a change manager to own and manage the delivery of change across the technology and business concerns of the project 	Unlikely	Moderate	
NSS26	Contract Pricing	<p>If the vendor contract:</p> <ul style="list-style-type: none"> is not signed by the end of the 12 month validity period provided by the vendor in their RFP Response - 31 October 2018 <p>Then: the NSS Programme will be exposed to possible price changes</p> <p>Resulting in:</p> <ul style="list-style-type: none"> Increased funding requirement as a consequence of the vendor varying their price proposal. 	Possible	Significant		<ul style="list-style-type: none"> Approval of the NSS Business Case, approximately as planned Ministry and Central Agency familiarity with Crown-Vendor Contract and terms Minister of Health regularly informed on status and progress Contract signed on time 	Rare	Significant	

Appendix 5: Market Analysis

Market Sounding

During the IT options assessment process, undertaken from 19th December 2016 to 24th March 2017, the Ministry performed a Market Sounding process to understand the market of potential suppliers.

Based on participant responses to the Market Sounding, there appeared to be relevant capability in the market to identify Commercial Off The Shelf (COTS) solutions that are extensible across screening programmes and address the complexity of the New Zealand health environment. The Market Sounding found that suppliers in the market:

- Offer a variety of views, solution options and approaches to providing health screening.
- Generally support public and private cloud as well as in-house hosting, if required.
- Are flexible regarding commercial arrangements.

A limited number of suppliers were invited to participate in the Market Sounding, from three broad categories: health sector IT suppliers; system integrators; and suppliers who could provide an innovation lens. All of the health sector IT suppliers who were invited chose to participate, and the responses that were received provided a relatively high level of detail. This indicated that there was likely to be strong interest from the market, both in New Zealand and globally, in this procurement process.

Desktop Research

In parallel with the Market Sounding, the Ministry conducted Desktop Research, to understand relevant global screening case studies. This revealed significant variation across the IT solutions used to support and enable these overseas screening programmes, as well as the approaches to screening in general. However, the IT solutions for screening commonly supported five main capability areas: campaign management; participant management; risk management; knowledge, data and analytics management; and programme operations. This observation informed the National Screening Solution business capability model, which is described in Figure 15.



Figure 15: Main Capability Areas

To deliver their respective solutions, agencies engaged suppliers from multinational IT and professional services firms, specialist technology product¹³ implementation specialists, healthcare IT firms, and screening IT specialists.

¹³ Including customer relationship management (CRM) and enterprise resource planning (ERP) products.

Appendix 6: NSS Core – Assessment Criteria

The Critical Success Factors (CSFs) detailed below were used to create a robust framework for assessment of the NBSP NSS Core options. These CSFs are aligned with the Better Business Case (BBC) framework.

Critical Success Factor 1: Potential affordability

How well the option:

- can be met from the likely available funding envelope, and
- matches other funding constraints.

High-level criteria		Detailed criteria	
1.1	Technology Investment/ Costs The IT solution (incl. integration costs) is affordable for the Ministry and third parties (e.g. primary care providers).	1.1.1	The Ministry has access to sufficient funding to pay for the development and implementation of the NBSP solution.
		1.1.2	Third parties, such as DHBs, GPs and other health care practitioners, are able to invest to change internal processes and integrate with the NBSP solution.
1.2	Operational Impact The increased operational costs associated with the IT solution are affordable.	1.2.1	The increased operational costs associated with the IT solution are affordable, including IT service management, increased management, administration and participation in the screening programme.

Critical Success Factor 2: Potential achievability

How well the option:

- is likely to be delivered given the organisation’s ability to respond to the changes required, and
- matches the level of available skills required for successful delivery.

High-level criteria		Detailed criteria	
2.1	Solution Achievability Solution can be delivered within known constraints (internally and externally).	2.1.1	Solution can be delivered within known constraints (internally and externally), including wider delivery commitments across Ministry and the health sector, and internal / external integration complexity.
2.2	Ministry Capacity & Capability The Ministry has the capacity and capability to support the delivery of the IT solution.	2.2.1	Ministry has capacity and capability to support the delivery and ongoing operations of the IT solution.
2.3	Sector Capacity & Capability The Sector has the capacity and capability, with available resources, and are actively engaged in delivering the IT solution.	2.3.1	The Sector and other health care providers have capacity and capability to support the IT solution delivery and operations.
		2.3.2	The IT solution encourages participation and has a minimal negative impact on sector and third-party provider's operational workload.

Critical Success Factor 3: Strategic fit & business needs

How well the option meets the agreed investment objectives, related business needs and requirements, and fits with other strategies, programmes and projects.

High-level criteria		Detailed criteria	
3.1	Solution Alignment with NBSP Investment Objectives The IT solution enables the programme to fully meet the NBSP Investment Objectives in a timely manner.	3.1.1	To achieve a greater mortality reduction from bowel cancer.
		3.1.2	To promote equity between population groups.
		3.1.3	To deliver bowel screening in a manner that is acceptable and encourages participation.
		3.1.4	To maximise benefits vs harm.
		3.1.5	To deliver a safe, high quality programme which is consistent nationally.
3.2	Aligns with Government ICT Strategy 2015 Outcomes The IT solution will be delivered in way that enables wider government outcomes to be achieved.	3.2.1	Customers experience seamless, integrated and trusted public services.
		3.2.2	Information-driven insights are reshaping services and policies, and adding public and private value.
		3.2.3	Adoption of information and technology innovations is accelerated and value is being created.
		3.2.4	Investment in innovative digital services is being prioritised and benefits are being realised.
		3.2.5	Complex problems are being solved and innovative solutions are being adopted.
3.3	Enables 'Population Health Vision and Scope' Strategic Outcomes The IT solution is interoperable and provides a foundation for future screening programmes.	3.3.1	Provides a foundation capability that can be used across multiple health screening programmes without excessive change.
		3.3.2	Readily supports interoperability across the sector through the use of defined standards (e.g. HL7 / FIHR, SNOMED etc.).
3.4	Aligns with Ministry on the Move The IT solution is sufficiently flexible, responsive and delivered in way that enables Ministry on the Move.	3.4.1	Enables Ministry on the Move through the adoption of agile management, co-design and the ability to efficiently respond to and drive changes in the business environment.

Critical Success Factor 4: Potential value for money

How well the option optimises value for money (i.e. the optimal mix of potential benefits, costs and risks).

High-level criteria		Detailed criteria	
4.1	Business Benefits: Improved Health Outcomes <i>Screening should result in the reduction of bowel cancer mortality (and potentially in incidence) and an improvement in quality and length of life.</i> The IT solution will enable the delivery of improved health outcomes.	4.1.1	Reduction in bowel cancer mortality.
		4.1.2	Reduction in bowel cancer incidence.
		4.1.3	Benchmarking improvement with international comparisons - variance with OECD average.
		4.1.4	Increase in proportion of people diagnosed with Stage 1 bowel cancer.
		4.1.5	Increase in 5 year survival rate for colorectal cancer.
4.2	Business Benefits: Improved Service Delivery <i>The implementation of a national screening programme will impact on wider service delivery, and should result in improved services including and beyond bowel screening.</i> The IT solution will enable the delivery of improved service delivery across the Sector.	4.2.1	Reduction in the proportion of colorectal cancers first identified through presentation and the Emergency Departments.

