Land Information New Zealand
Toitū te whenua

Advanced Survey and Title Services (ASaTS)

Detailed Business Case

Land Information New Zealand

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Contents

Table of figures

Table of tables

Glossary of terms

The table below outlines the terms used in this business case.

Term	Meaning
Advanced Survey and Title Services (ASaTS)	The name of the project to future proof the delivery of survey and title services.
Base case	The minimum essential change required.
Benefit cost ratio (BCR)	The present value of benefits over the forecast period divided by the present value of costs.
Integrated Property Services (formerly known as Better Property Services) (IPS)	A joint agency work programme that aims to aims to future proof building and property information by improving its quality and quantity, and assisting agencies to make it more open and accessible.
Business to business (B2B)	An add-on component for an enterprise service bus which enables secure and reliable messaging using a pre-defined standard for exchanging information.
Cadastre	The official record that enables the boundaries, location and other details of land properties to be reliably located.
Cadastral survey dataset (CSD)	Datasets certified by licensed cadastral surveyors and lodged with LINZ for approval as to survey.
Competitive dialogue	A type of competitive procurement process used for novel or unique and high-value procurements, usually when there isn't a known solution in the market. The agency openly advertises an invitation to participate in the competitive dialogue process and then shortlists the suppliers who will develop either a single solution or a different solution in individual dialogue sessions with the agency.
Conveyancer	A qualified person who carries out the legal work associated with property transactions.
Crown-owned land	Describes land held by government agencies and Crown entities. In this business case, the use of the term is deliberately blind to the many and complex differences in status, nomenclature, and legal rules that apply to different types of Crown-owned land.
Customer	A person that consumes services from a government agency. In LINZ's case, survey and title customers often refers to land professionals (often cadastral surveyors and conveyancers) but the term can also refer to a broader set of customers, including members of the general public, territorial authorities, and data consumers.
Data	The facts used as a basis for decisions, reasoning, discussion or calculation.
Environment	The conditions in which services are delivered, including the legislative and policy settings, operational processes and supporting technology.
Enterprise service bus (ESB)	A technology architecture that manages a set of rules and principles for integrating numerous applications and sharing information together over a bus-like interface. The core concept of the ESB architecture is that you integrate different applications by putting a communications bus between them and then enable each application to talk to the bus. This decouples systems from each other, allowing them to communicate without dependency on, or knowledge of, other systems on the bus.
Expression of interest (EOI)	A request to potential suppliers to demonstrate they are interested in and capable of delivering the services required by the ASaTS project.

Term	Meaning
Forecast period	The period of analysis for the business case. For the purposes of this business case, 11.5 years.
Force majeure	An uncontrollable event that legally excuses a party from fulfilling contract conditions.
Fundamental datasets	The 10 dataset themes in New Zealand identified as fundamental to the establishment of a national Spatial Data Infrastructure. These are: Positioning, Cadastre and Property, Address, Transport Networks, Geographic Names, Elevation and Depth, Imagery, Administrative Boundaries, Water, and Land Use and Cover.
Geographic information system (GIS)	A system designed to capture, store, manipulate, analyse, manage, and present geographic data.
Information	Collections of data which have been processed in such a way that the data is now meaningful, valuable, useful and relevant. The resulting output is meant to be used for communication with, or between, people.
Interface contracts	A commitment to providing a data or system interface that adheres to an agreed set of requirements.
Interoperability	The ability for systems and organisations to 'talk to each other' in an automated way, enabling data and information to be easily shared. In this business case, the term refers to both data and systems interoperability.
Landonline	The authoritative database of the titles register and cadastre. It enables land professionals to search and to lodge title dealings and survey data digitally.
Land Information New Zealand (LINZ)	A New Zealand government department responsible for land titles, geodetic and cadastral survey systems, topographic information, hydrographic information, managing Crown property and a variety of other land-related functions.
LINZ Data Service (LDS)	A service which provides free, online access to 40+ LINZ datasets.
Location based information	A plain language term to describe geospatial information related to a specific location, being the location and name of features on, above, or beneath the surface of the earth.
Māori Land Court	A specialist court with jurisdiction to determine matters concerning the ownership and governance of Māori land under the Te Ture Whenua Māori Act 1993.
Meshblock	A population-based land area that represents the smallest area from which statistical information is collected. Meshblocks are also used to determine electoral boundaries.
New Zealand Government open access and licensing (NZGOAL) framework	Government guidance for agencies to follow when releasing material for reuse by others. Aims to give New Zealanders greater access to government material.
Node	References and contains information that relates to the spatial position of a point.
Non-repudiation	The inability of a person or entity to legally repudiate (deny) its participation with an action or a piece of information.
Parcel	An area or space of land identified in the cadastre and associated with a property right.
Project period	The 4.5 year implementation period for ASaTS, which includes the decommissioning of Landonline.

Term	Meaning
Register of titles	A record of the legal owners of land and all dealings with the land, like transfers of ownership and mortgages, leases registered under the land transfer tenure system in terms of the Land Transfer Act 1952.
Request for proposal (RFP)	A formal request from LINZ asking suppliers to propose how they can deliver the needs of the ASaTS project.
Service requirements	Better Business Cases defines service requirements as the services required to satisfy the identified business needs and gaps.
Spatial Data Infrastructure (SDI)	A network of components that allows people to find, share, and use spatial data. Key Spatial Data Infrastructure components have been identified as: policy, access networks, standards, data, and people.
Stakeholders	People, groups, or organisations that have a vested interest in LINZ because they can affect, or be affected by, LINZ's actions.
Torrens property system	A system where all interests affecting a piece of land are recorded on a certificate of title. A copy of the certificate of title is held in a Register open to the public and a second copy of which is held by the landowner. Ownership is guaranteed by the Crown subject to certain limited exceptions.
Users	Direct users of either the current Landonline or next generation Landonline system. This category of people consists of cadastral surveyors, conveyancers, territorial authorities and others who have direct access to the system.
Territorial authorities	A city council or a district council named in Part 2 of Schedule 2 of the Local Government Act 2002.
Workspace	The application through which LINZ customers access Landonline to prepare and submit survey and title transactions.

1 Executive summary

1.1.1 An investment in Advanced Survey and Title Services (ASaTS)

This Detailed Business Case (DBC) proposes an investment in the future of survey and title services provided by Land Information New Zealand (LINZ).

Survey and title services underpin New Zealand's property market and the economy by facilitating the sale, purchase, and development of property.[1] As well as providing certainty for home owners and investors, the authoritative property information gathered via these services and freely redistributed by LINZ is fundamental to planning and decision making by central and local governments. This information is also used by businesses and the public in a host of innovative ways to inform daily decisions that require accurate location based information.

The Landonline technology platform used by surveyors, conveyancers, and others to complete property transactions has ageing (1990s) componentry based on a single 'black box' monolithic design. The inherent inflexibility of the present technology limits LINZ's ability to adapt to changing customer needs, to deliver on Government and Ministerial priorities and to efficiently distribute property information across organisational boundaries and systems. Furthermore, the support and expertise required to maintain the present technology is declining, an issue that will become critical in the next few years.

The proposed investment in ASaTS will therefore modernise and secure the future of the survey and title system. It will introduce a flexible, readily adaptable technology platform that delivers greatly enhanced services to LINZ customers and allows LINZ to seamlessly deliver property services and information across organisational boundaries and systems. The proposition is conservatively estimated to provide quantifiable benefits of between $[redacted] and $[redacted]. Figure 1 summarises the ASaTS investment proposition.

Figure 1: ASaTS investment proposition

Delivers improvements while mitigating risk to economy	Will deliver improvements to the quality and efficiency of current survey and title services and will deliver other new and innovative services. This will be done whilst mitigating the risks associated with the continued use of a platform that has decreasing market support and is becoming increasingly difficult to maintain.
Supports Government and Ministerial priorities	Will support a number of Government and Ministerial priorities, including Better Public Services and the ICT Strategy and Action Plan, while being a key enabler of Better Property Services, the Māori Land Service and LINZ's 10 year vision.
Provides quantifiable benefits of $[redacted]	Is expected to deliver between $[redacted] and $[redacted] (present value) in quantified economic benefits, together with a range of broader qualitative benefits.
Assures delivery by team with proven track record	Will be delivered by an organisation with experience in the successful delivery of business critical IT enabled projects (with specialist external support as required), for both the approaches to procurement and implementation. This support will mitigate the risks associated with transformational IT projects.

[1] Survey and title activity contributes $94 million per annum to GDP, $48 million of which is generated by the productivity gains from the current Landonline service introduced in the early 2000s (BERL economics, 2014, p. 3).

1.1.2 Why act now?

In facilitating the sale, purchase, and development of property, the survey and title service provided by LINZ is critical to the New Zealand economy – New Zealand's residential property market alone was valued at $791 billion in 2015[2] A failure to proactively invest in the quality and efficiency of the survey and title service will pose a significant risk to the continuity of essential service provision from 2020 and – at its most extreme – will compromise the ability of New Zealanders to undertake property transactions electronically.

LINZ has determined that now is the optimal time to plan for investment in this critical system (targeting 2020 for full 'go-live' for ASaTS). While the current platform is performing satisfactorily, failure to act now would delay any potential replacement of Landonline until after 2023[3] Good practice is to proactively plan for change rather than to be driven by reactive problems. By the time ASaTS is implemented, PowerBuilder (the programme code Landonline is built in) is expected to be significantly more difficult to update and LINZ's customers and stakeholders will be demanding better services, services which will be difficult for LINZ to deliver using Landonline. The risk to the system is combined with an aging Landonline application that is functioning in an increasingly sophisticated and versatile technology environment. As technology progresses, the level of service offered by LINZ to its customers will decrease and it will become an increasing burden and frustration for our customers to engage with our system. Also, Gartner Inc has advised organisations to migrate away from PowerBuilder by 2018.[4]

Acting now also ensures that LINZ can leverage the institutional knowledge held by key staff members who were involved in the delivery of the Landonline projects. The longer the implementation of ASaTS takes, the more likely first hand knowledge of Landonline will not be available.

1.1.3 The options reviewed

As part of developing the DBC, LINZ reviewed three options in detail. Figure 2 shows the costs[5] and benefits of each option and compares them to the cost of implementing Landonline.

[2] Reserve Bank of New Zealand (9 July 2015). Retrieved from http://www.rbnz.govt.nz. This value includes all private sector residential dwellings, flats, and apartments, 'lifestyle blocks' (with a dwelling), detached houses converted to flats and 'home and income' properties.

[3] This is based on 2 years for the better business case process, 1 year procurement and a 4.5 year project implementation.

[4] M. Driver, J. Duggan, *IT Market Clock for Programming Languages*, Gartner Inc, 2013

[5] As a quantitative risk assessment was only completed on the costs of the preferred investment option, all costs included are exclusive of a QRA derived contingency. This provides an appropriate base for cost comparison between the three options.

Figure 2: Options reviewed for the DBC

Note that costs for the base case, alternative option 6A and the preferred investment option are the nominal costs exclusive of a contingency (provided by a QRA). This is to enable the different options to be compared. The funding sought for the preferred investment option, which includes contingency, is summarised in Section 1.1.6. The benefits are in present value (discounted) dollar terms.

LINZ determined that the preferred investment option (option 6 from the Indicative Business Case (IBC)) will remain the preferred investment option for the DBC. It maintains the integrity of the property rights system, provides significant improvements to the services LINZ offers to its customers and keeps New Zealand a world leader for ease of transacting property rights. This option also enables LINZ to deliver on a number of Ministerial and Government priorities.

1.1.4 Delivering on Government, Ministerial, and LINZ-specific strategic priorities

The preferred investment option will provide the foundations for linking location information held by LINZ and other agencies – building footprints, addresses, land parcels, rating units, titles, and ownership data. A data linking capability such as that which would be provided by ASaTS is critical to the delivery of the Integrated Property Services (IPS) data integration objectives. With ASaTS, the amount and quality of the property data available to support property rights transactions will increase, and the information will be easier to search for and use.

It was estimated that, after the 2013 Cook Strait earthquakes, linked property data could have delivered savings of $2 million[6] to agencies involved in the response effort by resolving

[6] Property Data Management Framework project, Canterbury SDI programme, LINZ 2014

property identification issues. More broadly, the preferred investment option strongly aligns with Better Public Services Result Areas 9 and 10, and the Government Communications Information Office Strategy and ICT Action Plan – which emphasise the role of technology in building a more competitive and productive economy.

It is expected that ASaTS will make it easier for LINZ to deliver the proposed Māori Land Service, and it is central to LINZ's 10 year vision of delivering a world class location information system. Providing public access to property information through a web-based search service and introducing a Crown-owned land register, will support the aims of the Declaration on Open and Transparent Government. Figure 3 shows the strategic alignment of ASaTS to Government and Ministerial priorities.

Figure 3: The strategic context of preferred investment option

1.1.5 The preferred investment option provides significant improvements to services

The preferred investment is based on meeting three key drivers:

- *Business driver*: The inability to easily adapt Landonline to meet business needs, and concerns about the potential risks of decreasing market support for key Landonline components.

- *Customer driver*: Customer frustration with the current service offering and the subsequent impact it has on their efficiency.

- *Information driver*: Property information is not easily integrated across organisations and the subsequent impact this has on the quality of decisions made about land and location.

In delivering a solution that meets the intent of these drivers, there are significant quantitative and qualitative economic benefits.

SIGNIFICANT QUALITATIVE BENEFITS...

The investment will ensure LINZ can meet increasing customer expectations, improve the quality of information collected (which underpins decisions made by central and local government, and the private sector) and ensure the integrity of the property rights system is maintained. ASaTS will maintain New Zealand's position as a leader in the property rights sector.

Business driver

- Moving Landonline to a modular, modern and well-supported technology platform.

Customer driver

- Enabling LINZ to respond more quickly to changing customer and business needs (e.g. making the technology that delivers survey and title services compatible with modern office systems and mobile devices).
- Making it easier for customers to interact with LINZ in a digital environment, reducing customer frustration.

Information driver

- Supporting the delivery of the Māori Land Service which will enable the economic potential of Māori land to be unlocked.
- Supporting better investment decisions about Crown-owned land, by providing higher quality information.
- Enabling key LINZ, MBIE and local government property datasets to be linked, enabling accurate property identification (e.g. for insurance and disaster recovery efficiency).
- Enhancing the 3D capability LINZ has through exploring the capture and dissemination of 3D cadastral property rights data. This will lead to significant innovation and better quality decision making around built up urban environments and major public works activity.

Two case studies that illustrate the benefits are included in Section 5.4.5. These are summarised below:

- ASaTS integrating with surveying software packages to seamlessly organise the lodgement of survey plans, and the territorial authority certification and issue of land titles for new subdivisions.
- ASaTS will be used to perform title and property searches, manage the change of ownership, automatically notify territorial authorities and mortgage providers, and gain approval for the sale from the Māori Land Court (if applicable) for the sale of residential properties.

...AND OVER $[redacted] IN QUANTIFIABLE BENEFITS...

The preferred investment option is expected to deliver between $[redacted] and $[redacted] (present value) in additional quantified benefits, when compared to the base

case (the 'do minimum' option).[7] The majority of the quantified economic benefits relate to direct time savings.[8] Over 90 percent of these benefits accrue to the users of survey and title services.

The quantifiable benefits the preferred investment option will deliver are:

- Reducing the time users spend interacting with LINZ per transaction, by removing the duplication of effort between users' software and Landonline (expected to be approximately 7–8 minutes per average title transaction and over 1 hour per average survey transaction).
- Reducing survey requisition (error) rates, resulting in less re-work, decreased costs and quicker turnaround times for property developers.
- Providing notice of sale information directly to territorial authorities – reducing re-work and the time conveyancers and territorial authorities spend manually providing this information, and increasing the currency and accuracy of information to territorial authorities.
- Providing mortgage registration information directly to lending institutions – removing the need for conveyancers to manually provide this information and for lending institutions to manually update records.
- Reducing time spent interacting with LINZ, by introducing a search service available via the web.

The quantitative and qualitative benefits outlined as part of the preferred investment option are in addition to those benefits that were realised from earlier investments in Landonline.

The preferred investment option has a benefit cost ratio[9] (relative to the do minimum option) of between [redacted] and [redacted].[10]

1.1.6 The estimated cost of the preferred investment option

Project costs have been derived as a result of a detailed assessment and forecasting process. Project costs were determined through the development of a transition plan with five project phases, each of which was broken down into several stages of the software/solution development lifecycle: analyse, design, build, test and implement. This transition plan was used to inform the resources required, including personnel (LINZ and contractor) and non-personnel costs. These costs are comparable to those received from the market during the Request for Information (RFI) process.

LINZ has undertaken a quantitative risk assessment (QRA) process to develop a picture of the potential impact risk could have on the estimated costs of the ASaTS project.

- The 50th percentile of the QRA has been adopted as the expected project cost for the preferred investment option. This cost level reflects the proposed funding delegation the LINZ Chief Executive will be able to authorise expenditure up to.
- The 85th percentile of the QRA has been used to estimate the level of contingency required in the event a significant number of the risks identified in the QRA occur. This reflects the additional funding contingency the Minister of Finance and the Minister for Land Information will be able to authorise expenditure up to.

Table 1 summarises the risk adjusted project period costs determined as a result of the QRA process.

[7] The base case mitigates technology risks and issues, but does not deliver any quantifiable benefits.

[8] Wider economic benefits were unable to be quantified.

[9] Which assesses the marginal economic benefits for the investment relative to the costs.

[10] The benefit cost ratio was calculated against the base case as LINZ needs to upgrade the PowerBuilder component of Landonline and is therefore committed to incurring the cost associated with the base case. The range of [redacted] to [redacted] was determined using the expected/target cost of the preferred investment option (at the 50th percentile as per the quantitative risk assessment).

Table 1: ASaTS project period costs

Expenditure category ($[redacted])	Modelled cost	Cost at the QRA 50th percentile	Cost at the QRA 85th percentile
Project period costs *			
Capital expenditure	[redacted]		
Operating expenditure			
Total project period costs			

* Excluding capital charge and depreciation charges.

The preferred investment option has an estimated project period cost of $[redacted], including capital expenditure of $[redacted]. In addition to the $[redacted] project period costs, there will be an ASaTS associated capital charge and depreciation expense over the 4.5 year project period.

1.1.7 Funding the preferred investment option

FUNDING REQUIREMENTS

ASaTS requires funding up to the 85th percentile of the QRA costs, to ensure an appropriate level of contingency is included.

LINZ has developed three funding options for financing ASaTS' capital costs. In all of these options it is proposed that operating costs (and associated depreciation and capital charges) will be funded through third party (fee) revenue, with the exception of the expenditure relating to the Crown-owned land register ($[redacted] from FY [redacted]), which will be funded by way of a Crown operating appropriation.

Survey and title user fees have not increased since 2011. All three funding options require a fee increase. There is not a significant difference between the options as to the size of the fee increase, but there is a significant variation in the dates the fee increases will be introduced.

FUNDING OPTIONS

LINZ considered funding options that struck a balance between cost recovery principles, maintaining equity between current and future users, and the fiscal impact on the Crown. LINZ has identified three options that best meet the needs of the Crown and customers.

Option 1: Crown capital injection

The Crown provides a capital injection of up to $[redacted], with accumulated depreciation funds ($[redacted]) held by LINZ also being used to fund capital costs. This injection will not be repaid, and LINZ will accumulate depreciation related revenues from survey and title fee payers in reserves to fund future asset replacement and enhancements.

Option 2: Crown capital loan repaid with ASaTS accumulated depreciation

The Crown provides a repayable capital loan of up to $[redacted], which will be repaid. It is proposed LINZ will repay the capital loan with ASaTS depreciation flows charged to survey and title fee payers throughout the life of the investment. To be fiscally neutral to the Crown, this loan will need to be repaid by the end of FY [redacted]. A further capital injection of $[redacted] relating to the Crown-owned land register will be required, which will not be repaid.

Option 3: Third party funded, supplemented with repayable Crown capital loan

Under this funding option, ASaTS' capital cost will be funded through $[redacted] depreciation reserves and available third party memorandum account reserves and surpluses, supplemented with a repayable Crown capital loan for any funding shortfall during the project period.

The Crown capital loan will be repaid in full through charges to third party users by the end of FY 2026. The amount of capital loan required is contingent on when a fee increase is

introduced – a FY [redacted] fee increase will require a loan of $[redacted] and a FY [redacted] fee increase will require a loan of $[redacted]. In addition, LINZ will seek a Crown capital injection of a further $[redacted] to fund the Crown-owned land register, which will not be repaid.

Table 2 below compares the funding options.

Table 2: Comparison of ASaTS funding options

	Option 1: Crown capital injection (not repaid)	Option 2: Crown capital loan repaid with ASaTS depreciation reserves	Option 3: Memorandum surpluses and reserves with repayable Crown capital loan for funding shortfall
Crown capital injection amount	$[redacted]	$[redacted] (for the Crown-owned land register)	$[redacted] (for the Crown-owned land register)
Crown capital loan amount	[redacted]	$[redacted]	• $[redacted] if fees are increased in FY [redacted] • $[redacted] if fees are increased in FY [redacted]
Impact on the Crown	The $[redacted] capital injection will not be repaid so it will have a fiscal impact on the Crown balance sheet.	The capital loan will be repaid in full by the end of FY 2026. Repayment within the 10 year timeframe makes this fiscally neutral to the Crown. Depreciation reserves will not be available for the next investment cycle – requiring a commitment from the Crown for future replacements/ enhancements.	The capital loan will be repaid in full by the end of FY 2026. Repayment within the 10 year timeframe makes this fiscally neutral to the Crown. This option will ensure depreciation reserves are accumulated for the next investment cycle.
Impact on third party users	Fee increase of [redacted]%–[redacted]% in FY [redacted]. Third party users will be charged up to $[redacted] in capital charges over the life of the asset. This is significantly larger than under the other funding options.	Fee increase of [redacted]%–[redacted]% in FY [redacted] The capital charge cost to third parties will reduce as the loan repayments are made – which results in a reduced capital charge expense of $[redacted].	Fee increase of [redacted]%–[redacted]% if fees increase in FY [redacted], and a whole-of-life capital charge cost of up to $[redacted]. Fee increase of [redacted]%–[redacted]% if fees are increased in FY [redacted], and a whole-of-life capital charge expense of $[redacted]
Policy implications	This funding approach is consistent with cost recovery principles and guidance on the appropriate use of memorandum accounts. However, it has the largest fiscal impact on the Crown.	This option does not align with Cabinet expectations that departments will accumulate depreciation on their balance sheet to fund future asset replacement.	Fee payers will pay for two investment cycles over the life of the ASaTS asset – once for the ASaTS capital build and again for the accumulated depreciation for future asset replacement.

LINZ'S TRACK RECORD IN DELIVERING LARGE AND COMPLEX PROJECTS

The introduction of Landonline, the digitisation of land records, and a shift from a paper-based system to compulsory electronic lodgement of property transactions resulted in significant time and cost savings for Landonline users and the government. After implementing Landonline, LINZ reduced the cost of operating the survey and title service, substantially reducing its:

- expenditure from $67 million in 2003/2004 to $48 million in 2013/2014
- offices from 12 to three

- survey and title processing staff from 500 to fewer than 200.[11]

The successful delivery of the Landonline projects has given LINZ experience in the delivery of business critical technology. The implementation of Landonline is considered one of the public sector's most successful ICT-enabled change projects.[12] Importantly, a number of the team responsible for the delivery of the Landonline project remain employees of LINZ and will play important roles in delivering ASaTS. This expertise will be coupled with professional advisory services and the vendor (the contracted system integrator) to ensure the successful delivery of ASaTS. LINZ has also reviewed the lessons learnt from the delivery of the previous Landonline projects and incorporated these lessons into the design for ASaTS.

LINZ will dedicate significant resource to ASaTS – estimated to peak at 40 staff and contracted personnel in FY 2020. A resource plan has been developed that identifies the LINZ roles and their expected utilisation by phase. This plan also ensures that LINZ's frontline survey and title service and other LINZ functions continue without disruption. The resource plan includes both dedicated project personnel and part-time subject matter experts.

HIGH LEVEL OF CONFIDENCE FROM EXTERNAL ASSURANCE AND MONITORING

The Gateway Review 2 provided a high level of confidence that the project will be delivered. It identified the project is adequately governed and there is a high level of competence within the wider project team. The review also concluded there is strong and enthusiastic stakeholder support for the project and it is universally regarded as on track.

The independent review by IQANZ of the DBC concluded that: "the three drivers … present a reasonable case for investing in a second generation solution that will replace Landonline, and address current and future customer and business needs. The DBC clearly describes how the preferred option presents a solution that contributes to the wider Government and Ministerial priorities."[13] The review made 11 high priority recommendations and all of these have been addressed. Overall the findings were positive with four review components rated "mostly effective controls and three partially effective controls in place". It was clear the preferred investment option presented a best fit solution compared to the other options considered.

PRIMARY FEATURES OF PROCUREMENT AND DELIVERY APPROACH

The approach to procurement and delivery of the ASaTS project has been designed to provide clarity on the costs associated with the investment, to develop and support a shared and common understanding of investment objectives so that both parties are working towards the same outcomes, and to assist risk mitigation associated with transformational technology enabled projects of this nature. The procurement and delivery approaches have two primary factors.

A multi-stage procurement approach

LINZ will undertake a multi-stage competitive dialogue approach to the procurement of the preferred solution. A multi-stage competitive dialogue procurement approach is preferred because it will enable LINZ to learn about potential private sector provider(s) and their solution through a pre-qualification period, before entering into more detailed discussions with a small number of shortlisted respondents. This multi-stage approach is designed to maintain competitive tension for the duration of the process and to promote innovative solutions.

[11] It should be noted that volumes of survey and title transactions peaked in 2003/2004 and then sharply decreased in 2007/2008 during the global financial crisis. Since then volumes have steadily increased but are still approximately 30% lower than they were in 2003/2004.

[12] *Government ICT Strategy and Action Plan to 2017,* Department of Internal Affairs, Wellington, 2013

[13] *Land Information New Zealand Advanced Survey and Title Services Programme Independent Quality Assurance Review Business Case*, Independent Quality Assurance New Zealand, Wellington, 2014

A 'provide and maintain' delivery model

The preferred delivery model involves LINZ contracting a private sector provider(s) to be responsible for the design, build, support, maintenance, and enhancement of the preferred solution, with LINZ retaining responsibility for frontline service delivery and for providing a base level of support for the solution. This delivery model – which is consistent with the status quo – is preferred because it helps to optimise whole-of-life costs and facilitates a collaborative working relationship between LINZ and the preferred vendor, while transferring design, build, and maintenance risks to the vendor.

PRIMARY FEATURES OF APPROACH TO RISK MANAGEMENT

In recognition of the risks associated with ICT enabled change projects, LINZ will adopt a multi-faceted approach to the identification and management of the risks associated with ASaTS. The risk management approach has three primary features.

A phased approach to implementation

LINZ proposes a phased approach to implementing ASaTS, based on business requirements and the future state architecture. This approach is designed to mitigate the risks associated with a 'big bang' approach to deployment. Further work to refine the phases and how 'off-ramps' will be incorporated into the detailed design process will occur as part of the procurement phase.

A focus on change management

Approximately [redacted] percent of the total project period costs have been budgeted for business and change management activities, and a further [redacted] percent for the management and governance of ASaTS. LINZ has appointed a Change Director who will be responsible for ensuring that change management is comprehensive and effective.

The engagement of professional advisory services

LINZ intends to engage professional advisory services to assist with the procurement of a solution and the business and customer change aspects associated with ASaTS. These services have been, or will be, obtained for both the procurement and implementation phases and include procurement planning, developing the Implementation Business Case, vendor short listing and selection, commercial negotiations, vendor management, and contracting programme and project management professionals. This support will enable LINZ to determine the best solution to deliver on its outcomes and will add rigour to the implementation process by managing the integration and change across LINZ's processes, structure, strategy and people, and by helping to effectively manage the customer change process.

1.1.8 Next steps

Subject to the Cabinet's approval, the next step is to issue an expression of interest to the market, which is planned for early 2016. This will be followed by a 12 month procurement process, reflecting the complexity of ASaTS and the planned competitive dialogue approach. The time required for the successful delivery of ASaTS will be in addition to procurement and it is expected to take 4.5 years to fully implement and transition to business as usual.

An Implementation Business Case will be prepared once the Request for Proposal (RFP) responses are received. The LINZ Chief Executive will approve this Implementation Business Case (subject to it being within agreed financial tolerance levels) before a preferred supplier is selected.

2 Business case overview

2.1 Survey and title services

2.1.1 The survey and title service underpins the New Zealand property market, which is critical to the economy

New Zealand has a Torrens based system for land title registration. This system guarantees title to land and results in savings to the economy of nearly $2.3 billion per annum (when compared to a modern deeds system).[14] The survey and title system forms the basis of New Zealand's land-based property rights market and facilitates the sale, purchase, and development of property. As property is a major source of wealth and wealth generation in New Zealand, survey and title services are critical to the ongoing functioning of the economy.

The current Landonline platform enables registered users to access the electronic survey system and land titles registry via the internet. LINZ is required to operate the delivery of the survey and title service on a full cost-recovery basis. Costs (most of which are fixed in the short term) are recovered from fees and charges paid by users who disburse their charges to clients (property purchasers, owners, and developers). LINZ's costs represent a small percentage of the total costs of purchasing a property or developing a parcel of land – fees are currently $80 for an electronic title transaction and approximately $1,000 to lodge a survey for a three lot subdivision with no easements.

The majority of the users of the service are cadastral surveyors and conveyancers, who search and lodge survey data and title dealings, such as survey plans, transfers of ownership, and discharges of mortgage on behalf of their clients. Other users include real estate agents, banks, and valuers, who use Landonline to conduct searches of land information, as well as territorial authorities who use Landonline to certify that survey plans are consistent with resource consents.

2.1.2 New Zealand's property rights system compares well internationally

The property rights system in New Zealand is extremely efficient, being relatively quick and inexpensive. Banks readily accept title to land as security for a mortgage which can be used to leverage other ventures and economic activity. Confidence in the certainty of property rights in New Zealand also attracts investment. The maintenance and enhancement of survey and title services contributes to the government's priority to grow the economy.

2.1.3 New Zealand was the first jurisdiction in the world to deliver survey and title services electronically

New Zealand digitised its core survey and title records between 1997 and 2002, and fully introduced Landonline in 2003 to enable the electronic registration of survey and title transactions. This made New Zealand the first jurisdiction in the world to have a national, integrated electronic titles register and cadastre, enabling people to search property ownership and boundary records online.

The implementation of the electronic registration of survey and title transactions enabled LINZ to reduce the cost of operating the survey and title service substantially, from $67 million in 2003/2004 to $48 million in 2013/2014. Since 1998, LINZ has reduced the number of offices it operates from 12 to three, and reduced survey and title processing staff from 500 to fewer

[14] Berl economics (2014) *Valuing New Zealand's Survey and Title System*. www.berl.co.nz

than 200.[15] These reductions were made alongside a significant increase in the quality of services LINZ delivered to its survey and title customers.

2.2 Background to this business case

The ASaTS project was established in 2012. LINZ recognised it was facing a range of customer, business, and wider government drivers that meant it needed to consider how it delivers survey and title services in the future.

The IBC for ASaTS was approved by Cabinet in November 2013. The Cabinet Economic Growth and Infrastructure (EGI) Committee noted that LINZ needed to begin work on a second generation of investment to improve the quality and range of survey and title services LINZ provides to its customers, to upgrade the technology base to ensure system flexibility, and to enable integration with other central and local government property functions (EGI Min (13) 27/14).

EGI noted that the preferred investment option will:

- modernise the existing services to meet customer needs and expectations (e.g. enable access to Landonline via mobile devices)
- provide for a better interface between users' systems and Landonline, reducing the time customers spend interacting with LINZ
- address outdated technology issues, while using some components of the existing Landonline application
- provide a more complete record of all land in New Zealand, through developing a register of Crown-owned land
- introduce capability to allow property boundaries, in the future, to be defined and shown in three dimensions (3D)
- enable full system interoperability (to enable LINZ to contribute to a seamless property and building sector service).

EGI directed LINZ to develop a DBC for ASaTS based on the preferred investment option (EGI Min (13) 27/14).

Over the past 18 months LINZ has further explored the preferred option from the IBC. As part of the DBC stage, LINZ has revisited the case for change (including surveying Landonline users about their needs), reviewed a number of alternative investment options, and developed future state business requirements, an architecture vision, and a business capabilities blueprint. LINZ has put a RFI out to the market to get an indicative view of the solutions and associated costs of the preferred option. LINZ has also considered the resources, funding, and procurement processes required to deliver on ASaTS, Government and Ministerial priorities and seamless service delivery to its customers.

On 1 April 2015, EGI considered and deferred consideration of the ASaTS DBC. Consideration of the DBC was deferred and the Minister for Land Information was invited to provide further advice on the implications of the ASaTS proposal in relation to Better Property Services (now known as Integrated Property Services), other land-based data information systems and e-govt objectives.

[15] It should be noted that volumes of survey and title transactions peaked in 2003/2004 and then sharply decreased in 2007/2008 during the global financial crisis. Since then volumes have steadily increased but are still approximately 30% lower than they were in 2003/2004.

2.3 Mapping the business case to Treasury guidelines

LINZ has developed this DBC in compliance with the Treasury's *Better Business Cases: Guide to Developing the Detailed Business Case*.

Table 3 shows how the structure of this business case maps to the Treasury guidelines. Actions 1 to 8 apply to the development of indicative business cases, so they are not relevant for the DBC and therefore not included in Table 3.

Table 3: Mapping of business case sections

Treasury action	Business case section
Action 9: Revisit the Indicative Business Case and confirm the shortlist	Section 3 Strategic case, and Section 4 The investment proposal
Action 10: Economic Assessment of the Shortlisted Options	Section 5 Economic costs and benefits of the proposed investment
Action 11: Non-monetary Costs and Benefits	Section 5.4 Economic benefits
Action 12: Risk and Uncertainty	Section 5.3 Quantitative risk assessment
Action 13: The Proposed Option and Sensitivity Analysis	Section 4 The investment proposal
Action 14: The Procurement Strategy	Section 7.3 Market engagement, and Section 7.4 Procurement strategy
Action 15: Specify Requirements	Section 7.4 Procurement strategy
Action 16: Risk Allocation	Section 7.6 Risk sharing
Action 17: Payment Mechanisms	Section 7.7 Payment mechanism
Action 18: Contractual and Other Issues	Section 7.4 Procurement strategy
Action 19: The Financial Costing Model	Section 5.2 The cost of ASaTS
Action 20: Project Management and Planning	Section 8.2 Project management strategy
Action 21: Change Management Planning	Section 8.4 Business change
Action 22: Benefits Management Planning	Section 8.8 Benefits realisation
Action 23: Risk Management Planning	Section 8.7 Risk and issue management
Action 24: Post Project Evaluation Planning	Section 8.9 Project evaluation

3 Strategic case

3.1 Case for change

LINZ has identified three key drivers behind the need to make a second generation ICT-enabled investment.

- *Business*: The inability to easily adapt Landonline to meet business needs, and concerns about the potential risks of decreasing market support for key Landonline components.
- *Customer*: Customer frustration with the current service offering and the subsequent impact it has on their efficiency.
- *Information*: Property information is not easily integrated across organisations and the subsequent impact this has on the quality of decisions made about land and location.

The problems LINZ is looking to address through ASaTS were outlined in detail in the IBC. Since the IBC, LINZ has revisited the drivers for change to ensure they are still valid, including:

- undertaking extensive stakeholder engagement (detailed in Section 8.3.1)
- undertaking a survey of all Landonline customers (1276 conveyancers and 265 cadastral surveyors responded to the survey – approximately 21 percent of users surveyed)
- revising the investment logic map (Appendix 10.1)
- revisiting a technology risk assessment.

BUSINESS DRIVER

LINZ makes changes to the Landonline application through a series of releases, typically two a year. These releases make the system more robust and enable the system to reflect changes that customers and staff suggest to help make Landonline easier to use. As is common with 1990s technology, the components within Landonline are tightly integrated. This means it is likely that all components of the system will need to be tested when a small change is being made. The end-to-end system development lifecycle, including the time for regular enhancements and maintenance releases, is time consuming and frustrating for users.

Components of Landonline are reaching the end of their life. LINZ currently has a business as usual project underway to replace the mapping software within Landonline because it is no longer supported. The risk of delaying the replacement of this component is unacceptable for core national infrastructure and it is expected that replacement will cost $[redacted]. As time progresses, the number of components in Landonline that need to be replaced will increase and the cost for replacing them and integrating them into the ageing Landonline code and monolithic architecture will increase.

The core of the Landonline system is built using the PowerBuilder software development language. PowerBuilder has been used to develop the user interface and manages approximately half of the business logic in Landonline. PowerBuilder is a product which has a programming style (client-server) that pre-dates the preferred web multi-tier architecture of modern applications. The requirement of ASaTS going forward is to have a componentised and interoperable system, which this client-server architecture does not easily support. A componentised system will provide LINZ with the ability to more easily make changes to meet evolving customer needs.

Gartner, one of the world's leading independent information technology research companies, advises that users should reassess their continued investment in PowerBuilder on a 3 year sliding window and only consider the technology to be a safe investment for the next 4 years. They recommend that organisations start focusing on planning a replacement of this

technology now.[16] Due to its legacy status, many organisations are migrating away from PowerBuilder as capability to support it is becoming scarcer on a global scale. LINZ obtains its total development capability from outsourcing and has never had PowerBuilder development capability.

CUSTOMER DRIVER

Landonline has been running for 15 years. Users have acknowledged that the current electronic processes for searching and lodging survey and title documents are much better than the manual processes that existed before Landonline was introduced. However, they have also indicated that the usability provided by Landonline is poor compared to other modern applications.

A recent customer survey of all Landonline users found the largest complaint (24 percent of respondents) was usability. Frustrations are expected to increase as the technology customer's use for other business processes becomes more sophisticated. When Landonline was released to customers, LINZ undertook an extensive training programme. Since then no significant training has been done. However, LINZ expects that even if it undertook a training programme for its customers that significant customer frustrations would still remain due to the amount of time wasted processing transactions and Landonline's lack of integration with common software and devices.

Customers responding to the survey had some common frustrations:

- Landonline is not easy to use, resulting in frustration and wasted time and effort.
- Duplication of work occurs as a result of having to manually re-enter information which has already been provided in other applications customers use.
- Landonline is slow to use, leading to wasted time.
- Poor integration with software used by customers for core business processes limits the benefits of the software customers may use.
- Pre-validation of surveys is poor and surveyors are incorrectly told errors exist in their work, resulting in wasted time and effort.
- Landonline does not function on modern devices and some modern operating systems (e.g. tablets or Apple systems).

INFORMATION DRIVER

The economic benefits derived from the use and reuse of location information is widely acknowledged.[17] To assist this, LINZ is working to remove key barriers to accessing and reusing location information.

Areas of property information that are incomplete, inconsistent, or unavailable for reuse are: Crown-owned land information, 3D survey information, and Māori land. Incomplete, inconsistent, and inaccessible information is not only a barrier to economic growth; it leads to delays, inefficiencies and poor decision making for the public and the government. LINZ is looking to address the following list of problems through the ASaTS project:

- The public can only access information held in Landonline through registered users (e.g. surveyors, conveyancers and third party search providers), making accessing this information more difficult and costly than it could be. The information held within Landonline can help support well informed property transactions.

[16] M. Driver, J. Duggan, *IT Market Clock for Programming Languages*, Gartner Inc, 2013

[17] In 2009 a study by ACIL Tasman "Spatial information in the New Zealand Economy", found location information was estimated to contribute $1.2 billion a year to the New Zealand economy. If key barriers to the effective use of location information were removed the study estimated there would be a further $500 million in productivity benefits and an extra $100 million in government revenue.

- Poor quality information exists about Crown-owned land. Manual and time consuming processes are currently used to generate a point in time view of Crown-owned land and this view is not authoritative and the work is often repeated.
- 3D survey information is not centrally collected and is not made available for reuse by the public. Accessible location information has the potential to lead to innovation and higher quality decision making. Making 3D information available will support this outcome.
- Māori land information will be more accurate and current between LINZ and the Māori Land Court.

The key barriers affecting property datasets are integration, availability, and access. Decisions about land and property should be based on high quality relevant information; currently this is not always the case. Property information is not easily linked across organisations. The lack of linked property datasets, including parcel, title, address, rating unit, occupancy, and building footprint, makes it difficult to make good decisions about property in a timely manner (e.g. following an earthquake). As part of the development of the next generation of services for ASaTS, it is intended that the capability will be developed for linking property data. Currently, only LINZ's survey and title data is tightly linked. To populate this new capability, LINZ will work with other agencies and territorial authorities to extend data linkages across the property and building sector.

3.1.1 Why an investment needs to be made now

New Zealand's property rights system has a high level of integrity, and neither the delivery of the survey and title services, nor the Landonline system, is 'broken'. However, the constraints with the current system limit LINZ's ability to make changes in a timely and cost effective way to meet customers' needs and expectations as well as LINZ's business needs. Given the 7 year timeframe for developing and implementing a new system, the high level of current customer frustration, the limitations of dealing with a monolithic system built using a code that should be migrated away from by 2018, means the next generation system should be invested in now.