High-level criteria		Detailed criteria	
4.3	Programme Risk The IT solution is designed and delivered in a timely manner, nationally, and actively addresses and mitigates potential programme risk.	4.3.1	Addresses the risk that the NBSP is not available or cannot be integrated by the DHBs nationally.
		4.3.2	Addresses the risk that delivery of the programme is delayed within the given timeframes.
		4.3.3	Addresses the risk that required functionality to support a national programme is not sufficiently delivered.
		4.3.4	Addresses the risk that any required sourcing activities are not completed in time to meet programme delivery milestones.
		4.3.5	Addresses the risk that integration costs are prohibitive to onboarding DHBs and other users to the solution.
4.4	Programme Cost The cost of the IT solution is within agreed estimates.	4.4.1	The IT solution can be delivered within agreed cost estimates.
4.5	Whole of Life Cost The whole of life cost of the IT solution is within agreed estimates.	4.5.1	The whole of life cost of the IT solution is within estimated cost envelope across the planned 10 year window.

Critical Success Factor 5: Supplier capacity and capability

How well the option:

- matches the ability of potential suppliers to deliver the required services, and
- is likely to result in a sustainable arrangement that optimises value for money over the term of the contract.

High-level criteria		Detailed criteria	
5.1	Supplier Product There are products in the market that would support the proposed IT solution.	5.1.1	There are supplier(s) in the market with product(s) that meet the needs of the NBSP.
5.2	Supplier Capability There are suppliers in the market with the capability to deliver/ support the IT solution.	5.2.1	There are suppliers in the market with the capabilities required to meet the majority of the NBSP's needs.
5.3	Supplier Capacity There are suppliers in the market with the capacity to deliver/ support the IT solution.	5.3.1	There are suppliers in the market with the capacity (locally and/ or internationally) to deliver and support the required NBSP solution.
5.4	Support & Maintenance There are suppliers in the market to support/ maintain the IT solution.	5.4.1	There are supplier(s) in the market who can provide effective ongoing post-implementation support (or enable it through other mechanisms e.g. training or transfer of IP to the Ministry).

Appendix 7: NSS Core – Long List Options Analysis

NSS Core IT Options Assessment Approach

The IT Options Workshop held on 17 March 2017 was the culmination of a staged assessment approach designed to identify and evaluate options for the core NSS solution. The approach is depicted in Figure 16.



Figure 16: Assessment Approach for IT Options Analysis

The purpose of the IT workshop was for key stakeholders to assess the long list of proposed IT Options, define a shortlist of options (including a ‘do minimum’ option) and agree a preferred option. Potential sourcing or procurement requirements related to the options were deemed as out of scope for the purposes of the Workshop.

The Workshop was facilitated by Ernst and Young. Attendees were invited based on their roles and ability to provide a balance of perspectives from across the health sector and beyond. Attendees included representatives from the Ministry (NBSP, T&DS, NSU and service commissioning), Treasury, Counties Manukau DHB, and GCDO at Department of Internal Affairs.

NSS Core IT Options Summary

The table below is a representation of the IT Options following the long list assessment. The four options that were shortlisted are highlighted in orange.

Table 25: NSS Core - Long List Analysis Summary

#	CSF	High-Level Criteria	Use enhanced pilot solution		Create new national solution				
			1.1 Pilot clones	1.2 Pilot extension	2.1 Bespoke	2.2 Best of breed	2.3 COTS framework	2.4 COTS with build	2.5 COTS with config
1	Potential Affordability	1.1	Partial	Meets	Partial	Partial	Partial	Meets	Meets
		1.2	Does not meet	Meets	Meets	Partial	Meets	Meets	Meets
2	Potential Achievability	2.1	Does not meet	Partial	Partial	Partial	Partial	Meets	Meets
		2.2	Does not meet	Does not meet	Partial	Partial	Partial	Meets	Meets
		2.3	Partial	Meets	Meets	Meets	Meets	Meets	Meets
3	Strategic Fit & Business Needs	3.1	Does not meet	Meets	Partial	Partial	Partial	Partial	Partial
		3.2	Does not meet	Does not meet	Partial	Meets	Meets	Meets	Partial
		3.3	Does not meet	Does not meet	Partial	Meets	Meets	Meets	Partial
		3.4	Does not meet	Partial	Partial	Partial	Meets	Meets	Partial
4	Potential Value for Money	4.1	Meets	Meets	Meets	Meets	Meets	Meets	Meets
		4.2	Meets	Meets	Meets	Meets	Meets	Meets	Meets
		4.3	Does not meet	Partial	Partial	Does not meet	Partial	Meets	Meets
		4.4	Meets	Meets	Does not meet	Does not meet	Meets	Meets	Meets
		4.5	Partial	Meets	Does not meet	Does not meet	Meets	Meets	Meets
5	Supplier Capacity and Capability	5.1	Meets	Meets	Meets	Meets	Meets	Meets	Partial
		5.2	Meets	Meets	Meets	Meets	Meets	Meets	Partial
		5.3	Partial	Partial	Meets	Meets	Meets	Meets	Meets
		5.4	Partial	Partial	Meets	Does not meet	Meets	Meets	Meets

NSS Core IT Options Narrative Overview

The information provided in Table 26 is as a summary of narrative and discussion captured throughout the Workshop. Where an option was shortlisted, the overview provided reflects discussion and challenge from attendees at the detailed, rather than high-level, criteria.

Table 26: IT Options Narrative

1.1 – Clone BSP+ solution	Long-listed option only
<p><i>Option 1.1 was not brought through as a short-list option as it failed to meet any of the high-level criteria for strategic fit and business needs.</i></p>	
<p>Discussion centred on concerns at the lack of flexibility offered by this solution option, the Ministry’s ability to roll out consistent change across all DHBs (in line with Ministry on the Move) under this option, and limitations of the solution’s architecture. Specifically, the solution was established for the purpose of supporting a pilot rather than a national screening programme or a wider population health ecosystem. The BSP+ is primarily participant focussed, likely does not support a campaign management function, and is not risk-based which is the agreed preferred approach for any potential strategic solution.</p>	
<p>Based on discussions, the Ministry’s readiness to align to the Ministry on the Move principles is not yet considered sufficiently mature to deliver this option and the time and cost to prepare for this approach would outweigh the requirement for a timely solution. In this option it is assumed that the Ministry would be responsible for maintaining 20 clone solutions. It also assumes that this option does not include enhancements to alter current functionality instead would roll out the existing pilot and functionality to the remaining DHBs.</p>	
1.2 Enhance and extend BSP+ solution (BSP++)	Short-listed option
<p><i>Option 1.2 was short-listed primarily as a baseline or a do minimum option.</i></p>	
<p>It was noted that the pilot extension would similarly be based on the existing BSP+ architecture/structure and as such would be restricted in its ability to deliver a strategic national solution and be flexible enough to support a population health ecosystem in future. As a single instance it would help Ministry enable and drive towards common processes and way of working across DHBs, however this option would likely require extension and would essentially become ‘bespoke’.</p>	
<p>Based on discussions, the Ministry’s readiness to align to the Ministry on the Move principles is not yet considered sufficiently mature to deliver this option and the time and cost to prepare for this approach would outweigh the requirement for a timely solution.</p>	
<p>In order for this option to meet the requirements it is assumed that the Ministry would maintain responsibility for the solution given the existing vendor does not have capacity to meet the requirement.</p>	
2.1 – Bespoke solution	Long-listed option only
<p><i>Option 2.1 was not brought through as a short-list option primarily due its inability to meet the strategic fit and business needs criteria nor does it optimise value for money.</i></p>	
<p>There was strong challenge regarding the bespoke option, and the potential for open-source was discussed. The need for ongoing adaptation would create challenges and additional complexity in this option. This option was considered a complex solution to deliver, within current timelines, and the cost of mitigating potential programme risk was viewed as very high.</p>	
<p>The ability for Ministry to drive innovation in alignment with the wider Government ICT Strategy and Ministry on the Move principles is reduced due to the nature of the solution, and Ministry were viewed as not being sufficiently aligned to the innovative practices and processes. The programme cost attached to a bespoke solution was considered high and would prevent the option from meeting the value for money criteria required.</p>	
<p>There is an assumption that Ministry would require support from a system integrator to deliver the solution as it does not have the capacity under existing or projected resourcing levels to deliver on this option.</p>	

2.2 Best of Breed

Long-listed option only

Option 2.2 was not brought through as a short-list option primarily because it does not optimise value for money nor does it meet the potential affordability or achievability criteria.

A best of breed solution was viewed as enabling partial alignment to the All of Government ICT Strategy due to the discrete components being sourced for each primary functional area required for the solution. However, this option does not fully enable Ministry to drive towards alignment with Ministry on the Move.

The operational impact of this option would be significantly higher than others based on the level of change, integration and support required across multiple components to realise the solution in a timely manner. The programme risk profile of this option was described as high due to potential delivery time issues and challenges regarding commercial management arrangements.

It is assumed that there would be significant integration required, but that a system integrator would exist to provide this capability. It is also assumed that the licensing fees attached to this solution would be higher than other options for comparable functionality, negatively impacting whole of life costs.

2.3 COTS framework solution

Short-listed option

Option 2.3 was short-listed primarily because it aligns with the Government ICT Strategy outcomes and Ministry on the Move principles, and it was not sufficiently differentiated from 2.5.

The ability of an extensible COTS framework solution to meet the strategic needs of NBSP in a timely manner was discussed. It was noted that the solution would enable the adoption of agile management and co-design in alignment with Ministry on the Move principles relative to the other options.

Given the nature of the option, there is a risk that it may not be delivered within the timeframes for the NBSP nationally due to heavy customisation and configuration requirements. There was limited confidence from attendees as to how a supplier could effectively meet NBSP needs through a non-screening/ non-health specific COTS solution.

It is assumed that a COTS framework is not screening specific and would not readily support interoperability across the sector (e.g. through SNOMED, HL7 etc) and would require a higher level of customisation/ adaptation in order to do so. It is also assumed that this option would enable a wider population health ecosystem in future.

2.4 – Enhance and extend COTS solution

Short-listed option

Option 2.4 was short-listed primarily based on its ability to meet the greatest amount of critical success factors.

Sourcing a COTS solution that would be health/ screening specific and customising the non-core components allows the Ministry to retain greater control, for example allows the Ministry to shape the data and insights the solution will be capable of providing.

This option was viewed as enabling the adoption of agile management and co-design relative to the other options. It would also allow Ministry to absorb some of the potential operational impacts resulting from the change rather than pushing the change requirements outwardly to practitioners, providers and the wider sector.

It is assumed that changes to the COTS product to meet NBSP requirements will sufficiently align with the vendor's technology roadmap and acceptable levels of maintenance will be required. It is also assumed that this option would enable a wider population health ecosystem in future.

2.5 COTS with configuration

Short-listed option

Option 2.5 was short-listed primarily based on its ability to meet the achievability criteria and deliver a national solution within the required timeframes, and it was not sufficiently differentiated from 2.3.

Sourcing a COTS solution that supports all core NBSP requirements immediately would have constraints on the ability to amend the solution to align with the wider Government ICT Strategy if required. This option shifts the reliance to the vendor's roadmap which increases the risk to the Ministry.

It is assumed that this option exists within the market, with some reservations, and is the only option which should immediately meet the interoperability across the sector with limited need of customisation/configuration. It is also assumed that this option would enable a wider population health ecosystem in future.

Appendix 8: NSS Core – Short List Options Analysis

The table below is a representation of the IT Options following the short-list assessment. The agreed preferred option is highlighted in orange.