Good practice is to proactively plan for change rather than to be driven by reactive problems. The preferred investment option is expected to take 5.5 years to implement once the DBC is approved; this includes 1 year for procurement and 4.5 years for implementation and transition to business as usual. In 5 years it is expected that LINZ will have a large number of significant Landonline components at end of life and its customers will be demanding better, more improved services. These services will be difficult for LINZ to deliver given the current technology constraints.

The Landonline system, introduced in 2000, will become increasingly costly to support and harder to maintain. Gartner has advised that organisations should start focusing on the replacement of PowerBuilder now, with SAP (the owner of PowerBuilder) expected to begin reviewing whether to discontinue support for PowerBuilder in the near future. While SAP is currently committed to PowerBuilder, the scarcity of PowerBuilder professionals will ultimately determine the ongoing viability of PowerBuilder. There is also little to no awareness among the development community about PowerBuilder, along with a lack of long-term opportunities to use PowerBuilder. PowerBuilder relies on customers using full desktop client installation, which means it is not possible to provide web and mobile applications.

In addition to the PowerBuilder replacement, a significant number of updates will be required to maintain the existing service (and the base case) to ensure the continued support of the current Landonline system. These include a Citrix frontend replacement, a back end server infrastructure upgrade and a customer management system replacement.

Landonline also hampers LINZ's ability to respond appropriately to changes in the regulatory, policy, and legislative environment, and to deliver on the Government and Ministerial priorities shown in Figure 3. Stakeholders are also demanding improvements to Landonline in the form of increased efficiency, reliability, and usability, which will be difficult to deliver given the current technology constraints. Failure to invest (i.e. do nothing) in a new system will mean

that LINZ will be unable to respond and adapt to changes in the environment in which it operates.

3.2 Investment objectives and desired benefits

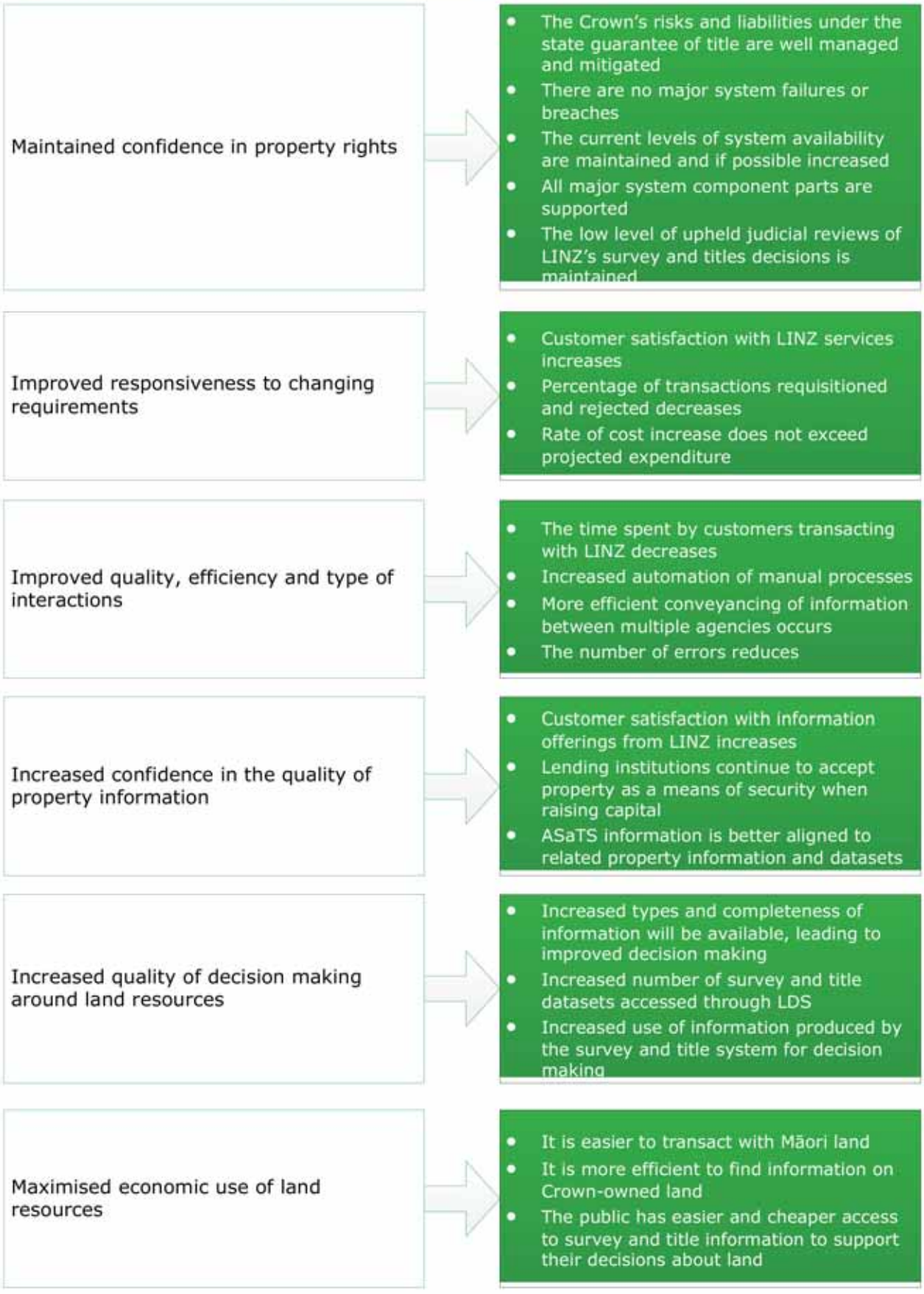
LINZ identified seven investment objectives as part of the IBC. LINZ reviewed these objectives for ASaTS and found they still apply. As part of this review, work was done to refine the investment objectives to reflect the greater understanding of the customer and technology needs that emerged during the development of the DBC. This work included:

- greater levels of market engagement
- the findings of the stakeholder engagement
- the outcomes of a user survey
- development of an architecture vision
- development of detailed business requirements
- the ASaTS economic benefits quantification process.

It should be noted that the most important outcome remains the same between the IBC and the DBC – maintaining the integrity of the property rights system as it underpins the New Zealand economy. This increased understanding is also reflected in the revised ASaTS Investment Logic Map, which is included in Appendix 10.1.

Figure 4 summarises the revised investment objectives and benefits expected to be received from implementing ASaTS. It should be noted that some of the benefits listed in Figure 4 contribute to more than one investment objective. Further information on the quantitative and qualitative benefits from the development of ASaTS is in Section 5.4.4.

Figure 4: Investment objectives and benefits



These investment objectives have driven the decisions around what new services and improvements to deliver through ASaTS.

4 The investment proposal

4.1 Revisiting the shortlisted investment options

THE SHORTLIST OF INVESTMENT OPTIONS

The IBC identified a list of seven investment options, ranging from a base case (focused on addressing PowerBuilder viability issues) through to a full transformation of the end-to-end service delivery model. Five options were shortlisted (shown in Table 4) and subject to a more detailed economic and financial assessment.

A preferred option was identified (option 6) and agreed to by EGI in November 2013. This option provided for a modernisation of the existing survey and title offering through using some components of the existing Landonline system (EGI Min (13) 27/14).

Table 4: Services delivered by each investment option

Service scope (customer offering)		Investment option				
		1 Base case	4 Some changes to current service offering & enhance service delivery	5 Implement interoperability and make Landonline Workspace contestable	6 Offer additional services & redevelop parts of the service delivery model introducing interoperability (preferred option)	7 Transformation of the service delivery model including interoperability
Delivering property services across organisational boundaries in a more efficient and effective way	Automating the process to gain Māori Land Court confirmation	×	•	✓	✓	✓
	Obtaining a more accurate picture of Crown-owned land	×	•	✓	✓	✓
	Notification of mortgage registration direct to lending institutions	×	•	✓	✓	✓
	Notification of sale (e.g. to territorial authorities)	×	•	✓	✓	✓
Meeting the service requirements for LINZ's current survey and title services	Maintain current services	✓	✓	✓	✓	✓
	Improve business reporting	×	•	•	✓	✓
	Enable system/data interoperability/reuse (with customers & government)	×	×	✓	✓	✓
	Improve operational performance (investment to improve process efficiency)	×	•	×	✓	✓
	Redevelop user interface	×	×	×[18]	•	✓
	Introduce 3D capability	×	×	•	•	✓

✓ Service offered under this investment option
• Some form of service offered under the investment option that partially meets the ASaTS service requirements
× Service not offered under this investment option

[18] LINZ will not redevelop its user interface but third parties could provide an alternative workspace which may offer a better level of service than the current Landonline Workspace.

VALIDATING THE BASE CASE AND THE PREFERRED INVESTMENT OPTION

As part of the development of the DBC, LINZ reviewed whether there had been any changes since the IBC that would have an impact on the specifications in the base case or the assessment of investment options.

The assessment of the investment options against the critical success factors is shown in Table 5. The higher the score, the more the investment option meets the critical success factors. The investment options were rated on a relative range from 1 (poor) to 5 (excellent) against each other. It was assumed all investment options could be designed in such a way that they met the hurdle criteria of maintaining the integrity of the property rights system. The critical success factors were not weighted (i.e. each success factor was given an equal level of importance).

Table 5: Investment options ranked against the critical success factors

Critical success factors	Description	Investment option					
		1 Base case	4 Some changes to current service offering and enhance service delivery	5 Implement interoperability and make Landonline Workspace contestable	6 Offer additional services and redevelop parts of the service delivery model introducing interoperability (preferred bundle)	7 Transformation of the service delivery model including interoperability	

Alignment with LINZ's other strategic priorities and capabilities	The extent to which the bundle:
	• fits with LINZ's other 2012-15 Statement of Intent priorities to:
	  ◦ increase the productive use of location based information
	  ◦ enable appropriate economic, environmental and recreational uses of Crown-owned and used land
	• is aligned to LINZ's key skills and capabilities, with a particular focus on specialist technical knowledge and expertise relating to land law.
		1	3	4	5	5	Focused on benefits

The delivery of location based property services and information is futureproofed	The extent to which the bundle: • takes a medium-term (~10 year) view of customers' and government's needs • aligns with the Better Property Services vision • enables interoperability with customers' systems and other government systems • is sufficiently agile to be able to respond to future changes • provides resilience to future demand changes and financial pressures • is aligned to All of Government expectations.	1	2	3	5	5	
Potential to improve the quality of service provided	The ability of the bundle to improve the quality of service delivered to customers and government, achieved through: • delivering services in a way which customers find easy to use • enabling transactions to be completed in a digital environment • providing continuity of electronic processing functionality • providing a complete and accurate view of Māori and Crown land records which can be easily obtained • potential for innovation in how services are delivered.	1	2	3	5	5	
Potential to improve value to government and customers	The ability of the bundle to improve value to government and customers, achieved through: • reducing duplication and improving efficiency of business processes • reducing duplication of ongoing investment • reducing customers' time spent interacting with government.	1	2	2	4	5	
Cost and affordability	The affordability of the bundle to LINZ and its customers, taking into account the ability to fund the bundle within existing funding constraints.	5	5	4	3	1	Focused on costs & affordability
Ease of implementation	The potential of the bundle to be executed, minimising risks and minimising the impact of change on business as usual activities to customers and LINZ.	5	4	3	2	1	Focused on risks
TOTAL		**14**	**18**	**19**	**24**	**22**	

Preferred investment option

This review determined there were no material differences that would alter the assessment of which was the preferred option.

ALTERNATIVE OPTIONS WERE ALSO CONSIDERED

The detailed costings prepared for the purposes of the DBC evidenced a greater than anticipated cost differential between the base case and the preferred investment option. As a result, a review was undertaken of the technology improvements and increased service offerings of the preferred option to determine whether an alternative should be considered. The options from the IBC (bundles 4 and 5), the base case and the preferred investment option were then compared to the business, customer and information drivers for investment (detailed in Section 3.1). From this process a variant of the preferred investment option or IBC option 6 was developed. This option is referred to as 'option 6A'.

4.2 Summary of options

The three investment options considered for the DBC vary in the level of customer improvement and strategic fit they each have. These options are summarised in Table 6.

Table 6: Summary of investment options

	Do nothing	Base case	Option 6A	Preferred option (option 6)
Description	Current Landonline service levels will be maintained in the short term; however, it will become increasingly difficult and costly to maintain this over time and the level of risk posed to the integrity of the property rights system is expected to become unacceptable from 2020. In the medium to long term, this will lead to a degradation of the existing services and will impose barriers to delivering new services.	The base case will maintain the integrity of the property rights system in the short to medium term by transferring the application from PowerBuilder to a more modern development language. However, without a platform shift it will not be possible to make significant enhancements without adding complexity to the system. If this option is implemented, it is expected that a platform shift would be required by 2026, with much of the investment from the base case not being reusable.	Option 6A involves the development of a modular technology platform capable of introducing new and innovative services as well as delivering enhancements to existing services.	The preferred option involves the development of a modular technology platform capable of introducing new and innovative services, as well as delivering enhancements to existing services. This option would also create, improve and increase the accessibility of location information data for use and reuse.
Services	Doing nothing will not deliver any improvements to the service offering.	The base case will not deliver improvements to the service offering.	Option 6A will move LINZ to a more modern and well supported technology platform, allowing the introduction of new and innovative services as well as enhancements to existing services for customers.	The preferred option moves LINZ to a more modern and well supported technology platform, allowing the introduction of new and innovative services as well as enhancements to existing services for customers, and supports Government objectives.
Strategic fit	Doing nothing will not enable LINZ to enhance its support for delivering strategic initiatives.	The base case does not enable LINZ to enhance its support for delivering strategic initiatives.	Option 6A will partially align with Better Public Services, IPS, 'The Power Of Where', open and transparent government and the Government ICT Strategy and Action Plan.	The preferred investment option is strongly aligned with Better Public Services, IPS, 'The Power Of Where', open and transparent government, the Government ICT Strategy and Action Plan and the Māori Land Service.

LINZ determined that option six should remain the preferred investment option as it maintains the integrity of the property rights system, provides significant improvements to LINZ's service offering to its customers, and keeps New Zealand a world leader for ease of transacting property rights. This option aligns to and positions LINZ so that it can deliver on a number of Ministerial and Government priorities.

4.3 Base case

Under the base case investment bundle, there are no significant changes to the services or improvements being offered to customers. The base case does not ensure the continuation of a well functioning Torrens system in New Zealand. The Torrens system delivers $2.3 billion in savings to the New Zealand economy per annum, with Landonline directly contributing $94 million in productivity gains per annum.[19] Under this option investment will be kept to a minimum to address the viability issues identified with PowerBuilder. The investment will involve migrating from PowerBuilder to a more modern development language and through this, reduce the immediate risk to the survey and title service from a lack of available resources to make system changes. However, this will only enable LINZ to maintain the current service offering for the short to medium term.

This investment bundle fails to meet the investment objectives. It does little to ensure the sustainable and enduring delivery of property services and information, it does not improve customers' interactions with government, it does not improve efficiency in the delivery of property services and information, and it does not improve the quality of the record about New Zealand land.

Although the base case mitigates the immediate risk to the continuity of essential service provision, the base case does not fundamentally redesign the monolithic nature of the system. This means that meeting any government requirements for information exchange and interoperability of services adds successive layers of complexity to the system, making the inevitable platform shift (expected to be required by 2026) significantly more difficult. If only the base case is delivered, the inevitable platform transition to a more modular design will become significantly more expensive and higher risk.

A number of staff members within LINZ hold significant intellectual property about how the current system operates and how it was build. This is an important risk mitigation for delivering both the preferred investment option and option 6A. These staff members hold a robust understanding of the complex rules and structures that will be required to be transferred to achieve a platform transition. As the base case does not restructure the platform, the transfer of rules and structures will be delayed. There is a significant risk this knowledge will be lost before the design of the new platform is done at a future date.

4.4 Option 6A

Option 6A was developed based on the preferred investment option (Section 4.5). It introduces largely the same architecture vision as the preferred investment option through developing a modular technology platform. Nearly all of the proposed customer service improvements are implemented under this option; however, it does not introduce interoperability and it does not deliver on Ministerial and Government priorities.

[19] Berl economics (2014) *Valuing New Zealand's Survey and Title System*. www.berl.co.nz

This option will contribute to two of the three investment drivers of ASaTS – the business and customer drivers. The new and improved customer services that will be delivered include:

- moving LINZ to a more modern and well supported technology platform
- improving the quality of user experience in accessing survey and title services
- making survey and title services available on more devices
- providing a better interface between customers' systems and Landonline
- providing greater automation of transactions
- allowing the public (and Landonline) users to search survey and title records over the internet
- removing inefficiencies in the property sale process (further detail on these services is in Section 4.5.1).

Although option 6A has some strategic alignment, it does not position LINZ to deliver on Ministerial and Government strategic priorities to the same extent as the preferred investment option. This option does, however, position LINZ so that with additional funding it will be possible to develop the capabilities to support the delivery of these priorities in the future. Option 6A excludes all services that contribute to delivering on the information driver. The services excluded are:

- improving the ease of transacting Māori land
- improving the currency of Māori land information
- [redacted]
- enabling data across the property sector to be linked
- delivering a more comprehensive picture of Crown-owned land
- exploring whether it is possible to enhance the current 3D capability so that property rights can be captured, validated and published in 3D.

There are a number of significant risks inherent in option 6A. These risks include the potential lack of intellectual property held by LINZ staff due to delays in delivery, the potential introduction of fragmented services to compensate for those not delivered by LINZ, and ASaTS will run the risk of being a system for today rather than for the future.

A full analysis of the alternative options considered is available in Appendix 10.2.

4.5 Preferred investment option

The preferred investment option will provide a significant modernisation of LINZ's service offering and will keep New Zealand as a world leader for the ease of transacting property rights. It will significantly improve user interactions with government, lead to better use and development of land resources, and maintain the integrity and certainty of the New Zealand property market.

4.5.1 The enhanced services under the preferred option

As part of developing the DBC, LINZ has explored in more detail the services planned for delivery as part of the preferred investment option. This thinking was informed by the February 2014 customer survey, feedback from key stakeholders and LINZ staff, and the development of business requirements. Table 7 outlines the new and improved services that will be delivered under the preferred investment option.

Table 7: ASaTS service offerings

Driver	Service	Improving existing	Additional, new or innovative
Business	Moving LINZ to a more modern and well supported technology platform	✓	
Customer	Improving the quality of user experience in accessing survey and title services	✓	
	Making survey and title services available on more devices	✓	
	Providing a better interface between customers' systems and Landonline	✓	
	Providing greater automation of transactions	✓	
	Improving the ease of transacting Māori land	✓	
	Allowing the public (and Landonline) users to search survey and title records over the internet		✓
	Removing inefficiencies in the property sale process		✓
Information	Improving the currency of Māori land information		✓
	Supporting the development of a Māori Land Service		✓
	Enabling data across the property sector to be linked		✓
	Delivering a more comprehensive picture of Crown-owned land		✓
	Exploring whether property rights can be captured, validated and published in 3D		✓

4.5.2 Improving existing services

MOVING LINZ TO A MORE MODERN AND SUPPORTED TECHNOLOGY PLATFORM

The current Landonline system is outdated and is expected to become increasingly more difficult and expensive to change. Under the preferred investment option, LINZ will redesign Landonline as a modern technology platform. The new system will have a modular design that breaks the current monolithic design down in logical components. This will make it easier to make changes to the system. It will also be possible to make changes to one area of the service without having to test or redevelop the whole system end-to-end. From a user perspective, the new service will resemble a typical web application that can be used on many devices and systems.

IMPROVING THE QUALITY OF USER EXPERIENCE IN ACCESSING SURVEY AND TITLE SERVICES

Improving the quality of user experience in accessing survey and title services under the preferred investment option will provide users with a seamless, streamlined user experience. Users will be able to easily personalise settings to reflect the way they use the service. Users will be provided with increased search capabilities and new communication channels that will allow them to easily contact LINZ staff using the system. Users will also be able to easily view the progress of their non automated transactions once they have been submitted to LINZ.

MAKING SURVEY AND TITLE SERVICES AVAILABLE ON MORE DEVICES

The services provided by ASaTS will be accessible on a wider range of devices and operating systems than the current Landonline service. Some of the common modern technology used by New Zealanders does not operate with Landonline (e.g. Landonline cannot be accessed on tablets and cannot be used on non-Microsoft windows operating systems). Surveyors undertake much of their work out in the field and want to be able to access the information provided by Landonline on a variety of devices.

PROVIDING A BETTER INTERFACE BETWEEN CUSTOMERS' SYSTEMS AND LANDONLINE

The new service will enhance how users transfer information from their own conveyancing and surveying software systems into Landonline, saving them time and effort. Landonline does not currently interface well with any of the systems used by customers for their core business processes. Discussions have been held with software providers as part of the initial design discussions and they have expressed an interest in working with LINZ to create a seamless model between their software and Landonline.

PROVIDING GREATER AUTOMATION OF TRANSACTIONS

ASaTS will increase the level of automation in survey and title transactions. This will include improving the automated quality checking of survey plans before their submission. Currently, when surveyors submit cadastral surveys to LINZ for processing they can be accepted into the system even when there are a number of issues with the survey that need to be resolved. LINZ staff review these surveys and requisition them back to the surveyors so they can address the issues raised. Currently the requisition rate is around 40 percent, leading to time delays, inefficiencies and increased costs for customers. Improving the pre-validation of survey plans and automating simple survey transactions will be a key focus area for ASaTS.

IMPROVING THE EASE OF TRANSACTING MĀORI LAND

Māori land is recognised as a taonga tuku iho or of special significance to Māori. It is managed and governed under specific legislation, the Te Ture Whenua Māori Act 1993 (TTWMA). Māori freehold land differs from general land in several ways, including often having multiple owners, a requirement that almost all dealings require approval from the Māori Land Court, and special restrictions on dealing with land.

If a transaction involving Māori land is lodged with LINZ, confirmation is required from the Māori Land Court for it to proceed. Currently, conveyancers have to demonstrate they have received Māori Land Court approval for the transaction to proceed. The conveyancer normally obtains this confirmation by post and submits a scanned copy to LINZ via Landonline. LINZ then manually checks that the correct approvals have been obtained. ASaTS will automate the process to obtain confirmation from the Māori Land Court, saving time for customers, the Māori Land Court, and LINZ. Customers will be able to use ASaTS to request confirmation from the Māori Land Court, and authorised Māori Land Court users will be able to review transaction details and supply confirmations electronically.

4.5.3 New or innovative services

ALLOWING THE PUBLIC TO SEARCH SURVEY AND TITLE RECORDS OVER THE INTERNET

Currently, only users who purchase and install Landonline software are able to search the official Land Transfer Register and cadastre. ASaTS will provide a web application that will allow users and the public to search and access any records held in Landonline.

It is expected that the search mechanism will use familiar (Google Maps style) spatial maps to make it easier for our customers to identify the land record they want.

REMOVING INEFFICIENCIES IN THE PROPERTY SALE PROCESS

Notification of property sale information

Section 31 of the Local Government (Rating) Act 2002 requires the owner of a property that has been sold to notify the relevant territorial authority of the sale within 1 month of the effective date of the sale. The notice must include the full name and address of the purchaser and the sale price. In addition to the requirements set out in this Act, territorial authorities often ask for other data such as whether the transaction was to a third party. If a conveyancer acts on behalf of the property owner, which occurs for the vast majority of property sales in New Zealand, the conveyancer sends the notification to the territorial authority. ASaTS will deliver a service that will let a conveyancer electronically notify a territorial authority with the required property sale information. LINZ will consider making this information available to the public, once any privacy and other implications have been addressed. LINZ is in discussion with Quotable Value (QV), who offers an existing web-based service for solicitors and territorial authorities, to determine who is best placed to offer a fully electronic, comprehensive, streamlined service.

Notification of mortgage registration

Lending institutions require that a conveyancer undertakes the property settlement process if a mortgaged property is involved. As part of this, the conveyancer is required to notify the institution when a registration is completed. Under ASaTS, conveyancers will be offered a new service that will automatically send an electronic notification to the relevant lending institution with the required information, so the conveyancer will not need to do it separately themselves.

IMPROVING THE CURRENCY OF MĀORI LAND INFORMATION

LINZ and the Māori Land Court have developed a system to enable electronic lodgement of Māori Land Court orders in Landonline, replacing manual post based lodgement. Currently Māori Land Court staff lodge orders electronically in Landonline but LINZ staff are required to key in updates to the records. ASaTS will create greater interoperability between the Māori Land Court system and LINZ and enable electronic and immediate updates of information when the status of Māori land changes. Increased interoperability will allow increased currency of Māori land information across agencies.

SUPPORTING THE DEVELOPMENT OF THE MĀORI LAND SERVICE

The Government has completed the TTWMA Review, which is a significant and exciting programme of reform for the governance and management of Māori land. In July 2014, the Cabinet agreed to the development of the Māori Land Service which will provide access to a suite of services led and delivered across multiple agencies. These new services are designed to help Māori unlock the economic potential of Māori land, while ensuring a balance between commercial and cultural interests.

The Cabinet also agreed to allocate responsibility for administering Māori land services to agencies. Te Puni Kōkiri will be responsible for supporting owner decision-making processes, for appointing and overseeing external managers and for administering a mediation service for Māori land disputes. The Ministry of Justice/Māori Land Court will retain responsibility for judicial functions and the case management of Māori land. LINZ will be responsible for maintaining the record of Māori land ownership and title, for providing information services for Māori land ownership and title, for providing registry

services for Māori land governance entities, and potentially for designing and possibly running IT systems. A report back on this programme is expected in March 2016.

LINZ, Te Puni Kōkiri, and the Ministry of Justice will look to leverage off ASaTS to support the delivery of the Māori Land Service, making it cheaper and easier to deliver this new system.

ENABLING DATA ACROSS THE PROPERTY SECTOR TO BE LINKED

The development of data linking capabilities within ASaTS is the first step towards delivering linked location information across the property sector. Development of the capability to hold and relate property information will provide LINZ with a platform to link key property information datasets within the property sector and to work with other agencies to create links between their property information and LINZ's property information (agencies include Ministry of Business, Innovation and Employment (MBIE) and territorial authorities). This capability will enable building footprints, addresses, land parcels, rating units, titles, and ownership data to be linked. LINZ will begin populating this capability as part of its work to develop a world class location information system, which is separate to the ASaTS project.

DELIVERING A MORE COMPREHENSIVE PICTURE OF CROWN-OWNED LAND

The size and value of Crown-owned land in New Zealand is significant. Crown-owned land is estimated to comprise over 40 percent of the total area of New Zealand and is valued at over $33 billion. Despite its size and value, the visibility of information regarding Crown-owned land is poor. Records about Crown-owned land are fragmented across government and generating a picture of Crown ownership requires the manual collation of data. ASaTS proposes the creation of a Crown-owned land register that will record all Crown-owned land that agencies administer. The register will be easily updated and easily searchable. It will show the agency that administers the land and the quality of the information held about the land.

It is not considered practicable or affordable for the Crown-owned land register to be populated with information on all Crown-owned land in New Zealand. Under the preferred investment option it is intended to limit the scope of the register to those government agencies that have high value or large areas of land. This means the register would encompass 17 departments and non-public service departments, Housing New Zealand Corporation and the New Zealand Transport Agency. Once a Crown-owned land register is operational and populated with a base layer of data, consideration will be given to extending the coverage to include land administered by additional agencies, as well as unallocated land.

EXPLORING WHETHER PROPERTY RIGHTS CAN BE CAPTURED, VALIDATED AND PUBLISHED IN 3D

Property rights are increasingly being created in three dimensions (3D) to cover rights in multi-story buildings, underground environments (including tunnels and passageways), and airspace. This is particularly important in cities where space is intensively developed and issues of urbanisation, affordability and opportunities for international competitiveness are a priority. People managing, creating and transferring rights, responsibilities, and restrictions defined in three dimensions expect information to be represented in digital form. Surveyors in New Zealand currently undertake surveys using 3D digital technology and a number of territorial authorities including those in Auckland, Wellington and Christchurch are increasingly visualising building and property data in 3D digital form to support city planning. Transportation, utilities and other infrastructure asset managers, as well as businesses, are making decisions based on 3D information. Initiatives like Smart Cities, smart buildings, and the increasingly rapid international adoption of Building Information Modelling are all based on 3D data. If LINZ does not

make the shift towards the collection, validation and dissemination of 3D cadastral data, the full benefits of a national property rights system are unlikely to be realised.

Individual technologies for capturing, manipulating, and visualising 3D are already well developed, but the technology to support a full 3D cadastre at the national level is still being developed internationally. The Gateway review of the DBC highlighted that one of the two greatest risks to the ASaTS DBC was the delivery of 3D as it is one of the newest areas of technology development. LINZ will further investigate options and capabilities for enhancing its current 3D capability during the procurement phase to reduce the technology risks and will confirm the 3D proposal in the Implementation Business Case.

4.6 Strategic fit of the preferred investment option

4.6.1 The strategic context of ASaTS

ASaTS is key to delivering the IPS future – a joint agency work programme that aims to future proof building and property information by improving its quality and quantity, and assisting agencies to make it more open and accessible. ASaTS will provide the foundations for linking location information held by LINZ and other agencies – building footprints, addresses, land parcels, rating units, titles, and ownership data. The amount and quality of the property data available to support property rights transactions will increase, and the information will be easier to search for and use.

It was estimated that, after the 2013 Cook Strait earthquakes, linked property data could have delivered savings of $2 million to agencies involved in the response effort by resolving property identification issues. More broadly, the preferred investment option strongly aligns with Better Public Services Results 9 and 10, and the Government Communications Information Office Strategy and ICT Action Plan – which emphasise the role of technology in building a more competitive and productive economy.

LINZ, Te Puni Kōkiri, and the Ministry of Justice will look to leverage off ASaTS to make it cheaper for the government to deliver the proposed Māori Land Service. ASaTS is also central to LINZ's 10 year vision of delivering a world class location information system. Providing public access to property information through a web-based search service and introducing a Crown land register support the aims of the Declaration on Open and Transparent Government. Figure 5 shows the alignment of the ASaTS to Government and Ministerial priorities.

Figure 5: The strategic context of ASaTS

The Ministerial and Government priorities in Figure 5 are closely related and many of the improvements offered by the preferred investment option support more than one priority.

Table 8 shows what the preferred investment option of ASaTS will deliver and how it aligns to the key Government and Ministerial priorities.

Table 8: What ASaTS will deliver

What ASaTS will deliver	Better Public Services	Integrated Property Services	The power of 'where'	Government ICT Strategy and Action Plan	Māori Land Service	Open and Transparent Government
A system that will deliver on current and future customer needs	✓	✓	✓	✓	✓	✓
Optimised end-to-end business processes	✓	✓		✓	✓	
Public and Landonline users will be able to search survey and title records over the internet	✓	✓	✓	✓		✓
Services will be available on more technology platforms (e.g. on smartphones and common operating systems)	✓	✓	✓			✓
The system will be interoperable with systems commonly used by customers	✓			✓		
User interfaces will be simplified and will be able to be customised for different users and different services	✓	✓	✓	✓		
Transactions will be automated where possible and manual processes business rules will be improved to decrease re-work by customers	✓	✓		✓	✓	
Shortened transaction times through automated notification of information to territorial authorities and the Māori Land Court	✓	✓		✓	✓	
Property information linking capability will be incorporated into ASaTS	✓	✓	✓	✓	✓	✓
Higher quality and new location information datasets will be made available to the public	✓	✓	✓	✓		✓
The system will be designed to be interoperable with other government systems	✓	✓	✓	✓	✓	
Identity assurance capabilities will be provided for digital service delivery that can be leveraged off for all of government use				✓		
The system will deliver high quality performance data				✓		
It will be explored whether 3D data can be captured, validated, and published for reuse	✓	✓	✓	✓		✓

4.6.2 How ASaTS delivers on the strategic context

A CUSTOMER FOCUSED ONLINE SYSTEM FOR TRANSACTING PROPERTY RIGHTS

The key driver of ASaTS is to improve the quality and types of services LINZ delivers to its customers and is in alignment with Better Public Services Results 9 and 10. The new service offerings (e.g. notice of sale) are designed to improve customer interactions with LINZ and other agencies in a digital environment. ASaTS will also deliver improved and streamlined processes and increased automation.

ASaTS has a clear focus about how to respond to the needs of its current and future survey and title customers. It will:

- make the system easy and intuitive to use
- provide greater interoperability with common customer systems and devices
- refine transaction processes so they are quick and seamless and, where possible, offer automated services.

ENABLE HIGH QUALITY, ACCESSIBLE, LINKED LOCATION INFORMATION

LINZ has identified that the greatest contribution it can make to New Zealand is through the development of a world class location information system. ASaTS is central to delivering on this by providing new (3D cadastral data and Crown-owned land information), higher quality location information (Māori land information) and by providing greater accessibility to location information (public access to survey and title records over the internet). When last measured, location information had added $1.2 billion in economic benefits to the New Zealand economy.[20] Barriers to accessing and reusing location information are estimated to be costing New Zealand $500 million a year.[21]

Crucial to customers being able to complete property transactions easily in a digital environment is high quality linked property data that is readily accessible and supports high quality decision making. ASaTS proposed data linking capability will provide the foundations for linking property information held by LINZ and other agencies – building footprints, addresses, land parcels, rating units, titles, and ownership data. Data linking is central to the success of the Government's IPS programme. Without ASaTS, a new vehicle will need to be found to enable government agencies to deliver the IPS future.

The release for the reuse and linking of high value property datasets aligns with the aims of the Declaration on Open and Transparent Government.

SUPPORTING ALL OF GOVERNMENT INITIATIVES

LINZ, Te Puni Kōkiri, and the Ministry of Justice will also look to leverage off ASaTS to make it cheaper to deliver the Māori Land Service, which is part of a programme of cross-agency work to unlock the potential of Māori land through reforms to the TTWMA. The Cabinet agreed in July 2014 that LINZ will be responsible for maintaining the record of Māori land ownership and title, for providing information services for Māori land ownership and title, for providing registry services for Māori land governance entities, and potentially for designing and possibly running the IT systems (EGI Min ((14) 14/4).

[20] *Modern spatial information in the NZ economy,* a report prepared for LINZ by Acil Tasman, August 2009

[21] *Modern spatial information in the NZ economy,* a report prepared for LINZ by Acil Tasman, August 2009

The design of ASaTS has been aligned to the Government ICT Strategy and Action Plan. LINZ is working with the RealMe team to ensure ASaTS adopts existing RealMe services where possible for identity verification. We will also explore how to develop the higher level non-repudiation capabilities required by ASaTS that could be leveraged off to develop an all of government solution. This will build on the previous innovation and support LINZ has provided for all of government ICT initiatives (e.g. infrastructure as a service and desktop as a service).

A more detailed description of ASaTS' strategic alignment with Government and Ministerial priorities can be found in Appendix 10.3.

4.7 Change required to deliver preferred investment option

To understand the level of business and technology change required to deliver the ASaTS project, and to inform the cost estimates, LINZ has undertaken significant work as part of the development of the DBC. This work has included documenting the high-level business processes, and developing business requirements, an architecture vision and a business capabilities blueprint. This section describes the functions required in the future state and highlights the level of change required to deliver the preferred investment option.

ASaTS WILL HAVE SIGNFICIANT BUSINESS AND CUSTOMER IMPACTS

The business capability model shown in Figure 6 provides a visual representation of all the business capabilities LINZ needs to operate in an ASaTS future state. The business capabilities diagram indicates the degree of change required under ASaTS, relative to the current state. The future state capabilities are defined in Appendix 10.4.

All business capabilities are subject to some change as a result of ASaTS

Figure 6 shows:

- 10 new business capabilities (which show specific capabilities required by ASaTS) will be introduced
- 12 of the existing business capabilities will undergo major change (43 percent of the current state)
- 16 of the existing business capabilities will undergo minor change (57 percent of the current state).

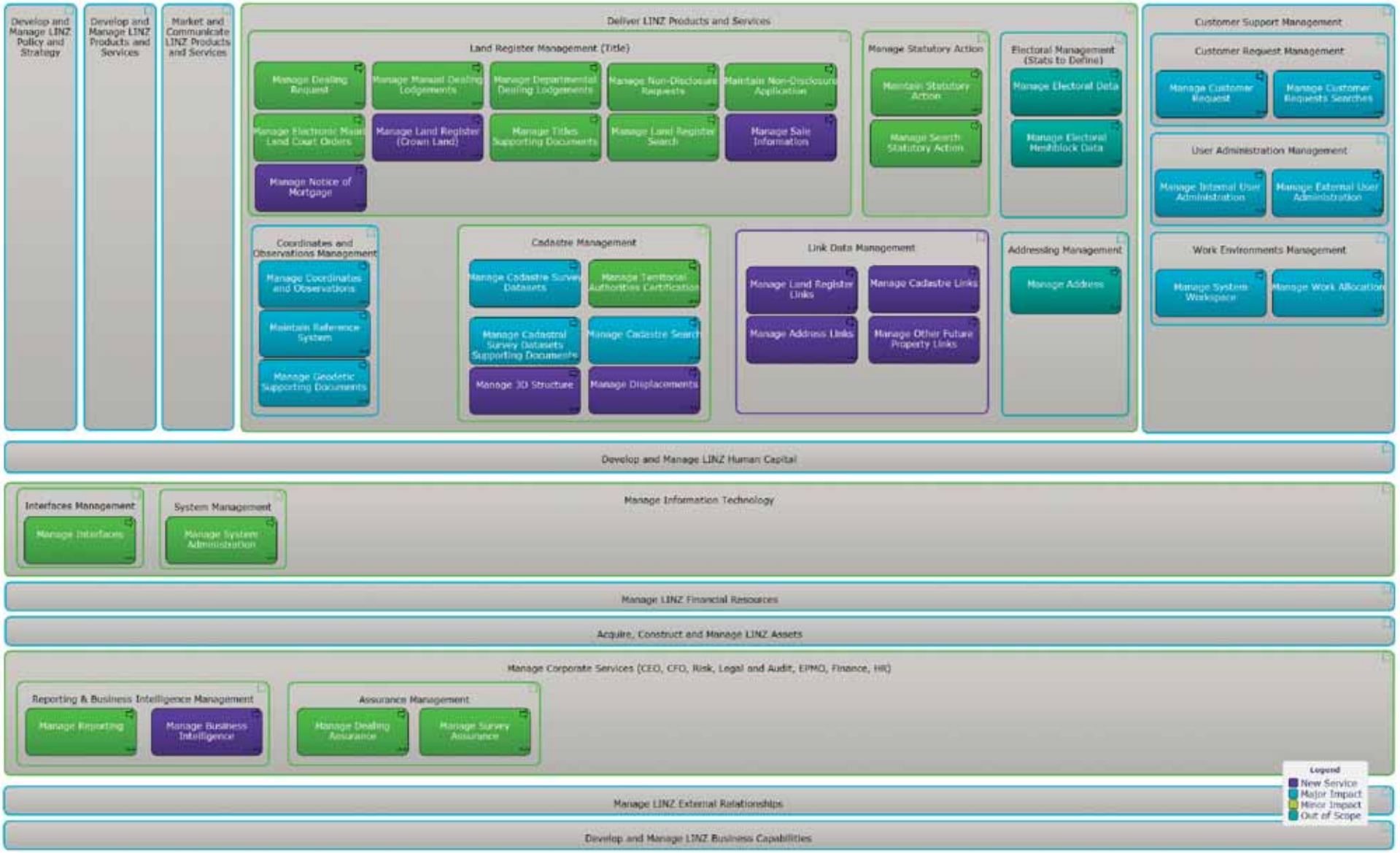
The impact on both LINZ and customers will be significant

Survey and Title Operations (the business unit that delivers frontline survey and title services) represents approximately 40 percent of LINZ full time equivalents (FTEs). ASaTS will have an impact on their day-to-day work through changes to both business processes and technology. As part of developing the ASaTS resource plan, LINZ has identified a number of new roles to support the new functions that will be implemented and a number of areas where it may be possible to increase automation. The exact nature and scope of the change will be developed in the Implementation Business Case. ASaTS will also have a significant impact on the teams responsible for managing Landonline and data improvement.

When using the new system, users will immediately notice the different ASaTS functions. They will be able to access the same information they can now, but they will do so using different screens. Currently, there are approximately 11,000 active Landonline users,

and special consideration has been given to how to manage the impact on these customers with the roll out of ASaTS.