Table 27: IT Options Short List Analysis

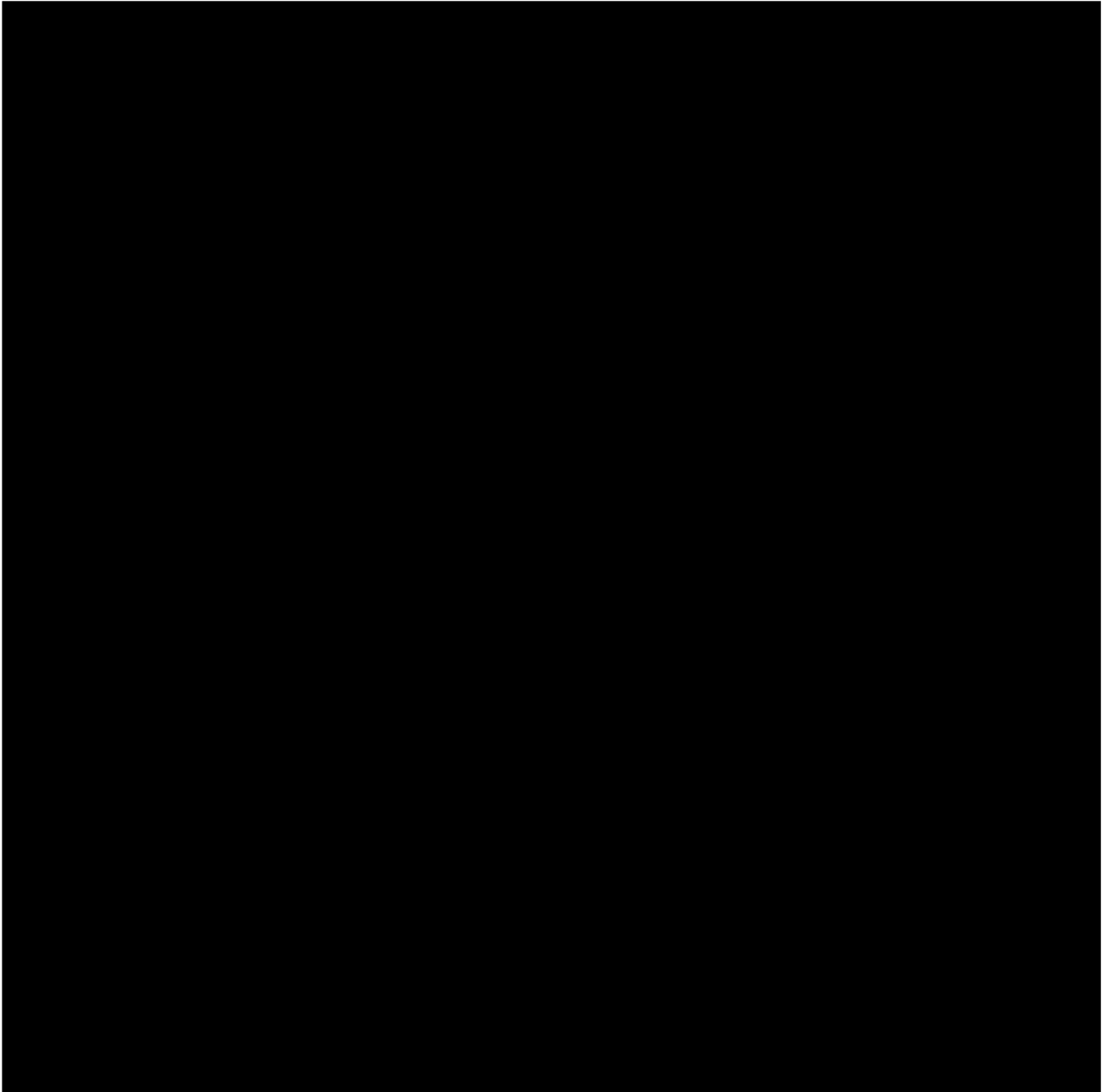
#	CSF	#	#	1.2 Pilot extension	2.3 COTS framework	2.4 COTS with build	2.5 COTS with config
1	Potential Affordability	1.1	1.1.1	Meets	Partial	Meets	Meets
			1.1.2	Meets	Partial	Meets	Partial
		1.2	1.2.1	Meets	Meets	Meets	Meets
2	Potential Achievability	2.1	2.1.1	Partial	Partial	Meets	Meets
		2.2	2.2.1	Partial	Partial	Meets	Meets
		2.3	2.3.1	Meets	Meets	Meets	Meets
			2.3.2	Meets	Partial	Meets	Partial
3	Strategic Fit & Business Needs	3.1	3.1.1	Meets	Meets	Meets	Meets
			3.1.2	Meets	Meets	Meets	Meets
			3.1.3	Meets	Meets	Meets	Meets
			3.1.4	Meets	Meets	Meets	Meets
			3.1.5	Meets	Meets	Meets	Meets
		3.2	3.2.1	Partial	Meets	Meets	Partial
			3.2.2	Partial	Meets	Meets	Partial
			3.2.3	Does not meet	Meets	Meets	Partial
			3.2.4	Does not meet	Meets	Meets	Partial
			3.2.5	Does not meet	Meets	Meets	Partial
		3.3	3.3.1	Does not meet	Meets	Meets	Partial
			3.3.2	Does not meet	Does not meet	Meets	Meets
		3.4	3.4.1	Partial	Meets	Meets	Partial
4	Potential Value for Money	4.1	4.1.1	Meets	Meets	Meets	Meets
			4.1.2	Meets	Meets	Meets	Meets
			4.1.3	Meets	Meets	Meets	Meets
			4.1.4	Meets	Meets	Meets	Meets
			4.1.5	Meets	Meets	Meets	Meets
		4.2	4.2.1	Meets	Meets	Meets	Meets
		4.3	4.3.1	Meets	Partial	Meets	Partial
			4.3.2	Meets	Partial	Meets	Meets
			4.3.3	Partial	Partial	Meets	Meets
		4.3.4	4.3.4	Partial	Partial	Partial	Partial
			4.3.5	Partial	Partial	Meets	Partial
		4.4	4.4.1	Meets	Meets	Meets	Meets
4.5	4.5.1	Meets	Meets	Meets	Meets		
5	Supplier Capacity and Capability	5.1	5.1.1	Meets	Meets	Meets	Partial
		5.2	5.2.1	Partial	Partial	Meets	Partial
		5.3	5.3.1	Meets	Meets	Meets	Meets
		5.4	5.4.1	Meets	Meets	Meets	Meets

Appendix 9: Security

Background

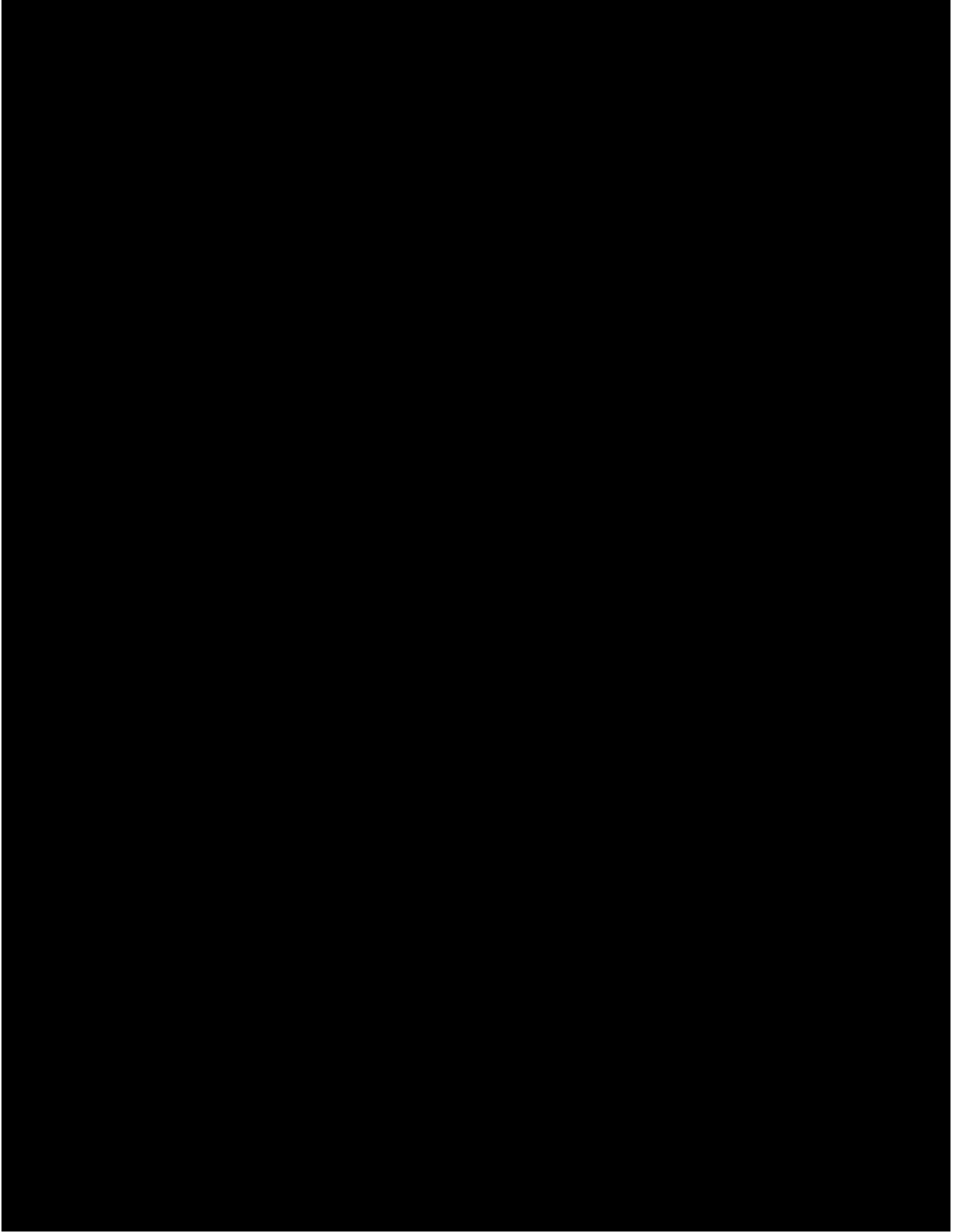


Summary



¹⁴ <https://www.ict.govt.nz/assets/Accelerating-Public-Cloud/Accelerating-Public-Cloud-Driving-digital-transformation.pdf>

Social Licence



¹⁵ <https://www.ict.govt.nz/guidance-and-resources/using-cloud-services/assess-the-risks-of-cloud-services/guidance-on-social-license-for-public-cloud-services/>

Appendix 10: Financial Case

Table 28: Detailed NSS Costings

Category	17/18 \$'M	18/19 \$'M	19/20 \$'M	20/21 \$'M	21/22 \$'M	22/23 \$'M	23/24 \$'M	24/25 \$'M	25/26 \$'M	26/27 \$'M	27/28 \$'M	Total \$'M
Design	s 9(2)(ba)(i)											
Build												
Test												
Deploy												
Migration & Integrations												
Datawarehouse												
Programme & disbursements												
Capex - Design, Build, Test & Deploy NSS incl Datawarehouse												
Provation												
Onboarding DHBs, NCC & Others												
BSP DHB Migration to December 2019												
DHB's rollout												
Total Non Departmental Expenditure												
Annual COTS charges												
Security, Integration & Programme costs												
BSP, Maintenance, Coexistence and Decom												
DHBs Onboarding & Migration from BSP												
Implementing NSS to DHBs												
Quality Assurance												
Total Departmental Expenditure												
Direct NSS Expenditure												
Depreciation												
Capital Charge												
Total Depreciation & Capital Charge												
Total NSS Expenditure												

Appendix 11: Lessons Learned

The NSS programme will design and implement the IT solution to support the NBSP and, subject to business cases, will support future population health and screening initiatives.

The lessons learned and their application to the NSS Programme are described in Table 29. These lessons are also featured in the NSS Assurance Plan.

Table 29: Lessons Learned and Application to the NSS Programme

Category	Lesson (in the context of the NSS Programme)
Governance	<ul style="list-style-type: none"> It was recognised that existing governance structures for the NBSP were not sufficient to support a major technology change programme. Governance structures for the NSS Programme have been defined, and the NBSP will be adjusted to accommodate these new governance structures, where the escalation path and decision-making authorities for these governance structures are defined and will be in place prior to the commencement of the Programme. The SRO for the programme is the Director of Service Commissioning within the Ministry, who has the authority to bring all stakeholders together, both internal and external, to resolve any issues. The Steering Group for the Programme will meet fortnightly, with the opportunity to hold weekly / ad-hoc meetings should the need arise. The Governance Group for the NBSP is supported by an independent advisor. All assurance reports will be provided to Ministry Executives and GCDO.
Programme & Project Planning	<ul style="list-style-type: none"> The project plan for the NSS is identified as a deliverable under the Design Phase contract, and it is the responsibility of the prime vendor to deliver this plan under the governance of the Ministry and support of the Ministry teams. Programme plans for the NBSP will be updated to reflect any change required by the NSS project plan. It is expected this will primarily be in relation to the deployment and change management plan for the rollout of NBSP nationally across all 20 DHBs. Assurance activities are planned towards the end of the NSS Design Phase, allowing the opportunity to address any findings and recommendations prior to the completion of the Phase. Further assurance activities will be completed prior the NSS implementation. The Programme has budgeted for assurance activities to be completed throughout the expected lifetime of the NSS (10 years). GCDO ICT Assurance team will be consulted on all aspects of assurance for the Programme, throughout its delivery lifecycle.
Sourcing Strategy & Procurement	<ul style="list-style-type: none"> The end-to-end procurement process has been managed by the Ministry’s Procurement Team. This included working with the Programme Team and key stakeholders to develop a clearly defined set of requirements as presented in the RFP. These requirements and procurement plan were rated as “Exemplar” by MBIE procurement. Independent legal assurance was obtained to support the procurement process for the NSS. This included assurance across all aspects of the tender submission to market and the subsequent evaluation of tender responses, draft contract, contract negotiations and providing ad hoc commercial advice. The Programme will continue to seek legal advice from the Ministry’s internal legal team throughout the programme lifecycle and independent legal advice as required. The probity report for the procurement process has been made available to NBSP Leadership and the SRO for review as part of the procurement recommendation paper approval process.

Category	Lesson (in the context of the NSS Programme)
	<ul style="list-style-type: none"> The NSS Design Phase contract has defined, at a detailed level, the specific deliverables that are required and the roles of both the vendor and the Ministry in relation to those deliverables. Guidance from Central Agencies and independent legal advice will be sought prior to the finalisation and approval of the Build Phase master services agreement.
Stakeholder Engagement	<ul style="list-style-type: none"> Due to the nature of the Programme, and overarching NBSP, it is critical that the internal and external stakeholder communities are clearly defined with an engagement plan for each stakeholder group clearly defined. This stakeholder map and engagement plan is a deliverable within the NSS Design Phase. The Programme will actively engage with DHBs, laboratories and clinical specialists to ensure that the NSS, and wider NBSP, fully addresses their requirements to ensure the highest quality national bowel screening outcome for New Zealand.
Management of Change	<ul style="list-style-type: none"> The technology change enabled by the NSS is an enabler to the wider change workstream that will ultimately be responsible for delivering bowel screening nationally within New Zealand. The technology change components will be planned and managed within the NSS programme workstream and will support and inform the business change management plan and processes. The NSS design, implementation and deployment plan will be specifically designed to enable rather than hide the business change programme. All aspects of the end-to-end change programme will be covered by the assurance activities for the NSS programme within the overall NBSP.
Risks and Issues	<ul style="list-style-type: none"> The NSS risk register has been created and is now being actively managed. Risks will be reviewed as part of ongoing and targeted assurance activities within the Programme. The assurance activities planned to be completed towards the end of the NSS Design Phase will address all aspects of Programme IQA, Technical Design Assurance, Security Assurance and Privacy Assurance. A quantitative risk assessment has been completed as part of the NSS business case.
Resourcing	<ul style="list-style-type: none"> The prime vendor for the NSS is responsible for the delivery of the NSS programme outcomes. The Ministry has interviewed all senior team members from the vendor prior to contract signing to ensure confidence in the capability and capacity of the team being presented to deliver the solution. Resourcing has been identified as a risk for the programme and will be actively monitored and reported as part of the programme assurance activities.
Business Case	<ul style="list-style-type: none"> The NSS programme is supported by its own business case, which will deliver against objectives identified in the overarching NBSP Programme Business Case. The NSS business case will be informed and supported by a Better Business Case Gateway Review, and a series of IQA activities will be completed prior to the completion of the design phase of the programme, allowing for remedial action to be taken if required and provide an off-ramp opportunity for the programme. The NSS Programme Assurance Plan supports this business case.
Programme and Project Management	<ul style="list-style-type: none"> The NSS programme will deliver the technology solution required by the NBSP, and as such the programme and project plans, schedules and financials will be managed centrally and consistently to ensure consistency and predictability of programme and programme outcomes.
Transition into Service	<ul style="list-style-type: none"> The NBSP is currently rolling out bowel screening to a small number of additional DHBs on the Interim Solution. The NSS programme will replace the Interim Solution in these DHBs and allow the national rollout to complete.