Figure 6: ASaTS future state business capability map

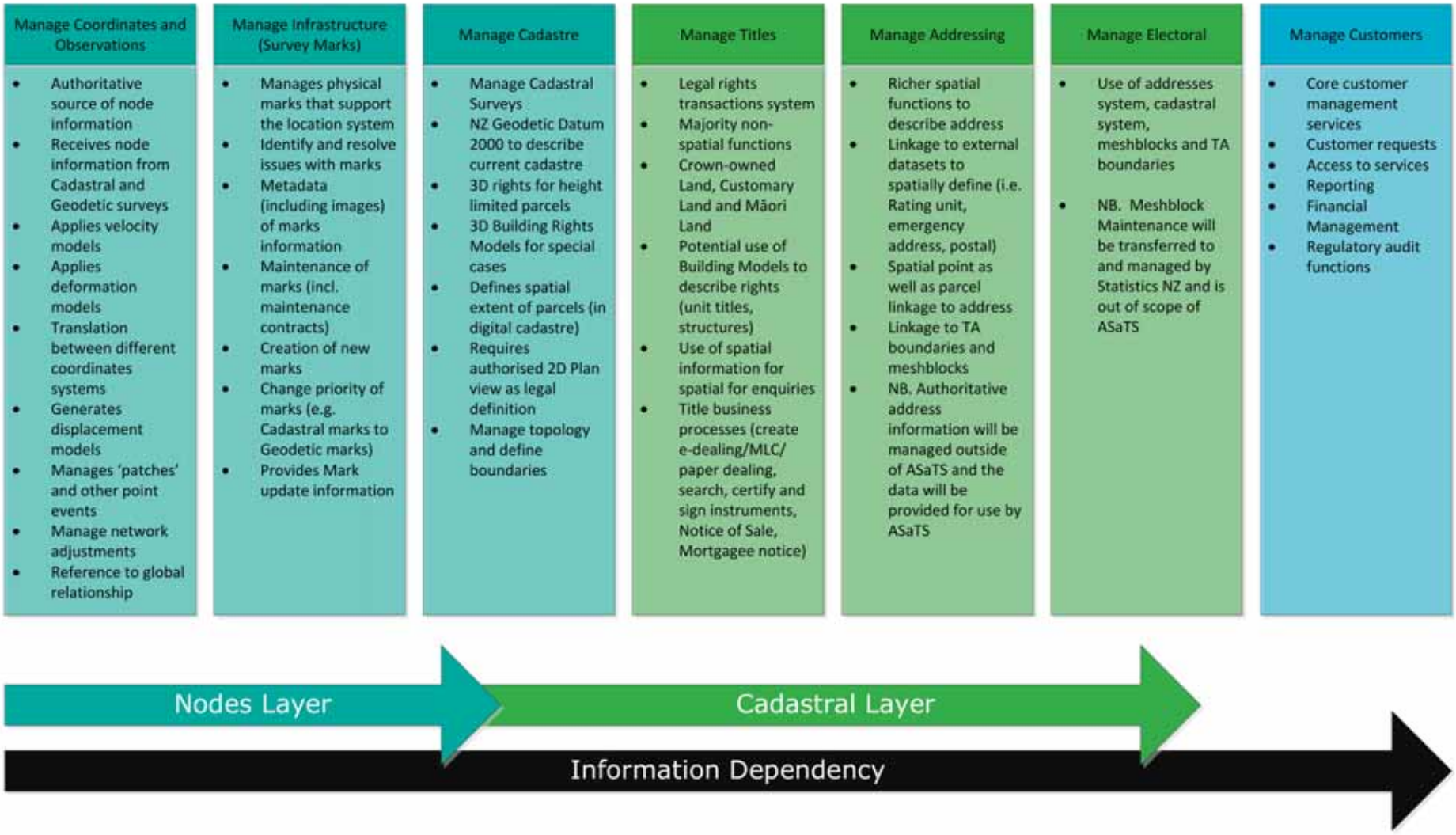


THE FUTURE STATE FUNCTIONAL VIEW – A MORE FLEXIBLE SYSTEM

Figure 7 provides an overview of the high level future state that ASaTS will deliver. Functions have been separated to provide a more componentised system, which will enable changes to be made more easily, reduce the effort of development and testing, minimise the impact of change on users and reduce timescales. The proposed future state functions will enable LINZ to change one part of the system without having an impact on services being delivered from another part of the system. This will drive efficiency in the roll out of future maintenance and enhancement releases. The functional area for ASaTS will be aligned so the improvements for one customer group can be met with minimal disruption of services being delivered to other customers. The new system will be designed so a number of smaller applications can be independently replaced in the future.

Figure 7 was developed to conceptualise the separate functions the future state system will need to perform. The different functions are clearly shown by the different columns including Manage Cadastre, Manage Titles and Manage Customer. These are all independent areas of system function. The functional separation concept is fundamental to delivering a componentised, agile and sustainable future state system which supports reduced testing effort.

Figure 7: ASaTS future state functional view



A SIGNIFICANT LEVEL OF TECHNOLOGY CHANGE WILL BE REQUIRED

Based on the functional future state view above, an architecture vision has been developed.

The future state architecture depicts the business, application, and data components of the future state. A set of guiding principles was used in conjunction with high-level business processes to identify the common and specific technology capabilities required in the future state.

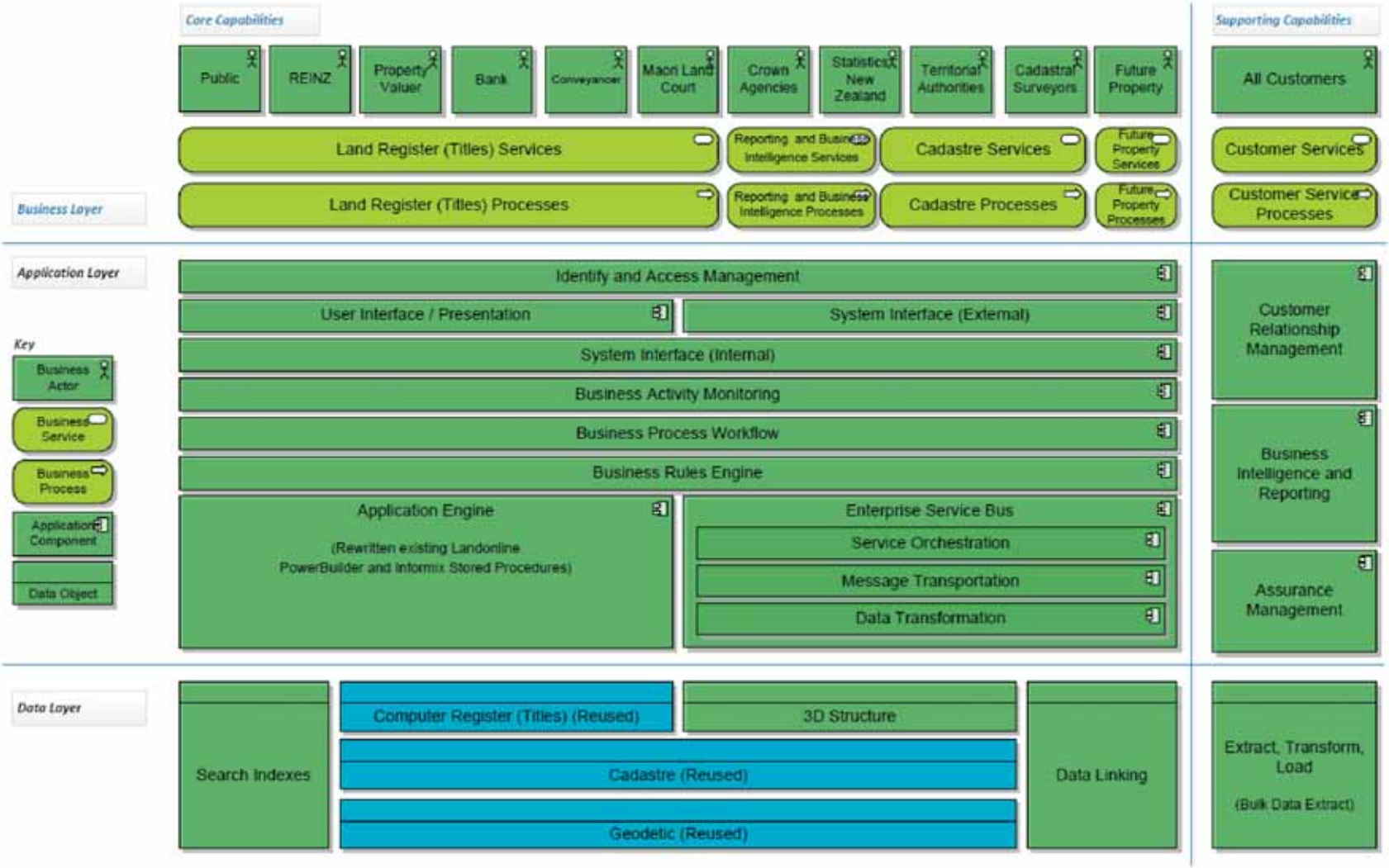
The ASaTS future state architecture, shown in Figure 8, is not necessarily a single instance of a large single system, but a logical view that can be separated across the functions. A more detailed description of the components can be found in Appendix 10.4 and of the technology components in Appendix 10.5.

The future state architecture is representative of a bespoke build of the entire system. For the purposes of the DBC, a bespoke build was assumed to support the cost estimation process. The architecture at a component level could change to fit with a commercial off the shelf (COTS) vendor's architectural design, to benefit from their existing developed solutions. This means LINZ may need to accept some of the vendor's design decisions.

The architecture at a functional or tower view is less likely to change and a new monolithic system with cadastre, title, and geodetic tightly integrated will not be built or purchased. A number of new software components have been proposed which will be common across the entire solution. These are expected to be COTS-type solutions (e.g. business process workflow). There may also need to be some consolidation of the towers (e.g. manage coordinates and observations and manage cadastre) to fit an off the shelf solution. These will be determined during the procurement process in discussion with prospective vendors, and changes to the cost assumptions will be outlined in the Implementation Business Case.

When Landonline was originally developed, most of these components were not available off the shelf and were developed as bespoke solutions. Over time, additional components have been added to Landonline that are off the shelf. These components have been highly customised and are unlikely to be suitable for reuse in the ASaTS solution (e.g. CRM and business reporting). An assumption from the IBC was that the current database technology (Informix) and the bespoke code (legacy stored procedures and DataBlades) will be reused in the future state. As part of the analysis from the RFI process, this assumption is now understood to be a limitation on the future state and will restrict potential vendors (in particular COTS products) from providing different offerings which may better meet LINZ's requirements. To this end, the reuse is targeted at the business processes, business rules, geospatial calculations, datasets and the data models (where possible) rather than at the technology that supports the data repositories.

Figure 8: ASaTS future state architecture



The blue indicates the items that are being reused or are targeted for reuse.

5 Economic costs and benefits of the proposed investment

5.1 Summary comparison of risk, costs, and benefits

This section outlines the costs and benefits of the proposed investment. Table 9 provides an overview of the preferred investment option against the options of do nothing, the base case and option 6A. For the purposes of comparison, the costs for the preferred option are exclusive of the contingency which was identified as part of the QRA (which is detailed in Section 5.3)

Table 9: Summary comparison of risks, costs and benefits

OPTIONS	RISKS	COSTS[22]	BENEFITS	
			Qualitative	Quantitative[23]
DO NOTHING	**Significant risks associated with critical system failure** A failure to proactively invest in the quality and efficiency of survey and title services will pose significant risks to the continuity of essential service in the future. At its most extreme, do nothing will compromise the ability of New Zealanders to undertake property transactions electronically and lead to an increase in manual intervention being required.	**Unknown** The incremental costs associated with the do nothing option have not been considered in detail. At a minimum, current operating expenditure will need to remain. It is expected that there will be an increase in maintenance expenditure relating to significant Landonline components reaching end of life and needing replacement.	**No qualitative benefits** This option will not deliver any qualitative benefits.	**No new or additional benefits and the potential for benefit decrease** As long as Landonline remains functional, the New Zealand Torrens system will continue to deliver $94 million of value to GDP per annum. The do nothing option will not deliver any new or additional benefits over and above this level, while there is also a potential that – over time and due to the monolithic nature of the system – benefits will decline.
BASE CASE	**Reduces risks associated with current system, while creating project-related risks** This option mitigates the risks associated with the technology Landonline is built on. Given it is a minimal investment (which involves the replacement of software development language only), there is a high likelihood increased investment will be needed in the future.	**$[redacted] over the project period** *($[redacted] whole-of-life)* LINZ would keep investment to a minimum and only address the viability issues associated with the PowerBuilder software development language. LINZ will need to invest $[redacted] over the project period to migrate to a more modern development language.	**No distinct qualitative benefits** This option does not provide changes to the customer offering or improvements to service delivery. As a result, the base case investment option does not deliver any distinct qualitative benefits.	**No quantitative benefits over the baseline/status quo** This option ensures New Zealand continues to have a well-functioning Torrens system that delivers the quantified benefits referred to above, but it does not deliver any additional quantified economic benefits.

[22] All costs exclude both capital charge and depreciation costs, and are in nominal value.

[23] All quantified benefits are included in present value whole-of-life (which is then used for the benefit cost ratio calculation in Section 5.4.3).

OPTION 6A	**Increased risks associated with deliver of business critical ICT project** Option 6A is expected to be subject to the risks identified for the preferred investment option. In addition to these risks, option 6A is also subject to a number of other significant risks including the potential for staff turnover (resulting in a lack of knowledge available in the future), introducing fragmented services and building a solution to meet the needs of today's requirements not the needs of the future.	**$[redacted] over the project period** *($[redacted] whole-of-life)* This option costs $84.1 million over the project period, consisting of $[redacted] of capital expenditure and $[redacted] of net operational costs. Option 6A has been modelled on the preferred investment option and introduces largely the same architecture vision as the preferred investment option, without building functionality for interoperability and other modules that deliver on Governmental and Ministerial priorities.	**Reduced qualitative economic benefits** Option 6A does not deliver on many of the qualitative benefits that underpin ASaTS delivering on Government and Ministerial priorities. In particular, option 6A will not deliver qualitative economic benefits with respect to: • building the foundations to enable relationships across the property and building sector to be linked • improving the currency of information on Māori land • enhancing the 3D capability in Landonline.	**Economic benefits of $[redacted] to $[redacted] over the base case** Option 6A is expected to deliver between $[redacted] and $[redacted] (present value) in quantified economic benefits over and above the status quo and the base case investment option. This represents the majority (95%) of the quantified economic benefits from the preferred investment option. The quantified benefits associated with the preferred option that are not realised under this option are those derived from the development of the Crown-owned land register and improved interactions with the Māori Land Court.
PREFERRED INVESTMENT OPTION	**Risks associated with delivery of business critical ICT project** This option mitigates the risks associated with the functionality and operability of the current Landonline system. However, given its status as a business critical ICT project, there are certain risks associated with the delivery of the preferred investment option. The key risks, which have been quantified as part of the QRA process, include: • an increase in vendor personnel rates • a solution that requires data migration • a change to the level of change management required • an event resulting in a delay to project timelines • an increase in the effort required to deliver the project • an increase in the amount of commercial off the shelf products used • risks associated with service orientated design and development efficiencies.	**$[redacted] over the project period** *($[redacted] whole-of-life)* This option costs $[redacted] over the project period, consisting of $[redacted] of capital expenditure and $[redacted] of net operational costs.	**A number of significant qualitative economic benefits** The preferred investment option will deliver a number of qualitative economic benefits, including: • making it easier to interact with LINZ in a digital environment • enabling LINZ to respond more quickly to changing customer and business needs • building the foundations to enable relationships across the property and building sector to be linked • supporting better investment decisions about Crown-owned land, by providing higher quality information • improving the currency of information on Māori land • enhancing the 3D capability in Landonline.	**Economic benefits of $[redacted] to $[redacted] over the base case** The preferred investment option is expected to deliver between $[redacted] and $[redacted] (present value) in quantified economic benefits over and above the status quo and base case. Over 90 percent of these benefits accrue to users of the survey and title service.

5.2 The cost of ASaTS

This section outlines the cost estimates of the ASaTS project. The costs detailed in this section are reflected in the financial impact and affordability modelling discussed in Section 6.

5.2.1 Approach to estimating the costs of the investment

GENERAL APPROACH

Project costs for the base case and the preferred investment option have been determined through:

- developing a transition plan that sets out the planned approach to project implementation (discussed further in Section 8.2.1) – within the transition plan, five project phases are envisaged
- breaking each project phase down into several stages of the software/solution development lifecycle: analyse, design, build, test and implement
- identifying required personnel types (LINZ and contractor), along with the number of FTEs and expected utilisation by project phase and stage
- identifying non-personnel costs.

The following inputs have informed the cost estimation process:

- Responses to the RFI – cost estimates were sought as part of this process and follow up discussions were held with some respondents to clarify the cost information they provided. The RFI process is discussed in more detail in Section 7.3.
- A LINZ ASaTS Resource Plan.

The LINZ ASaTS Resource Plan was developed to help LINZ plan for the resource demands of the ASaTS project, drawing on:

- previous Landonline implementation projects
- current LINZ personnel costs and non-personnel costs
- the future state architecture, which has defined the technology components required
- business/customer change costs associated with other large ICT-enabled projects.

KEY ASSUMPTIONS

Outlined below are the key assumptions that underpin the estimated costs contained in this DBC. Further details on the assumptions used are contained in Appendix 10.6.

Delivery model assumptions

It is assumed that the existing delivery model will be retained, as per the preferred option in Section 7.2.2. That is, it is assumed that a private sector provider will be contracted to assist with the design, build, and ongoing maintenance of the ASaTS solution, but not with frontline service delivery.

Procurement assumptions

It is intended that the private sector provider(s) will be paid on achievement of pre-agreed milestones during the design and build phase of the project. The payment milestones will reflect the specifications of the preferred solution. Following implementation of the solution, it is assumed that the private sector provider(s) will be paid a fee for the provision of maintenance and support services. For the purposes of the financial and economic modelling, it is assumed that all costs will be paid for as they are incurred.

It is also assumed that LINZ will seek specialist professional advisory services to assist with programme management and the management of the impact of change on businesses and customers (discussed further in Section 7.4).

All costs associated with resources supplied by the solution provider and the professional advisory services provider are reported as 'contractor' costs.

Solution delivery assumptions

The cost estimates are underpinned by an assumption that the solution will be delivered through a bespoke build with an element of COTS (as opposed to another model such as Software as a Service). The RFI process showed there is not one 'off the shelf' solution which would meet all of LINZ's requirements and a significant level of customisation is likely to be required in developing the ASaTS solution.

The cost estimates have been subjected to a rigorous QRA process to understand and quantify the risks that typically add cost (refer to Section 5.3). Therefore no specific contingency has been included in the costs in this DBC, although a conservative approach was taken to costing. The procurement stage will validate costs against market responses.

5.2.2 Estimated costs

Costs are reported in two periods:

- *Project period*: Estimated costs over the 4.5 year ASaTS implementation period (midway through FY 2017 through to the end of FY 2021).
- *Whole-of-life*: Estimated costs over the forecast period for the business case – life of ASaTS asset (10 years after the first implementation of the asset – 11.5 years).

Costs reported in this section are in nominal terms and do not include depreciation or capital charge, which are financial rather than economic costs. Section 6 considers the affordability of the proposed investment, including the impact on costs of capital charges, depreciation and the QRA process applied.

PROJECT PERIOD COSTS UNDER THE OPTIONS

Cost impact

Figure 9 shows the project period cost to LINZ of the base case, Option 6A and the preferred investment option.

Figure 9: Project period costs by investment option

Figure 9 shows that:

- LINZ must invest a minimum of $[redacted] over the project period to migrate from the PowerBuilder code to a more modern development language and maintain existing services.
- The preferred investment option costs $[redacted] over the project period. It introduces new and innovative services, modern technology, and will significantly improve the quality of existing services.
- Option 6A requires a project period investment of $[redacted] to develop largely the same architecture vision as the preferred investment option without building functionality for interoperability and other modules which deliver on Government and Ministerial priorities.

Breakdown of project period cost

Table 10 shows a breakdown of the project period costs by operational and capital expenditure. The majority of these costs will be capitalised, the larger portion of which relates to personnel costs. This reflects the assumption of a bespoke build.

[redacted]. The ASaTS cost savings outlined in the table below are derived from the ASaTS related efficiencies which will accrue to LINZ (further detail is in Section 5.4). The ASaTS Landonline licence cost savings reflect the reduction in digital certificates as a result of the ASaTS web-based searching service.

Table 10: Breakdown of project period cost for the base case, option 6A and the preferred investment option

Project period costs ($[redacted]	Base case	Option 6A	Preferred option
Capital expenditure			
Personnel	[redacted]		
Hardware			
Software			
Fit-out and office costs			
Crown-owned land register			
Total	[redacted]		
Operating expenditure			
Personnel			
Maintenance, support and licences			
Hardware / software			
Crown-owned land register			
Fit-out and office costs			
[redacted]			
ASaTS cost savings			
Landonline license cost savings			
Total	[redacted]		
Total project period costs	[redacted]		

Costs associated with the Crown-owned land register

The preferred investment option includes the development of a Crown-owned land register.

The capital cost of this is estimated at $[redacted] (out of the total preferred option capital expenditure of $[redacted]). This consists of:

- $[redacted] of depreciable assets
- $[redacted] relating to data collection (which is not depreciable).

Operating expenditure relating to the Crown-owned land register is expected to be $[redacted] over the project period (excluding capital charge and depreciation). The impact of capital

charge and depreciation on costs is included in Section 6 when funding and affordability is considered.

The Crown-owned land register is not delivered under the base case or option 6A.

Breakdown of capital expenditure by phase

Figure 10 shows the ASaTS capital expenditure for each project phase for both the preferred option ($[redacted]) and option 6A ($[redacted]). Both the features of, and the delivery approach to, the base case are distinct from those of the preferred option and option 6A. The base case has not been included in Figure 10 on this basis.

Figure 10: ASaTS capital expenditure by phase

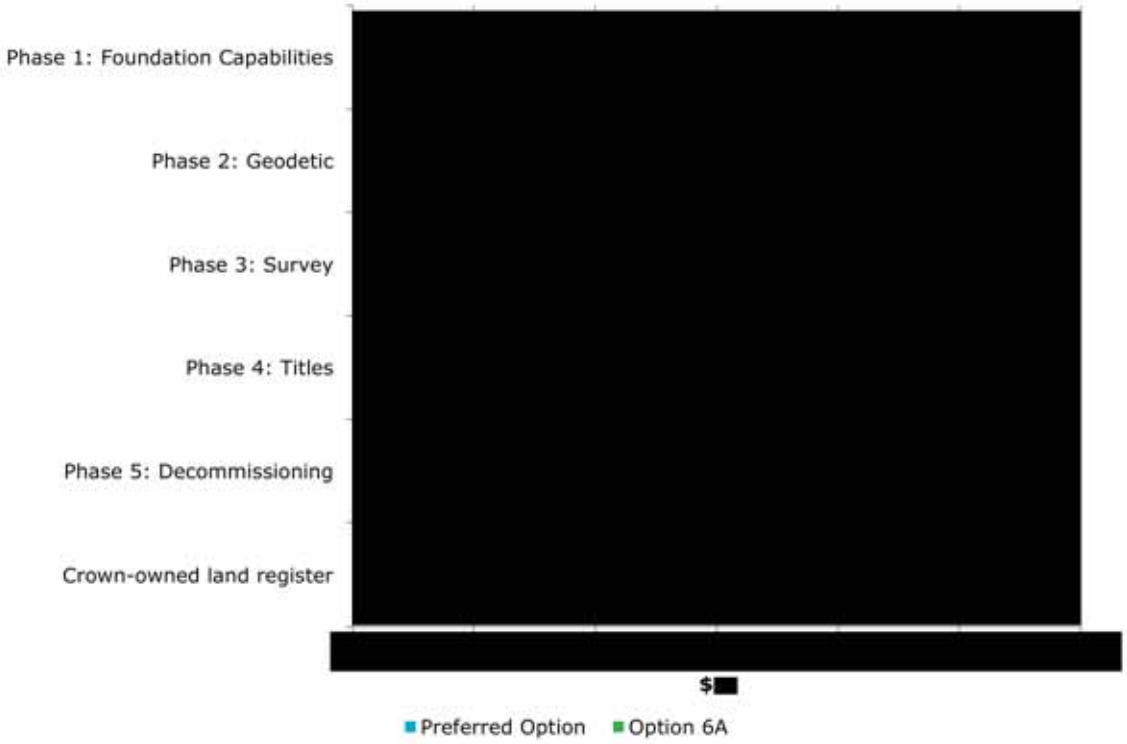


Figure 11 provides a breakdown of the project period costs by contractors, LINZ personnel and non-personnel costs, for the base case, option 6A, and the preferred investment option.

Figure 11: Percentage breakdown of costs by activity over the project period

Figure 11 illustrates the following:

- LINZ FTEs represent a higher proportion of total costs under option 6A and the preferred investment option compared to the base case ([redacted] and [redacted] percent respectively compared

to [redacted] percent). This reflects the much greater business/customer impact under option 6A and the preferred investment option.

- Contractor costs represent a lower proportion of total costs under the option 6A and the preferred investment option compared to the base case ([redacted] and [redacted] percent respectively compared to [redacted] percent). This reflects the higher LINZ involvement under option 6A and preferred investment option.
- Non-personnel costs represent a relatively small proportion of total costs under all three investment options ([redacted] to [redacted] percent). This reflects the assumption that the preferred solution will be a bespoke build using a small number of COTS.

Figure 12 shows the proportion of project period costs by activity under the three investment options.

Figure 12: Proportion of personnel costs by activity over the project period

Under the preferred option:

- technology costs represent approximately [redacted] percent of costs
- business change (change management, business processes and training) costs represent approximately [redacted] percent of costs
- management and governance costs represent approximately [redacted] percent of costs.

Figure 12 illustrates the importance being placed on managing the business/customer change under option 6A and the preferred investment option.

WHOLE-OF-LIFE COSTS UNDER THE OPTIONS

Whole-of-life costs have been calculated for each of the investment options. Whole-of-life costs include project period costs as well as the incremental ongoing operational costs directly attributable to the project. This enables an assessment of the ongoing impact on costs of the investment options.

Cost impact

Figure 13 shows the whole-of-life cost for the base case, option 6A, and the preferred investment option. The whole-of-life costs for option 6A and the preferred investment option include some cost savings that are used to offset ASaTS operating expenses.

Figure 13: Whole-of-life cost by investment option

Breakdown of whole-of-life costs

Table 11 shows a breakdown of the whole-of-life costs by operational and capital expenditure.

Table 11: Breakdown of cost impacts for base case, option 6A and preferred investment options

Whole-of-life costs ([redacted])	Base case	Option 6A	Preferred option
Capital expenditure			
Personnel	[redacted]		
Hardware			
Software			
Fit-out and office costs			
Crown-owned land register			
Total	[redacted]		
Operating expenditure			
Personnel			
Maintenance, support and licences			
Hardware / software			
Crown-owned land register			
Fit-out and office costs			
[redacted]			
ASaTS cost savings			
Landonline license cost savings			
Total	[redacted]		
Total whole-of-life costs	[redacted]		

TIMING OF COSTS

The timing of cash costs has important implications for affordability. The costs associated with the base case, the preferred investment option and option 6A (excluding depreciation and capital charge) are shown in Table 12, Table 13 and Table 14.

Table 12: Base case whole-of-life costs

Base case cash costs ([redacted]	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	Total
Capital expenditure														
Personnel	[redacted]													
Hardware														
Software														
Fit-out and office costs														
Total														
Operating expenditure														
Personnel														
Maintenance, support and licences														
Hardware / software														
Crown-owned land register														
Fit-out and office costs														
[redacted]														
ASaTS cost savings														
ASaTS Landonline license cost savings														
Total														
Total annual cash														

Under the base case, costs peak in FY [redacted]. However, the base case still represents a like-for-like replacement. The base case addresses the viability concerns associated with PowerBuilder, but does not ensure long term sustainability or address current customer frustrations.

Table 13: Preferred investment option whole-of-life costs

Preferred investment option cash costs ($[redacted]	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	Total
Capital expenditure														
Personnel	[redacted]													
Hardware														
Software														
Fit-out and office costs														
Crown-owned land register														
Total														
Operating expenditure														
Personnel														
Maintenance, support and licences														
Hardware / software														
Crown-owned land register														
Fit-out and office costs														
[redacted]														
ASaTS cost savings														
ASaTS Landonline license cost savings														
Total														
Total annual cash														

Under the preferred investment option costs peak in FY [redacted]

Table 14: Option 6A whole-of-life costs

Option 6A cash costs ($[redacted]	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	Total
Capital expenditure														
Personnel	[redacted]													
Hardware														
Software														
Fit-out and office costs														
Crown-owned land register														
Total														
Operating expenditure														
Personnel														
Maintenance, support and licences														
Hardware / software														
Crown-owned land register														
Fit-out and office costs														
[redacted]														
ASaTS cost savings														
ASaTS Landonline license cost savings														
Total														
Total annual cash														

The capital expenditure cost profile under option 6A reflects the reduced capital cost for development compared to the preferred investment option. Ongoing operating costs under this option are above the status quo, due to increased contractor costs associated with the ongoing support of new ASaTS functionality.

5.3 Quantitative risk assessment

The objective of the QRA process was to develop a picture of the potential impact that risk could have on the costs of ASaTS (both positive and negative). A QRA quantifies the probability of occurrence and the potential impact of key risks.

Consideration of risks relating to revenue (e.g. the risk that transaction volume forecasts are inaccurate) has been addressed through a separate sensitivity analysis, the results of which are in Appendix 10.6.1.

The QRA focuses on the cost impact of 10 key risks (which are detailed below). Other (smaller) risks would provide only incremental (if any) change in the costs over and above these key risks. The QRA was only run on the preferred investment option and not on the base case or option 6A.

RISKS QUANTIFIED

The following risks are used in the QRA. The uncertainty in the cost drivers affected by these risks was first explored by considering what would constitute the absolute best and worst case values (to establish the extremities of the probability distribution function). The optimistic, pessimistic and most likely risk scenarios were then captured. The quantitative risk assessment inputs are detailed in Appendix 10.7.

A solution that requires data migration

The current architecture view and market feedback has indicated that data migration is not required. However, there is a risk data migration may be required and this will have an impact on the costs. The main source of uncertainty is around the current Informix data potentially having to be migrated to a system that has a different data structure.

Duration uncertainty

The below factors could have an impact on project timelines, which will lead to an increase in project costs:

- interoperability with and dependency on other systems
- increased government scrutiny on ICT projects
- legislative changes and their effect on requirements and scope
- delays in the delivery of all of government service roadmaps on which ASaTS relies.

An increase in vendor personnel rates

If there is a lack of vendor capability in New Zealand it could result in LINZ paying more expensive contractor rates or rates for overseas contractors.

Internal resource uncertainty

Internal resource requirements for ASaTS have been fully costed. The extent of backfilling required for resources used by ASaTS may be less than what has been costed. There is a risk that the cost of internal resources could come in less than expected.

Change management uncertainty

A significant amount of change management was required during the implementation of Landonline. Although the change management needs are expected to be less because ASaTS is

a second generation investment (current users are familiar with electronic processing), [redacted]. There is a risk that the change management resources required will be lower than expected.

Business process resource uncertainty

There is a risk that the business process resource requirements may be different than expected due to the:

- extent of the reuse of current LINZ business processes
- capability of the vendor and knowledge of the LINZ business environment
- experience of the vendor with 3D functionality
- amount of COTS products in the overall solution.

Uncertainty of level of development resources required

ASaTS has assumed a bespoke development with the use of some COTS packages. The extent of development is based on the amount of software reuse in the solution and the phasing of the development. The current costing assumes that [redacted] percent of the current lines of source code can be reused, specifically the database stored procedure code for accessing the data and performing spatial calculations (depicted in the ASaTS future state architecture outlined in Figure 8). Changes to the project phasing due to a more paralleled development could reduce costs. However, if less software is reused this may increase development resource costs.

Cost of ongoing support and licensing

There is the risk that the support and licensing arrangement will cost more or less than budgeted for due to the uncertainty around the final solution.

Cost of ongoing hardware

The ongoing hardware costs are based on an Infrastructure as a Service (IaaS) arrangement. There is a risk that the performance and capacity requirements, volume uncertainty and 3D hardware costs may result in LINZ paying more or less than allowed for in the ongoing project costs.

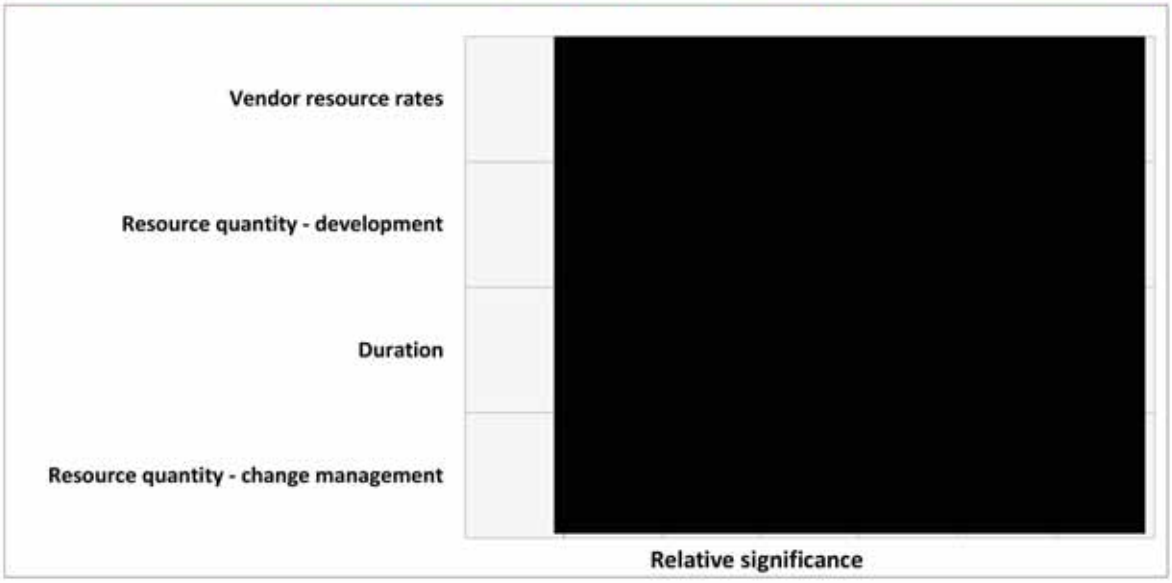
Cost of upfront licensing

There is a risk that this cost could be lower or higher than budgeted, as a vendor has not yet been selected and we do not know what licences will be required.

RELATIVE SIGNIFICANCE OF RISK

The key risks that have had an impact on costs under the QRA are represented graphically in Figure 14. The dominant uncertainties affecting these results (in order of relative significance) are the vendor resource rate uncertainty ([redacted]), the development resource quantity uncertainty for the development of the ASaTS platform, and the potential for an increased duration of the project period ([redacted]).

Figure 14: Sensitivity analysis of project period cost (preferred investment option) [24]



5.3.1 Results of the QRA

The results of the QRA relate to project period costs (excluding depreciation and capital charge), at the 50th and 85th percentiles.

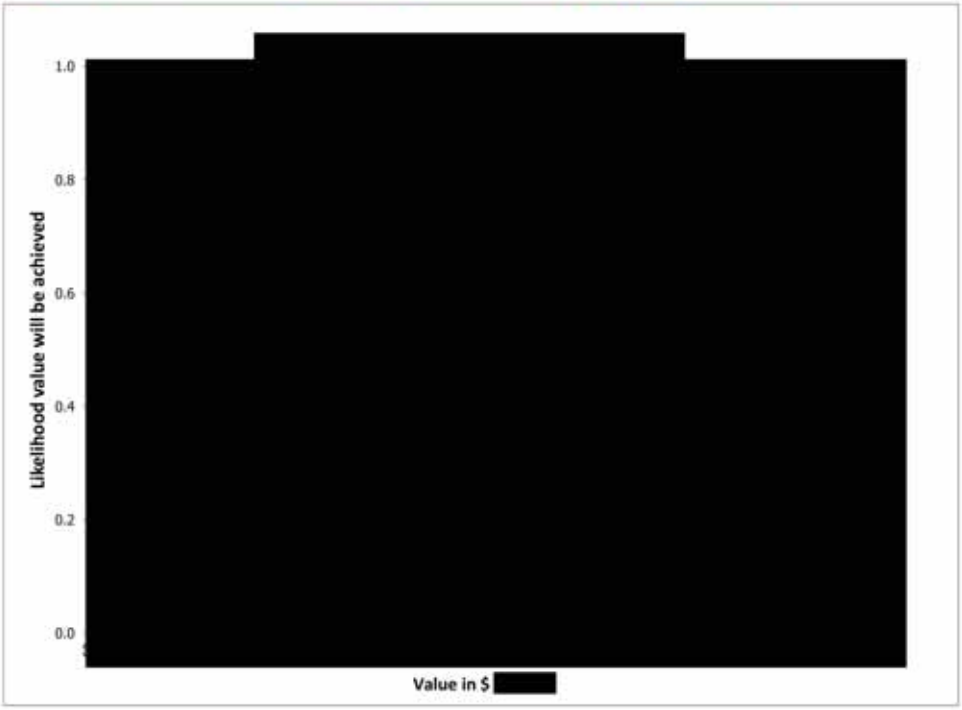
- The 50th percentile of the QRA has been adopted as the expected project cost for the preferred investment option.
- The 85th percentile results have been included to estimate the level of contingency, which is used to inform the level of Crown funding requested. Further detail on the funding requirements for the preferred investment option is included in Section 6.

CAPITAL EXPENDITURE

These results cover the portion of costs associated with capital expenditure for the preferred investment option over the project period. This is a key input into the capital funding request (detailed in Section 6). The results of the capital expenditure QRA are shown in Figure 15. The expected capital cost of the preferred option at the 50th percentile is $[redacted], and $[redacted] at the 85th percentile.

[24] Rank order correlation – Spearman Rank

Figure 15: Total capital expenditure – project period



TOTAL PROJECT PERIOD COST

These results cover all project period costs for the preferred investment option (incorporating both capital and operating expenditure). The results of the project period QRA are shown in Figure 16. The QRA indicates the project period costs (excluding capital charge and depreciation) are expected to be $ at the 50th percentile, and $ at the 85th percentile.

Figure 16: Total project period costs

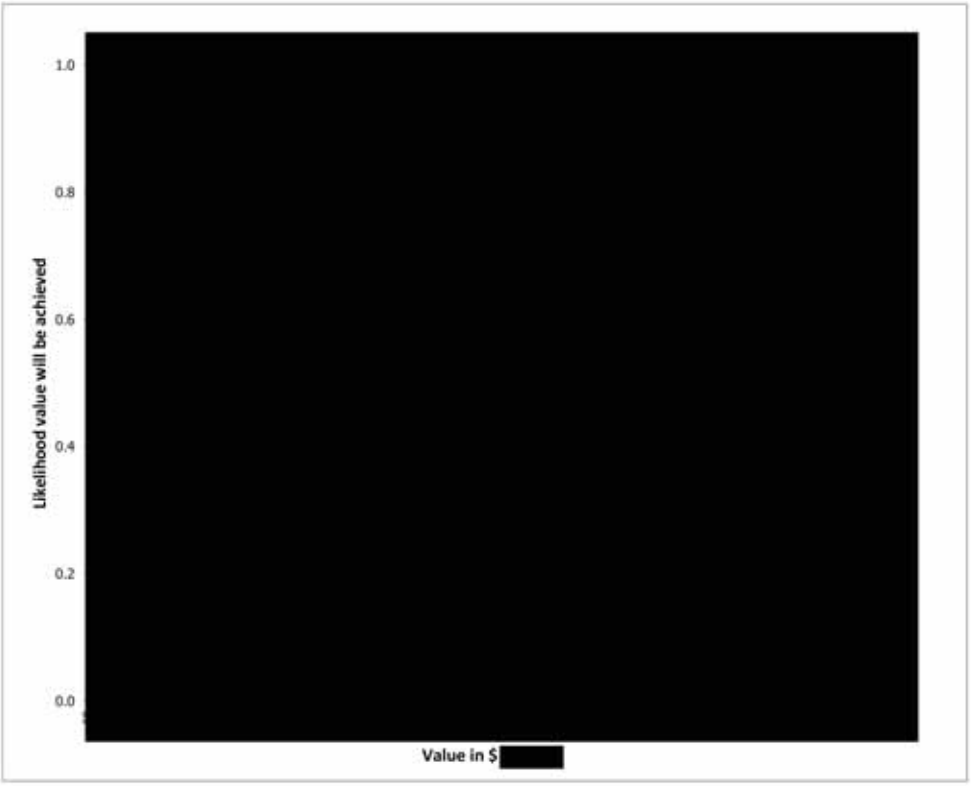


Table 15 shows the impact the QRA has on project period costs, compared to the raw modelled costs.

Table 15: Quantitative risk assessed project period costs

Expenditure category ($[redacted])	Modelled cost	Cost at the QRA 50th percentile	Cost at the QRA 85th percentile
Project period costs *			
Capital expenditure	[redacted]		
Operating expenditure			
Total project period costs			

* Excluding capital charge and depreciation charges.

Table 15 shows how the QRA has had an impact on the costs, starting from the initial cost modelling. The expected project period costs (at the 50th percentile) have come to $[redacted], including capital expenditure of $[redacted]. At this cost, the QRA indicates there is a 50 percent chance the forecast project period cost target will be met. When contingency up to the 85th percentile is included, the project period costs increase to $[redacted], of which $[redacted] is capital expenditure.