Category	Lesson (in the context of the NSS Programme)
	<ul style="list-style-type: none"> Standard Operating Procedures (SOPS) that define all operational processes and procedures for the NBSP will be updated to support the change introduced through the NSS. The end-to-end support model is a deliverable under the design phase that will clearly identify all roles, processes and procedures required to successfully transition the NSS into a production state and deploy NBSP using it. The identification of changes required to the NBSP Service Delivery Model (removal of manual processes) will also be a deliverable of the NSS Design Phase. This will include consideration for quality and assurance requirements relating to the implementation of the NSS and deployment of the NBSP.
Financial Management	<ul style="list-style-type: none"> The NSS programme will be establishing the first enterprise-level solution within the Ministry hosted in the public cloud, provided and supported on a Software as a Service (SaaS) solution model. It is critical that the financial treatment and management of the service is defined in detail and up front prior to the commencement of the NSS Build Phase in order to avoid issues that may arise in the future from the accountancy treatment decision(s). A detailed financial model has been prepared to support the NSS business case, which includes a high-level implementation plan and roadmap. Funding has been approved to support the Design Phase of the Programme, with a view that during this Phase the NSS business case will be progressed through to approval. Note that the approval of the business case is required to enable the Programme to award the Build Phase Contract and commence the development of the NSS.
Methodology	<ul style="list-style-type: none"> The programme will align to the prime vendors delivery methodology, this methodology is aligned to Prince 2 and PMBOK. This method will be used consistently across all programme workstreams to ensure that the programme is not using multiple, and potentially conflicting, methodologies.
Dependency Management	<ul style="list-style-type: none"> The NSS solution is dependent on a number of key integrations across ministry, clinical and laboratory systems. These dependencies will need to be fully identified, described and reported on both in terms of design and as part of assurance reporting activities. The NBSP is fully dependent on the delivery of the NSS solution in order to successfully achieve the programme outcomes.
Capturing Lessons Learned	<ul style="list-style-type: none"> The NSS programme has captured significant lessons learned from the current rollout of the NBSP to Hutt, Wairarapa and Southern DHBs. These have been captured in detail and will be referenced through the NSS programme design and delivery. The NSS programme will capture lessons learned in relation to the design, implementation and use of cloud-based services, in particular Salesforce, AWS and Mule, Social Licence. These lessons learned will be made available to the Ministry and GCDO for consultation.

Table 30 summarises lessons learned that are specifically relevant to the NSS programme and its outcomes.

Table 30: Lessons Learned Relevant to the NSS Programme and its Outcomes

Category	Lesson Learned
Reuse	<ul style="list-style-type: none"> The NSS must be able to be reused to support multiple screening programmes, subject to future business case/s approval. The Ministry currently runs and operates multiple solutions to support its screening programmes and population health initiatives. Many of these systems are approaching end of life and in some cases can no longer be safely enhanced (operationally or economically) to meet changing screening requirements. The Ministry has made the strategic decision to establish a technology platform that is able to support all population health screening programmes.
Data Management	<ul style="list-style-type: none"> Data Management to support screening initiatives must be supported in the NSS. Screening programmes typically address the whole population of New Zealand, or subsets of that population. The management of a population data set to maintain its quality, completeness and integrity is a challenge can lead to errors across the screening programmes, where the data management for screening typically occurs out of system and is supported through undocumented manual processes.
Central Agencies	<ul style="list-style-type: none"> Ongoing engagement with and advice from Central Agencies to understand changing strategies and priorities for the government is critical to the ongoing success of the Programme. Government priorities as well as technology trends are constantly changing. The Programme and overarching NBSP must maintain continual communication with the Central Agencies that are able to provide guidance and ensure the NBSP and NSS delivery remains on track and is able to escalate issues that may not be able to be addressed by NBSP or the Ministry; e.g. Social Licence.
Quality & Assurance	<ul style="list-style-type: none"> All NBSP workstreams and projects should be supported by an appropriate assurance plan. Due to the scale and nature of the NSS Programme, it will be supported by its own assurance plan, which will inform and support the overarching programme assurance plan for the NBSP. IQA will be performed across all aspects of the Programme and relevant aspects of the NBSP, including capability and management of the vendor prior to implementation.
Supplier Management	<ul style="list-style-type: none"> The NBSP, through Ministry T&DS, will be required to manage NSS suppliers and contracts at an operational level in alignment with the sourcing strategy, including reporting, performance, compliance, and communications. The NBSP will put in place effective management and monitoring processes, to ensure that supplier performance can be measured against a defined set of metrics. The NBSP will engage T&DS to support the identification and monitoring risks related to the use of IT suppliers for the NSS. The MoH Commercial team will be engaged to provide continuous monitoring and reporting of supplier performance to the governance group.

The four critical lessons are: Business Continuity/Disaster Recovery in place; technology environments that support the production solution; ensuring underlying technology is always supported; and having in place suitable and well-functioning governance supported by clearly documented management processes.

Table 31: Key Lessons from the EY Review of the BSP

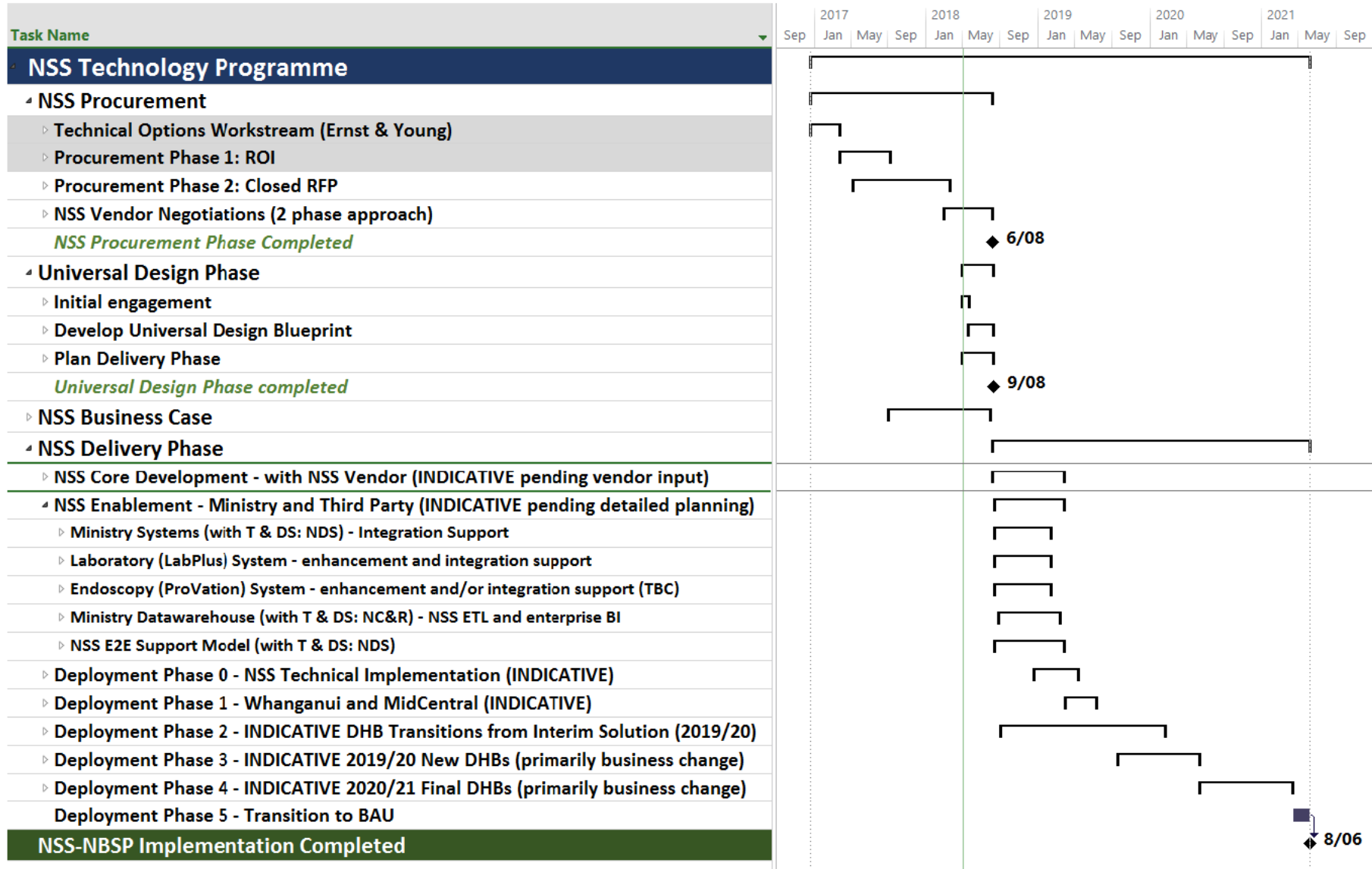
ID	Title	Recommendation	Actions	Status	Est. date for completion
K1	Business Continuity and Disaster Recovery	Establish defined processes for IT disaster recovery for the BSP+ IT solution in time for rollout to DHBs 2 and 3 before 1 July 2017, aligned with the Ministry's overarching enterprise strategy and integrated with business continuity management.	Business Continuity Plan developed to support NBSP business operations supported by the NCC. Increased platform resilience was achieved through the migration of the BSP infrastructure from the MoH Kapiti data centre to the Revera data centre. While there remains a risk of data loss this risk has been significantly reduced, however not eliminated.	Complete	N/A
			BSP Platform Remediation Initiative - will address remaining aspects of the recommendation through the development and testing of a disaster recovery plan for the BSP solution. Project initiation phase is underway.	In Progress	Dec-18
K2	Environment Management	It is recommended that additional environments be established and maintained, under appropriate governance within the Ministry enterprise IT estate. Establishing stable environments for each level of testing will separate development, system, integration and user test environments and enable necessary testing to be performed prior to releases. Supporting the environments with integrated release and change management processes will optimise delivery of the BSP+ IT solution across DHBs.	BSP Platform Remediation - will address all recommendation K2 through the provisioning of an additional BSP environment to support integration testing, making existing testing and training environments fully available to support DHB on boarding, training and problem management. Project initiation phase is underway	In Progress	Dec-18
K3	Platform and Technology Stack	It is recommended the application tier of the Interim solution be ported onto a supported stack (Java SE 7 as a minimum), and the technical architecture is revisited and optimised to meet the functional and non-functional requirements of the bowel screening IT solution.	BSP Platform Remediation - will address all remaining aspects of the recommendation through the development and testing of a disaster recovery plan for the BSP solution.	In Progress	Dec-18
K4	Governance and Risk Processes	It is recommended that steps be taken to establish and formalise a clear, integrated governance across all aspects of the programme, integrated with an established risk management plan that defines policies and procedures in place to handle and continuously monitor project and programme risks. Communication of governance and risk policies across stakeholders from the business, vendor and DHBs through standard, auditable channels will improve awareness across the enterprise.	This recommendation has been addressed through the definition of the Interim Service Delivery Model (SDM) and Service Operating Procedures (SPOs). Operational governance and processes and procedures have been defined by the NCC and service operating procedures have been created to support the on-boarding of the NCC and the shift from a pilot programme operating in Waitemata to a national solution.	Complete	N/A
			It is reconsider that ongoing activity will be required under a BAU context to maintain operational processes and procedures and that these will need to be fully revised to reflect the change introduced through the deployment of the NSS.	Complete	N/A
			A programme level risk register has been created and is under active management. Project Brief 008 is now complete and was led by the T&DS Preventative Health service delivery manager. This project collated all existing programme documentation and related processes and procedures, re-catalogue them and report on any remedial activity that is required to ensure all processes and procedures for the BSP and required programme governance artefacts are available. Action is underway to address the findings from the governance baselining activity	Complete	N/A
K5	Stakeholder Engagement	It is recommended the Ministry places increased focus on setting up well-defined stakeholder management practices. Establishing an effective and timely communication plan will ensure stakeholder transparency throughout the life of the project. Key activities include facilitating a walkthrough of the BSP+ IT solution and manual processes, involving stakeholders in developing a training plan, and providing guidance to support additional stakeholder activities.	The ministry has increased engagement with the sector through the establishment of the NCC and continued NBSP rollout. There has also been briefing sessions, a sector workshop in November 2017 to walkthrough the strategy in relation to the NSS. Training plans and documentation is available and is continuing to be updated and refined. The Ministry will continue to focus on Stakeholder engagement as bowel screening is rolled out nationally and the design development and implementation of the NSS.	Complete	N/A
			It is recognised that ongoing activity will be required under a BAU context, and that increased focus on stakeholder engagement will be required to support the realisation of the NSS outcomes.	In Progress	Jul-18
			The NSS project will be creating a detailed change management plan through the design phase of the project, this change management plan will include all aspects of technology, operations and clinical change for the programme.	In Progress	Jul-18
K6	Knowledge Management	It is recommended that the Ministry takes an active approach to formalise the change management process across internal and external stakeholders and to ensure addressing stakeholder change concerns and needs is treated as a priority. Additionally, change management and release management activities should be coordinated so participating DHBs are continually informed. The Ministry should facilitate a knowledge-sharing culture by using tools to manage knowledge, storing and tracking training material in a central repository and keeping material regularly updated.	The NBSP has implemented an AoG Shared Workspace (https://see.govt.nz/SitePages/LandingPage.aspx) to support knowledge management for the programme which is being used to support DHB rollout and NSS procurement activities. DHB communication and associated knowledge management remains a work in progress as it is something that will need to be continually monitored and managed throughout the lifetime of the NBSP programme.	Complete	N/A
			As the NBSP rolls out nationally the body of knowledge will increase and as such it will become increasingly important that this body of knowledge is maintained and managed.	Complete	N/A
			The two Shares workspaces will be managed and maintained through BAU and Project activities.	Complete	N/A
K7	Operational and Commercial Arrangements	It is recommended that the internal commercial maintenance and support agreements are reviewed and updated before rollout to DHBs 4 and 5 to ensure there is sufficient coverage across all aspects of the IT solution in preparation for rollout to further DHBs.	This recommendation was completed prior to the NCC "go-live". It should be noted, however, that commercial management of the programme, vendors and service providers will be continually managed going forward.	Complete	N/AA5 F11A2 F1 1C8A6 F11A1 F11
			The commercial lead for the NBSP is currently completing analysis across all commercial relationships required for the NBSP to ensure that the all aspects of the NBSP and NSS are supported by appropriate commercial arrangements.	Complete	N/AA5 F11A2 F1 1C8A6 F11A1 F11
			A further review of commercial relationships and contracts will be completed through the NSS project to ensure that all services management and commercial arrangements are fully known will appropriate SLAs and OLAs in place across all involved parties.	Complete	N/AA5 F11A2 F1 1C8A6 F11A1 F11