5.4 Economic benefits

The base case (do minimum) does not deliver any economic benefits; it only mitigates risks. The preferred investment option delivers significant quantitative and qualitative benefits to a range of customers, including conveyancers, cadastral surveyors, the general public, property purchasers/sellers and land developers, territorial authorities, data consumers, central government, and users of Landonline.

Option 6A is expected to deliver the majority (95 percent) of the quantified economic benefits derived from the preferred investment option. The quantified benefits associated with the preferred investment option that are not realised under option 6A are derived from the development of the Crown-owned land register and improved interactions with the Māori Land Court.

Benefits from ASaTS accrue in a variety of ways, including through cost savings, efficiency gains, and new opportunities to create value through doing things in new ways and doing new things. This section summarises the qualitative and quantitative benefits of the preferred investment option.

5.4.1 Approach to undertaking the quantitative economic analysis

APPROACH TO ESTIMATING QUANTITATIVE BENEFITS

To quantify benefits, LINZ has focused on the quantifiable direct time savings benefits from ASaTS. These benefits are in addition to the significant benefits the original implementation of Landonline delivered in the early 2000s.

The assumptions used to underpin the benefits modelling have been developed based on:

- the February 2014 customer survey sent to all Landonline users (which received a response rate of 21 percent)
- interviews done as part of the external stakeholder engagement process, including interviews with cadastral surveyors, conveyancers, banks, and territorial authorities
- Landonline statistics on the number of transactions and requisition rates
- NZIER sourced transaction volume forecasts and predicted volume forecasts beyond the NZIER forecast period
- interviews with LINZ subject matter experts.

The assumptions and inputs used to underpin the economic modelling are detailed in Appendix 10.8.

Benefits are always more difficult to quantify than costs as they can emerge over time and can be difficult to attribute to a particular project. The approach to the quantitative economic

analysis has focused on benefits that can be directly attributed to the implementation of ASaTS.

Wider economic benefits that result from ASaTS (e.g. from increased innovation as a result of improving data quality), have not been quantified. The approach adopted is more conservative and robust. It is also easier to measure whether the estimated benefits have been realised. Appendix 10.9 covers the benefits LINZ will measure for realisation tracking.

QUANTITATIVE ECONOMIC BENEFITS THE ASaTS PROJECT IS EXPECTED TO DELIVER

Table 16 summarises the benefits identified from ASaTS that it is possible to quantify.

Table 16: Quantitative economic benefits resulting from the ASaTS project

Benefit type	Who receives the benefit	Description of benefit
Better interface with customer systems	Clients of conveyancers and cadastral surveyors	• Landonline will be able to interface more seamlessly with customers' systems (e.g. surveying software and conveyancing software) leading to decreased duplication of activity for surveyors and conveyancers. • Increased usability will also reduce the time surveyors and conveyancers spend entering information into Landonline and interacting with LINZ for each transaction, resulting in cost savings for their clients. • It is expected that the greatest reduction in duplication of activity will be for surveyors. • Note: software providers may need to make some adjustments to their offering to enable this benefit to be realised, but this is not expected to be significant.
Reduced survey requisition (error) rate	Clients of cadastral surveyors and LINZ	• ASaTS will investigate opportunities to reduce the number of surveys requisitioned. Current constraints mean the pre-validation process for surveys is not as efficient or effective as it could be. Reducing the number of surveys requisitioned (the 'error rate') is expected to result in significant time savings for both cadastral surveyors and LINZ staff due to reduced re-work. • ASaTS will make Landonline easier to use and will automate some survey reports, reducing requisition rates and time spent by LINZ staff checking datasets.
Notification of sale to territorial authorities	Territorial authorities and clients of conveyancers	• By ensuring notice of sale details are an exact match with Landonline, territorial authorities will receive accurate information about the ownership of each parcel of land. This will significantly reduce the time territorial authorities spend correcting errors or chasing information received. • Conveyancers will no longer need to manually notify territorial authorities of a property sale occurring, reducing the time spent undertaking this activity.
Notification of mortgage registration direct to lending institutions	Lending institutions and clients of conveyancers	• An electronic notification from LINZ to lending institutions when a mortgage is registered against a title will result in time savings to the four largest banks. It is estimated that no investment is required from lending institutions to receive these benefits. • Conveyancers will no longer need to manually send lending institutions information related to mortgage registration notification, resulting in time savings for conveyancers and cost savings for their clients.

Benefit type	Who receives the benefit	Description of benefit
A more accurate picture of Crown-owned land	Clients of conveyancers and cadastral surveyors, LINZ and central government	• A Crown-owned land register will be developed which will identify the agency responsible for administering a parcel of Crown-owned land, resulting in less 'ringing around town' for conveyancers and cadastral surveyors, resulting in cost savings for their clients and developers. • The register will also result in a reduction of time spent by LINZ who will no longer have to undertake manual exercises to identify land owned by the Crown. • The register is also expected to help central government to make more informed and better policy decisions (e.g. identify land available for housing or other all of government issues in which Crown-owned land may play a role).
Improved interactions with the Māori Land Court	Clients of conveyancers and LINZ	• Automatic confirmation of records from the Māori Land Court will lead to a reduction in the number of transactions that are submitted without appropriate approvals. This will reduce the number of transactions LINZ staff need to send back to the conveyancer and the need for conveyancers to interact with the Court.
Easier searching of property information through web-based searching	E-search Landonline users, property buyers and sellers and LINZ	• The development of a web-based search facility will enable non-Landonline customers to search, identify and retrieve a copy of a title or plan instantly. • Web-based searching will make it possible for existing search customers to complete their interactions with LINZ more quickly. • It is estimated there will be a reduction in call centre support enquiries from e-search customers who currently need to register as Landonline users and install digital certificates. It is expected that once e-search-only customers migrate to web-based searching most of the calls from e-search customers will not be required as they will no longer need to annually renew their digital certificates. • Time savings are also expected to accrue from a reduction in manual search queries submitted by email or existing web forms. The majority of manual search customers are assumed to use the web-based search facility in future.
Survey and title process efficiencies	LINZ	• There are opportunities to make some efficiency gains through better design of LINZ's business processes. This is particularly the case on the survey side of the business, where all transactions involve manual input from LINZ staff. A business process optimisation exercise will be undertaken as part of ASaTS to identify the opportunities that exist.
Improved survey and title business reporting	LINZ	• Landonline's business reporting is inadequate to meet the current needs of LINZ. The current reporting component was added to Landonline late in the development process and requires significant manual intervention to produce the statistics required for management purposes. • ASaTS will remove the complexity from the current reporting processes and provide the opportunity to develop new automated reporting, leading to time savings for LINZ.
Testing time savings	LINZ	• Due to the current setup of Landonline, a large amount of functional and regression testing is required for any maintenance release or infrastructure upgrade. • With ASaTS proposing a component design and an increased capability of automated testing it is expected that time savings will accrue to LINZ.

5.4.2 Results of the quantitative economic analysis

ASaTS IS ESTIMATED TO DELIVER OVER $[redacted] PRESENT VALUE BENEFITS OVER THE ASaTS WHOLE-OF-LIFE PERIOD

The present value of quantitative economic benefits from ASaTS (under the preferred investment option) is estimated to be between $[redacted] and $[redacted][25]. Under option 6A, the present value quantitative economic benefits are estimated to be $[redacted] to $[redacted].

Figure 17 shows the whole-of-life present value of benefits for the low and the high ranges used for modelling the preferred investment option.

THE VAST MAJORITY OF QUANTIFIABLE BENEFITS ACCRUE TO CUSTOMERS

This analysis highlights that the majority of quantifiable benefits for ASaTS are expected to accrue to customers (95 percent), with only a small minority of benefits expected to be recognised by LINZ (5 percent).

It was anticipated that the majority of quantifiable benefits would accrue to customers, as significant LINZ efficiencies were realised as part of the original Landonline implementation in 2002, when electronic lodgement and searching was introduced.

Figure 17: Present value of quantified economic benefits

Figure 18 breaks down the quantified present value of the economic benefits for the preferred investment option by benefit area, for both the low and high ranges.

[25] This range largely depends on the estimated value of conveyancers' and cadastral surveyors' time charged to their clients. The charge out rate used for conveyancers is $200 (low) to $250 (high) an hour and cadastral surveyors $125 (low) to $150 (high) an hour. These rate ranges were discussed and confirmed with the New Zealand Law Society's Property Law Group, the Auckland District Law Society, and the New Zealand Institute of Surveyors.

Figure 18: Present value of quantified economic benefits under the preferred investment option (by benefit area)

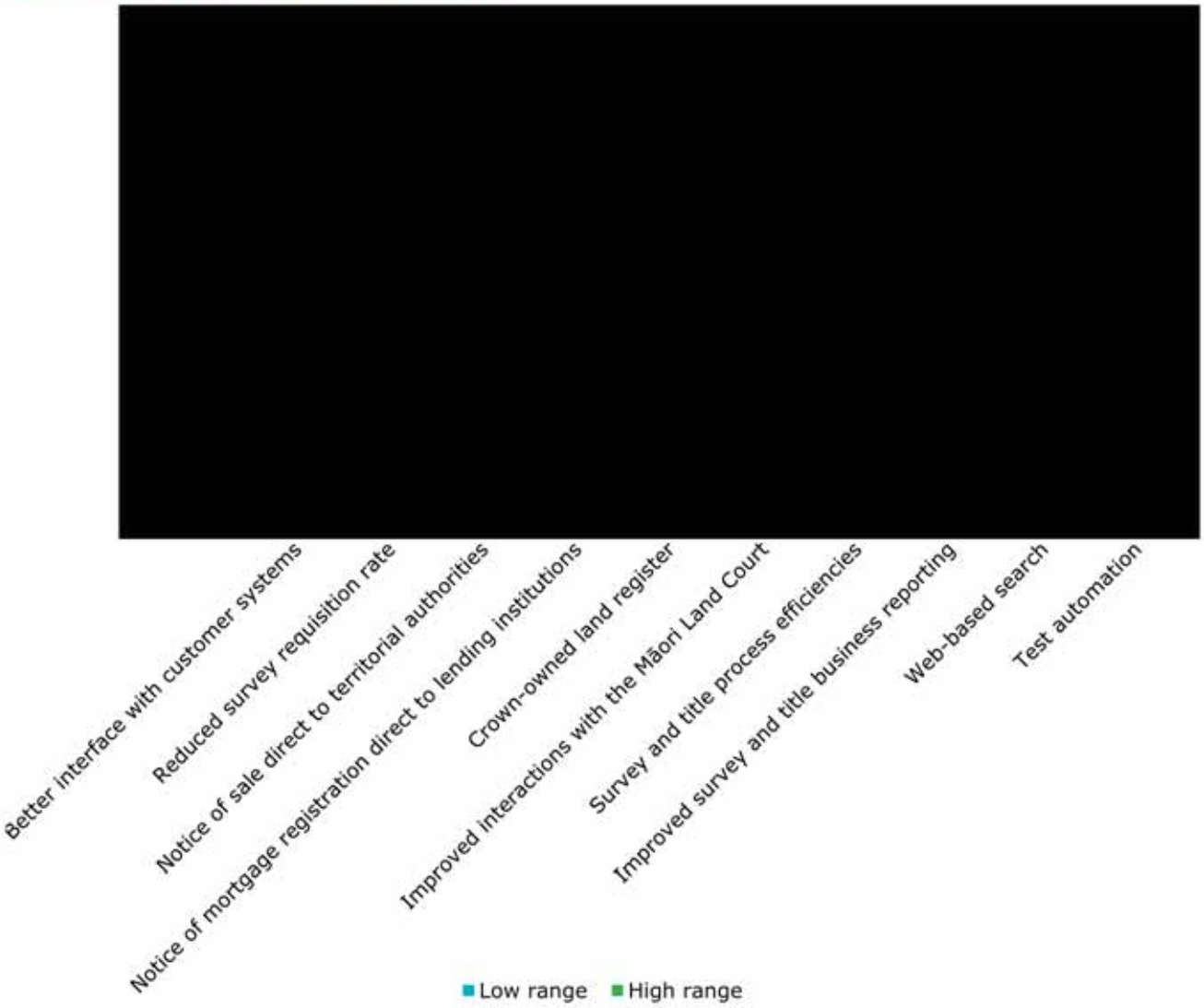


Figure 18 highlights that the majority of benefits will be delivered as a result of:

- a better interface with users' systems
- notices of sale being sent directly to territorial authorities
- direct notification of mortgage registrations to lending institutions.

5.4.3 Benefit cost ratio

The benefit cost ratio (BCR) expresses the ratio of the monetary benefits of a project relative to its monetary costs (expressed in present value terms). The higher the BCR the greater the marginal economic benefits of the investment option relative to its costs. A BCR greater than one indicates that the marginal quantitative benefits to the economy of ASaTS would exceed the marginal quantitative costs of ASaTS.

Calculating a BCR is a useful technique to compare the relative ratio of economic benefits and costs of investment options. However, the BCR should not be considered in isolation from the risk and affordability analysis. It is important to note that the BCR only accounts for benefits that are able to be quantified. There are many benefits associated with ASaTS that are not able to be quantified.

The BCR analysis has been done for the preferred investment option using a QRA risk adjusted whole-of-life cost to allow an assessment of the expected benefits against the expected whole-

of-life costs (at the QRA 50th percentile) and whole-of-life costs including contingency (at the QRA 85th percentile). The base case and option 6A were not subjected to a QRA and the BCR analysis is therefore based on the initial costs modelled for these options.

PRESENT VALUE WHOLE-OF-LIFE COSTS

Present value whole-of-life costs have been discounted using the Treasury discount rate for ICT projects plus the Treasury forecast Consumer Price Index (CPI) rates (taken from the 2014 Treasury Budget: Economic and Fiscal Update). Net present cost refers to the present value of costs net of LINZ efficiency financial savings.

Table 17 below summarises the present value (non-risk adjusted) whole-of-life costs of the base case, option 6A and the preferred investment options. For the preferred investment option the risk adjusted costs covering the 50th and 85th percentiles have also been included, as these costs are important inputs for the benefit cost ratio calculation.

Table 17: Present value whole-of-life costs

Present value whole-of-life costs ($[redacted])	Base case	Option 6A	Preferred option
Capital expenditure	[redacted]		
Operating expenditure			
Present value cost			

The cost benefit analysis has been done using a comparison between the competing proposals (base case relative to the preferred investment option/option 6A) based on the guidance provided by Treasury in the Cost Benefit Analysis Primer v1.12. The BCR analysis outlined below considers the benefits of option 6A and the preferred investment option against the incremental cost of those options over and above the cost of the base case. A comparison has also been made against a zero base ('do nothing'). However, this is not seen as a valid option due to the risks it poses to the survey and title system (refer to Section 4.1)

Table 18 shows the BCR of the preferred investment option and option 6A against the base case and against the 'do nothing' option[26]. For the preferred investment option the risk adjusted costs covering the 50th and 85th percentiles have been included, as assessment of the BCR at these cost levels is important to consider (noting that costs at the 50th percentile are considered most likely and therefore the BCR at this level should be the focus). A QRA was not completed on the costs of the base case and therefore the BCR calculated relative to the base case is more conservative (lower) than if the QRA contingency had been added to the base case costs.

[26] The do nothing option was not costed in detail so it has been assumed as a zero base. However, it is expected that there would be an incremental cost increase over time associated with doing nothing (due to the increased costs associated with the maintenance of an aging system).

Table 18: Benefit cost ratio for the preferred investment option and option 6A

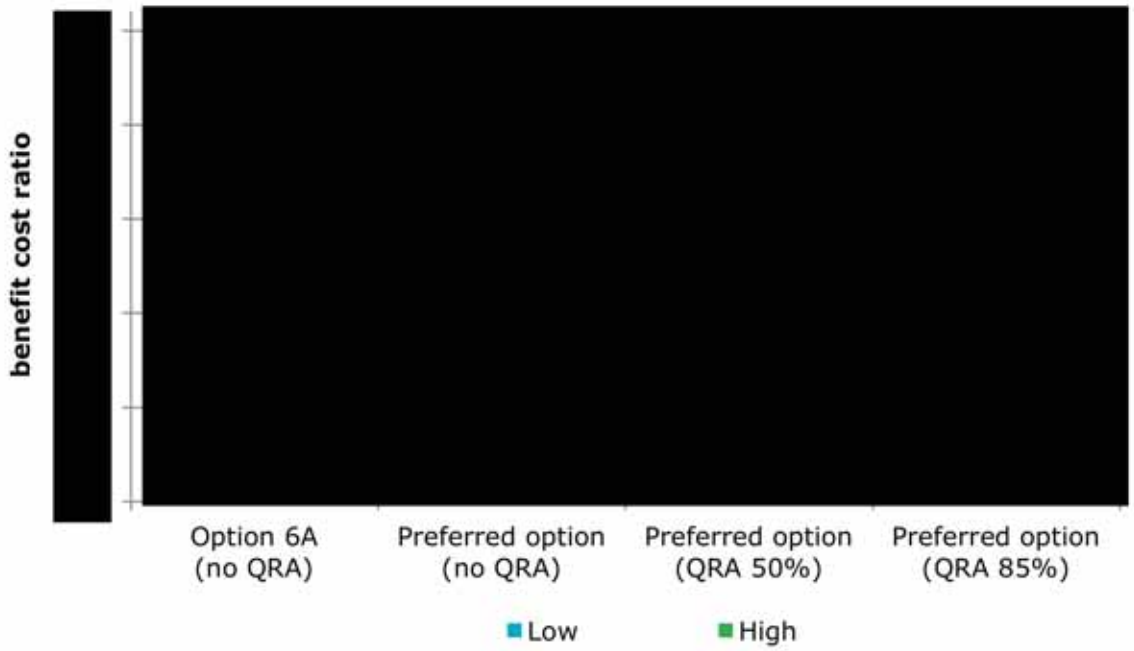
Benefit cost ratios	Option 6A (no QRA)	Preferred option (no QRA)	(QRA 50%)	(QRA 85%)
Benefits				
Present value whole of life benefits (high) ($[redacted]				
Present value whole of life benefits (low) ($[redacted]				
Costs				
Present value whole-of-life costs ($[redacted]				
Present value whole-of-life costs (base case) ($[redacted]				
Incremental present value whole-of-life costs against base case ($[redacted]				
Benefit cost ratio (against base case)				
Benefit cost ratio (high)				
Benefit cost ratio (low)				
Benefit cost ratio (against do nothing)				
Benefit cost ratio (high)				
Benefit cost ratio (low)				

At the QRA 50th percentile, which is the expected whole-of-life present value cost of the preferred investment option, there is a benefit cost ratio (against base case) of between 1.6 and [redacted] The 85th percentile risk adjusted cost of the preferred investment option has been included in Table 18 to illustrate that whole-of-life costs at this level still result in a BCR greater than 1 (against base case). This shows the significant benefits associated with the ASaTS investment (when compared with the base case).

The benefit cost ratio of option 6A of between [redacted] and [redacted] (against base case) is higher than that of the preferred investment option because the majority of the cost differential between the options relates to positioning LINZ to deliver on Government and Ministerial priorities and on increased interoperability (as described in Section 3.1), the benefits for which have not been quantified. Under option 6A, [redacted] percent of quantified benefits from the preferred investment option are captured.

The BCRs for both the preferred investment option and option 6A (relative to the base case) are presented in Figure 19. As the BCRs have been calculated by reference to the base case, the base case itself has not been included.

Figure 19: Benefit cost ratio (relative to base case)



The BCR does not include any additional costs that may be faced by parties other than LINZ (e.g. any costs faced by software providers to enable a better integration with ASaTS). Following discussions with a key software provider ([redacted]), it was agreed that these costs are not expected to be significant.

5.4.4 Qualitative economic benefits of the preferred investment option

In addition to the quantitative time savings benefits described above, the preferred investment option will deliver a number of qualitative economic benefits (or benefits that are not able to be quantified). A number of qualitative benefits are closely associated with the quantitative benefits outlined in Section 5.4.2. The qualitative benefits include:

- enabling LINZ to respond more quickly to changing customer and business needs
- making it easier for our customers to interact with LINZ in a digital environment
- providing increased availability, quality, currency and usability of information.

ENABLING LINZ TO RESPOND TO CHANGING CUSTOMER AND BUSINESS NEEDS

ASaTS will have a more componentised design that makes it easier to make system changes without having to test the whole system end-to-end, as is the case currently. This will make it easier for LINZ to meet current and future customer expectations and business needs in an agile and proactive manner.

MAKING IT EASIER TO INTERACT WITH LINZ IN A DIGITAL ENVIRONMENT

ASaTS will significantly improve the quality of existing services and offer new services to the public, making it easier to interact with LINZ in a digital environment, supporting Better Public Services Result Areas 9 and 10.

Making the system easier to use (improved service)

Making Landonline easier to use was the most commonly requested enhancement in the recent customer survey, mentioned in 24 percent of all responses. ASaTS will update the look and feel of Landonline and make it more intuitive, so that less user training will be required. Users

will be able to easily personalise settings to reflect the way they use Landonline and they will be able to easily search for material. Landonline will also interface with all common modern systems, including mobile devices.

Many cadastral surveyors undertake their work in the field and they want to be able to access information contained within Landonline when they do so. Of cadastral surveyor respondents to the customer survey, 79 respondents (31 percent of surveyor respondents) identified benefits from accessing information on mobile devices. They confirmed they wanted access to information in Landonline on a variety of devices.

Providing greater automation of transactions (improved service)

ASaTS will increase the level of automation in survey and title transactions. This will include improving automated quality checking of survey plans before their submission. Currently, when surveyors submit cadastral surveys to LINZ for processing they are accepted into the system, reviewed by staff and requisitioned for correction of any errors. Currently the requisition rate is at 40 percent, leading to time delays, inefficiencies and increased costs for customers. Improving the pre-validation of survey plans and automating simple survey transactions will be a key focus area for ASaTS.

Allowing the public to search survey and title records using a web-based application

Currently, only users who purchase and install a Landonline licence software are able to search for information on their official title and survey information. ASaTS will provide a web application that will allow the public to search and access any records held in Landonline. It is expected the search mechanism will use familiar (Google Maps style) spatial maps to make it easier for customers to identify the land record they want.

PROVIDING INCREASED AVAILABILITY, QUALITY, CURRENCY AND USEABILITY OF INFORMATION

ASaTS will deliver increased availability, quality, and currency of information to survey and title users, data consumers (via the LINZ Data Service (LDS)) and the public. Products and services built using location information create hundreds of billions in revenue for the world economy.[27] Free, accessible location information drives innovation and greater productivity across the economy, underpins planning decision making and improves the safety and prosperity of communities. ASaTS will contribute to this through creating a Crown-owned land register, enabling access to Landonline information via the internet, creating the capability for greater linkages between the key property datasets, increasing the currency of information held on Māori land and enhancing the capabilities of Landonline around 3D data.

Searching survey and title information over the internet (new service)

The introduction of a web-based facility will allow members of the public buying and selling property to easily search titles to check the restrictions applying to a property (e.g. easements). Many of the benefits from this service have been quantified, but it should be noted that the web-based search facility has the potential to have a negative impact on the revenue of third party search providers (e.g. QV, a state owned enterprise). This will occur as LINZ will be making official survey and title records available to the public at a cost of $5 per record. LINZ has been unable to quantify the potential impact of this change on the revenue for QV.

Supporting the development of [redacted]

[redacted]

[27] *What is the economic impact of geo services?* a report prepared for Google by Oxera, January 2013. Geo services are defined here as an industry comprising all interactive digital mapping and location based services.

Improving the currency of Māori land information

ASaTS will deliver greater currency of Māori land information between the Māori Land Court and LINZ due to a greater interoperability between the two systems. This means Māori land owners will have access to current information about the land they and others hold which will help inform high quality decision making about property.

Building the foundations to enable information across the property and building sectors to be linked

ASaTS will build the foundations to enable property related datasets to be linked. Agencies that could use this capability include MBIE and territorial authorities. Population of the relationship information will be part of LINZ's programme of work to develop a world class location information system and to deliver on the IPS future as described in Section 4.6.

System wide benefits from linked location information

Economic growth from location information comes from the interplay of location information to uncover new patterns and knowledge. Linked information across agencies will lead to the development of more 'packaged' services that better meet the needs of people and businesses.

Linked location information will provide LINZ and other government agencies that hold property data with the ability to easily combine their datasets for multiple purposes. Linked data is key to delivering the IPS future, which has an estimated net present value of $323 million once delivered.[28]

Government benefits

The development of linked location system data and the subsequent roll out of policies and operational processes with other agencies in the property and building sector is expected to deliver the following benefits:

- Enable LINZ to develop a cohesive view of its location information within the property sector.
- Lead to improved decision making for government, local government and the private sector through the availability of integrated property data.
- Create future efficiencies for the private sector and government when there is a need to use linked location information, such as in an emergency situation like the Canterbury earthquakes. It was estimated that, after the 2013 Cook Strait earthquakes, linked property data could have delivered savings of $2 million to agencies involved in the response effort by resolving property identification issues. Based on these figures, it is expected the availability of linked location information could have saved recovery efforts significantly more after the Canterbury earthquakes.
- Contribute to LINZ delivering on its leadership role within the location system by leading the development of important property and building datasets in agreed formats to agreed standards.

Stakeholder feedback on linked location information

The development of linked location information with a focus on property and building data was one of the clearest needs from the literature scan and meetings with external users. Work has been done with key stakeholders (MBIE, Christchurch City Council, and Wellington City Council) on the benefits they expect to be realised from fully integrated linked property information. All of the agencies consulted were supportive of LINZ developing this capability to facilitate this as part of the new service.

[28] *Integrated Property Services: Assessing the Economic Value of a Integrated Property Services (BPS) Future,* a report prepared for LINZ by ConsultingWhere and ACIL Tasman, November 2013

The following benefits from linked data were identified by stakeholders:

- Better informed decision making for central and local government, iwi, and the public about property, due to the availability of related property information.
- Potential process improvements for territorial authorities from having linked location information available.
- Increased efficiency for government and the private sector as they will no longer need to data match to relate location information.
- Increased value-add services for the public from the increased availability of location information.

Improving the quality of investment decisions about Crown-owned land

As part of the preferred investment option, LINZ will develop and populate a Crown-owned land register with data from agencies that have large and valuable land holdings. A Crown-owned land register will:

- enable government to determine the most productive use of its land assets from an 'all of government' perspective
- enable the Crown to identify and transfer Crown-owned land to private owners to ensure it is put to its best use and to create potential savings or revenue for the Crown
- increase the availability of Crown-owned land information for reuse (contributing to LINZ's leadership role within the location information sector)
- increase the ability of agencies to effectively undertake biosecurity and pest management work
- enable LINZ to meet the expectations of Ministers and the public by providing an accurate picture of Crown-owned land
- create efficiencies for the private sector from being able to identify who manages Crown-owned land.

All of the stakeholders (consisting of central government, local government, and iwi) consulted on the development of a Crown-owned land register were supportive of this initiative. It should be noted that even a partially populated Crown-owned land register will begin to deliver on the above benefits.

Benefits to government

LINZ champions the development of a spatial data infrastructure through the New Zealand Geospatial Strategy. A well functioning spatial data infrastructure in New Zealand will unlock an estimated $500 million in potential economic benefits by removing the barriers to accessing location information. The Crown-owned land dataset, once collected, will be shared for reuse by the government and private sector, thereby reducing barriers to accessing location information. This will also contribute to LINZ meeting the objectives of the Declaration on Open and Transparent Government, under which agencies are expected to release high value data.

By providing a centralised picture of Crown-owned land LINZ is also meeting the intention of the *Government ICT Strategy and Action Plan to 2017*. This key strategic document "sets out an action plan to transform service delivery through digital self-service channels and to unlock the full economic potential of government's information holdings".[29]

Accurate information about Crown-owned land would enable the government and businesses to make higher quality decisions that contribute to New Zealand's economic growth. Currently, individual agencies manage land within their silos and a centralised visibility of Crown-owned

[29] Government ICT Strategy and Action Plan to 2017, Government Chief Information Officer, Department of Internal Affairs, Wellington p. 6

land would enable the government to determine the most productive use of its assets from an 'all of government' perspective (whether that be for economic, social, or recreational purposes). LINZ expects the all of government view will provide the most significant benefit to the government.

A centralised picture of Crown-owned land would enable more effective collaboration and cooperation between agencies and territorial authorities around the sustainable ongoing management of biosecurity issues on land. Agencies such as the Department of Conservation (DoC), territorial authorities, and LINZ obtain information on who owns land for biosecurity and pest control planning. DoC carries out its own extensive data matching exercise with Landonline before undertaking biosecurity planning. Occasionally this is not sufficient and manual checking of land ownership is required.

Territorial authorities have indicated that, if Crown-owned land does not have a title, they are unable to assess the land for rates purposes. If there is a more accurate picture of Crown-owned land, it will be possible for them to undertake an accurate rates assessment for this land. It is not clear what the scale of this issue is and what the possible rates obligations for government would be.

When agencies need to extract a view of Crown-owned land they either need to undertake a manual check of Landonline and/or collect and collate the data from other agencies that administer Crown-owned land. The government periodically undertakes projects that need to identify Crown-owned land for different purposes. Treasury recently tried to identify Crown-owned land so that it could be more effectively used – identifying land for disposal, education, farming, water storage areas. It found that the fixed asset registers at departments were not able to provide authoritative information.

Benefits to the public

If there is a register of Crown-owned land, Landonline customers will no longer need to infer which government agency is responsible for administering the property. This will remove the need for them to manually seek this information, through mechanisms such as 'ringing around town' to find out which agency is responsible for administering a parcel of land.

Enabling innovation through the use of 3D cadastral data

LINZ will explore whether it is possible to develop a foundational layer of 3D cadastral data that consumers will be able to leverage off to provide 3D visualisation of property rights. 3D cadastral data will be made available for external users to reuse through the LDS. This will provide for more effective decisions, create innovation and make it easier for surveyors to interact with LINZ.

Enabling government to make more effective policy, operational and planning decisions

Once 3D visualisation of property rights is available, it is expected that central and local government will be able to make more effective policy, operational, and planning decisions, especially in high density urban areas. Planning and building smarter cities and transport systems will cut down on energy costs and could assist in avoiding accidents, reducing emissions, enabling changes in travel behaviour, and making cities more healthier and productive.

Creating innovation by enabling 3D data to be integrated with other spatial information

Land and property developers, as well as other users of cadastral information, are expected to derive benefits from 3D data being available for integration with other spatial information (e.g. a land developer could take cadastral data, including 3D, and add topographic data, aerial imagery, utility information, and building data to present a clear picture of the land being developed). Without the cadastral data (including 3D) it will be significantly harder to interpret the land development constraints.

3D visualisation will allow better understanding of multilayer ownership rights for complex structures and dwellings such as apartment blocks. Making 3D cadastral data digitally available and integrated in the 2D cadastre will make it possible to query air-space parcels. Having a 3D

capable cadastre will allow people to query whether any ownership rights are in conflict, rather than having to rely on paper based drawings that are difficult to interpret.

Potential benefits from 3D identified by customers

As part of the development of the DBC, the customer survey asked what the potential benefits of 3D visualisation will be. There were 81 cadastral surveyor respondents to the question (31 percent of cadastral surveyors who responded), with the general themes being that 3D will provide:

- a better understanding of complex properties such as unit titles
- a better understanding of the vertical component of rights
- faster understanding of rights
- better understanding of easements.

There were 69 conveyancers who responded to the same question (5 percent of conveyancers who responded to the survey). The general themes of their responses were that 3D will:

- reduce time spent interpreting data
- make it easier to visualise complex developments
- help with interpreting what was happening with unit titles and apartment buildings
- lead to easier identification of properties and easement areas and their relationships to other properties.

As part of the development of the IPS objectives, key customers were surveyed. The results from this work indicated that 55 percent of respondents thought the integration of 3D information will result in productivity and/or cost improvements of more than 10 percent.[30]

[30] Land Information New Zealand, *Survey and Title Services Indicative Business Case*, Wellington, 2013 p. 86

5.4.5 Case Studies

The case studies below illustrate how ASaTS could be used in the future.

CASE STUDY ONE: CADASTRAL SURVEYOR LODGING A SIMPLE SUBDIVISION PLAN

A land developer has an exciting new housing development in Tauranga. The cadastral surveyor is lodging the subdivision plan with LINZ. They begin by loading survey data from the cadastre into their surveying software package. They then add in new survey data and use the software tools to create a new Land Transfer plan of the subdivision.

In Landonline

The surveyor imports the Land Transfer Plan into Landonline using LandXML format. It is possible this process could fail due to anomalies in the existing Landonline data. The surveyor will then need to use a work-around process to import the data and manually link the survey to existing data in Landonline.

The surveyor also needs to draft a seven page survey report in his office software, print it out and then scan the image into Landonline.

The surveyor instructs Landonline to pre-validate his plan. Landonline produces a three page pre-validation report that contains many warnings and other miscellaneous information not relevant to his plan. The surveyor examines the report, but is likely to overlook critical issues due to the amount of superfluous information in the report.

The surveyor submits the plan for LINZ approval. The plan is moved into a workflow queue, and after a week the surveyor receives a notice from LINZ telling him that the plan contains an error and cannot be approved.

The surveyor uses Landonline to amend the plan and correct the error, and then re-submits it to LINZ. The corrected plan is approved and is ready for the issue of new titles for the sections.

In the ASaTS future

The Land Transfer Plan is imported into ASaTS. The surveyor is pleased to see that all the detail and customisations they set up in their own software have been imported through into ASaTS, and that the system has correctly linked his plan to the underlying survey data. The surveyor then completes an online survey report inside ASaTS, which is far quicker than the previous process of manually uploading a scanned report.

The surveyor instructs ASaTS to pre-validate the subdivision plan using smart business rules. ASaTS produces a concise, easily read report that highlights a number of errors that will have previously been found only after the plan had been submitted. The surveyor is able to resolve these errors using their own software package tools and then replicate the changes in ASaTS using the new interoperability features.

The surveyor submits the plan for LINZ approval. Because it is a straightforward subdivision ASaTS is able to automatically check the survey, allowing the plan to be approved with minimal intervention from LINZ staff. The approved plan is now ready for the issue of new titles for the sections.

CASE STUDY TWO: SOLICITORS ACTING IN A PROPERTY SALE

A Nelson couple are buying their first home and talk to their lawyer about a house that perfectly meets their needs and budget.

In Landonline

Unfortunately their lawyer is away from the office and cannot access Landonline, so the couple need to wait until the next day before they get the legal 'all clear' and the sale is agreed. The lawyers for both parties begin the conveyancing process. The staff in the law firm acting for the couple are new to Landonline and it takes them a number of attempts before they are able to set up the transaction to change the ownership of the house.

Because the property is Māori freehold land, approval of the sale must be sought from the Māori Land Court. A legal executive sends a letter to the Māori Land Court with copies of the sale documents and requests approval. After a delay of several days the approval is received. The legal executive scans a copy of the approval into Landonline for later examination by LINZ staff.

As completion of the sale approaches, the lawyers for the seller and the couple who are buying the home use Landonline to electronically sign the transfer documents and submit them to LINZ. Landonline uses smart business rules to automatically review and then register the transaction. The ownership of the property is changed and the couple can now move into their new home.

For local body rating purposes the local council must be notified and the lawyer for the couple fills out a paper Notice of Sale and posts it to the council. Unfortunately the lawyer makes a small error when filling out the Notice of Sale and this error makes its way into the council's rating valuation database.

In the ASaTS Future

Their lawyer is away from the office but is able to use the new ASaTS internet search capability on their tablet to locate the property on a map and receive a copy of its certificate of title.

After checking the title and other property details the lawyer calls the couple and gives them the legal 'all clear'. Staff in the law firm acting for the couple use ASaTS to set up the transaction to change the ownership of the house. Even though some of the staff are new to conveyancing, the simple and intuitive ASaTS interface makes this process quick and easy.

Because the property is Māori freehold land, approval of the sale must be sought from the Māori Land Court. A legal executive uses ASaTS to request this confirmation and details of the sale are sent electronically to the Court. After reviewing the transaction, the Court electronically approves it and the confirmation attaches automatically to the transaction.

For local body rating purposes the local council must be notified and the lawyer for the couple uses ASaTS to create an electronic Notice of Sale. ASaTS automatically populates this Notice with information from the transaction and schedules it to be electronically sent to the council when the sale is completed. The council is then able to update its rating valuation database with accurate and timely information.

5.5 Comparison between the IBC and DBC

COST DIFFERENCES BETWEEN THE IBC AND DBC

Since the IBC was approved by Cabinet in November 2013, work has been done to refine the indicative costs used to compare the different investment options outlined in the IBC. This work has focused on developing a more detailed analysis of the costs for the different investment options. In the case of both the base case and the preferred investment option, this has resulted in an increase in both the costs and benefits associated with these options.

The cost difference between the IBC and DBC is detailed in Table 19 below. As option 6A was created after the IBC, there is no comparative figure for option 6A.

Table 19: Cost differences between the IBC and DBC (excluding QRA)

	Detailed business case ($[redacted])	Indicative business case ($[redacted])
Project period costs		
Preferred option	[redacted]	
Base case		

The costs outlined in the DBC vary from those in the IBC and are largely offset against the difference in benefits. This is due to a number of factors, including the following:

- The IBC outlined indicative costs that were used to enable a comparison across the investment options, which were based on assumptions about the products available in the market.
- The market engagement during the RFI process, used to support the DBC costs, identified there was no off the shelf solution available to deliver ASaTS.
- All costs from the RFI respondents indicated the preferred investment option would have a cost [redacted].
- As part of the DBC, more robust and in-depth cost analysis was performed for the base case and preferred investment option using the RFI responses and discussions with public and private sector specialists experienced in delivering products of a similar scale, complexity and risk.
- LINZ has doubled the change management budget for ASaTS since IBC (it is now budgeted at 29 percent of project costs). This increase is based on market feedback received during discussions and on feedback gathered during lessons learnt meetings in regard to issues faced when implementing IT enabled projects.

BENEFIT DIFFERENCES BETWEEN THE IBC AND DBC

The benefit difference between the IBC and DBC is detailed in Table 20. As option 6A was created after the IBC, there are no comparative figures for option 6A.

Table 20: Benefit differences between the IBC and DBC (present value)

Economic benefits (PV)	Detailed business case ($[redacted])	Indicative business case ($[redacted])
Preferred option - high	[redacted]	
Preferred option - low		
Base case - high	0.0	0.0
Base case - low	0.0	0.0

A survey focusing on LINZ's survey and title customers was done during the development of the DBC. This survey validated the original case for change, and future described and quantified the improvements customers sought and the benefits they could leverage from the

improvements proposed under the preferred investment option. As a result, the quantified benefits significantly increased from those identified in the IBC phase. The setup of the current system means that many of these improvements can not be delivered by Landonline, or by the base case.

6 Assessment of affordability and funding options

6.1 Approach to financial modelling

GENERAL APPROACH

A financial model has been developed to estimate the impact and affordability of ASaTS. The financial model includes baseline modelling that takes:

- revenue and expenditure associated with third party and Crown funded services for LINZ from the FY 2015 budget
- forecasted revenue and expenditure over the next 13 financial years from FY 2016 to FY 2028.

The model is used to analyse the whole-of-life impact of the ASaTS project on the Survey and Title category (which is fully third party funded), as well as on LINZ's wider financial position, for each of the short-listed investment options.

The modelling exercise undertaken for the purposes of the DBC is underpinned by a large number of assumptions. In particular, revenue forecasts are based on forecast survey and title transaction volumes, which have historically had a significant level of variability. The results of this modelling should be interpreted in this context. Appendix 10.6 contains a description of the assumptions used in the financial modelling.

The results presented in this section focus on the preferred investment option. If the base case or option 6A were to be substituted for the preferred investment option, it is proposed a similar approach to funding would be adopted.

IT IS ASSUMED A CASH RESERVE OF $10 MILLION WILL BE RETAINED

The survey and title memorandum account cannot go into deficit. To ensure LINZ has sufficient funds to meet its costs, it is assumed that $10 million in cash will be held as a reserve in the survey and title memorandum account for normal property market cycle fluctuations. This balances LINZ's need to prudently manage its cash balance sheet with the competing tension of not unduly over recovering third party monies.

THIRD PARTY FEE LEVELS

Survey and title services operate on a full cost-recovery model, including the recovery of associated depreciation and capital charges. Survey and title costs are recovered through fees paid by Landonline users (mainly cadastral surveyors and conveyancers, operating on behalf of property purchasers/sellers and land developers). Fees for the survey and titles service are reviewed annually by the LINZ Fees and Charges Committee, with fee levels last being increased in 2011.

The financial modelling has been completed with a view to assessing the expected impact on fees and the memorandum account under each funding option. LINZ will monitor and address fee levels, where necessary, to manage the memorandum account balance.

6.2 Cost of preferred investment option

MODELLED COST OVER THE PROJECT PERIOD

Section 5.2 outlined the estimated project period cost of the preferred investment option which was determined as a result of a detailed assessment of project work phasing and resourcing requirements. This process identified project period costs of $[redacted] for the preferred investment option.

EXPECTED/TARGET PROJECT PERIOD COSTS

Section 5.3 outlined the estimated project period costs after being subjected to a QRA to understand the potential impact of risk on project costs. LINZ has identified the 50th percentile QRA cost ($[redacted]) as the expected project cost for the preferred investment option. The project period cost comprises $[redacted] of capital expenditure and $[redacted] of operating expenditure.

PROJECT PERIOD COSTS INCLUDING CONTINGENCY

When risk adjusted to the 85th percentile, project period costs for the preferred investment option are $[redacted]. To provide a sufficient level of contingency, LINZ has adopted the 85th percentile project period costs ($[redacted]) as the basis for the requested level of Crown funding. The project period cost comprises $[redacted] of capital expenditure and $[redacted] of operating expenditure.

6.3 Funding sources and options

6.3.1 Funding options

Ideally, sufficient accumulated depreciation would be available to fund ASaTS. However, the depreciation available for ASaTS is approximately $[redacted]. Most of the Landonline depreciation pool was used to fund earlier phases of the Landonline build. The Cabinet approved this approach in CBC (06) 2.

LINZ has sought to identify funding options that strike a balance between:

- cost recovery principles (i.e. those who benefit from ASaTS should pay for the investment)
- maintaining equity between current and future users of survey and title services
- minimising the fiscal impact on the Crown.

Having considered a number of funding options that have varying degrees of impact on both survey and title customers and the Crown, LINZ has identified three options that best meet the needs of the Crown and survey and title customers:

1. Option 1: Crown capital injection (not repaid)
2. Option 2: Crown capital loan repaid with ASaTS accumulated depreciation
3. Option 3: Third party funded, supplemented with a repayable Crown capital loan for the funding shortfall.

The available accumulated Landonline depreciation pool ($[redacted]) is drawn on first, under all funding options. Detailed analysis of the impact of the funding options on ASaTS is set out in Appendix 10.6.6.

Table 21 summarises the impact of each funding option on third party fee payers and the capital required from the Crown.

Table 21: Comparison of ASaTS funding options

	Option 1: Capital injection (not repaid)	Option 2: Crown capital loan repaid with ASaTS depreciation reserves	Option 3: Memorandum surpluses and reserves with repayable capital loan for funding shortfall
Crown capital injection amount [31]	$[redacted]	$[redacted] *(for the Crown-owned land register)*	$[redacted] *(for the Crown-owned land register)*
Crown capital loan amount [32]	[redacted]	$[redacted]	• $[redacted] if fees are increased in FY[redacted] • $[redacted] if fees are increased in FY[redacted]
Impact on the Crown	The $[redacted] capital injection will not be repaid. It will have a fiscal impact on the Crown balance sheet.	The capital loan will be repaid in full by the end of FY 2026. Repayment within the 10 year timeframe makes this fiscally neutral to the Crown. Depreciation reserves will not be available within LINZ for the next investment cycle – requiring a commitment from the Crown for future replacements/ enhancements.	The capital loan will be repaid in full by the end of FY 2026. Repayment within the 10 year timeframe makes this fiscally neutral to the Crown. This option will ensure depreciation reserves are accumulated for the next investment cycle.
Impact on third party users	Estimated a fee increase of [redacted]%–[redacted]% in FY [redacted] Third party users will be charged up to $[redacted] in capital charge costs over the life of the asset. This is significantly larger than under the other funding options.	Estimated a fee increase of [redacted]%–[redacted]% in FY [redacted] The capital charge cost to third parties will reduce as the loan repayments are made – which results in a reduced (whole-of-life) capital charge expense of up to $[redacted]	Scenario 1 – estimated a fee increase of [redacted]%–[redacted]% if fees increase in FY [redacted], and a whole-of-life capital charge cost of up to $[redacted] Scenario 2 – estimated a fee increase of [redacted]%–[redacted]% if fees increase in FY [redacted], and a whole-of-life capital charge expense of $[redacted].
Policy implications	This funding approach is consistent with cost recovery principles and guidance on the appropriate use of memorandum accounts. However, it has the largest fiscal impact on the Crown and customers are paying the largest amount of capital charge.	This option does not align with Cabinet expectations that departments will accumulate depreciation on their balance sheet to fund future asset replacement.	Fee payers will pay for two investment cycles over the life of the ASaTS asset – once for the ASaTS capital build and again for the accumulated depreciation for the next cycle.

FUNDING THE CROWN-OWNED LAND REGISTER

The benefits derived from the Crown-owned land register accrue largely to the Crown, rather than to third party users. Under all funding options a Crown capital investment of $[redacted] will be required for the implementation of this register. Based on who the benefits of this investment accrues to, [redacted] percent of ongoing operating costs are assumed to be funded by the Crown, with the remaining [redacted] percent funded by third party users. An annual Crown operating appropriation increase of approximately $[redacted] from FY [redacted] onwards is required for LINZ to cover the Crown portion of the increased operating costs.

6.3.2 Option 1: Crown capital injection (not repaid)

Under this option, ASaTS capital costs will be funded through a Crown capital injection of up to $[redacted] and $[redacted] of Landonline depreciation reserves. The capital injection will

[31] At QRA 85th percentile cost point.

[32] At QRA 85th percentile cost point.

not be repaid and LINZ will accumulate depreciation related revenues from survey and title fee payers to fund the replacement of the asset. This funding approach is consistent with cost recovery principles and guidance on the appropriate use of memorandum accounts. However, it has the largest fiscal impact on the Crown and third party users pay the largest amount of capital charge.

It is proposed that operating costs (and associated depreciation and capital charges) be funded through third party (fee) revenue, with the exception of the expenditure relating to the Crown-owned land register which will be funded through a Crown appropriation. This funding approach has been applied to both the 50th and 85th percentile QRA costs shown in Table 22.

Based on the financial modelling, an increase in third party user fees between [redacted]% to [redacted]% is estimated to be required in FY[redacted], to fund the increased ASaTS operating costs associated with capital charge and depreciation.

Table 22: ASaTS costs and funding requirements (under funding option 1)

Expenditure category ($[redacted])	Cost at the QRA 50th percentile	Cost at the QRA 85th percentile
Fee increase required	[redacted]%	[redacted]%
Project period costs		
Capital expenditure*	[redacted]	
Operating expenditure (ASaTS)		
Operating expenditure (Crown-owned land register)		
Total project period costs		
Plus: project period depreciation and capital charge		
Depreciation and capital charge (ASaTS)	[redacted]	
Depreciation and capital charge (Crown-owned land register)		
Total funding requirements over project period		
Funded from:		
Capital expenditure		
LINZ depreciation reserves	[redacted]	
Crown capital injections		
Operating expenditure, depreciation and capital charge		
Third party revenue		
Crown appropriation**		
Total funding sources	[redacted]	

* Including $[redacted] associated with the development of a Crown owned land register.

** A Crown appropriation is required to cover a portion of the operating costs, capital charge and depreciation relating to the Crown owned land register.

Table 22 outlines the project period funding requirements under funding option 1, which shows the need at the 50th percentile QRA cost point for:

- A **Crown capital injection** of $[redacted] to fund capital project period costs of $[redacted]. The remaining capital cost will be funded through $[redacted] of LINZ depreciation reserves.
- **ASaTS operating expenditure** of $[redacted] to be covered by third party user fees. This is made up of $[redacted] of general ASaTS operating expenditure, along with the associated depreciation and capital charge of $[redacted] over the project period.

- An increase in Crown operating appropriation to fund the Crown costs associated with the **Crown-owned land register** (this is [redacted] percent of the Crown land register operating costs, with [redacted] percent being charged to third parties). Project period costs are estimated at $[redacted] for ongoing operations, along with $[redacted] for associated capital charge and depreciation. An annual Crown operating appropriation increase of approximately $[redacted] from FY [redacted] onwards is required to cover the Crown's share of these costs.

While the 50th percentile QRA cost has been identified as the expected cost, an appropriate level of contingency in project funding arrangements needs to be included. Therefore project period costs of $[redacted] (QRA 85th percentile) have been used as the basis for the funding commitments (and associated delegations). Project period costs at this level will require a Crown capital injection of $[redacted].

6.3.3 Option 2: Crown capital loan repaid with ASaTS accumulated depreciation

The difference between this option and option 1 is that, instead of accumulating ASaTS depreciation to fund future asset replacement, LINZ will use ASaTS depreciation to repay the initial capital contribution from the Crown.

Under this option the Crown provides a repayable capital loan of up to $[redacted], with a further capital injection of $[redacted] relating to the Crown-owned land register (which will not be repaid). It is proposed that LINZ will repay the capital loan with ASaTS depreciation flows charged to survey and title fee payers throughout the life of the investment.

REQUIREMENT TO REPAY CROWN CAPITAL LOAN BY FY [redacted] (TO BE FISCALLY NEUTRAL TO THE CROWN)

For this loan to be fiscally neutral to the Crown, it is required to be repaid by the end of FY [redacted]. As the useful life of ASaTS extends out to the end of FY [redacted], LINZ expects to have approximately $[redacted] (at the QRA 85th percentile) of depreciation funding available to repay the $[redacted] in FY 2026. This leaves a repayment shortfall of approximately $[redacted] relating to depreciation flows expected to be generated in FY [redacted] and FY [redacted]

As a result of this depreciation timing difference, LINZ will need to make a one-off repayment of the $[redacted] shortfall at the end of FY [redacted]. The proposed funding source for this one-off repayment is a loan from the survey and title memorandum account which will be repaid with ASaTS accumulated depreciation over the remaining two years of the asset's life. The Treasury has advised that this approach is consistent with the acceptable use of memorandum accounts.

ALIGNMENT WITH EXPECATION ON ACCUMULATING DEPRECIATION FOR FUTURE ASSET REPLACEMENT

This funding approach is consistent with cost recovery principles and guidance on the appropriate use of memorandum accounts. However, it will not provide any accumulated depreciation funds for the replacement of ASaTS in the future. This option therefore does not align with the Cabinet's expectations that departments will accumulate depreciation on their balance sheet to fund future asset replacement[33].

Future asset replacement will be required to be funded in a similar manner, as LINZ will have no accumulated depreciation reserves to draw on for the investment cycles following ASaTS. In addition, the flexibility of being able to make minor enhancements to ASaTS throughout its life will be removed. The need for minor enhancements can be caused by a variety of factors, such as changes to cadastral survey rules. Any enhancements will require further capital injections from the Crown. If this funding option is selected, an arrangement for funding minor

[33] Cabinet funding expectations (CAB Min (12) 10/3A)

enhancements will be established so as not to disrupt operations or to foster dysfunctional behaviour in terms of accounting treatment.

Table 23 outlines the ASaTS costs and funding requirements under this funding option. Based on the financial modelling, an increase in third party user fees of between [redacted]% to [redacted]% is estimated to be required in FY [redacted]. The fee increase required is lower than that under option 1 (fee increase of [redacted]% to [redacted]%) as the capital charge reduces as the capital loan is repaid over the life of the asset.

Table 23: ASaTS costs and funding requirements (under funding option 2)

Expenditure category ($[redacted])	Cost at the QRA 50th percentile	Cost at the QRA 85th percentile
Fee increase required	[redacted]%	[redacted]%
Project period costs		
Capital expenditure*	[redacted]	
Operating expenditure (ASaTS)		
Operating expenditure (Crown-owned land register)		
Total project period costs		
Plus: project period depreciation and capital charge		
Depreciation and capital charge (ASaTS)	[redacted]	
Depreciation and capital charge (Crown-owned land register)		
Total funding requirements over project period		
Funded from:		
Capital expenditure		
LINZ depreciation reserves	[redacted]	
Crown loan (repaid)		
Crown capital injection for Crown-owned land register		
Operating expenditure, depreciation and capital charge		
Third party revenue	[redacted]	
Crown appropriation**		
Total funding sources	[redacted]	

* Including $[redacted] associated with the development of a Crown owned land register.

** A Crown appropriation is required to cover a portion of the operating costs, capital charge and depreciation relating to the Crown owned land register.

Table 23 outlines the project period funding requirements under funding option 2, which shows the need for:

- A **Crown capital loan** of up to $[redacted] with a non-repayable capital injection of $[redacted] for the Crown-owned land register. The remaining capital cost will be funded through $[redacted] of LINZ depreciation reserves. The capital loan will be repaid in full (with ASaTS depreciation funding and a one-off additional repayment of $[redacted]) by the end of FY [redacted].
- **ASaTS operating expenditure** will be paid for by third party user fees. This is broken down by ASaTS operating expenditure, along with the associated depreciation and capital charge over the project period.
- An increase in Crown operating appropriation from FY [redacted] to fund the Crown costs associated with the **Crown-owned land register** (as outlined in option 1).

6.3.4 Option 3: Third party funded, supplemented with a repayable Crown capital loan

Funding option 3 has been developed to provide a funding arrangement that significantly reduces the fiscal impact on the Crown, and ensures accumulated depreciation is available for the investment cycles following ASaTS. This option also results in survey and title customers paying the least amount of capital charge.

Under this funding option, ASaTS capital cost will be funded through $9.3 million depreciation reserves, available third party memorandum account reserves and surpluses, and a repayable Crown capital loan for the funding shortfall during the project period.

The capital loan will be repaid in full through charges to third party users by the end of FY 2026 (i.e. the capital investment will be repaid within 10 years of the loan agreement being established, making this fiscally neutral to the Crown).

This funding option is expected to require an increase in third party user fees to ensure there is sufficient funding for the ASaTS investment and for repayment of the capital loan. The amount of capital loan required and the expected level of the fee increases depend on when the fee increase is introduced. LINZ has considered a number of alternative dates for the fee increase – the two preferred dates are either at the start of FY[redacted] or at the start of FY [redacted].

Based on the financial modelling, an increase in third party user fees of between[redacted]% to [redacted]% is estimated to be required if a fee increase is introduced in FY [redacted], and between [redacted]% to [redacted]% if the fee increase occurs in FY [redacted]. The fee increase will fund the increased ASaTS operating costs as well as the capital build cost.

LINZ will seek an exemption from paying a capital charge on the portion of the ASaTS investment funded by third party user fees. This would mean the capital charge would only be payable on the outstanding balance of the Crown loan. This is discussed in further detail later in this section.

Table 24 sets out the modelled costs and funding sources under funding option 3, for the two fee increase scenarios, at both the 50th and 85th percentile QRA cost points.

Table 24: ASaTS costs and funding requirements (under the two alternative third party funded fee increase scenarios)

Expenditure category ($[redacted])	Fee increase in FY 19		Fee increase in FY 21	
	Cost at the QRA 50th percentile	Cost at the QRA 85th percentile	Cost at the QRA 50th percentile	Cost at the QRA 85th percentile
Fee increase required - FY19	[redacted]%	[redacted]%		
Fee increase required - FY21			[redacted]%	[redacted]%
Project period costs				
Capital expenditure*	[redacted]	[redacted]	[redacted]	[redacted]
Operating expenditure (ASaTS)	[redacted]	[redacted]	[redacted]	[redacted]
Operating expenditure (Crown-owned land register)	[redacted]	[redacted]	[redacted]	[redacted]
Total project period costs	[redacted]	[redacted]	[redacted]	[redacted]
Plus: project period depreciation and capital charge				
Depreciation and capital charge (ASaTS)	[redacted]	[redacted]	[redacted]	[redacted]
Depreciation and capital charge (Crown-owned land register)	[redacted]	[redacted]	[redacted]	[redacted]
Total funding requirements over project period	[redacted]	[redacted]	[redacted]	[redacted]
Funded from:				
Capital expenditure				
LINZ depreciation reserves	[redacted]	[redacted]	[redacted]	[redacted]
Survey and title memorandum account	[redacted]	[redacted]	[redacted]	[redacted]
Crown loan (repaid)	[redacted]	[redacted]	[redacted]	[redacted]
Crown capital injection for Crown-owned land register	[redacted]	[redacted]	[redacted]	[redacted]
Operating expenditure, depreciation and capital charge				
Third party revenue	[redacted]	[redacted]	[redacted]	[redacted]
Crown appropriation**	[redacted]	[redacted]	[redacted]	[redacted]
Total funding sources	[redacted]	[redacted]	[redacted]	[redacted]

* Including $[redacted] associated with the development of a Crown owned land register.

** A Crown appropriation is required to cover a portion of the operating costs, capital charge and depreciation relating to the Crown owned land register.

As is the case under funding option 1 and 2, the QRA 85th percentile is used as the basis for the expected funding commitments required.

Table 24 outlines the project period funding requirements under the two third party funded fee increase scenarios, which show the need for:

- A **Crown capital loan** of up to $[redacted] under the FY [redacted] fee increase scenario, and up to $[redacted] under the FY [redacted] fee increase scenario (both at the QRA 85th percentile). The remaining capital cost will be funded through $[redacted] of LINZ depreciation reserves and third party user fees. The capital loan will be repaid in full (with memorandum account surpluses) by the end of FY [redacted].
- **ASaTS operating expenditure** will be paid for by third party user fees. This is broken down by ASaTS operating expenditure, along with the associated depreciation and capital charge over the project period. The only component that is variable, based on the fee increase scenario, is capital charge. Capital charge is based on the Crown bridging loan balance. At the QRA 85th percentile cost this comes to a project period expense of $[redacted] under the FY [redacted] fee increase scenario and $[redacted] under the FY [redacted] fee increase scenario.
- As is the case under funding option 1, an increase in Crown operating appropriation to fund the Crown costs associated with the **Crown-owned land register** (this is [redacted] percent of the operating costs, with [redacted] percent being charged to third parties). Project period costs are estimated at $[redacted] for ongoing operations, along with $[redacted] for the associated capital charge and depreciation. An annual Crown operating appropriation increase of approximately $[redacted] from FY [redacted] onwards is required to cover the Crown's share of these costs.

ALIGNMENT WITH GOVERNMENT GUIDELINES ON COST RECOVERY AND THE USE OF MEMORANDUM ACCOUNTS

Along with the difference in capital loan and fee increase requirements, the two third party funded fee increase scenarios have different levels of compliance with government guidelines on charging fees and the use of memorandum accounts.

Treasury and Auditor-General guidelines set out the expectations for how agencies should approach cost recovery for third party funded services:

- There must be an empowering provision that allows the regulations to be set.
- The regulations can only do what the relevant Act states they can. If the relevant Act only allows for cost recovery, the regulations cannot allow for additional money to be charged; the fees cannot be excessive.
- The same user group must be charged if capital expenditure is recovered as part of user charges over a period of time. Fee payers must face the true costs involved to them.
- Charges for services provided by Crown agencies that exceed the costs of providing those services could be seen as a tax.

Neither of the third party funded scenarios aligns with guidance on cost recovery and the administration of agency memorandum accounts. The two main issues are:

- *Fees should reflect the true costs of operating Landonline*: Under the third party fee options, fees will be increased when a large memorandum account surplus currently exists. Consequently, fee payers will not be paying the true cost of operating Landonline as the guidelines require.
- *Equity*: In the early stages of the ASaTS build, fee payers will pay for services they will not benefit from and, in the process, subsidise future fee payers. And, in building a surplus to repay the capital loan, fee payers will in effect be charged twice – as they will pay the capital cost of the ASaTS implementation as well as the depreciation funding for the next investment cycle.

The automation levy used to fund the original Landonline build set a precedent for the use of third party funding for capital projects. Notwithstanding that the levy was approved by the Cabinet, the Regulations Review Committee subsequently ruled the levy breached Parliament's Standing Orders because fee regulations were imposed in a way that was unusual or unexpected. Although there are differences between the automation levy and proposals being considered here, the Committee may take a similar view.

Equity issues are mitigated (in particular relating to the FY [redacted] fee increase) because a wider group of fee payers will contribute to the repayment of the capital loan by FY 2026. This will address one of the concerns the Regulations Review Committee had in 1999 about the Landonline automation levy (the Committee said the Cabinet should have been given an option of spreading the levy over a longer period). Ideally, capital costs should be spread across the lifetime of the asset (in this case 10 years).

Some new services will be introduced in FY 2019 (mortgage notification, notice of sale and web-based searching). These services will, over the life of ASaTS, provide 57% of the total quantified economic benefits. A fee increase introduced at the start of FY 2021 would mean services available at this point in time will provide 69% of the quantified benefits over the life of ASaTS. Note that all services that contribute to the estimated $[redacted] to $[redacted] in quantified economic benefits are estimated to have commenced by December 2020.

POTENTIAL IMPACT OF THIRD PARTY REVENUE FLOWS ON THE CROWN LOAN FUNDING REQUIREMENT

- The size of the capital loan required is contingent on estimated survey and title third party revenue flows. A conservative view on third party transaction forecast data has been taken, due to the volatile nature of the property market. Historically there has been significant variability between the forecast and actual volumes, especially when forecasting out more than 4 years.
- If survey and title transaction volumes are significantly less than forecasted, LINZ may require an increase in the Crown capital loan and a subsequent increase in fees to repay the loan within the required time. It is proposed that any additional Crown funding required will be allocated in subsequent Budget years and will be repaid in full by FY 2026.

CAPITAL CHARGE EXEMPTION REQUIRED FOR THE THIRD PARTY FUNDED PORTION OF ASaTS

A capital charge applies to departmental net assets. ASaTS will be a Crown-owned departmental asset and, unless an exemption is granted, ASaTS will be included in the net asset calculation for capital charge obligations.

Under this funding option, third party users fund the development of ASaTS. Imposing a capital charge on the portion of the investment funded by survey and title fee payers is punitive and is not aligned to the intent of the capital charge regime.

Therefore a partial exemption from capital charge for the portion of capital costs funded by fee payers will be sought. In practice this will mean the capital charge will only be payable on the outstanding balance of the capital loan from the Crown (i.e. total advances to LINZ from the Crown less any repayments made).

All of the affordability outputs presented in this paper assume a capital charge exemption will be granted for the portion of the ASaTS capital costs funded by survey and title customers.

6.3.5 Comparison of the funding options

Table 25 provides a comparison of the different features of the three funding options.

Table 25: Comparison of ASaTS project funding options

Consideration	Option 1: Crown capital injection (not repaid)	Option 2: Crown capital loan, repaid with ASaTS accumulated depreciation	Option 3: third party funded, supplemented with repayable Crown capital loan	
			Fee increase in FY [redacted]	Fee increase in FY [redacted]
Financial considerations				
Capital injection	The Crown provides a capital injection of up to $[redacted]	The Crown provides a capital injection of up to $[redacted] ($[redacted] to be repaid and $[redacted] for the Crown land register that will not be repaid).	The Crown provides a capital injection of up to $[redacted] ($[redacted] to be repaid and $[redacted] for the Crown land register that will not be repaid).	The Crown provides a capital injection of up to $[redacted] ($[redacted] to be repaid and $[redacted] for the Crown land register that will not be repaid).
Net debt (Crown)	Providing a capital injection for ASaTS is likely to have a negative impact on the Crown's net debt position. The amount of capital required under option 3 is significantly lower than that under options 1 and 2. The capital injections under options 2 and 3 will be repaid by the end of FY			
Net worth (LINZ)	Net worth increases by $[redacted] with the capital injection, and then moves in line with memorandum account surpluses/deficits.	Net worth initially increases by $[redacted] from the capital injection, but decreases as the capital loan portion is repaid to the Crown.	Net worth initially increases by $[redacted] from the capital injection, but decreases as the capital loan portion is repaid to the Crown.	Net worth initially increases by $[redacted] from the capital injection, but decreases as the capital loan portion is repaid to the Crown.
Depreciation funding	LINZ will accumulate depreciation funding over the life of the asset.	LINZ will use accumulated depreciation funding to repay the capital loan. This means there will be no depreciation funding available to fund asset enhancements and future replacements.	LINZ will accumulate depreciation funding over the life of the asset.	
Repayments	No repayments will be made to the Crown.	LINZ will repay the capital loan ($[redacted]) with ASaTS depreciation funds available, supplemented with a one-off repayment from the memorandum account for the depreciation shortfall at the end of FY 2026.	LINZ will repay the capital bridging loan ($[redacted]) from FY [redacted] to FY [redacted]	LINZ will repay the capital bridging loan ($[redacted]) from FY [redacted] to FY [redacted]

Consideration	Option 1: Crown capital injection (not repaid)	Option 2: Crown capital loan, repaid with ASaTS accumulated depreciation	Option 3: third party funded, supplemented with repayable Crown capital loan	
			Fee increase in FY [redacted]	Fee increase in FY [redacted]
Capital charge/ financing costs	An increase in the capital charge appropriation will be required in line with the capital injection. This will be paid for by user charges and will not change over time. Whole-of-life capital charges are expected to be approximately $[redacted] (at the QRA 85th percentile).	Capital charge will increase in line with the Crown loan, but will then decrease as capital repayments are made. Whole-of-life capital charges are expected to be approximately $[redacted] (at the QRA 85th percentile).	Capital charge will increase in line with the Crown loan, but will then decrease as capital repayments are made. Whole-of-life capital charges are expected to be approximately $[redacted] (at the QRA 85th percentile).	Capital charge will increase in line with the Crown bridging loan, but will then decrease as capital repayments are made. Whole-of-life capital charges are expected to be approximately $[redacted] (at the QRA 85th percentile).
Minor asset enhancements	Any capital enhancements over the life of the ASaTS asset will be funded by accumulated depreciation.	Any future enhancements will require a capital injection from the Crown, which will be repaid in a similar manner to the initial capital injection.	Any capital enhancements over the life of the ASaTS asset will be funded by accumulated depreciation.	
Asset replacement	Future asset replacement will be largely funded through accumulated depreciation funding from the LINZ balance sheet.	Future asset replacement will need to be funded with an upfront capital loan from the Crown, which will be repaid through accumulated depreciation over the life of the investment.	The future asset replacement will be largely funded through accumulated depreciation funding from the LINZ balance sheet.	
Principle/policy considerations				
Cost recovery (principle)	The Crown will fund the current investment, and users will fund depreciation, which will be used to fund the future asset replacement.	Users will fund the cost of the existing asset (both capital and financing) over the life of the asset.	Users will fund the cost of the existing asset (both capital and operating) over the life of the asset. Users' contributions to depreciation funding will be used to fund the future asset replacement.	

Consideration	Option 1: Crown capital injection (not repaid)	Option 2: Crown capital loan, repaid with ASaTS accumulated depreciation	Option 3: third party funded, supplemented with repayable Crown capital loan	
			Fee increase in FY [redacted]	Fee increase in FY [redacted]
Equity between current and future users (principle)	The principle of equity between current and future users is met, as users are only funding the depreciation of the investment when each component is capitalised. This means they will only start to pay when they begin to accrue the benefit. User fees will be managed to ensure fees are kept on a cost recovery basis.	The principle of equity between current and future users is met, as users are only funding the depreciation of the investment when each component is capitalised. This means they will only start to pay when they begin to accrue the benefit. User fees will be managed to ensure fees are kept on a cost recovery basis.	As the full ASaTS system will not be in use until FY 2021, users will be paying for some benefits they have not yet received. Based on the timeframe for when the quantified benefits are expected to be introduced, services to accrue 57% of the total quantified economic benefits are expected to have commenced by the start of FY [redacted] (when the fee increase will be introduced). Fee payers will fund the capital costs associated with the implementation of ASaTS as well as the depreciation associated with the next investment cycle.	Over the life of ASaTS fee payers will fund the capital costs associated with the implementation of ASaTS as well as the depreciation associated with the next investment cycle.
Minimising the fiscal impact on the Crown (principle)	The Crown will fund the capital injection. Future assets arising from user charges will offset the Crown's debt position. However, it will remain on the LINZ balance sheet and be inaccessible to the Crown.	During the project period, the capital impact on the Crown will be up to $[redacted] (relating to the capital loan as well as to the $[redacted] Crown land register capital injection). LINZ will repay the capital loan in full by the end of FY [redacted] The net fiscal impact of the capital loan on the Crown over the life of the ASaTS asset will be nil.	During the project period, the capital impact on the Crown will be up to $[redacted] (relating to the capital loan as well as to the $[redacted]). LINZ will repay the capital loan in full by the end of FY [redacted] The net fiscal impact of the capital loan on the Crown over the life of the ASaTS asset will be nil.	During the project period, the fiscal capital impact on the Crown will be up to $[redacted] (relating to the capital loan as well as to the $[redacted] Crown land register capital injection). LINZ will repay the capital loan in full by the end of FY 2026.The net fiscal impact on the Crown over the life of ASaTS will be nil.
Cabinet funding expectations (CAB Min (12) 10/3A)	This option aligns with Cabinet expectations that departments will accumulate depreciation on their balance sheet to fund future asset replacement.	This option does not align with Cabinet expectations that departments will accumulate depreciation on their balance sheet to fund future asset replacement.	This option aligns with Cabinet expectations that departments will accumulate depreciation on their balance sheet to fund future asset replacement.	

6.4 Proposed project expenditure delegations

LINZ proposes three levels of delegation in respect of authorising ASaTS project expenditure. These delegations reflect the outcome of the QRA and are the same under all three funding options. Note that the proposed delegated project period cost levels are exclusive of both capital charge and depreciation.

It is proposed that:

- LINZ Chief Executive has delegated authority to approve ASaTS project period costs of [redacted].
- Joint Ministers (Minister of Finance and Minister for Land Information) have delegated authority to approve project period expenditure [redacted].
- Expenditure over the 85th percentile ($[redacted]
- Figure 20 illustrates the relationship between risk adjusted project period costs and the delegation levels outlined above.

Figure 20: Delegation limits for project period costs (excluding capital charge and depreciation)

6.5 Approach to funding the base case and option 6A

If the base case or option 6A is selected to proceed rather than the preferred investment option, it is proposed that each of these options will be funded using the same principles outlined for the preferred investment option. This would include the following funding options:

- Option 1 – a Crown capital injection that is not repaid
- Option 2 – a Crown capital loan, repaid using ASaTS accumulated depreciation funds
- Option 3 – memorandum account surpluses/reserves applied to the ASaTS investment, supplemented with a repayable Crown capital loan, and with a fee increase in either FY [redacted] or FY [redacted].

A QRA has not been performed for the base case and option 6A. If the base case or option 6A were to be progressed, a QRA will need to be performed to determine the expected project period cost and the required level of contingency to inform the request for capital funding from the Crown.

7 Commercial case

This section discusses the current approach to the delivery of survey and title services, as well as the commercial and procurement considerations relevant to the ASaTS project.

7.1 Current commercial model

7.1.1 Machinery of Government model

LINZ is a government department and has no profit making objectives.

7.1.2 Funding of LINZ services

SURVEY AND TITLE SERVICES

Survey and title services are required to operate on a cost recovery basis, with revenue generated through fees to users of Landonline for transactional services and regulated survey and title information products.

LINZ (and ultimately the New Zealand Government) currently bears all the short-term revenue risk associated with fluctuations in transaction volumes, which are highly variable. In 2008 there were record low property transaction volumes resulting from the global financial crisis. LINZ sought, and received, two capital loans from the Crown to address the fact the costs of providing survey and title services exceeded the revenue received and cash available. These capital injections were fully repaid by December 2013.

DATA DISSEMINATION

LINZ makes its primary data (including survey and title data) available for free through the LDS. This approach is consistent with:

- the New Zealand Data and Information Principles, which state that government data and information should be open, readily available, well managed, reasonably priced, and reusable unless there are necessary reasons for its protection[34]
- the Declaration on Open and Transparent Government, which states that the Government commits to actively releasing high value public data[35]
- a Cabinet decision that primary survey and title data be priced to cover costs of dissemination (i.e. a profit should not be made from disseminating primary data)[36]
- a Cabinet directive to create a national spatial data infrastructure.[37]

The costs of data dissemination are met by Crown funding.

OTHER LINZ SERVICES

The majority of other services offered by LINZ are funded by the Crown, with some LINZ functions part funded through third party fees (e.g. the Overseas Investment Office).

[34] Cabinet Minute. CAB Min 29/12.

[35] Declaration on Open and Transparent Government. (2011). Retrieved from: http://ict.govt.nz/guidance-and-resources/open-government/declaration-open-and-transparent-government/

[36] Cabinet Minute. CAB (97) M 27/2B.

[37] EGI Min (10) 30/14.

7.1.3 Delivery model – role of LINZ and role of private sector

LINZ'S ROLE IN THE DELIVERY OF SURVEY AND TITLE SERVICES

LINZ delivers all frontline survey and title services via:

- Landonline
- a contact centre (which provides advice on registration, cadastral requirements and how to use Landonline)
- Customer Service Officers (who provide over the counter support, obtain manual records, conduct searches for non-Landonline users)
- survey and title advisors and technical staff.

This delivery model was adopted because it was considered important for LINZ to hold a close relationship with its customers and with its regulatory functions.

Approximately 170 LINZ FTEs are involved in the frontline delivery of survey and title services, delivered through LINZ's Hamilton and Christchurch offices.

Survey and Titles Operations staff time is spent in this way:

- Approximately 30 percent of their time is spent on the technical processes for supporting the registration of land title dealings and the lodgement/approval of survey plans.
- The remaining 70 percent of their time is spent processing survey and title transactions.

ROLE OF THE PRIVATE SECTOR IN THE DELIVERY OF SURVEY AND TITLE SERVICES

The majority of survey and title activities are carried out online by LINZ's customers. Given the focus on electronic delivery, LINZ relies heavily on technology to deliver its services. LINZ outsources the majority of its ICT services – including Landonline services and corporate ICT support – and has done so for a number of years. LINZ has always contracted third party expertise for coding business rules into the PowerBuilder language.

[redacted]

7.1.4 Comparison with international delivery models

As part of the development of the DBC, research was conducted about how other jurisdictions deliver survey and title services to inform the potential delivery models for ASaTS. Like LINZ, many of the government agencies examined contract with a private sector organisation to deliver ICT services, but the government agency retains responsibility for the provision of frontline services. Teranet, a private sector organisation operating in Ontario and Manitoba, Canada, also delivers frontline title services to customers (to a different extent in each state) under a long-term concession model. The key driver leading to greater involvement of the private sector internationally has been to generate additional funds for the respective governments.

7.2 Proposed commercial model

7.2.1 Funding of survey and title services

Following the property market slump in 2008, LINZ considered whether a different funding model should be adopted for survey and title services (e.g. implementation of an industry levy). The current user pays model was deemed to be the most appropriate given that those who use the survey and title services LINZ offers directly benefit from them. It was also deemed the most practical model to implement.

On the basis of the work recently done, LINZ has not considered alternative funding models for the ongoing delivery of survey and title services. Section 6.3 outlines the potential funding options for ASaTS.

7.2.2 Delivery model – role of LINZ and role of private sector

LONG LIST OF OPTIONS

In the context of the ASaTS project, LINZ has considered a range of options for the roles of LINZ and the private sector in the delivery of survey and title services. Each of the seven options considered in the initial desktop assessment phase is represented in Table 26.

Table 26: Delivery model options

Service	Delivery options						
	Option 1: Traditional public sector procurement	Option 2: Design and build	Option 3: Provide and maintain *Current LINZ model and preferred option	Option 4: Provide, maintain and operate	Option 5: Concession	Option 6: Joint venture with a government agency with similar functions to LINZ	Option 7: Divestment
Design	Government	Private	Private	Private	Private	Government/Private	Private
Build	Government	Private	Private	Private	Private	Government/Private	Private
Test	Government	Private	Private	Private	Private	Government/Private	Private
Implement	Government	Government/ Private	Private	Private	Private	Government/Private	Private
Finance	Government	Government	Government	Government	Private	Government/Private	Private
Operate (frontline service delivery)	Government	Government	Government	Private	Private	Government/Private	Private
Maintain	Government	Government	Private	Private	Private	Government/Private	Private
Own	Government	Government	Government/Private	Government/Private	Private	Government/Private	Private
Transfer	N/A	N/A	N/A	N/A	Government	Government	N/A
Basis of compensation for contractor	Services rendered	Services rendered	Services rendered and/or results	Services rendered and/or results	Results	Services rendered and/or results	N/A
Typical contract duration	<5 years	<5 years	5-15 years	5-15 years	10-30 years	Depends on involvement of private sector	N/A

SHORTLISTED OPTIONS

As a result of desktop assessment, three options (options 1, 6 and 7) were removed from further consideration on the basis they were not suited to the requirements of the ASaTS project. A high-level summary of the shortlisted options is provided below.

Design and build (Option 2)

The private sector provider(s) designs, builds, and tests the solution following the requirements specified by LINZ. The private sector provider(s) and LINZ are responsible for the implementation. LINZ will own the asset post-development and will be responsible for frontline service delivery, along with maintenance and support.

Provide and maintain (Option 3)

The private sector provider(s) designs, builds, tests and implements the solution and is also responsible for ongoing maintenance and support. Responsibility for ongoing frontline service delivery will remain the responsibility of LINZ.

Provide, maintain and operate (Option 4)

The private sector provider(s) designs, builds, tests and implements the solution and is also responsible for frontline service delivery, along with maintenance and support.

Concession (Option 5)

The private sector provider(s) designs, builds, tests, implements and finances the solution and is also responsible for frontline service delivery as well as maintenance and support. The concession model is typically characterised by an agreement of an extended term (i.e. beyond that of the agreements used under alternative options) and by ownership of the relevant assets (with the exception of the underlying data) by the provider.

APPROACH TO THE ASSESSMENT OF SHORTLISTED OPTIONS

The approach to the assessment of the shortlisted delivery models was based on a number of policy, strategy and commercial objectives and principles developed by LINZ for the purposes of the ASaTS project.

Specifically, each of the four shortlisted delivery model options was assessed against three broad criteria:

- *Viable*: Is the approach suitable to the requirements and specification of ASaTS? This assessment involved a review of the options against the requirements and specifications of ASaTS.
- *Desirable*: Does the approach support the objectives of ASaTS and, in this context, do the benefits of the approach outweigh any disadvantages? This assessment required a review of the options against the strategic and commercial principles developed for ASaTS.
- *Achievable*: Do the private sector and LINZ have the capability to implement and operate the solution? Is there sufficient market interest to ensure a competitive procurement process? This assessment drew on the RFI responses (discussed in Section 7.3) and additional market testing, together with an assessment of relevant international examples/models.

PREFERRED DELIVERY MODEL OPTION (PROVIDE AND MAINTAIN)

Following the viability, desirability, and achievability assessment processes outlined above, the 'provide and maintain' (Option 3) model was identified as the preferred delivery model in the context of ASaTS and for the ongoing delivery of survey and title services.

Primary features of preferred delivery option

As indicated, the provide and maintain model is predicated on:

- the private sector provider(s) being responsible for the design, build, test, implementation, maintenance and support of the solution
- LINZ retaining responsibility for frontline service delivery, while also providing a base level of support for the solution.

The preferred option equates to a continuation of the current delivery model. It should be noted that, while the current delivery model has been identified as the preferred option for ASaTS, LINZ does not have a preference as to the identity of the provider of the solution.

Why the provide and maintain delivery model is preferred

The provide and maintain delivery model has a number of key advantages:

- The private sector provider(s) integrates maintenance and the ongoing development of the solution with design and implementation, thereby achieving greater whole-of-life efficiencies and effectiveness, and contributing to the optimisation of whole-of-life costs.

- A partial risk transfer occurs – the private sector provider(s) assumes development, implementation and maintenance risks, while LINZ retains all operational and revenue risks.
- It facilitates a collaborative relationship between LINZ and the private sector provider(s) through the design, build and service stages of the contract to leverage capability, knowledge and expertise.

These advantages have been balanced against the perceived disadvantages of this delivery model, including the theory that private sector providers are likely to have more incentive to extract efficiencies in frontline service delivery (and to optimise whole-of-life costs) under alternative models with greater private sector involvement.

The provide and maintain delivery model meets the three broad assessment criteria as follows:

- *Viable*: The outcomes required from the solution can be specified in a contract and change parameters can be built in to provide flexibility. In addition, this delivery model – to the extent it reflects that currently adopted by LINZ – has proven itself to be viable.
- *Desirable*: The incentives and risk transfer provided for by this delivery model means whole-of-life costs and service benefits will be captured. Frontline and regulatory functions are strategically important to LINZ, and LINZ has demonstrated it has the necessary capability to deliver these functions.
- *Achievable*: The market engagement process (as outlined in further detail in Section 7.3) demonstrated that the private sector has sufficient capacity, capability, and interest in the ASaTS project to ensure a competitive procurement process. In addition, LINZ has considerable experience with this approach, including the delivery of frontline functions.

WHY OPTIONS INVOLVING GREATER INVOLVEMENT OF THE PRIVATE SECTOR WERE NOT PREFERRED

There are a range of reasons why the current delivery model was preferred over options which involve a greater role for the private sector, such as the concession model adopted in Ontario and Manitoba.

- LINZ is a government department and has no profit motive and therefore no driver to generate revenue beyond what is needed to cover costs. An important consideration to a private sector provider will be their ability to derive revenue from (a) core survey and title transactions, (b) primary data built up from transactions, and (c) value added services such as data products. A private sector provider will have the incentive to generate significant revenue from core survey and title transactions by increasing the costs of these services. By way of example, fees charged by Teranet in Ontario are significantly higher than those charged by LINZ (e.g. $C30 per title search in Ontario compared to NZ$5 per title search in New Zealand).
- To derive revenue from value added services such as data products, a private sector provider will likely seek exclusive or preferential rights to commercialise or to on-sell the data which underpins survey and title services. However, it is strategically important to LINZ (and consistent with New Zealand Government policy) to make such data available to the public.
- LINZ's survey and title services are delivered online, allowing for efficiencies to be secured across the organisation (i.e. by a reduction in the number of physical offices and associated employee numbers). In this way, LINZ has already extracted many of the efficiencies a private sector operator may be looking to extract in providing frontline services. In other jurisdictions the private sector has been able to extract major efficiencies because services were previously paper based.
- The current delivery model is well supported by stakeholders. There is no customer-led desire for a greater involvement of the private sector, as has been the case in other jurisdictions. There may be some risk of stakeholder opposition if an alternative delivery model was pursued.