Appendix 12: NSS Key Roles and Responsibilities

Role	Responsibilities
Programme Senior Responsible Owner (SRO)	<p>The SRO champions and provides support to the Programme as required, to ensure ongoing alignment with organisational priorities and to provide support in approval forums. The SRO is responsible for:</p> <ul style="list-style-type: none"> Overseeing NBSP to ensure that it remains within the approved scope, timescales and budgets and will enable the realisation of the desired benefits. Holding and authorising allocation of the NBSP budget. Leading communications with internal and external stakeholders and ensuring that the Governance groups are kept appropriately informed on progress, risks and issues. Resolution of issues beyond the scope of the Programme Manager.
NBSP Programme Director	<p>The role leads the development, design and implementation of the overarching NBSP. The role is accountable to the Group Manager National Screening Unit and to the Programme SRO. The role has overall responsibility for NBSP and specifically is responsible for:</p> <ul style="list-style-type: none"> Relationship and agreement with providers. Development and implementation of the NBSP plan and business cases. Leadership of stakeholder engagement. Monitoring and reporting overall progress, including timely escalation of risks and issues. Support individual DHBs with the development, design and implementation of the projects.
NBSP Clinical Director	<p>The purpose of this role is to provide clinical advice to inform the business case and implementation of the programme; and support DHBs and providers with the clinical aspects of planning and implementation of the programme.</p>
NBSP Programme Manager	<p>This role is responsible for leading the implementation of the Programme and is accountable to the Programme Director. Key responsibilities include:</p> <ul style="list-style-type: none"> Detailed programme planning for the business case and implementation planning with providers. Detailed monitoring and reporting of progress in all streams of the NBSP, and oversight of all risk and issue identification, escalation and resolution activities for the Programme. Liaison with Tranche Implementation project managers and teams. Support to individual DHBs with the development, design and implementation of the NBSP. Support the Programme leadership, including Project Managers, in the management of Programme streams, dependencies and scheduling.
Manager Technology Initiatives	<ul style="list-style-type: none"> Responsible for technology change programmes within the NSU, including responsibility for the successful development, implementation and deployment of the NSS for the NBSP.
Commercial Manager	<p>Responsible for the development and completion of the NSS procurement process, including the two-stage contract establishment process and associated activities.</p> <ul style="list-style-type: none"> Ongoing role focuses on supporting the management of the new NSS vendor and providing advice and support for the design and development of the End-to-End Support Model and any negotiations required with Sector stakeholders for NSS integrations.

Role	Responsibilities
Senior PM, NSS Core Solution	<p>Responsible for the successful and timely development and implementation of all NSS enablers aligned with the NSS Core delivery process. This includes responsibility for:</p> <ul style="list-style-type: none"> • Design, development, testing and implementation Ministry-internal and Sector-based integrations. • Development of the Support Model for the end-to-end NSS. • Transitioning DHBs from NBSP Interim Solution to the NSS.
Senior PM, NSS Enablers	<p>Responsible for</p> <ul style="list-style-type: none"> • The successful and timely implementation of Ministry and Sector partners' system changes to achieve the required integration with the new NSS. • The management and maintenance of the Interim Solution, including the implementation of any required enhancements and the decommissioning process. • Monitoring and management of the Interim Solution – NSS coexistence model.
Analysis Lead	<p>Responsible for the provision of accurate, comprehensive and timely inputs for the NSS Core and NSS enablement workstreams' deliverables, including:</p> <ul style="list-style-type: none"> • Business requirements development from the NBSP service delivery model. • Technical requirements and technical options analysis supporting the development of critical solution components. • Data analysis for Core NSS development and data migration design. • Service design and options analysis for the development of the NSS Support Model.
Testing Lead	<p>Responsible for the validation, verification and acceptance activities for the Core NSS and the NSS enablers, through the development and execution of Ministry-led testing activities. This will include:</p> <ul style="list-style-type: none"> • Development of the overarching test strategy. • Definition and execution of the system integration testing/end-to-end solution testing activities (Core NSS and third-party integration partners). • Definition and execution of business acceptance testing activities with Ministry and Sector stakeholders. • Management of issue resolution process with project management support. • Development of Test Exit Report and Technical Implementation Recommendation.
Change Integration	<p>Responsible for well-planned and communicated cohesive change implementation for both Core NSS and NSS Enablers, including:</p> <ul style="list-style-type: none"> • Development and execution of the technical implementation plan. • Development of the deployment strategy and detailed deployment plan. • Leadership for the development and execution of the Interim Solution – NSS coexistence approach and supporting activities, particularly the operational monitoring of the coexistence environment.

Appendix 13: NSS Programme Plan



Appendix 14: Glossary

Acronym	Description
BSA	BreastScreen Aotearoa
BSP	Bowel Screening Pilot System (Sometimes used interchangeably with “BSP+”)
BSP+	BSP with critical enhancements including manual processes
CIO	Chief Information Officer
COTS	Commercial Off The Shelf
DE	Departmental Expenditure
DHB	District Health Board
EY	Ernst and Young
FIT	Faecal Immunochemical Test
GCDO	Government Chief Digital Officer
HPI	Health Provider Index
HPV	Human Papilloma Virus
ICT	Information Communication Technology
IQA	Independent Quality Assurance
MBIE	Ministry of Business, Innovation and Employment
NBSP	National Bowel Screening Programme
NCC	National Coordination Centre
NCSP	National Cervical Screening Programme
NDE	Non Departmental Expenditure
NDS	National Digital Services
NES	National Enrolment Service
NHI	National Health Index
NSS	National Screening Solution (previously: National IT Solution for NBSP)
NSU	National Screening Unit
OECD	Organisation for Economic Co-Operation and Development
RFP	Request For Proposal
ROI	Registration of Interest
SaaS	Software as a Service
SIGG	Screening Information Governance Group
SLA	Service Level Agreement
SME	Subject Matter Experts
SRO	Senior Responsible Owner
T&DS	Technology and Digital Services
TNM	TNM Classification of Malignant Tumours
UNHS	Universal Newborn Hearing Screening