ALTHOUGH A PREFERRED DELIVERY MODEL OPTION HAS BEEN IDENTIFIED, THE PRIVATE SECTOR PROVIDER(S) COULD CHOOSE TO DELIVER THE SERVICE IN A NUMBER OF WAYS

It is important to note that LINZ has not pre-determined the nature of the preferred ASaTS solution and the manner in which the private sector provider(s) will deliver on the business requirements sought by LINZ through ASaTS. A function of the preferred procurement approach, which is described in further detail in Section 7.4, is to permit a dialogue between LINZ and the shortlisted providers about individual solutions.

The ownership of the relevant assets will depend on the nature of the solution adopted. Under Software as a Service model, ownership will be retained by the private sector provider(s) and LINZ will pay a service charge. Alternatively, where a new software build is undertaken, ownership of the supporting hardware and software will be retained by the private sector provider(s) but LINZ will own the application and source code.

7.3 Market engagement

7.3.1 Engagement undertaken

LINZ began a formal market engagement process as part of developing the DBC. The market engagement was focused on a RFI issued in March 2014. The RFI was advertised on the Government Electronic Tenders Service and was designed to obtain information from technology providers and system integrators on the innovation, technology and high level costs of a solution in line with the IBC preferred option.

Eight responses to the RFI were received from both New Zealand and international providers. Follow-up sessions were completed with five of the respondents. The follow-up sessions were designed to:

- provide respondents with a brief overview of LINZ's target state architecture
- allow an opportunity to map a respondent's product and capability to the target state architecture
- provide an opportunity for a question and answer session on the responses provided
- enable a review of the cost estimates provided
- facilitate a high-level discussion on the next steps in the procurement process.

In addition to the RFI process, LINZ has continued to engage with stakeholders and international counterparts as part of project planning activities.

7.3.2 Findings

THERE IS STRONG MARKET INTEREST IN THE ASaTS PROJECT

The RFI responses received confirmed there is a significant level of market interest in the design, build, and maintenance of the solution, and there is a pool of providers with existing capability to deliver and support the solution.

LOCAL AND INTERNATIONAL CAPABILITY EXISTS

RFI responses were received from both New Zealand and international vendors evidencing varied capability and experience in the delivery of design, build, and ongoing maintenance services.

Following the RFI sessions, LINZ was informed that some respondents are considering partnering together, including the potential partnering of New Zealand and international organisations.

A RANGE OF SOLUTIONS WERE PROPOSED

The respondents to the RFI presented a range of different solutions based on the business requirements outlined in the RFI document. The proposed solutions included:

- bespoke build
- 'Software as a Service' with customisation
- 'Commercial off the Shelf' solution with customisation
- code transformation (i.e. the replacement of the existing PowerBuilder code).

While a range of alternative solutions were presented, the RFI process and particularly the follow-up engagement with selected respondents, reiterated LINZ's position at the forefront of electronic survey and title service provision. The RFI process also evidenced the fact there is not an 'off the shelf' solution which would meet all of LINZ's requirements, particularly for desired innovation (e.g. capture of 3D property rights), and that a significant level of bespoke build is likely to be required in developing the ASaTS solution.

THERE IS A DESIRE TO CO-DEVELOP SOLUTION REQUIREMENTS

The RFI respondents expressed a desire to engage in detailed discussions with LINZ about the specifics of the solution requirements and to work with LINZ in identifying opportunities for innovation in the delivery of survey and title services before a RFP is issued. This desire has informed thinking about the preferred go-to-market approach.

7.4 Procurement strategy

The procurement and implementation of the ASaTS project will be one of the most significant projects LINZ undertakes over the next 10 years. To mitigate delivery risks and to help ensure the desired benefits of the ASaTS investment are delivered, LINZ has engaged (in the case of procurement support), or intends to engage, an experienced advisor(s) to help with:

- *Preparation for procurement activities*: Preparation for procurement activities will include the refinement of business requirements, and the preparation of procurement materials (including the development of a detailed procurement plan including timelines and milestones, identification of key risk and assessment criteria and material for all stages of procurement) to support project governance and the evaluation panel through the procurement process. It is envisaged that an external independent provider will be engaged to provide specialist advice and support around the use of quantitative decision support tools for providing financial, probability, multi-criteria and strategic analysis. An example of a probability analysis tool is the Monte Carlo stochastic analysis simulation.
- *The procurement process*: Support for the procurement process and the development of the Implementation Business Case (which includes the selection of the preferred vendor).
- *Business and customer change*: Support for the business and customer change aspects associated with the ASaTS project is expected to cover vendor management, change management, business requirements, business process optimisation, and programme and project management.

The remainder of this section relates to the procurement of a vendor to assist in the design, build, and ongoing maintenance of the ASaTS solution.

7.4.1 Business requirements

To inform the DBC and in preparation for go-to-market, LINZ developed business requirements. This process has resulted in the identification of approximately 500 current state business requirements, together with an additional 600 future state requirements. This work was informed by the customer survey done in February 2014 and by workshops with LINZ subject matter experts, including frontline staff.

LINZ continues to work on refining the business requirements which are key to articulating to vendors what is required of the ASaTS solution. The business requirements will then be further

refined through competitive dialogue to ensure they provide a common understanding of the business requirements between LINZ and the vendors. It is expected that the vendors will demonstrate how their proposed solution meets the requirements through full traceability. This in turn will enable LINZ to evaluate how the vendors' proposed solutions will deliver the benefits outlined in this business case, address the drivers (customer, information and business) and support the realisation of the strategic case.

7.4.2 Contractual considerations

CONTRACTUAL DOCUMENTATION

It is expected that the contract with the private sector provider(s) will have two components:

- A design and build specification based on business requirements that will be the subject of discussions between LINZ and potential private sector provider(s).
- A service agreement with two parts; an agreement for the use of the assets/system and an agreement for the provision of ongoing maintenance and support services (including the development and implementation of enhancements to the system).

The contractual documentation developed and negotiated as part of the procurement process will comply with all MBIE guidelines.

COMMERCIAL TERMS

LINZ has considered the commercial terms that will underpin the agreement for the delivery of the ASaTS solution. The terms are designed to ensure LINZ achieves the intended benefits from the investment, while balancing the risks it is exposed to and the need to facilitate a long-term relationship of collaboration with the chosen private sector provider(s).

The commercial terms have been divided into two sub-categories:

- fundamental terms that will be stated as compliance requirements in the procurement materials
- terms on which feedback will be sought from the market as part of the procurement process.

These terms will continue to be refined during the procurement, planning and competitive dialogue processes.

Fundamental terms

'Whole-of-life' approach

Consistent with the preferred procurement approach, the terms of the agreement will require the private sector provider(s) to take on the risk and reward of designing and developing the ASaTS solution, maintaining and supporting the solution over the term of the agreement, and upgrading and developing the solution on an ongoing basis.

Relationship management

It is anticipated the agreement will require the private sector provider(s) to commit to a relationship management framework with the aim of facilitating a long-term working relationship with LINZ characterised by openness and transparency.

Transitional planning and support

If the ASaTS solution is to be provided by a party other than the current vendor of Landonline, the new private sector provider(s) will be required to commit to working with the existing vendor in facilitating a seamless transition between the existing and newly-developed solutions. Similarly, the private sector provider(s) will be required to agree to a transitional process (or set of transitional service principles) which will apply on the expiry or termination of the agreement.

Termination

The agreement will provide both LINZ and the vendor with certain termination rights. It is envisaged LINZ will have a right to terminate the agreement in circumstances where the [redacted]

Consortia

The agreement will propose each consortium member is expressly jointly and severally liable for the performance of all services and obligations of any members of the consortium (which will enable LINZ to seek recourse from one, rather than from each, of the consortium members), or the proposal will detail the roles, responsibilities and accountability of each consortium member to the satisfaction of LINZ.

Change of control and ownership

It is proposed that for the duration of the agreement shareholders in the vendor may, without restriction, transfer shares in the vendor between themselves and within their own wholly-owned and controlled groups (including funds that are and remain under common ultimate management control). [redacted]. No change in the ownership of the vendor may occur, other than as set out above, without LINZ's consent, to be provided at its absolute discretion.

Tax

It is assumed the private sector provider(s) will take all taxation risk under the agreement. LINZ does not envisage entering into an agreement structured to mitigate private sector tax liabilities.

Phased delivery approach

The agreement entered into with the vendor will mandate the delivery of the preferred solution in agreed phases (in contrast to a 'big bang' delivery approach). The agreement will specify 'off-ramps', points where LINZ can terminate the contract for factors such as [redacted]. If LINZ chooses to end the implementation at the end of one of the phases, it expects there will be number of costs and risks that will need to be acknowledged. The use of a phased approach with off-ramps reflects the important role a phased approach to delivery plays in mitigating key operational and transitional risks associated with the ASaTS project. The phased delivery approach will also be reflected in the performance management framework (including the agreed Key Performance Indicators (KPIs)).

Interface with other systems and agencies

The agreement will require that the ASaTS solution is capable of interfacing appropriately with related software/systems (e.g. software used in conveyancing transactions) while also being able to interact effectively with other property related data systems across the New Zealand public sector. In effect, this requires a commitment on the part of the private sector provider(s) to deliver an open solution (as opposed to a solution that requires all associated users to be operating off the same technology platform).

Use of mandated 'All of Government' suppliers

The agreement entered into between LINZ and the private sector provider(s) will require, where appropriate and to the extent required, the vendor engages suppliers who have been designated as preferred suppliers as part of the 'All of Government', or 'Common Capability', procurement model adopted by the New Zealand Government.

Control over development and enhancement roadmap

In procuring the ASaTS solution, LINZ is focused on facilitating innovation in terms of functionality and service provision. It therefore anticipates a programme of product

development and enhancements over the life of the ASaTS solution. The agreement between LINZ and the private sector provider(s) will provide the mechanism by which LINZ will be able to control the development and enhancement roadmap. This will ensure all developments are LINZ-appropriate (in terms of need) and are aligned with the strategic direction of the organisation.

Identity verification/management

The agreement entered into between LINZ and the private sector provider(s) will require the ASaTS solution to accurately and appropriately validate the identity of transacting and non-transacting users. The agreement will require the presentation of multiple authentication factors that must be validated before the identity of a transacting user is accepted.

Terms for market consultation

Agreement term

LINZ is focused on building a long-term relationship of collaboration and partnership with the chosen private sector provider(s). With this focus in mind, feedback on the proposed term of [redacted]

Risk allocation

The approach to risk allocation provided for in the agreement will reflect the fundamental concept that the party best able to manage a risk should be allocated that risk. A summary of the proposed allocation of risk is included in Section 7.6.2.

Project scope changes

A mechanism for scope and/or scale changes to ASaTS will be included in the agreement with the vendor. The mechanism will be transparent, fair to both the private sector provider(s) and LINZ, and will manage LINZ's risk. The procurement process will provide an opportunity for private sector provider(s) to propose mechanisms by which changes in project scope may be dealt with.

Intellectual property

The approach to ownership and rights in respect of intellectual property will depend on the nature of the solution adopted by LINZ. However, the approach to ownership and rights in respect of intellectual property more generally will be the subject of detailed discussions with private sector provider(s) during the procurement process. The adopted approach will need to comply with relevant State Services Commission guidelines while ensuring LINZ is adequately protected from a business continuity and security perspective[38]. Further detail on intellectual property matters can be found later in this section.

Payment mechanism and performance regime

Consistent with the preferred procurement approach, it is anticipated the agreement between LINZ and the private sector provider(s) will have two components: a design and build specification based on business requirements, and a service support agreement (comprising the use of the assets/service and the ongoing maintenance and support of the system). [redacted]. An overview of the proposed payment mechanism can be found in Section 7.7.

[38] State Services Commission, '*Guidelines for Treatment of Intellectual Property Rights in ICT Contracts*' (January 2008)

Continuous improvement

The performance regime provided for in the agreement will reflect a desire on the part of LINZ to see continuous improvement on the part of the private sector provider(s) in the delivery of contracted services. It is envisaged the KPIs which are agreed between LINZ and private sector provider(s) will include specific service targets/measurements.

Incentives for ongoing development

The performance regime (and its relationship with the payment mechanism) will be used to provide incentives for the private sector provider(s) to invest in continual improvement and innovation in the delivery of services, together with enhancements to the underlying product. The procurement process will provide an opportunity for private sector provider(s) to propose a process by which product and service improvements will be delivered over the term of the agreement and the mechanisms by which LINZ may receive the benefits of technological development and innovation over the agreement term.

INTELLECTUAL PROPERTY

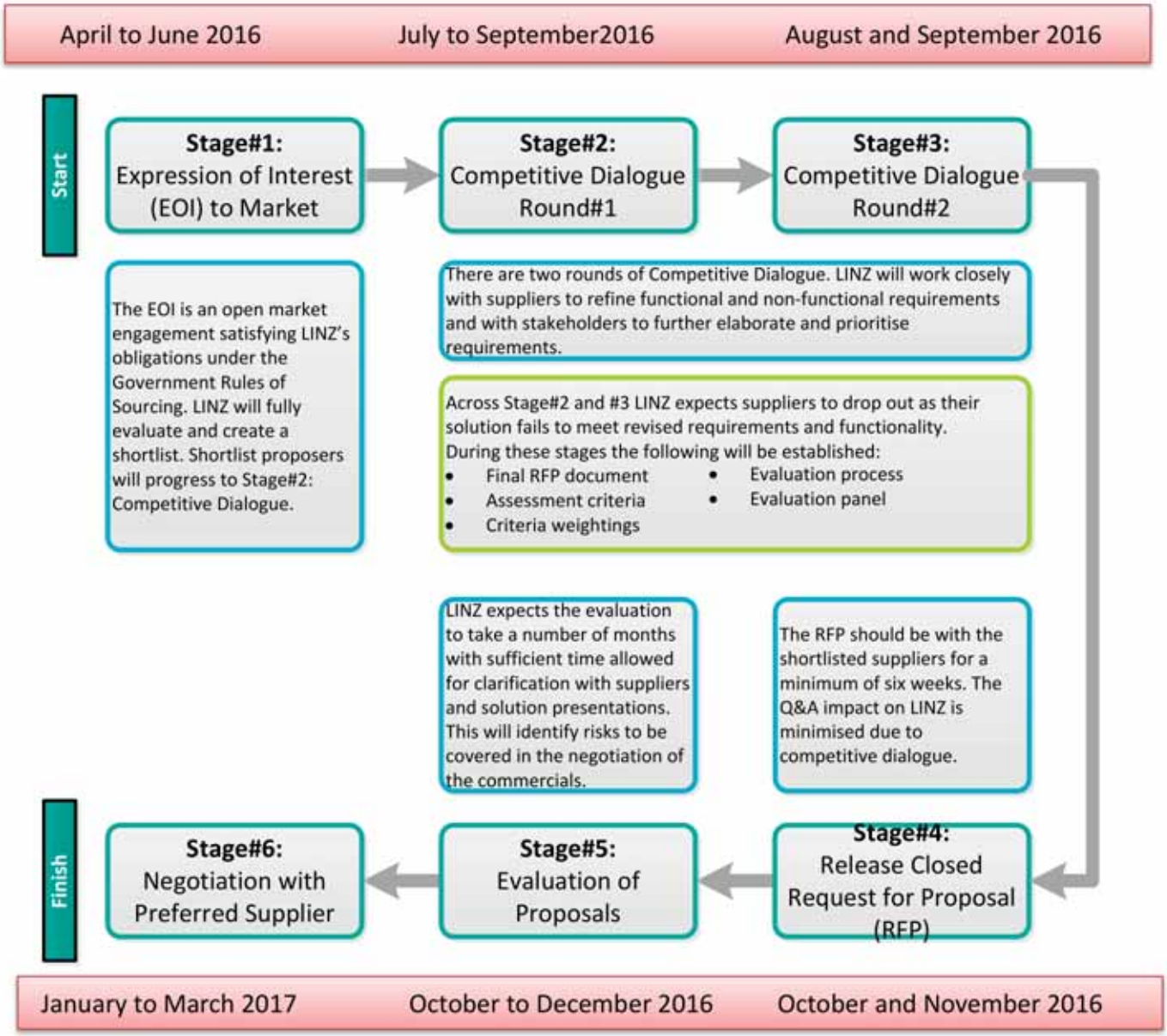
Ascertaining the desired approach to the ownership of intellectual property will be a key element of the procurement process and ultimately the negotiations with the preferred provider. RFI respondents have indicated an interest in opportunities to commercialise the new intellectual property created as part of the ASaTS project for use in other jurisdictions. LINZ is interested in exploring opportunities to reduce its costs or to improve the service at the same cost by enabling the private sector provider(s) to commercialise intellectual property generated as part of ASaTS, provided the risks are appropriately mitigated. LINZ will comply with the State Services Commission *Guidelines for Treatment of Intellectual Property Rights in ICT Contracts* in procuring the ASaTS solution.

7.5 Preferred go-to-market approach

A MULTI-STAGE PROCESS WITH COMPETITIVE DIALOGUE IS PREFERRED

LINZ plans to undertake a multi-stage competitive dialogue approach to procurement. A multi-stage competitive dialogue procurement approach will enable LINZ to learn about the potential private sector provider(s) and their solution through a pre-qualification period, before entering into more detailed discussions with a shortlisted set of respondents. Figure 21 outlines LINZ's planned approach to procurement.

Figure 21: Planned go-to-market approach



There are six stages envisaged as part of this approach:

- *Stage 1 – Expression of Interest*: An Expression of Interest (EOI) will be issued that allows the market to compete in a transparent way in a cost and time efficient manner. The outcome will be a shortlist of private sector provider(s) who have proven capability of providing the required solution. The EOI will describe the required solution and set out the assessment criteria that will be used to select the shortlisted private sector providers.
- *Stages 2 and 3 – Competitive dialogue*: Two rounds of competitive dialogue are proposed, allowing the opportunity for LINZ to work closely with potential providers in refining the functional and non-functional requirements for the ASaTS solution. Dialogue also allows an opportunity for additional engagement with stakeholders to further develop the business requirements, as well as a discussion and assessment of indicative costs.
- *Stage 4 – Request for Proposal*: A RFP will be issued to the shortlisted private sector providers under a closed procedure. The RFP will include more detailed requirements than the EOI and require providers to submit detailed costs capable of acceptance.
- *Stage 5 – Evaluation of proposals*: RFP proposals will be evaluated and a preferred provider selected. Further details on the evaluation approach can be found in Section 7.5.1.

- *Stage 6 – Negotiation with preferred supplier*: LINZ will enter into detailed contractual negotiations with the preferred provider selected in Stage 5.

WHY A COMPETITIVE DIALOGUE APPROACH IS PREFERRED

LINZ considered three possible approaches for stages 2 to 4 of the market approach; one stage tendering procedure (RFP), multi-stage tender excluding competitive dialogue (EOI/RFP), and a multi-stage tender process with competitive dialogue (EOI/CD/RFP). A multi-stage procurement process with competitive dialogue approach was identified as the preferred option for ASaTS.

During the RFI, respondents indicated a desire to work closely with LINZ before a RFP was issued. This desire, together with the fact a number of features sought by LINZ as part of ASaTS are not currently available in the market (e.g. representing property rights in 3D), underpinned the decision to undertake a competitive dialogue approach to procurement.

Under competitive dialogue LINZ will be able to:

- clarify any issues to be resolved before the final RFP is released
- reach the maximum possible resolution of contract terms
- minimise the need and therefore the temptation to negotiate rather than to clarify.

Competitive dialogue provides a mechanism for these discussions and for LINZ to further refine its requirements based on what is achievable. This type of approach is suitable where the solution is likely to be particularly complex and will require significant technical dialogue.

This approach will allow LINZ to work closely with the shortlisted providers to clarify, specify and fine-tune the final proposal through a series of targeted workshops with the right technical and specialist personnel from both LINZ and the shortlisted suppliers. This avoids the risk of only dealing with the providers' sales people.

LINZ recognises a competitive dialogue is both costly and time consuming for all parties. Consideration will be given to compensating suppliers for their technical resources taking part in the competitive dialogue process. This generates better outputs and allows LINZ to assess and score the suitability of suppliers as potential long-term providers through their behaviour, openness and transparency.

Benefits

Any investment in the time and cost in competitive dialogue is offset in the latter stages of the procurement process, in particular by significantly reducing the risk around the finalisation of the requirements during the negotiation stage, early insight (and a greater level of clarity and accuracy) around costs, the establishment of the complex commercial agreements, and other matters such as governance structures.

Resourcing

A dedicated and experienced procurement manager has been appointed and is working though the procurement phases, in particular the complex and time consuming competitive dialogue process. They will be supported by both the in-house procurement team and external expertise from the MBIE commercial pool team and professional services consultants.

Probity

A multi-stage procurement process with competitive dialogue will require a robust probity plan, and the engagement of an independent probity and assurance service provider throughout the duration of the procurement. This approach also recognises that one-on-one discussions are an important part of the process and the independent probity provides a high level of assurance to these shortlisted suppliers.

MBIE Government Procurement Branch

MBIE have been consulted and support the approach outlined in Figure 21. Guidance prepared by MBIE identifies a range of advantages of the competitive dialogue approach, which further supports LINZ adopting this process.

The planned go-to-market approach:

- encourages effective market research, early engagement with the market and good procurement planning
- maintains competitive tension between potential providers which drives better value for money
- promotes innovative solutions (consistent with the objectives of ASaTS)
- offers an opportunity to build effective working relationships with potential suppliers during the competitive dialogue phase.[39]

7.5.1 Evaluation of market responses

EVALUATION APPROACH

The key risks and assessment criteria for evaluation will be developed as part of the detailed procurement plan. The procurement plan will be developed before the release of the EOI to the market in early 2016. The procurement plan, which will cover all six stages of the proposed procurement process, will address the following requirements:

At a detailed level:

- The EOI evaluation process, including identifying the information needed to make short-listing decisions. This will include financial analysis, probability analysis, multi-criteria analysis, and strategic analysis. The output will be a shortlist of suppliers to proceed to the next stage – competitive dialogue.

At a high level (given the procurement plan will be a living document and will evolve during the competitive dialogue process):

- The proposed strategy around the first round of competitive dialogue. This will include stakeholders roles and responsibilities, workshop formats including duration, assessment criteria (if required), and budgeted costs. The output of this will be a detailed discussion document for the RFP.
- The proposed strategy for the second round of competitive dialogue will be based on the detailed discussion document for the RFP. This will include stakeholders roles and responsibilities, workshop formats including duration, assessment criteria (if required), and estimated costs. The output of this will be a final RFP document.
- Format and engagement around the release of a closed RFP. This will include boiler plate terms, updates of previous deliverables suitable for the RFP and initial assessment criteria (excluding what is determined during the competitive dialogue processes).
- Post-RFP negotiation strategy based on risk weighted costs and benefits analysis as defined during earlier stages.
- Key participants and stakeholders in each stage of the process and their roles and responsibilities.

It is intended that respondents will be requested to provide indicative pricing at part of the EOI. This will be aggregated and used for reference during the competitive dialogue stages. Respondents may also be required to provide separate price and non-price responses to the

[39] Ministry of Business, Innovation and Employment, '*Competitive Dialogue – How it works in New Zealand*' (July 2013)

RFP. This will enable LINZ to consider non-price components of the proposals separate to the price proposals.

INDICATIVE EVALUATION CRITERIA

The criteria against which EOI and RFP responses will (to the extent applicable) be evaluated will be developed and refined by LINZ as part of the evaluation and negotiation plan referred to above. In the interim, LINZ has identified an indicative set of criteria which it anticipates will form part of the evaluation process. The list of indicative evaluative criteria is as follows.

Non-price criteria

Respondent capability

ASaTS represents a business critical project for LINZ. To mitigate the risks associated with the delivery of the ASaTS project, LINZ seeks a private sector provider with the appropriate capability in delivering such projects. It is anticipated an assessment of the relative capability of each respondent will form an essential part of the evaluation process.

Sector knowledge

It is anticipated respondents will be evaluated on the extent of their experience in providing survey and title solutions, together with their track record in delivering projects of a similar size and complexity to ASaTS.

Ability to deliver business requirements

The ability of the proposed solution to support both the objectives of ASaTS as well as LINZ's operational and strategic objectives is expected to be evaluated and compared.

Opportunities for innovation in the delivery of survey and title services

While capturing the lessons of the past and acknowledging the benefits and advantages of the current system are important, ASaTS is focused on the procurement of a solution that delivers significant advances in the provision of the survey and title services rather than simply continues the existing service. Respondents will need to work with LINZ in delivering these advances and to demonstrate insight and innovation in service delivery.

Key personnel

The depth of experience together with the expertise of proposed key personnel is expected to form part of the evaluation criteria. Consideration will also be given to the approach taken by the vendor to succession planning for key personnel. This will include an assessment of the proposed project management team and the suitability of the relationship management framework proposed/agreed to by a respondent.

Additional considerations

The overall quality, consistency and completeness of a response will likely be evaluated at each stage of the process.

Price-related criteria

Cost of solution

It is likely the cost of each solution will form an important aspect of the evaluation process. It should be noted, however, that LINZ is not in the market for the lowest-cost solution on offer; rather LINZ is focused on procuring a solution which represents optimal value for money. 'Value for money' typically means acquiring the solution with the lowest whole-of-life cost that is 'fit for purpose' and meets the requirements. However, in the context of ASaTS, LINZ is also seeking to procure a future-proofed solution while also facilitating innovation in terms of functionality and service provision. Given these objectives, it is proposed that value for money represents the optimum combination of whole-of-life costs and asset/service quality, as measured against the solution requirements. As noted above, it is anticipated respondents will be asked to provide separate price and non-price responses.

Service fee

The quantum of the service and maintenance fee proposed by the private sector provider(s) will likely form part of the evaluation process. As previously noted, LINZ is not in the market for the lowest-cost solution on offer; this extends to the costs of ongoing maintenance and service of the solution.

These criteria will continue to be refined as the evaluation plan is developed.

7.6 Risk sharing

7.6.1 Risk overview

The assessment of risk allocation for the ASaTS contract has been based on the concept of optimal, rather than maximum, risk transfer from LINZ to the preferred private sector provider(s). Optimal risk transfer implies a collaborative approach to risk sharing, whereby risk is allocated to the party best able to manage and mitigate it in the sense of either reducing the likelihood of the risk occurring or reducing the costs of rectifying that risk.

7.6.2 Risk allocation

An exercise was undertaken to identify the major risks associated with delivering the business requirements of ASaTS over the life of the solution. The principal risks identified by LINZ and their proposed allocation are set out in Table 27. The most appropriate allocation of risk will be refined as part of the procurement process and confirmed as part of the contract negotiations. LINZ acknowledges there may be increased costs associated with the transfer of risk to the vendor, and the increased costs will be considered against the benefits that accrue from the transfer. LINZ will develop assurance and monitoring around any risk transfer to the vendor as part of the procurement phase and associated Assurance Plan.

Table 27: Proposed risk allocation

Type of risk	Risk	LINZ retains risk	Vendor takes risk
General	If there are specific law changes relevant to the provision of survey and title services (i.e. changes to the Land Transfer Act 1952 which introduce new requirements on title registration), this may necessitate changes to the scope and requirements of the ASaTS project or inhibit delivery of the project.	[redacted]	
	If there is a force majeure event (being an event outside of the control of the parties), this may have an impact on the ability of the parties to deliver the ASaTS project as contracted.		
Financial	If there are exchange rate movements, this may have an impact on the cost of delivering the ASaTS project.		
	If there are changes in LINZ revenue (e.g. a fall in revenue based on reduced transaction volumes), this may have an impact on the ability of LINZ to fund the ASaTS project as proposed.		
Procurement	If the relationship with the existing vendor is damaged by the procurement process, this may result in challenges and risks associated with the ongoing provision of the Landonline system during the transitional phase.		
Design and build	If there is an insufficient level of skilled resources available to design and build the solution, this may have an adverse impact on LINZ's ability to deliver the ASaTS project as proposed.		
	If there is an inappropriate specification of initial business requirements, this may result in a solution which does not deliver the objectives of the ASaTS project.		
	If the solution delivered by the ASaTS project is not fit for purpose, this may result in a failure to realise the objectives of the ASaTS project.		
Implementation	If planning has not identified all the costs of implementing the solution, this may result in increased project costs which have an adverse impact on the affordability of the ASaTS project.		
	If an operational interruption occurs during the transitional phase, this may result in an inability on the part of LINZ to deliver survey and title services as required to enable functioning of the New Zealand property market.		
	If the current system experiences critical failure before the new solution is in place, this may be result in an inability on the part of LINZ to deliver survey and title services as required to enable functioning of the New Zealand property market.		
	If the private sector provider(s) faces financial distress, this may result in a failure on the part of the provider to deliver the ASaTS solution as contracted.		
	If there is insufficient LINZ resource available during the implementation phase, this may result in delays in the delivery of the ASaTS project and the achievement of the project objectives.		
Lifecycle	If the service is not available for use as anticipated due to deficiencies in maintenance, this will have an adverse impact on the ability of LINZ to deliver survey and title services as required to enable operation of the New Zealand property market.		
	If the technology becomes obsolete sooner than expected, this may result in an inability to realise the objectives and benefits of the ASaTS project.		

7.7 Payment mechanism

A payment mechanism is being designed to ensure the private sector provider(s) has the incentives to achieve the desired outcomes of ASaTS.

The payment mechanism will put into effect the allocation of risk and responsibility between LINZ and the private sector provider(s). It will determine the payments LINZ will make to the provider(s) and establish the incentives for the provider(s) to deliver the outcomes required in a manner that delivers value for money for LINZ.

There are two primary components to the payment mechanism – one for each of the 'build' and 'service' stages of the project.

DESIGN AND BUILD

It is envisaged the private sector provider(s) will be paid on achievement of pre-agreed milestones during the design and build phase of ASaTS. The payment milestones will reflect the specifications of the preferred solution and will be developed in conjunction with the private sector provider(s) during the procurement process.

ONGOING SUPPORT AND MAINTENANCE

Following the implementation of the solution, it is anticipated the private sector provider(s) will be paid a fee for the provision of maintenance and support services. This fee will be linked to the assessment of provider performance in accordance with the performance management framework and penalties for non-performance.

PERFORMANCE MANAGEMENT FRAMEWORK

The performance management framework included in the contract between LINZ and the private sector provider(s) will be designed to:

- provide a structured method for evaluating the performance of the private sector provider(s)
- encourage behaviours that support and contribute to achievement of the objectives and outcomes sought from the ASaTS investment.

Performance in solution delivery and service delivery will be measured against KPIs developed by LINZ in conjunction with the private sector provider(s) during the procurement process. Consistent with the general objectives of the performance management framework, the KPIs will be designed to measure whether or not the provider(s) is delivering the outcomes required from ASaTS while maintaining a level of flexibility for the provider to deliver the outcomes in an innovative way.

It is anticipated KPIs will be identified and grouped into bands according to their importance as measures of success in delivering the outcomes required from ASaTS.

Solution delivery

Solution delivery KPIs will be aligned to stage gates of key stages of each phase of delivery. It is anticipated KPIs will cover the key stages of an ICT-enabled project as well as the management of these stages, including:

- Design
- Build
- Test
- Implement
- Solution management

- Contractual management.

Service delivery

By reference to the KPI framework which underpins the relationship between LINZ and its existing service provider, it is anticipated KPIs will cover several areas including:

- End user incident resolution and request fulfilment
- Contact responsiveness
- Results of customer satisfaction surveys
- First call resolution
- Availability and performance of services
- Release management and stability following change
- Information and data security
- Capacity monitoring
- Disaster recovery.

LINZ will monitor performance against KPIs on a regular basis using defined measurement mechanisms. The results of this assessment will form part of regular reporting.

Where KPIs are not being met, the private sector provider(s) will be expected to prepare and implement performance improvement plans which target specific areas of non-compliance.

The service fee will be subject to abatement where:

- services are not delivered or are incomplete because of actions of the provider(s) (e.g. not having software in service or not having sufficient personnel available)
- the quality of the delivery of services is measured as not meeting the required standard.

8 Management case – planning for successful delivery

8.1 The Survey and Title Change programme

LINZ has developed the Survey and Title Change programme (STCP) to ensure the survey and title services are seamlessly and efficiently delivered, represent best value for customers' money while also ensuring the integrity of the property rights system is maintained. This programme sits in the wider strategic context for LINZ of increasing the value from location information 10-fold over the next 10 years and in the wider government strategic context of Better Public Services, the ICT Strategy, and the IPS objectives.

This programme is made up of a number of projects, one of which is the ASaTS project which is seeking a second generation investment in Landonline. LINZ determined the best way to ensure successful delivery of a number of projects that were delivering on the same outcomes was to combine them into a single programme with a robust governance structure.

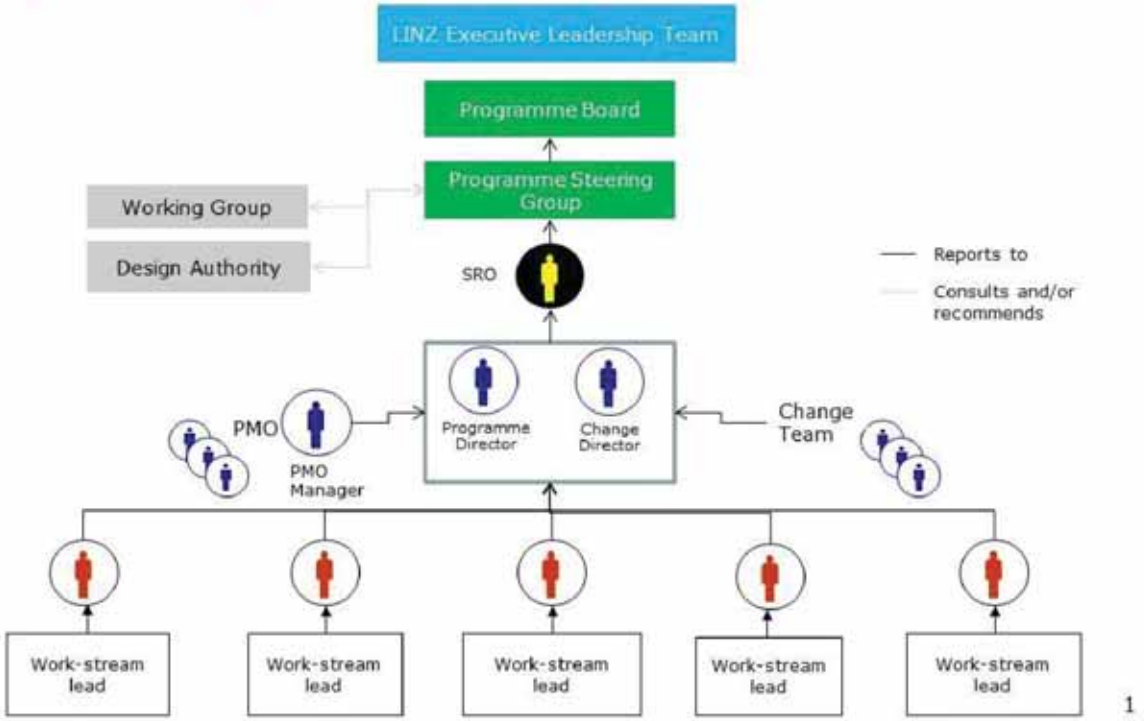
8.1.1 STCP governance arrangements

GOVERNANCE ARRANGEMENTS

The combined governance structure of the STCP ensures consistency and high quality dependency management between the current Landonline, operational functions and the new ASaTS project functions.

The governance structure for the STCP was approved by the LINZ Executive Leadership Team and the STCP Board in October 2014.. The current structure is shown in Figure 22.

Figure 22: STCP governance structure



THE STCP BOARD

The STCP Board meets monthly and consists of the:

- Deputy Chief Executive, Property Rights (who is both the Senior Responsible Owner and the DBC Project Sponsor), LINZ

- Deputy Chief Executive, Corporate, LINZ
- Deputy Chief Executive, Location System, LINZ
- Independent Member.

In 2015, the membership of the Board was reviewed and the membership changed to reflect the change from DBC delivery to the procurement phase, taking into account the need for experience with transformational programmes/projects.

Responsibilities of the Board

The following are the key responsibilities of the Programme Board:

- Ensuring that agreed business benefits, objectives, and outcomes for the STCP are met.
- Providing timely and consistent programme decisions, direction, and feedback to the LINZ Executive Leadership Team, and facilitating the prioritisation of STCP activities where conflicts occur.
- Ensuring the STCP's scope, objectives, and deliverables remain aligned to the LINZ business strategy and the scope outlined in the Detailed Business Cases, Implementation Business Cases, and Implementation Plans.
- Reviewing and approving deliverables and key documents.
- Supporting the Senior Responsible Owner (SRO) to tackle significant constraints, risks and issues, and act as an escalation and resolution point for issues.
- Ensuring that documented progress and systemic STCP risks and issues are reported to the LINZ Executive Leadership Team, and external parties as needed.
- Encouraging seamless integration and clear communication among all STCP partners.
- Facilitating the release (and associated funding) of LINZ resources required for STCP tasks.

SUPORT FOR THE PROGRAMME BOARD

As shown in Figure 22, there are four governance bodies that sit below and support the STCP Board and the SRO for ASaTS to ensure the programme is effectively delivered.

Table 28 provides an overview of the role of these bodies.

Table 28: The roles of each governance body

Governance body	Role	Regularity of meetings
STCP Steering Group	Responsible for making fundamental decisions for the programme lifecycle and ensuring it remains on track for time, cost and quality.	Monthly
STCP Working Groups	Comprises key subject matter expertise within LINZ and outside who are responsible for making key business unit decisions and supporting the programme team with resourcing and actions to maintain timelines and validating design artefacts.	Fortnightly (or as required)
STCP Design Authority	Responsible for resolving issues around design questions and recommending possible solutions.	Weekly (or as required)
STCP Programme Management	Responsible for reporting and validating progress across all projects against plans, reviewing and mitigating issues and risks, managing costs to budget, managing benefits realisation, and driving substantive and sustainable change across all affected stakeholders,	Fortnightly

To support these governance arrangements work has been done to:

- develop a vision, terms of reference, and programme definition
- develop a stakeholder engagement plan
- develop risk, dependencies, and issues registers that sit across the programme and are actively managed
- implement a reporting framework to the STCP Board to ensure it is informed on developments within the programme.

These are live programme documents and their contents and structures will be reviewed as the STCP develops. As the programme progresses it is expected the support provided to the Board will increase.

RELATIONSHIP TO INTEGRATED PROPERTY SERVICES GOVERNANCE

ASaTS is a key enabler for the IPS objectives as described in 4.6, so care has been taken to ensure there are linkages between the two. IPS has an Oversight Group that includes representatives from a number of agencies and is chaired by the Deputy Chief Executive Location System, who also sits on the STCP Board. The IPS Working Group, which sits below the Oversight Group, is chaired by a LINZ Policy Group team member who has close ties to the ASaTS project team. The IPS team also provides a monthly update on the progress of IPS to the STCP Board. As work progresses in both areas, consideration will be given to creating closer ties between the programmes.

8.2 Project management strategy

8.2.1 Phased approach to implementation

LINZ plans to adopt a phased approach to implementing ASaTS. The development of the transition plan was guided by a set of design principles. Based on these principles, the approach was designed to mitigate risks, rather than to take a higher risk 'big bang' approach to deployment. A phased transition was determined to be the best fit approach, guided by the following:

- The transition plan will use a risk mitigation approach. Customer impact will be balanced with ensuring the integrity of the system.
- Benefits will be delivered early in the project lifecycle.
- A key focus will be placed on understanding relationships between the information layers, as they imply dependencies.
- Supporting capabilities will be developed in parallel with the core capabilities (i.e. customer support, or business intelligence and reporting).
- Landonline will incur minimal change from the ASaTS project.
- Single authoritative data sources (master data management) will be maintained (i.e. addressing information accessed through services, not by duplicating datasets).
- Projects will be responsible for decommissioning their own legacy systems.
- End-to-end business process optimisation will occur as early as possible.

This approach means that a 6 year project can be reduced down to 4.5 years through having overlapping phases. This phased approach also allows for off-ramps and does not have an impact on overall project costs. Under a phased approach there is an increased effort (approximately six months) associated with additional regression testing, business change and implementation that will not be required under a big bang approach. However, this cost is offset against the cost of retaining LINZ core resources for a longer project period, which will be required under a big bang approach. A longer project period is assumed under a big bang approach, as it unlikely the duration of the stages can be reduced sufficiently (by adding more resources to each stage) and there is limited ability to overlap the stages to reduce the duration from 6 years (2 years of design, 3 years of build and 1 year of testing) into the 4.5 years planned for the phased approach.

The ASaTS transition plan was developed based on the understanding of the requirements and the future state architecture. The transition plan will be further refined during the procurement phase based on the solution approach chosen. Two possible approaches are a bespoke build or a COTS plus customisation solution.

A bespoke build would enable LINZ to share the database and data access functions between the old and new systems, while replacing the client and business logic layers. The data access functions and potentially the database could then be progressively transitioned.

If a COTS plus customisation solution is chosen, a database migration is more likely to be required. Transition could then be undertaken by business function, including data migration. This will require analysis of Landonline to determine the impact of moving each function. This solution may also require database synchronisation to support the legacy functions in Landonline during parallel running.

Figure 23 shows the approach implementation, which is based on five phases of activity.

Figure 23: Phased approach to implementation

The order of the phases is driven by the survey and title information dependencies (i.e. geodetic information is required to support survey business processes, which in turn are required to support title business processes):

- Phase 1 will put all the key system components in place and address broad areas such as end-to-end business process optimisation.
- Phases 2, 3, and 4 will configure and customise the system components to meet the specific ASaTS requirements.

- Phase 5 involves decommissioning the remaining infrastructure.

Parallel execution of systems is envisaged, and has been costed for, over the 4.5 year project period. Further work will be done to refine what the phases will look like and how the off-ramps will be incorporated into the design of ASaTS in discussions with the market as part of the competitive dialogue process.

8.2.2 Project management

APPROACH TO PROJECT MANAGEMENT

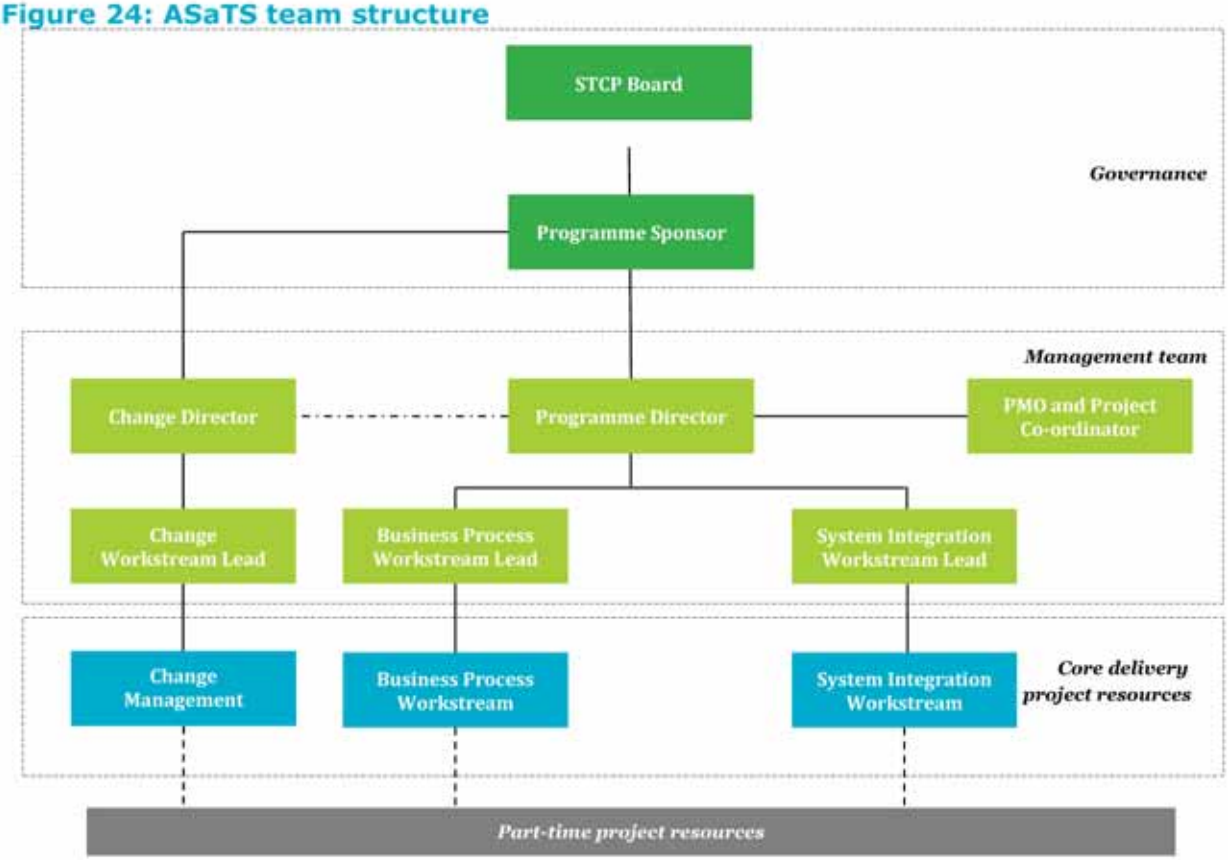
LINZ follows the PRINCE2 and MSP approaches to project management. The project will be controlled according to LINZ's project management framework, which sets our requirements for:

- *Project governance*: stage gates, funding points, reporting and oversight, prioritisation and change management, risk and issue management, definition of roles, responsibilities and required delegations.
- *Project control processes*: planning and scheduling, resource management, dependency management, risk and issue management, monitoring and reporting, stakeholder and communication management, quality management and information management.
- The use of project tools.

PROJECT TEAM STRUCTURE

LINZ has appointed a Programme Director who has substantial experience in leading and delivering on programmes of this magnitude and complexity, including the highly successful Landonline 100% e-Lodgement programme. Figure 24 shows the planned ASaTS team structure for the implementation phase.

Figure 24: ASaTS team structure



LINZ RESOURCE PLANNING

The implementation of Landonline is seen as one of the public sector's most successful ICT-enabled change projects. Some of the people involved in the initial Landonline implementation still work for LINZ today and will be involved in the implementation of the ASaTS project.

However, access to LINZ resources and information is likely to be constrained by existing business as usual activities, including the release and backfill of senior experienced subject matter experts to the project. It is estimated that the preferred investment option will require an average of around [redacted] FTE of LINZ effort over the 4.5 year project period, with around [redacted] FTEs required at the peak of implementation.

A resourcing plan for the implementation of ASaTS has been developed and work has begun to recruit key staff.

The resource plan identifies what LINZ resources will be required, at what utilisation and at what time. This plan includes both dedicated project resources as well as LINZ subject matter experts:

- A Change Director
- Business analysts
- Survey and Title analysts
- ICT Test Manager and analysts
- Landonline Application Specialists
- Project Co-ordinators
- A Communications Advisor
- A Benefits Manager
- A Workforce Manager
- Subject matter experts covering the following areas: Crown land, Māori land, cadastral survey (regulatory and operations), land titles (regulatory and customer facing), location information, geodetic, legal, privacy, procurement, policy, finance, human resources.

As part of preparing for ASaTS, LINZ is also planning for sufficient frontline capabilities to be brought on board to ensure high levels of service can be maintained throughout the implementation period.

8.2.3 Timeline

Subject to the Cabinet's approval, the next step is to issue an expression of interest in early 2016. Table 29 sets out an indicative timeline for the project. This provides an indication of the amount of time that will be allocated to the subsequent stages of the project following the finalisation of the DBC.

Overall, the timeline indicates that procurement will take approximately 12 months, reflecting the complexity of ASaTS and the planned competitive dialogue approach. The time required for the successful delivery of the project will be in addition to the time taken for procurement and is expected to take 4.5 years to fully implement and transition to business as usual. During the procurement phase, further clarity will be gained about the milestones for the implementation phase.

Table 29: Indicative timeframe

Activity	Date
The DBC is submitted to the Capital Investment Panel	January 2016
Preparation period – prepare procurement plan, assessment criteria, probity plan and procurement material	August 2015–February 2016
ASaTS is considered as part of the Budget 2016 process	February-March 2016
Ministerial Announcement	March 2016
Issue NOI	March 2016
Issue EOI	April 2016
EOI responses due	May 2016
Assessment of EOI responses and shortlist providers	June 2016
Invite shortlisted providers to participate in competitive dialogue	June 2016
Competitive dialogue (assumes two rounds)	July 2016 – September 2016
Confirm solution requirements and finalise and issue RFP	October 2016
Proposals due	November 2016
Assess proposals and select preferred provider(s)	December 2016
Prepare and submit Implementation Business Case	December 2016 – February 2017
Mobilisation of the LINZ project team	January 2017
Announce preferred provider	February 2017
Commence discussions/negotiations with preferred provider	February 2017
Finalise contract negotiations	Quarter 2 2017
Phase 1 – Foundational Capabilities	Quarter 3 2017 – late 2018
Phase 2 – Geodetic	Quarter 3 2017 – mid 2019
Phase 3 – Survey	Early 2018 – mid 2020
Phase 4 – Titles	Mid 2018 – late 2020
Decommissioning	2020

LINZ is working through the interface between the ASaTS timeline and the timelines contained in the contract with its existing service provider to ensure it remains in a strong negotiating position throughout.

Table 30 sets out the expected decision making and approval process matrix for procurement using the following RACI process:

- R – Recommending the decision
- A – Approving the decision
- C – Consulted in reaching decision
- I – Informed about decision.

As part of developing the procurement this decision matrix will be refined.

Table 30: Decision making and approval process

Activity	Cabinet	Minister for Land Information	LINZ Chief Executive	STCP Board	ASaTS Project Team	Evaluation Team
Cabinet consideration of the DBC and approval to go-to-market	A	R	R	R		
Approval to issue EOI		I	A	R		
Assess EOI responses and identify shortlist vendors		I	C	A		R
Approval to issue RFP		I	C	A	R	
Assess proposals and select preferred vendor		I	A	R		R
Prepare and submit Implementation Business Case		I	A	R	R	
Announce preferred vendor		I	A	R	R	
Approval to sign contract		I	A	R	R	

8.2.4 Lessons learnt from previous projects

LINZ has compiled a Lessons Learnt Report from the previous Landonline projects:

- The Automation Programme Evaluation April 2003 – Teega Associates Limited.
- The 100% e-lodgement Programme Lessons Learned Report compiled by the Programme Manager in June 2009.
- Material gathered while investigating archived LINZ records. This incorporates additional items identified during a workshop of a group of key participants from the Landonline and 100% e-lodgement programmes.
- This Lessons Learnt Report has been reviewed by the STCP Board, the Review team, and the Project team and the information it contains has been used to inform the design and plan for implementing the new system.

8.3 Stakeholder engagement and communications

8.3.1 Detailed Business Case engagement

During the development of the DBC, the project team held ASaTS specific engagement with its stakeholders. A customer survey was done in February 2014, with a response rate of 21 percent. The responses from this survey were used to inform what the ASaTS future should look like. LINZ also used a variety of other communications channels to engage with stakeholders and seek their feedback, and to update them on the progress of ASaTS. The stakeholders LINZ engaged with formally during the development of the DBC are listed in Appendix 10.10.

LINZ also has a page dedicated to ASaTS on its website, which provides regular updates on the progress of the project. Updates are also provided through additional forums such as Landscan, a newsletter produced by LINZ for its stakeholders.

8.3.2 Stakeholder engagement during ASaTS implementation

LINZ has developed a stakeholder engagement plan to enable it to deliver a customer focused solution, while minimising risk to the successful delivery of the programme. The success of the ASaTS project will rely on meeting customer expectations. To ensure this happens, LINZ will work closely with key stakeholders to ensure they understand that this next generation

investment is designed to keep New Zealand as a leader in the property rights sector and to provide a better quality customer experience.

As part of the implementation phase of ASaTS, LINZ will increase its engagement with stakeholders. It has started work to include representatives from the New Zealand Law Society and the New Zealand Institute of Surveyors (the key user group peak bodies) on the project team to ensure the project will deliver on the future needs of our users and customers.

8.4 Business change

The change management needs for ASaTS will be significant given the number of users of Landonline and the degree of change being proposed. LINZ designed and delivered a significant training programme with its customers and staff when Landonline was introduced and when electronic lodgement of survey and title transactions became mandatory. LINZ has budged $[redacted] nominally ([redacted] percent of the total project period costs) for business change activities.

To ensure the successful delivery of the project LINZ has appointed a Change Director as part of the STCP. The Change Director has developed a Change Management Programme to ensure stakeholders, survey and title staff, and the regulators are equipped to deliver the survey and title service successfully in the new environment. The Change Management Programme will ensure there is continued engagement with LINZ's customers and staff throughout the project so that the changes being made meet the needs of users and staff.

Cost estimates include dedicated budget for:

- A Change Director (responsible for ensuring change management for the overall STCP is comprehensive, effective and promoted as being strategically critical to the success of the programme)
- Customer and user experience design
- Preparation of training material
- Trainers (to train LINZ staff and customers)
- Focus groups with users
- Communications.

As mentioned in Section 8.3.2, the SRO has been working with the New Zealand Law Society and the New Zealand Institute of Surveyors to identify a practising conveyancer and cadastral surveyor to become part of the LINZ project team for the duration of ASaTS. LINZ adopted this approach as part of the previous Landonline implementation and found it to be extremely successful for understanding how Landonline is used in practice and for obtaining buy in from stakeholders. Cost estimates include budget for this resource.

8.5 Vendor management

Technology is a key enabler of change for ASaTS, but it is first and foremost designed to deliver on the services sought by LINZ and its customers. Ensuring both the technology implementation and the business and customer change aspects of ASaTS are effectively managed will be pivotal to ASaTS' success.

As noted in Section 7.4, LINZ proposes to engage professional advisory services to assist with the business/customer change aspects associated with ASaTS. LINZ does not have in-house expertise for specialist roles for a project of this scale and magnitude. This will include support for vendor management, and programme and project management. The support will provide LINZ with added challenge and rigour over different aspects of the implementation of ASaTS. This includes providing direction and control over the solution vendor and managing the integration and change across LINZ's processes, structure, strategy, and people, as well as helping to effectively manage the customer change process.

8.6 External project assurance and monitoring

8.6.1 Central agency monitoring

As a major government ICT-enabled project going through the Better Business Case process, the ASATS project is subject to central agency assurance and monitoring. This involves engagement with:

- Treasury – IMAP (major projects monitoring)
- Treasury – Vote Lands team
- DIA, Office of the Government Chief Information Officer/Government ICT Strategy and Planning
- Department of Prime Minister and Cabinet
- State Services Commission – agency liaison.

The project team has regularly consulted with central agencies during the development of the DBC, with joint monitoring meetings being held monthly. Central agency engagement will continue throughout the lifespan of the project.

A LINZ Assurance Plan for the next phase, investment decision, has been developed in consultation with and endorsed by the office of the Government Chief Information Office ICT Assurance Team that outlines ongoing ASaTS assurance activities.

8.6.2 Gateway

The project was subject to a *Gateway Review 2 – Delivery strategy: Detailed Business Case* review in August 2014. The recommendations contained in that report have been, or are being, addressed. The Gateway report rated the project as amber – successful delivery appears feasible. The main reason for this rating and not one a level higher (green-amber) was the threshold of gaining approval from Cabinet for the DBC, although they acknowledged significant work had been done to secure this. Other key findings for the review were that:

- the project is adequately governed
- there is a high level of competence within the wider project team and due consideration has been given to resourcing in the wider LINZ context
- there is strong and enthusiastic stakeholder support for the project and it is universally regarded as on track
- the governance needed to be reconfigured and procurement planning would need to rapidly advance. As noted STCP governance arrangements were reconfigured in early 2015 and procurement planning has been advanced significantly since the Gateway review.

The Gateway Review team stated that the next review should be at *Gate 3: Investment decision* and take place before signing supplier contracts, currently planned for late 2016/early 2017.

8.6.3 Independent quality assurance

Independent quality assurance (IQA) was conducted over the life of the DBC project, reporting to the LINZ Chief Executive. IQA involved:

- a baseline health report
- monthly reviews and reports
- fortnightly reviews of Programme Board material
- a review of the DBC.

There were 11 key recommendations from the IQA review of the DBC, all of which have been addressed. A summary of the findings from the IQA review follows:

- The three drivers described in the DBC present a reasonable case for investing in a second generation solution.
- The preferred option presents a best fit solution (compared to the options considered) that addresses the organisational needs.
- The technology risks associated with Landonline (driven by the legacy technology components and design approach) is a key driver for the need to invest now.
- The modelling completed to underpin the economic and financial cases is robust, comprehensively detailed and supported by well articulated and reasoned assumptions.
- The inherent nature of a bespoke solution, which entails a great deal of the unknown, demands that the cost model be revisited and updated as soon as practicable after the RFP.
- An appropriate and proven (during the DBC development) governance arrangement is proposed for the programme.

8.7 Risk and issue management

8.7.1 Approach to risk management

LINZ has developed a risk management framework based on the ISO 31000 – Risk Management Standard. The ASaTS project uses the LINZ risk management framework to manage the ASaTS project risks.

The STCP uses the STCP Control Book to record and manage risks, issues, assumptions and dependencies.

Throughout the procurement and implementation period (early 2016 and onwards):

- work-stream leads will review work-stream risks and issues weekly and raise them with the Programme Director and the ASaTS Project Management Office (PMO)
- the PMO will co-ordinate a programme-level risk workshop every month both from a strategic and programme delivery perspective
- the Programme Director will report on key risks to the SRO weekly and the Programme Steering Committee fortnightly
- the Programme Board will review and advise on significant programme risks monthly
- the LINZ Executive Leadership Team will consider the strategic risks from ASaTS as part of the LINZ strategic risk cycle.

8.7.2 Key project risks

Significant work is underway to prepare for the procurement phase of the ASaTS project. The key high risks for the ASaTS project are shown in Table 31. This table shows the current level of risk (given the mitigations that have been implemented). It is not possible currently to mitigate some of the below risks, as determining the appropriate mitigation will depend on decisions made during the procurement phase.

Table 31: Key project risks

Stage	Risk	Likelihood *(Almost Certain, Likely, Possible, Unlikely, Rare)*	Consequence *(Extreme, High, Medium, Low, Negligible)*	Immediacy of risk occurring	Approach to risk mitigation
Procurement	Uncertainty about requirements relating to certain aspects of ASaTS (e.g. 3D) may create ambiguity for the vendors leading to solutions that are not appropriately aligned to ASaTS vision.	Possible	High	Medium term (3–12 months)	• Transparency with vendors through the business scenarios developed for the EOI process about any areas that need further definition. Include possible alternatives where possible to cater for uncertainty. • 3D and interoperability – remain as the scope areas still requiring agreement. A white paper will be developed to formalise these aspects. • Māori Land Service – close monitoring and continued communication through the project teams will be required to identify and act on dependencies. • This was part of the QRA quantification and has been included in the contingency. • LINZ has a requirements management plan that outlines how requirements are managed (including the communication to stakeholders including vendors).
Procurement	Inability to secure appropriately skilled internal resources during the procurement phase could result in delays and/or cost over runs, causing damage to LINZ's external reputation.	Unlikely	High	Long term (12+ months)	• LINZ will build up resources in operations and regulatory teams through recruitment and training to prepare for implementing the recommended option. • LINZ has developed a project resource plan that includes secondments and MOUs with areas of LINZ to secure project resources. • Any issues around resourcing pressure points will be escalated early to the STCP Board to seek assistance with re-prioritisation.
Procurement	Large variations in cost	Unlikely	High	Medium	• Appropriate contingency has been modelled in

Stage	Risk	Likelihood *(Almost Certain, Likely, Possible, Unlikely, Rare)*	Consequence *(Extreme, High, Medium, Low, Negligible)*	Immediacy of risk occurring	Approach to risk mitigation
	and/or benefits between the DBC and the Implementation Business Case could mean the Implementation Business Case is not approved, leading to delays.			term (3–12 months)	to the DBC costs. • Cost indicators will be monitored through the procurement period so that issues can be identified early and addressed.
Procurement	The preferred vendor(s) with a viable solution lack the capability to deliver the project and provide ongoing support to LINZ, leading to sub-optimal solutions for ASaTS along with a higher than expected cost.	Unlikely	High	Medium term (3–12 months)	• LINZ will include vendor resourcing options/models along with their delivery capabilities and track record as key evaluation criteria and a discussion point for competitive dialogue.
Procurement	If LINZ selects a multiple vendor offering, there is a risk the vendor partnerships might decay during the procurement process leading to their offerings being no longer viable.	Unlikely	High	Medium term (3–12 months)	• LINZ will include discussion about the strength of vendor partnerships during competitive dialogue. • LINZ will implement contractual constructs to safe guard itself from vendor fall outs. • LINZ will seek a 'prime vendor' type procurement strategy to avoid risk if possible.
Procurement	Delivery of the ASaTS business requirements may require a consortia of vendors, but the market may not agree to work together in LINZ's preferred configuration, leading to sub-optimal solutions and delivery of	Unlikely	High	Medium term (3–12 months)	• LINZ will include discussion about its preferred vendor configuration during the competitive dialogue stage. • LINZ will be transparent about the preferred configuration of vendors according to the procurement strategy (e.g. prime vendor).

Stage	Risk	Likelihood *(Almost Certain, Likely, Possible, Unlikely, Rare)*	Consequence *(Extreme, High, Medium, Low, Negligible)*	Immediacy of risk occurring	Approach to risk mitigation
	solutions.				
Execution	If the project is unable to secure appropriately skilled internal resources during the implementation phase, it could result in delays, cost overruns and cause damage to LINZ's external reputation.	Unlikely	High	Long term (12+ months)	• LINZ will build up resources in operations and regulatory teams through recruitment and training to prepare for implementing the recommended option. • LINZ will develop project resource plans including secondments and MOUs with BAU managers to secure project resources. • Any issues around resourcing pressure points will be escalated early to the STCP Board to seek assistance with re-prioritisation.
Execution	If the project team is unable to manage interdependencies and resulting issues, this may mean the ASaTS vision is not successfully delivered without time and cost overruns.	Unlikely	High	Long term (12+ months)	• LINZ is developing scope documents that define the scope of the programme and outline how it will deliver on what has been agreed with the Minister and Cabinet. • LINZ will ensure that ASaTS and other LINZ dependencies don't duplicate effort/result in gaps in thinking. • The STCP Management Office will closely monitor and manage dependencies.
Execution	The change management effort required may be more than what is currently budgeted for resulting in increased cost, stakeholder dissatisfaction and poor implementation of the ASaTS solutions.	Unlikely	High	Long term (12+ months)	• A Change Director has been appointed and will plan, manage and execute all change activities within the programme. • This is a QRA risk that was quantified and included in the development of the contingency budget for the project.

8.7.3 Issues

The STCP's issues management processes will be co-ordinated by the ASaTS PMO. The ultimate responsibility rests with the Programme Director to progress a resolution of any issues. A process has also been implemented that escalates issues to the appropriate place in the governance for action and treatment. Possible treatments vary from low level management by the project team through to developing and implementing dedicated action plans agreed to by the STCP Board.

8.8 Benefits realisation

Work has started to ensure the benefits outlined in this business case are appropriately measured and monitored. Appendix 10.10 provides the current benefits register for the ASaTS project, which sets out existing measures, targets, and baselines where possible for ASaTS to deliver on.

Many of the quantitative benefits estimated in this business case are based on results from the customer survey done in February 2014. LINZ currently runs monthly and annual surveys of its survey and titles customers. As part of these surveys, it will measure whether it is delivering on the benefits it set out to achieve –particularly around the time saving benefits.

For the other benefits ASaTS expects to deliver (e.g. reduced requisition rates for surveys), LINZ monitors these performance indicators to measure the success of its current operations. Consideration has been given as to when ASaTS will begin to have an impact on the current performance indicators.

Designing the best-fit benefits realisation approach will be undertaken throughout the initial stages of the ASaTS project. A Benefits Manager will be appointed as part of ASaTS to ensure the project is appropriately evaluated and the benefits are achieved. The costs for this resource have been incorporated into the project cost estimates contained in this business case.

Successful realisation of the benefits from ASaTS will depend on four key factors:

- The nature of the relationship that develops between LINZ and the private sector provider (vendor management is discussed in Section 8.5).
- The effectiveness of the change management activities undertaken (discussed in Section 8.4).
- The effectiveness and strength of the contract and, in particular, the effectiveness of the payment mechanism embodied in the contract in shaping the behaviour of the private sector provider(s) and aligning LINZ's and the provider's interests.
- The processes LINZ will put in place to monitor and manage contractual compliance and delivery.

8.9 Project evaluation

The ASaTS project will be evaluated at regular points throughout implementation to confirm that the desired outcomes have been met. This evaluation will be measured against the following three categories:

- Overall assessment
- Quality of deliverables
- Opportunities for improvement.

OVERALL ASSESSMENT

An overall project assessment will include analysis and discussion on how ASaTS performed when measured against the outcomes, objectives, and deliverables set out in this DBC. It will also address issues including, but not limited to:

- how ASaTS' progress compares to its original timeline and budget
- whether explanations for material deviations from the plan and any changes to the scope of ASaTS were appropriately documented and approved with the timeline and budget being adjusted appropriately.

QUALITY OF DELIVERABLES

The evaluation will assess the quality of key deliverables including the satisfaction of the key stakeholders regarding ASaTS and its key deliverables. This will include analysis as to which deliverables, if any, exceeded expectation and provided additional added value and which deliverables, if any, failed to meet objectives or expectations.

OPPORTUNITIES FOR IMPROVEMENT

Part of the evaluation will cover opportunities for improvement if ASaTS, or part thereof, were to be repeated. This will include a discussion about any areas that were problematic or where improvement possibilities have been identified and what actions could be implemented to prevent these issues recurring. In addition, this will identify any processes or best practices established during ASaTS and describe how these practices will be formalised and how any possible improvements will be used in the future.

LINZ has conducted lessons learned exercises from the previous Landonline implementation projects and the IBC phase of work. These learnings have been incorporated into the work done at the DBC stage and the planned approach to project implementation.

9 Chief Executive's letter

Land Information New Zealand: Advanced Survey and Title Services Detailed Business Case

To whom it may concern

I can confirm that in relation to the Advanced Survey and Title Services DBC:

- I have been actively involved in the development of the investment proposal through its various stages.
- I accept the strategic aims and investment objectives of the investment proposal, its functional content, size, and services.
- The financial costs of the proposal are sound (at the level of analysis appropriate at Detailed Business Case stage) and are based on the best available information.
- As part of seeking approval for proceeding with this investment proposal, I will:
    - Seek approval to authorise proposed expenditure up to the 50th percentile ($[redacted]).
    - Propose that expenditure between the [redacted] requires the approval of joint Ministers (Minister for Land Information and Minister of Finance).
    - Propose that expenditure over the [redacted] requires further Cabinet approval.
- Section 5.3 contains more detailed information on the funding delegation limits which have been modelled as part of the quantitative risk assessment.
- Suitable contingency arrangements are in place to address any current or unforeseen affordability pressures.

Yours sincerely

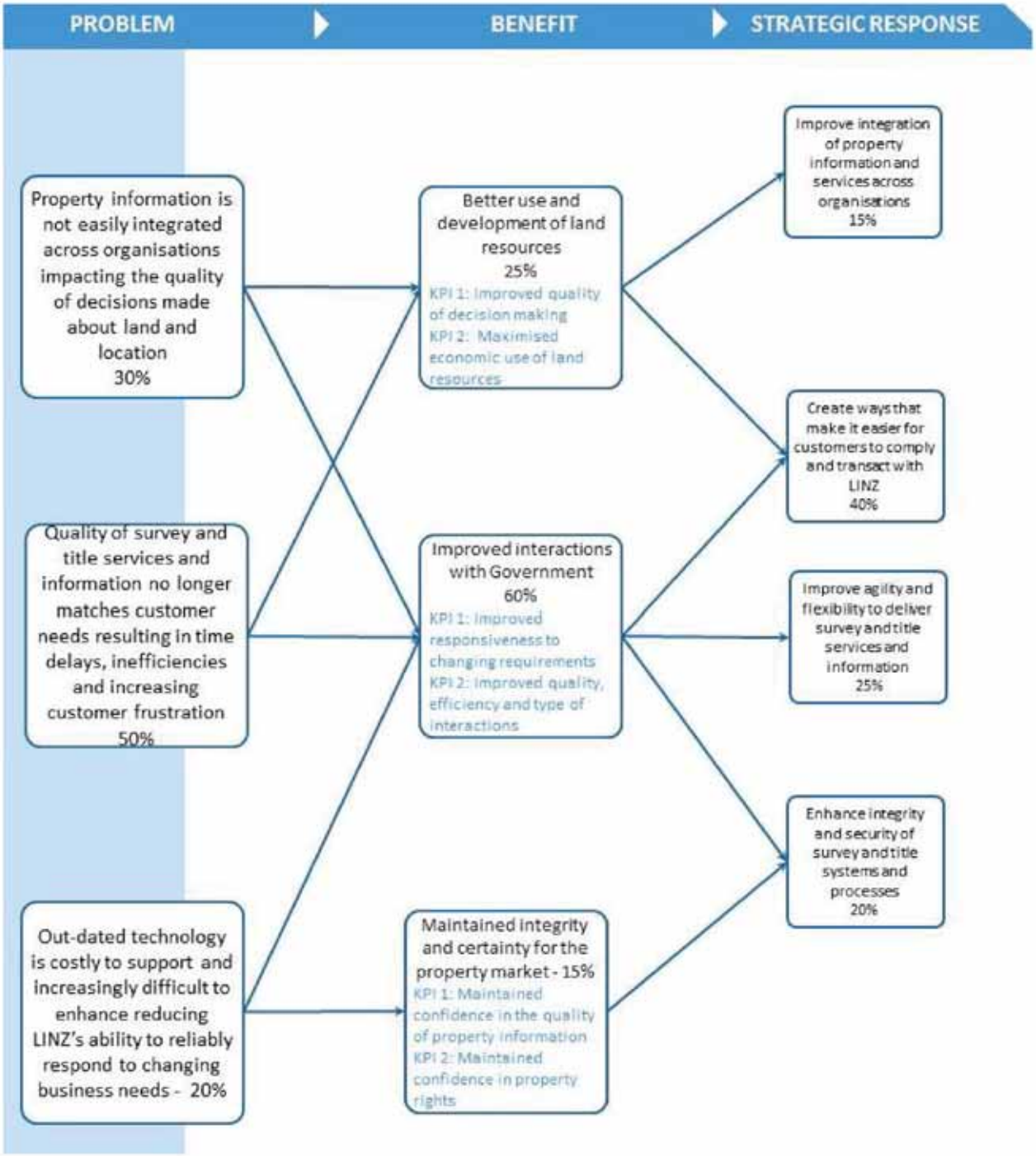
Peter Mersi
Chief Executive
Land Information New Zealand

10 Appendices

10.1 Investment logic map

Figure 25 provides the investment logic map for the ASaTS project.

Figure 25: ASaTS investment logic map



10.2 Validation of the preferred option

In developing this DBC, detailed costing was done on the preferred investment option and the base case. This detailed costing identified there were significant differences to the indicative costs outlined in the IBC. Because of these cost increases LINZ undertook a review of the technology improvements and increased service offerings of the preferred investment option to determine whether the increase in expenditure was justified or whether an alternative investment option, with a lower cost, needed to be considered.

This review started by considering the three drivers for the investment:

- *Business driver*: The inability to easily adapt Landonline to meet business needs, and concerns about the potential risks of decreasing market support for key Landonline components.
- *Customer driver*: Customer frustration with the current service offering and the subsequent impact on their efficiency.
- *Information driver*: Property information is not easily integrated across organisations, which has an impact on the quality of decisions made about land and location.

The viable options from the IBC (investment bundles 4 and 5) and alternatives to the base case and preferred investment option were then compared to the drivers to examine the impact these had on the strategic fit, service offerings, benefits, solution, costs and risks. This appendix outlines the analysis that was undertaken.

10.2.1 Revisiting IBC investment bundles

The IBC outlined 5 investment bundles: bundles 1, 4, 5, 6 and 7. IBC bundle 1 became the DBC base case and IBC bundle 6 became the DBC preferred investment option. The IBC indicated that IBC bundle 7 would have a higher cost than the preferred investment option and was therefore discounted from this analysis. The remaining two options outlined in the IBC that fell between the base case and the preferred investment option in terms of cost and service offerings were included in this analysis. These are:

- Bundle 4 – make some changes to the current service offering and enhance service delivery
- Bundle 5 – implement interoperability and make Landonline Workspace contestable.

Investment bundle 4

Investment bundle 4 delivers the base case and looks to implement minor improvements to service delivery aspects that are either high risk or can easily be changed.

There would be minor improvements to the operational performance of existing services by identifying and implementing some business process and workflow improvements. This would involve the application of a framework to assess, identify and prioritise process improvement opportunities. These prioritised opportunities would then be implemented making the changes required to technology components (e.g. changes to business rules and workflow tools) as well as providing any training required for staff.

There would also be better management of the overall system testing scope and flexibility by:

- segmenting the source code into modules to support a reduced software development lifecycle duration
- moving the business logic from the user interface into a dedicated workflow engine to support the ease of future process change
- aligning the source code modules with workflow steps as they provide logical boundaries for system activities
- limiting the scope of change to processes to enable spot testing and end-to-end testing.

The move to modularity that investment bundle 4 introduces will remove the immediate technology risk and address the technical drivers around reducing the complexity of making changes to the system in the short term. However, it does not provide full separation of the vertical and horizontal layers of technology required to:

- provide the agile system
- support the new service offerings
- meet the future needs of the solution.

In addition, bundle 4 introduces complexity to the system with the addition of new components required to support the delivery of new service offerings, which over time will cause further technical issues for managing change.

Investment bundle 5

Investment bundle 5 was focused on enabling third party suppliers (e.g. software suppliers who supply land professionals with services) to provide an alternative to the existing Landonline Workspace. Third party alternatives would effectively have competed with Landonline for customers.

LINZ would provide an interface to access Landonline. Third parties would be responsible for data capture, the pre-validation of datasets and the generation of plan images. LINZ would need to either verify that third parties' pre-validation of datasets is correct or continue to run its existing pre-validation process as data is submitted (it is likely LINZ would always need to run data integrity checks to avoid corruption of the database). LINZ would still be responsible for validating (approving) datasets.

In the short to medium term, LINZ would continue to provide the current Workspace, but would not invest in improving the quality of the service offered (other than to make the changes described below). In the long run, there may be opportunities for LINZ to reduce its investment in the Workspace if third parties deliver to expected performance levels and if their offerings provide better data accuracy.

Survey and conveyancing software providers were engaged during market engagement for the development of the DBC. They were asked whether they would develop a work space offering. Providers indicated they did not support this option and they did not want to design products to offer a work space compatible with Landonline. They did not believe they would make a sufficient return on the investment required. This option has therefore been discounted due to a lack of market support.

10.2.2 Developing new investment bundles

After considering and eliminating the IBC investment bundles, alternative options were considered. The new service offerings were associated with the relevant investment driver and were prioritised. The key driver of the project was to address the technology risks associated with the PowerBuilder code and the risk this posed to the integrity of the New Zealand survey and title system. The removal of the risk to the survey and title system is important for positioning LINZ to deliver on future customer, Ministerial and Government needs in an agile and sustainable manner. As investment bundles 4 and 5 were not realistic solutions, LINZ considered two further investment bundles:

- Alternative option 1A – base case (without modularity) and significant service improvements.
- Alterative option 6A – preferred option (with modularity) without some of the service improvements delivered by the preferred investment option.

The outcome from this work is shown in Table 32. Also included in this table are the base case IBC investment bundle 4 and the preferred investment option from the DBC to enable a full comparison to be done.

Table 32: New rankings for the service offerings

Driver	Service	Base Case	Alternative Option 1A	IBC Bundle 4[40]	Option 6A	Preferred Option
Business	1. Moving LINZ to a more modern and well supported technology platform	✗	✗	✗	✓	✓
Customer	2. Improving the quality of user experience in accessing survey and title services	✗	✓	✗	✓	✓
	3. Making survey and title services available on more devices	✗	✓	✗	✓	✓
	4. Removing inefficiencies in the property sale process	✗	✓	✓	✓	✓
	5. Allowing the public (and Landonline) users to search survey and title records over the internet*	✗	✓	✗	✓	✓
	6. Providing a better interface between customers' systems and Landonline	✗	✓	✗	✓	✓
	7. Providing greater automation of transactions	✗	✓	✗	✓	✓
	8. Improving the ease of transacting Māori land	✗	✗	✓	✗	✓
Information	9. Improving the currency of Māori land information	✗	✗	✓	✗	✓
	10. Supporting the delivery of a Māori Land Service	✗	✗	✗	✗	✓
	11. Enabling data across the property sector to be linked	✗	✗	✗	✗	✓
	12. Delivering a more comprehensive picture of Crown-owned land	✗	✗	✓	✗	✓
	13. Exploring whether property rights can be captured, validated and published in 3D	✗	✗	✗	✗	✓

* This service offering is associated with both the customer and information drivers.

[40] Note that some of these indicators have changed since the IBC. Although many of the services are similar, LINZ has a greater understanding of how it will deliver these services using the technology available and the market capabilities. It has therefore been able to provide a more accurate assessment of which services it can deliver and in what manner.

10.2.3 Alternative option 1A

OVERVIEW

Alternative option 1A delivers the base case and high quantitative benefits through significant improvements to service offerings to customers. This investment bundle does not include the modularisation of the platform. This means the new platform would retain the monolithic design of Landonline. By not implementing modularisation, LINZ would introduce significant long term risks and would only delay the point at which it would need to make significant investment into the system to implement modularisation and technical layer separation.

In this investment bundle the new service offerings would be developed as additions on the side of the existing system, which would significantly increase the complexity of the system. This increased complexity would add extra cost when making alternations for core business purposes, would make it harder to support delivery of the Māori Land Service and would make it harder to deliver future potential services to government (e.g. implementing a register of foreign ownership). It would also get progressively more expensive to test and maintain the system, as large components reached end of life and had to be replaced.

IMPACT ON BENEFITS

Alternative option 1A delivers the majority (95 percent) of the quantified economic benefits from the preferred investment option. The only quantified benefits not delivered are from the development of the Crown-owned land register and through improved ease of transacting Māori land.

DIFFICULTIES AND RISKS

A number of the LINZ staff involved in the delivery of the Landonline projects are reaching retirement age. The longer the implementation of ASaTS takes, the more likely it is the knowledge of the Landonline system will not be available.

SUMMARY

LINZ is operating in an environment of increasing expectations from Ministers, the Government, and the public. By not implementing modularisation and by adding extra complexity to the current Landonline structure, LINZ would position the survey and title system so it was not in a sustainable position in the long term; it would need significant investment shortly and would have increased complexity when that investment was eventually made. Although this option has significant benefits, they did not balance the significant long-term risks to the survey and title system. This option was therefore discounted from further analysis.

10.2.4 Option 6A

Option 6A was developed based on the preferred investment option (Section 4.5) and introduces largely the same architectural vision as the preferred investment option through a modular technology platform. Nearly all of the proposed customer service improvements are implemented under this option. However, it does not introduce interoperability and it does not deliver on Ministerial and Government priorities.

This option would contribute to two of the three investment drivers of ASaTS: the business and customer drivers. The new and improved services (noting these services are described in detail in Section 4.5.1) include:

- moving LINZ to a more modern and well supported technology platform
- improving the quality of user experience in accessing survey and title services
- making survey and title services available on more devices
- providing a better interface between customers' systems and Landonline

- providing greater automation of transactions
- allowing the public (and Landonline) users to search survey and title records over the internet
- removing inefficiencies in the property sale process.

Although option 6A has some strategic alignment, it does not position LINZ to deliver to the same extent on the Ministerial and Government strategic priorities identified as part of developing the preferred investment option. This option does position LINZ so it will be possible to develop the capabilities to deliver on these priorities in the future, with additional funding. Option 6A excludes all services that contribute to delivering on the information driver. The services excluded are:

- improving the ease of transacting Māori land
- improving the currency of Māori land information
- leveraging ASaTS to support delivery of a Māori Land Service
- enabling data across the property sector to be linked
- delivering a more comprehensive picture of Crown-owned land
- exploring whether property rights can be captured, validated and published in 3D.

IMPACT ON BENEFITS

Option 6A delivers the majority (95 percent) of the quantified economic benefits from the preferred investment option. The quantified benefits not delivered under this option are from the development of the Crown-owned land register and improved ease of transacting Māori land. This option has a benefit cost ratio of between [redacted] and [redacted], relative to the base case. This option does not deliver on many of the qualitative benefits that underpin ASaTS delivering on Government and Ministerial priorities.

COST

Indicative costing of option 6A has been done. This work shows the nominal project period costs excluding capital charge and depreciation are $[redacted]. It should be noted that the further investment required to deliver the remaining new service offerings (not delivered under this option, refer to Table 32) will be more than the cost difference between option 6A and the preferred investment option ($[redacted]). This is because there is a base level of resource required to govern and manage a project and there is synergy in delivering all of the new service offerings during a single project. In addition, LINZ will also face costs associated with navigating the Better Business Case process and Cabinet approval for the additional funding required to deliver these additional services.

Nominal cost

The timing of cash costs has important implications for affordability. The nominal costs associated with option 6A (excluding depreciation and capital charge) are shown in Table 33. These costs are presented excluding any LINZ cost savings, as discussed in the analysis of economic benefits.

Table 33: Option 6A nominal costs (excluding depreciation and capital charge)

Option 6A cash costs ($)	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	Total
Capital expenditure														
Personnel														
Hardware														
Software														
Fit-out and office costs														
Crown-owned land register														
Total														
Operating expenditure														
Personnel														
Maintenance, support and licences														
Hardware / software														
Crown-owned land register														
Fit-out and office costs														
ASaTS cost savings														
ASaTS Landonline license cost savings														
Total														
Total annual cash														
Project period total														
Post-project period total														

Under option 6A, costs peak in FY

Where does the cost lie?

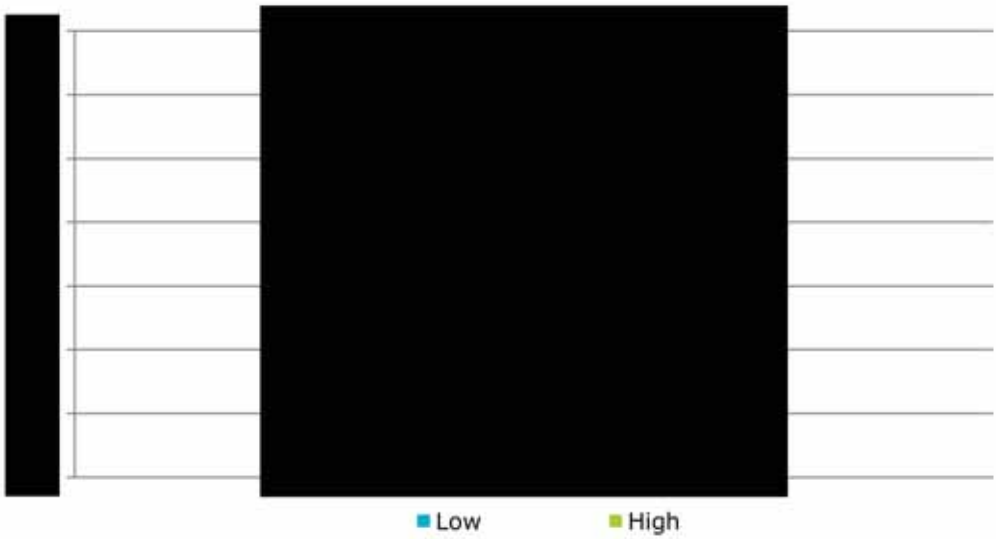
Figure 26 shows the proportion of project costs by activity under option 6A. Technology costs represent approximately [redacted] percent of costs, business change costs (change management, business process and training) represent approximately [redacted] percent of costs and management and governance costs represent approximately [redacted] percent of costs. Like the preferred investment option, this reflects the importance placed on managing the business/customer change.

Figure 26: Proposition of option 6A costs by activity over project period

Benefit cost ratio

The present value of the benefits relative to the present costs of option 6A results in a BCR of between [redacted] and [redacted], as shown in Figure 27.

Figure 27: Benefit cost ratio of option 6A



Incremental ASaTS operating capital expenditure

LINZ's internal incremental personnel requirements to support the delivery of the ASaTS preferred investment option is set out in Table 34.

Table 34: ASaTS option 6A FTE per year by role type

Average FTE Summary by role by year - alternative option 6A	Jun 2017	Jun 2018	Jun 2019	Jun 2020	Jun 2021	Jun 2022	Jun 2023	Jun 2024	Jun 2025	Jun 2026	Jun 2027	Jun 2028
[redacted]												

RISKS OF OPTION 6A

There are a number of risks associated with LINZ adopting option 6A. These include:

- *Reputational risk*: LINZ has communicated to stakeholders that it will deliver on interoperability with the Māori Land Court, will position itself to support delivery of the Māori Land Service, and will deliver data linking capability. Through not delivering these new services there is a risk stakeholders could view this project as not delivering key services.

- *Increased future additional costs*: Work on developing requirements and design will focus on the services being delivered and will not elaborate on requirements for future services in detail. There is the potential that, when future services are included, re-work may be required as the solution is not fully aligned to future needs.

- *Poor strategic alignment*: There is a risk LINZ will have increased difficulties in delivering on its 10 year vision and the IPS future without significant investment.

- *Building for the requirements of today, not for the requirements of 2020 (when the solution will be delivered)*: Although this option positions LINZ to deliver on the future through modularity, there are no interoperable components. There may be emerging urgent initiatives LINZ needs to deliver on and it will not be able to, without increased investment.

- *Fragmenting of services*: There is a risk that other agencies will begin to offer the services (e.g. 3D) that ASaTS was intended to deliver. If more than one agency offers a similar service, the offering could become fragmented instead of LINZ being the only agency to offer the survey and title services.

- *Loss of knowledge*: LINZ has a number of staff who were involved in the delivery of previous Landonline projects. The longer ASaTS takes to deliver, the more likely it is these staff members will no longer be available for the project. As LINZ will be losing valuable knowledge, this could make it harder to deliver the future services that have been removed from this investment option.

OPTION 6A IS A SUB-OPTIMAL SOLUTION

Further investment would be required under option 6A to deliver the service offerings that contribute to the information driver. The cost of further investment would be more than the $[redacted] difference in cost between the preferred investment option and option 6A. This is due to a number of factors, including the base level of resources required to govern and manage a project and the synergies generated in delivering all of the new service offerings during a single project.

There is also a large number of significant risks inherent in option 6A. These risks include a lack of intellectual property remaining within LINZ in the future, introducing fragmented services and building a solution to meet the needs of today's requirements not the future's.

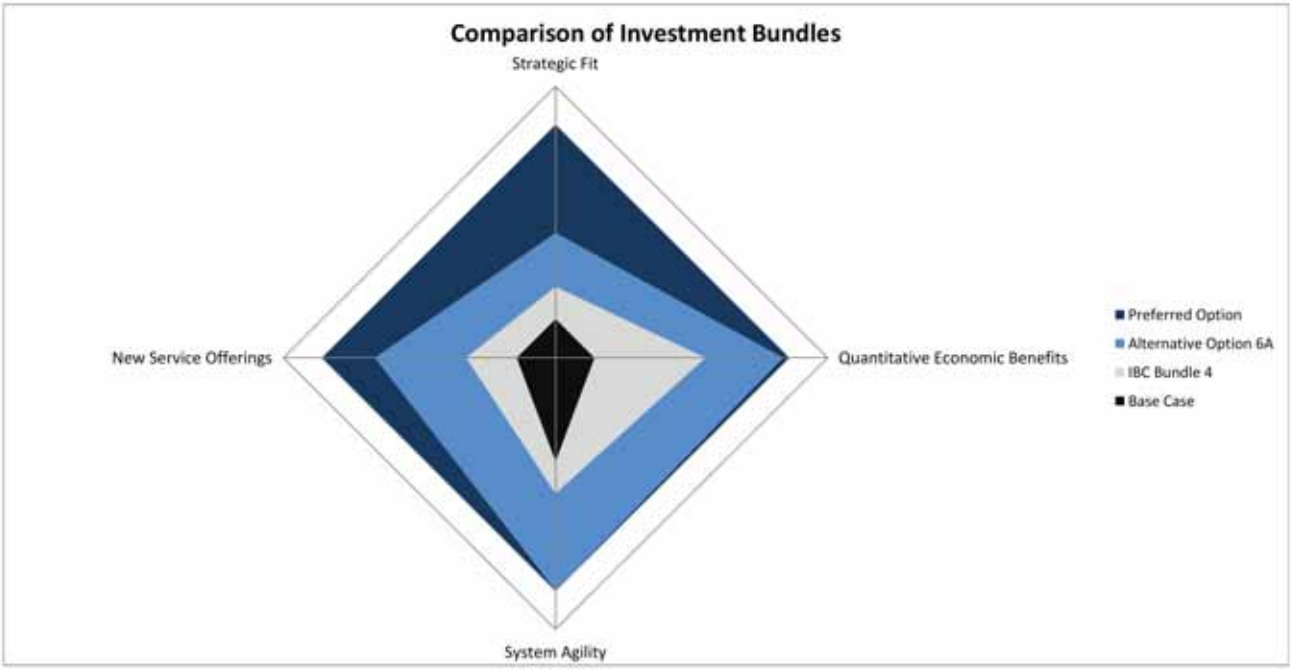
Under this analysis, LINZ has determined the preferred investment bundle is still the optimal solution. The preferred investment option has the best alignment to the three investment drivers and it removes the technology risk, provides a sustainable and agile solution, delivers new services requested by customers and aligns to Ministerial and Government priorities.

10.2.5 Comparing investment bundles

In assessing the investment bundles, a comparison was made between the different options and what the preferred investment option would deliver. This comparison looked at the strategic fit, the new service offerings, the benefits, the solution, the costs and the risks of the options.

Figure 28 compares the options against the strategic fit, the new service offerings, the benefits and the solution.

Figure 28: Comparison of investment bundles



COMPARISON OF COST

As part of developing this DBC, detailed costing was only done for the base case and the preferred investment option. As part of the analysis for this appendix, indicative costing was done for option 6A. Figure 29 shows a comparison of the nominal costs (excluding capital charge and depreciation) of the base case, alternative option 6A and the preferred investment option. In addition this has been compared with the original Landonline investment made in 1997 and 2009.

Figure 29: Comparison of costs for option 6A and preferred investment option

10.2.6 Conclusion

LINZ has determined the preferred investment bundle is still the optimal solution. The preferred option has the best alignment to the three investment drivers and it removes the technology risk, provides a sustainable and agile solution, delivers new services requested by customers and aligns to Ministerial and Government priorities. The preferred investment option delivers all of the quantified economic benefits without introducing further risks to the delivery of ASaTS.

10.3 Contribution to Government and Ministerial priorities

10.3.1 Integrated Property Services

In May 2014, the Cabinet endorsed work towards a future where central and local government provide seamless, integrated property and building information and services (EGI Min (14) 10/13). The objective of the IPS programme is to future proof building and property information by improving its quality and quantity, and assisting agencies to make it to more open and accessible. Data linking capability introduced by ASaTS will contribute to this objective by making it possible for customers to experience seamless and consistent digital and online property and building services from all of the relevant areas provided or mandated by government. Information will be able to be reused by others, including the private sector, to provide end services to customers. Access to information and transactions will be faster, easier and cheaper. At the moment, government information and services are disjointed leading to inefficiencies for local government and a time consuming and disconnected customer experience. It has been estimated that, after the 2013 Cook Strait earthquakes, linked property data could have delivered savings of $2 million to agencies involved in the response effort by resolving property identification issues. It is expected the potential savings from having linked property data would have been far greater.

ASaTS is key to delivering on the IPS future as it will:

- improve the customer experience when transacting with property rights and decrease the cost of transacting
- increase the amount and quality of the property data available to support property rights transactions
- provide the foundations for key property rights datasets across government to be integrated in the future, making them easier to search and use (as discussed above).

10.3.2 Developing a world class location information system

Location information provides powerful insights for economic development and investment decision-making. LINZ has identified that the biggest difference it can make to New Zealand over the next 10 years is by leading the development of a world class system of integrated, seamless location information. LINZ's goal over this period is to increase 10-fold the value created through the use of location information. Location information acts as a reference point for combining different types of data and is especially powerful when combined with time reference points (e.g. who is buying what, where and when and factors influencing that such as the trends in the housing market). Barriers persist in realising the full potential of location information for New Zealand. Key barriers include difficulties about knowing what information exists and where it exists, access issues (including costs), and poor compatibility (interoperability) between different sets of data.

ASaTS will contribute to the removal of barriers around property rights location information by providing increased access to, and higher quality, property information datasets. There are a number of new services proposed for delivery as part of implementing the new service to improve the availability and accessibility of location information. These are described in section 4.5 under the preferred investment option.

LINZ has assumed responsibility for removing barriers to cadastral and property data and manages some of the key datasets within this area: digital parcels, the digital cadastre and survey definition, rights registers, and Crown-owned land areas. Under ASaTS, LINZ will improve the quality and accessibility of these datasets to better enable their reuse.

10.3.3 Better Public Services Results 9 and 10

LINZ has undertaken an analysis of how ASaTS supports the delivery of Better Public Services Result Areas 9 and 10. An action plan has been created and monitoring will be undertaken to ensure all opportunities are realised. Table 35 outlines how ASaTS aligns to the actions of Better Public Services.

Table 35: Alignment to Better Public Services

Result 9: New Zealand businesses have a one-stop online shop for all government advice and support they need to run and grow their business	
Result 10: Consolidate and rationalise the government web domain and rewrite service information to make transactions easier to find and use	
Action	***What ASaTS will do***

Result 9 – Collect information and share it so businesses only have to tell government once	• The ASaTS future state includes two key capabilities which will support this action. The first is interoperability which will allow agencies to share information between systems. The second is a Data Relationship Management service which will enable agencies to store additional information alongside LINZ data so they can easily match records.
	• ASaTS has conducted a risk assessment across the Landonline system to identify the key security and authentication concerns related to how the system is used and the information it holds. This information has provided valuable input into the development the future state in the form of current state risks and future state requirements.
	• ASaTS defined key business requirements which will:
	  ○ Provide web services to improve interoperability between customers' and government agencies' systems.
	  ○ Ensure survey and title data continues to be available for reuse in alignment with privacy considerations.

Result 9 – Create a shared 'front door' for government services Result 10 – Consolidate and rationalise the government web domain and rewrite service information to make transactions easier to find and use	• Provide interoperability services between customers' and government agencies' systems. • Identify the customer types and the services they need to use to support a tailored user experience from a single website. • Offer the services from both a user interface and a system interface. • Consider the operating model inputs by developing a business capability blueprint.
Make the transactions in the Result 10 'basket' more user friendly	• Optimise the end-to end-business processes. • Enhance the user experience with a simplified user interface for the different customers and service types. • Improve the quality of information available on Crown and Māori owned land
Results 9 and 10 – Provide more transactions and services in the digital environment	• Offer new digital services which share more LINZ data which will provide more accurate information and reduce manual processes. • Better integrate LINZ services with customers' systems. • Allow agencies to link their data to LINZ data and reduce the effort required from customers using manual processes.
Results 9 and 10 – Setup new, highly targeted and integrated services and adopt RealMe	• Consider identity and access management as a capability of the future state architecture. • Work with DIA to create a service offering for our non-repudiation requirement that could be leveraged off for all of government purposes.
Results 9 and 10 – Identify and adopt digital service standards	• Engage the GCIO to understand the appropriate use of the technical standards as well as engage its customers to determine what survey and spatial standards should be supported. • Adopt tooling which supports aligning architecture and business processing to requirements. This will support the

Result 9: New Zealand businesses have a one-stop online shop for all government advice and support they need to run and grow their business	
Result 10: Consolidate and rationalise the government web domain and rewrite service information to make transactions easier to find and use	
Action	***What ASaTS will do***
	consistency of documentation and potentially provide reusable artefacts for other agencies.
Result 10 – Evolve contact centre capability to promote and complement digital service delivery	• One key learning from the development of Landonline was the need to develop the customer support processes in parallel with the core system. This will ensure that the tightly coupled business processes and systems are aligned. • The programme has planned to increase the number of contact service analysts within the contact centre to support the transition through the phase implementations and for three years afterwards before reducing the current level. • Further roles will be introduced into the contact centre to support the external data relationships management and interoperability on the boarding of third parties and other agencies for 3–5 years post ASaTS implementation.
Result 10 – Assist customers to transact digitally, and provide alternatives for those who can't	• Ensure survey and title services continue to be offered digitally. • Share information with other agencies to enhance interagency property services. • Provide system interfaces to allow customers to interact with LINZ in system to system context. • Manage the business logic and rules in a common way to support all customer channels. • Maintain existing manual channels for those who cannot transact digitally.

10.3.4 Government ICT Strategy and Action Plan

ASaTS will leverage off existing all of government ICT initiatives (e.g. infrastructure as a service).

ACTIONS IN GOVERNMENT ITC STRATEGY

ASaTS will also align with the frameworks defined in the Government ICT Strategy and Action Plan, specifically with the following actions.

Action 1.3: Rationalise entry points for information and increase accessibility

This initiative will:

- Provide ASaTS with a framework for ensuring information and services are joined-up across government as well as being easier to locate and access.
- Guide ASaTS as new channels for accessing survey and title services are developed. The ASaTS future state includes user interfaces and system interface capabilities which could use the developed framework.

Action 2.1: Integrated transactional account view

This initiative intends to create an optional integrated customer transaction account view for the public and businesses. The ASaTS future state includes a Customer Support Services capability which could provide account and transaction information for this initiative. However, the benefit of this may be limited as a large proportion of LINZ customers are conveyancers who act on behalf of their clients.

Actions 3.1, 3.2: Identity and authentication as key enablers

This initiative will provide ASaTS identity assurance capabilities for digital service delivery which are fit for purpose and build trust in government.

RealMe provides authentication of validated users. Currently, it doesn't provide non-repudiation functionality which is a key requirement of Landonline today and for the ASaTS project. Non-repudiation provides proof of the integrity and origin of transaction data.

In addition to current RealMe services, LINZ requires document signing and non-repudiation capabilities. LINZ will explore developing these capabilities for ASaTS in such a way they could be leveraged off in the future to develop an all of government service. LINZ will work with RealMe to determine how this solution can be developed.

Actions 7.2, 7.3: Customer insight

This initiative will provide ASaTS with a framework for enabling customers to easily provide feedback on government services. During ASaTS implementation there will be a focus on understanding the different customer views. This initiative could provide ASaTS with a mechanism to support collating the opinions of LINZ customers.

Actions 9.1, 9.2: Measure and improve service performance

This initiative will develop and publish consistent service delivery performance measures. ASaTS will be able to use these cost and quality information benchmarks during the development of the future state. They will help guide the operational concerns to ensure service excellence is achieved.

Action 10.3: Authoritative information and joined up processes

This initiative intends to identify and facilitate opportunities for using authoritative data to inform business process improvement and service integration.

LINZ currently holds a lot of business and customer data because of its non-repudiation requirements. LINZ has mature processes which capture and validate data about customers before they can use some of the key LINZ services. LINZ also holds the authoritative address register for New Zealand. This dataset could support the implementation of this initiative.

Actions 11.1, 11.2, 11.3: Information hubs

This initiative will provide ASaTS with a framework to integrate and consolidate information assets to enrich data, provide authoritative sources to agencies and support improvements in information security. The ASaTS future state includes the development of System Interfaces and an ESB to share authoritative data. There is a possibility this initiative could deliver the capability ASaTS requires. However, this assumes the Information Hub capability meets the ASaTS requirements.

Actions 12.1, 12.2, 12.3: Advanced analytics

This initiative will drive the use of analytics, supported by rich authoritative information hubs, for better decision making.

The ASaTS future state includes a Business Intelligence capability which will provide LINZ with insights about its operational performance as well as with the survey and title transactions taking place throughout New Zealand.

Actions 13.1, 13.2: Open by default – active reuse of information assets

Action 13.1 intends to accelerate the release of public information assets for commercial and social reuse and the co-production of services. LINZ is leading this initiative in conjunction with DIA and Statistics New Zealand. The Action 13.1 initiative is looking at developing a shared capability that leverages existing solutions including the LDS and Statistics Datahub. ASaTS is not planning to develop a publishing solution – it will provide extracted datasets in a form

ready for publishing. This data can be uploaded and published using LDS. The ASaTS architecture design is taking a services oriented approach with loosely coupled interfaces to ensure that both projects can progress in parallel with a minimal impact on each other.

Actions 14.1, 14.2: Information management, privacy and security framework

This initiative will provide ASaTS with an information management framework that balances service delivery with the protection and security of government held information, the privacy of information about members of the public and the confidentiality of business information.

The ASaTS future state includes an Identity and Access Management capability to support managing access to the LINZ survey and title services. This initiative will provide guidance on how digital services could be accessed and on how to ensure the privacy of sensitive information. LINZ has also recently undertaken a review of Landonline to ensure it is meeting its security and privacy obligations.

Actions 19.1, 19.2, 19.3: Government architecture

This initiative will provide ASaTS with a framework to ensure the technology architecture is standardised and aligned across government to support agency reuse opportunities. For ASaTS, this will mean architecture deliverables will need to use the common language, capability types, standards and processes defined in the framework. This will help support opportunities to reuse and align government capabilities with a key focus on interoperability between agencies.

Actions 24.1, 24.2, 24.3, 24.4: Common business services

This initiative attempts to increase efficiency and to support joined-up service delivery through expanding the suite of common capabilities available to agencies. LINZ already has processes in place for managing customer data, capturing customer transaction information (e.g. forms) and collecting payments from customers. These capabilities are also included in the ASaTS future state, including a Business Rules Management capability.

10.3.5 Declaration on Open and Transparent Government

ASaTS is aligned to the Declaration on Open and Transparent Government. The government holds data on behalf of New Zealanders and the release of this data enables the private and community sectors to use it to grow the economy, strengthen our social and cultural fabric, and sustain our enviornment. ASaTS will actively release government data by maintaining open access to the currently available bulk survey and title data through the LDS. It will provide direct access to this data for the public. ASaTS will also release the high value Crown-owned land data to the public for reuse in accordance with the Declaration and Principles.

10.4 Detailed description of ASaTS future state functional view

A detailed description of the modules contained in the future state functional view (Figure 7) is outlined below.

MANAGE COORDINATES AND OBSERVATIONS

The Manage Coordinates and Observations component will be the engine that authoritatively stores the nodes (e.g. boundary points and trigonometrical stations) in the geodetic and cadastral system. This engine will contain the complex mathematical models to describe the velocity and deformation of how New Zealand is moving. It will also be used for conversion between different geographic coordinate systems and geodetic datums. This module will also manage the height (3D) and time (4D) dimensions, allowing simpler management of coordinate accuracy upgrades and 'patching' (to reflect events that effect the cadastre, such as earthquakes) to represent changes to the land.

MANAGE INFRASTRUCTURE (SURVEY MARKS)

The Manage Infrastructure (Survey Marks) module is an asset management type capability for maintaining and managing geodetic and cadastral mark information. It links to the nodes in the Manage Coordinates and Observations module to determine the location of marks. External users are expected to interact with this system (maintenance contractors, geodetic surveyors, cadastral surveyors, and potentially other customers over time) to raise alerts, manage jobs, provide information, create new marks, and other tasks related to the management of marks.

MANAGE CADASTRE

The Manage Cadastre module will manage the cadastre and produce cadastral data in a format that can be consumed by other systems. The nodes that make up the cadastre will be provided by the Manage Coordinates and Observations module, which will translate nodes to NZGD 2000 (or other suitable epoch in the future). Cadastral surveyors will interact with this Manage Cadastre module and be able to submit changes (through a workflow process with quality assurance) to the cadastre. This Manage Cadastre will also consider 3D and 4D rights, as well as 3D objects that exist in the cadastre. In the current form, plans of rights defined in three dimensions are only stored as images related to the survey; moving to a 3D data environment will require further investigation for future change.

MANAGE ADDRESSING

The Manage Addressing module will also use the cadastral layer produced in the Manage Cadastre as the spatial basis of the system. The Manage Addressing module will be concerned with providing an authoritative set of addresses for New Zealand, which can be spatially represented and consumed by external parties. Linkages with other external datasets may be considered for this module. The addressing system is being developed separately and is currently not in scope for ASaTS but it is expected to provide a mechanism for address searching within the cadastre and title functions.

A potential value add from this approach is the spatial linking of addresses to coordinate movements over time. The current form of managing addresses uses a spatial point on the cadastre to represent the address (usually aligned to the front door of the property). Over time these spatial points are not managed as a part of the cadastre and can become spatially misaligned with the cadastre. In the proposed Manage Coordinates and Observations engine, a set of nodes representing address points could be managed and aligned with other nodal shifts in the cadastre. This would then better align the datasets for future changes and prevent the 'drifting' of address points.

MANAGE ELECTORAL

The Manage Electoral module will be moved out of the current Landonline system and some of the functions will move to Statistics New Zealand. The module will consume the cadastral layer produced in the Manage Cadastre module as well as other datasets (such as meshblocks and territorial authority boundaries, and also addresses) to fulfill the needs of the Electoral functions. The electoral system is currently not in scope for ASaTS.

MANAGE TITLES

The Manage Titles module uses the cadastral layer produced in the Manage Cadastre module as the spatial basis of the system. The Manage Titles module is concerned with ownership and rights in relation to a parcel. This existing functionality will be extended to allow information about Crown-owned land to be recorded. The ASaTS future state functionality will include spatial queries of titles (e.g. all titles in a particular spatial area) and will provide users with greater visual representation of 'where' the title is. For height limited parcels and Unit Titles, the 3D object (e.g. surfaces of a building information model) or strata information will be contained as a part of the cadastre and can be visually represented to a user.

MANAGE CUSTOMERS

The Manage Customers module will provide a common set of support services used to manage customer interactions, customer requests, access to services, reporting, financial management, regulatory and audit functions, training, and help. This module will need to integrate with the other functions to provide a seamless customer experience and to allow for the simpler management of customer interactions. This is a key module required for a successful system operation.

10.5 Detailed description of technology components

A detailed description of the technology components contained in the future state architecture is outlined below.

3D STRUCTURES

The cadastre is represented as a two-dimensional fabric in Landonline and there are requirements for certain structures to be represented in three dimensions. In particular, these are Unit Titles (ownership rights in multi-party buildings such as apartments), rights such as tunnels (passing under properties), and height restrictions. The system will have the ability to store 3D structures or volumes that represent the rights of a particular 3D structure. These structures will need to be linked to the titles and cadastre datasets to provide an accurate description of relevant rights.

APPLICATION SERVER

An application server is a software framework that provides a generalised approach to creating a business system. It uses standard application components, interfaces and service layer models. The application server is dedicated to the efficient execution of procedures (programmes, routines, scripts) to support its applied applications.

ASSURANCE MANAGEMENT

As a large amount of the work on the land tenure system is carried out by third parties (i.e. conveyancers, surveyors, local government) there is a strong need to provide internal and external assurance management. The current systems which support this function are currently being considered for replacement outside of the STCP but they will continue to have a dependency on the survey and title information. The assurance management system is being designed with an understanding of the ASaTS future state. At this stage, it is not expected these assurance management activities will form a core part ASaTS.

BUSINESS INTELLIGENCE AND REPORTING

Business intelligence is a type of software application that transforms raw data into meaningful information and reports for business purposes. Business intelligence can handle enormous amounts of unstructured data to help identify, develop and otherwise create new opportunities. Business intelligence makes interpreting large volumes of data easier.

BUSINESS PROCESS WORKFLOW

A workflow engine is a software application that defines a process, the rules governing business process decisions and routes information. A workflow engine manages and monitors the state of activities, such as the processing and approval of an ownership change application, and determines the next activity according to defined processes (workflows). The actions may be anything from saving an application form in a document management system to sending a reminder e-mail to users, or escalating overdue items to management. A workflow engine facilitates the flow of information, tasks, and events.

BUSINESS RULES ENGINE

A business rules engine is a software application that executes one or more business rules in a runtime environment. A business rules engine enables an organisation's policies and other operational decisions to be defined, tested, executed, and maintained separately from the application code. Rule engines typically support rules, facts, priority (score), mutual exclusion, preconditions and other functions. An example of a business rule could be that 'a solicitor cannot work on the ownership of a land title registered in their own name'.

BUSINESS ACTIVITY MONITORING (BAM)

Business Activity Monitoring (BAM) helps monitor business activities. The capability provides aggregation, analysis, and the presentation of real-time information about activities inside the organisation involving staff, customers and partners. A business activity can either be a business process that is orchestrated by the business process workflow, or a business process

that is a series of activities spanning multiple systems and user actions. BAM is an enterprise solution primarily intended to provide a real-time summary of business activities to operations managers and upper management. An example of how LINZ could use a BAM type solution is the monitoring of real-time workflows against agreed service level agreements, supporting operational management.

CADASTRE

The cadastre is the official record of cadastral survey marks (CSDs) that define the location of boundaries of land interests under various tenure systems, including freehold, leasehold, Māori and Crown land. It includes official survey plans, easement areas, exclusive use areas, information about boundary marks, survey measurements and other supporting information provided by surveyors.

A CSD is produced by a licensed cadastral surveyor and lodged with LINZ. These CSDs show a property's legal boundaries, areas and dimensions. In the case of subdivisions the territorial authority certifies the survey to verify that sub-divisional requirements and services (e.g. providing roading and drainage), have been met. Landonline provides an option for the online certification of CSDs by territorial authorities. When a CSD is lodged with LINZ, it has to be accompanied by a survey report that explains its purpose, how it was completed, and how it complies with the prescribed standards.

Land transfer plans are the most common kind of CSD. In the case of a land transfer plan, when LINZ is satisfied the plan meets the legal requirements, it deposits the plan. The existing title for that land area is cancelled, and new Land Registers (certificates of title) are created for the new parcels of land shown on the deposited plan.

The current system records the observations and marks in 2D form (normalised to mean sea level). The future state will allow relevant nodes to be recorded, validated and exported in 3D digital format and provide richer information. Further work will be done to identify changes at the application level and the impact on the surveyors who use the system. There will need to be a greater understanding of how the node information is currently managed across the functional sub-systems of Landonline and how these can be migrated to a future state. There is also a desire to move towards fully automated survey approval for simple CSDs. Currently, the standards and rules that govern the submission and approval of cadastral surveys are not simple to codify and are likely to be reviewed by LINZ.

COMPUTER REGISTER (TITLES)

A Land Register (more commonly known as a certificate of title) is a register of all rights and interests that both establish and limit the rights to ownership or usage by named parties over one or more parcel(s) of land. Each certificate of title carries a state guarantee as to the correctness of the details registered.

There are multiple types of Land Register, which vary depending on the classification of land. There are likely to be new classifications of land in the future increasing the types of Land Register. The five main classifications in Landonline are:

- land freehold registers for fee simple land
- land interest registers for leasehold land, or for any land of a lesser interest than freehold land
- unit title registers for stratum freehold or leasehold interests in a unit-titled development
- composite Land Registers for the issue of a Land Register combining estates (e.g. fee simple and leasehold or fee simple and life estate)
- customary marine title under the Marine and Coastal Area (Takutai Moana) Act 2011.

Every title in the Land Register has a unique title reference, a legal description, a current view and a historic view, including an image of the paper Certificate of Title (if one existed) captured when the system was digitised. Each will also have a diagram, or reference to, and/or association to a survey plan, and in almost every instance they should be associated to

relevant parcel(s). In the future state, with the creation of other Land Registers, some type of title or reference will be required, but these may not be the same as typical titles described under the Land Transfer Act 1952. There will still be parcel(s) which will be linked to ownership or custodianship.

Most Māori land and some Crown-owned land is also recorded in the Land Register. The alignment of records with the Māori Land Court is an ongoing process and the differences that exist are mostly in the area of customary Māori land (managed by the Māori Land Court). Currently, most of the Crown-owned land in New Zealand does not have a title. ASaTS proposes the creation of a Crown-owned land register that will record the Crown-owned land that agencies are aware they administer. Generally when Crown-owned land is disposed of, the process involves providing a freehold title for the land and hence will follow typical titles processes. Complexity arises when Crown-owned land is transferred between Crown entities or when its purpose is reclassified, which does not involve the issuing of a new title.

CUSTOMER RELATIONSHIP MANAGEMENT

A Customer Relationship Management (CRM) system supports the provision of customer interactions, customer requests and access to services. Its goal is to track, record, store in databases, and then analyse information in a way that increases customer relations. In addition to its core request and service functions, the CRM system could be used to improve interactions between LINZ and its customers. Service quality can be maximised using analytics and key performance indicators to give LINZ information on where to focus customer service efforts to maximise efficiency and to decrease idle and unproductive contact with its customers.

DATA LINKING

Data linking will enable LINZ information to be better linked with other property sector information. Currently the property sector is segmented across councils, MBIE, LINZ, and other agencies. Each agency collects information that does not directly correlate with other agencies' information and requires the customer to provide the integration point. LINZ will initially provide this service in terms of its own authoritative data, but also provide a service which links other disparate datasets (by using references, not the entire dataset) not held by LINZ for third parties.

ENTERPRISE SERVICE BUS

An ESB is used for designing and implementing communication between mutually interacting software applications in a service-oriented architecture. It promotes agility and flexibility with regards to communication between applications. Its primary use is in the integration of complex systems. Key functions include service orchestration, message transportation and data transformation, details of which follow:

- *Data transformation*: Data transformation is the transition of data formats and values between the formats of the sending application and the receiving application. This often involves conversion to a common application independent canonical[41] model. This data transformation usually occurs on the fly during a message transmission and enables source systems and receiving systems to maintain separate data models by using an intermediary language.
- *Message transportation*: Transportation is the conditional routing of messages, based on a non-centralised policy (without the need for a central rules-engine) between the sending application and the receiving application.
- *Service orchestration*: Service orchestration is the coordination of multiple implementation services exposed as a single, aggregate service. There are different levels of services, which vary from small technical services, to business processes to

[41] Canonical data model is a design pattern for integrating disparate data formats. It functions as a translator between the two formats (i.e. if one person speaks Spanish and another speaks Mandarin, this allows them to speak through a common language of English).

business services. The granularity of these services determines the reusability. It is often very difficult to design reusable services without designing for a specific implementation.

EXTRACT TRANSFORM AND LOAD

Extract, Transform, and Load (ETL) refers to a process in database usage that:

- extracts data from outside sources
- transforms it to fit operational needs, which can include quality levels
- loads it into the end target (database, operational data store, data mart, or data warehouse).

GEODETIC

The Geodetic Business Information Object is the underpinning spatial reference system used by the cadastre to describe the shape of New Zealand. Marks and nodes that make up the system are currently split into cadastral and geodetic survey marks. In essence, these are all physical and virtual marks that describe the shape of the land. In Figure 7, it is proposed that all observation and coordinate data be managed in a separate module. By managing the data separately, the core mathematical models used to define the geodetic movement can be managed in one place and tailored to better suit the future state. These models can also be moved away from the current state where this geodetic information is altered outside Landonline.

IDENTITY AND ACCESS MANAGEMENT

Identity and access management enables the right individuals to access the right resources at the right times for the right reasons.

Identity management includes the management of user access, their authentication, authorisation, and privileges across the system. Non-repudiation is a requirement of the current Landonline system and is likely to be required in the future state. LINZ needs to be certain the person who initiates the transaction is the person who performs the action, as the Crown is guarantor on all title ownership in New Zealand. Any perceived weakness in the control environment will erode confidence in and stress the non-repudiation model.

SEARCH INDEXES

This data object consists of data extracted from authoritative sources structured to support searching. No data is mastered here and the indexes could be updated regularly from the source.

SYSTEM INTERFACE (INTERNAL AND EXTERNAL)

A system interface is a shared boundary across which two separate components of a computer system exchange information. The exchange can be between software systems, computer hardware, peripheral devices and combinations of these. The interface will support a range of transport protocols (e.g. RESTFul Web Services, SOAP Web Services, and B2B).

USER INTERFACE/PRESENTATION

The user interface is the space where the interaction between humans and machines occurs. The goal of this interaction is the effective operation and control of the application at the user's end, and feedback from the application. This helps the operator make operational decisions. A number of different user roles need to be supported by the user interface or interfaces (e.g. power user, task specific user, and data requestor).

10.6 Financial modelling assumptions and outputs

This appendix outlines the assumptions that have been used to inform the financial modelling of the ASaTS project over the FY 2015 to FY 2027 whole-of-life.

COMPONENTS OF FINANCIAL MODELLING

The financial modelling for the ASaTS DBC project is broken down into two components.

Baseline modelling

Baseline modelling forecasts LINZ's operations outside of the ASaTS project. Results from the baseline modelling will not change as a result of any ASaTS investment.

Base case and ASaTS investment modelling

Base case modelling assesses the impacts of the minimum investment required to replace the PowerBuilder code within Landonline. ASaTS modelling assesses the impacts of both the preferred investment option and option 6A. The base case, preferred investment option, and option 6A all have the same level of detail in terms of the input structure.

MODELLING ASSUMPTIONS

All modelling is in nominal terms, which provides a view of the nominal funding amounts that will be required to cover the costs associated with the ASaTS project.

The financial model developed on these assumptions is based on separating LINZ's expenditure into 13 categories which are based on LINZ's appropriation structure:

- The survey and title system
- Location based information infrastructure
- Leading the geospatial programme
- Management of Crown-owned land
- Ministerial services
- Policy advice
- Administration of the New Zealand Geographic Board
- Ratings valuation
- Valuation Registration Board
- Centralised clearance service for acquisitions and disposals
- Land disposal services for other agencies
- Administration of the overseas investment regime
- LINZ biosecurity programme.

FY 2015 budget data has been used as the baseline input for the financial analysis. Adjustments have been made to normalise figures for one-off costs and revenues captured in FY 2015.

This appendix covers the following areas.

Baseline revenue and expenditure assumptions

The baseline revenue and expenditure assumptions covered are:

- *Revenue assumptions*: Revenue is split by category and is comprised of a combination of third party revenue and Crown funding.

- *Assumptions on baseline expenditure*: This is the expenditure LINZ incurs as part of performing its day-to-day operations under the status quo. ASaTS decisions have no impact on business as usual expenditure.

Baseline balance sheet assumptions

The baseline balance sheet assumptions covered are:

- *Asset assumptions*: This includes LINZ's cash reserves, accounts receivable, current assets and other non-current assets.
- *Assumptions having an impact on LINZ's liabilities*: This includes accounts payable, employee entitlements, and other liabilities.
- *LINZ equity balance assumptions*: LINZ's equity is comprised of a memorandum account and taxpayer funds. Assumptions have been made regarding LINZ's revenues and the subsequent impact on LINZ's equity balance.

Base case and ASaTS assumptions

Assumptions for base case and ASaTS expenditure: This reflects the incremental operating and capital expenditure costs of the base case and ASaTS investment options.

10.6.1 Baseline revenue and expenditure assumptions

REVENUE

LINZ receives revenue from the Crown and third party sources. Where outputs and categories charge for services, they are expected to operate on a cost recovery basis. For other output areas or where third party revenue does not cover costs, expenses are covered by Crown funding.

Crown funding

LINZ has seven Crown categories:

- Location based information infrastructure
- Leading the geospatial programme
- Management of Crown-owned land
- Ministerial services
- Policy advice
- Administration of the New Zealand Geographic Board
- LINZ biosecurity programme.

The total Crown appropriation from FY 2015 to FY 2018 is taken from the latest appropriation estimates from Vote Lands, released by Treasury. For FY 2019 onwards, Crown funding has been held flat with no inflation adjustment applied. This is consistent with advice given by Treasury.

With this Crown funding assumption in place, this has highlighted a Crown funding gap for the out years that LINZ will need to address. For modelling purposes, a Crown revenue 'efficiency savings' item has been added to capture the shortfall between Crown appropriation and forecast Crown expenditure. This LINZ crown funding issue has been excluded from the ASaTS project cost analysis as the majority of the project cost relies on survey and title third party funded revenue.

Third party revenue

LINZ receives its main third party revenue from the following seven third party revenue sources, with survey and title revenue making up 90 percent:

- The survey and title system
- Management of crown land – CERA
- Ratings valuation
- Valuation Registration Board
- Centralised clearance service for acquisitions and disposals
- Land disposal services for other agencies
- Administration of the overseas investment regime.

Due to the fact the ASaTS project does not call on any of the other LINZ third party revenue sources we have primarily focused on the survey and title revenue, modelling this at a more granular level.

Survey and title third party revenue

Survey and title revenue is fully generated from third party sources based on a user pays model. The revenue has been separated into the three main product groups – title transactions, survey transactions, and search transactions.

A high level description of the approach taken for modelling survey and title third party revenue is as follows:

- Revenue is calculated under current fixed transaction fees for title, survey and search products over the forecast period and includes the fee increase associated with each funding option.
- Revenue is calculated based on a fee per transaction and multiplying this fee by forecast transaction volumes.
- Title, survey and search transactions are based on the June 2014 NZIER survey and the title volume forecast for FY 2015 to FY 2018. After this 4 year period, revenue is assumed to stay at FY 2018 levels. Table 36 below shows the forecast annual growth for title, survey and search transactions.

Table 36: Survey, title and search transaction forecast growth rates

Transaction type	NZIER forecast growth rate			Assumed growth				
	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23
Title transactions	-1%	3%	2%	0%	0%	0%	0%	0%
Survey transactions	-6%	3%	3%	0%	0%	0%	0%	0%
Search transactions	1%	3%	3%	0%	0%	0%	0%	0%

- NZIER provides a revenue range (high, low, and central) which gives an 80 percent confidence interval.
- Revenue forecasting is highly uncertain due to the volatile nature of the property market. Due to the capital loan amount being contingent on the survey and title revenue flows, it is important that a realistic estimate of revenue is taken. To ensure sufficient capital is available, a realistic but conservative approach to revenue flows has been used, which has been combined with the quantitative risk assessment to provide sufficient contingency for ASaTS.

- Analysis of historic NZIER forecasts when compared to actuals (the earliest being December 2011) shows a consistent trend of volumes coming in 22%–65% below the central forecast (when compared to the low forecast). The lower end occurred in the early years of NZIER forecasting (2011). The NZIER forecasting is now likely to be more accurate due to better data.
- For this analysis LINZ has opted to take a conservative view, forecasting transaction volumes between the NZIER low and central volume forecasts. LINZ has adopted a position that is 25% below the mid-point for the revenue forecasting (i.e. a position slightly lower than the central volume forecasts provided by NZIER).

A range of different scenarios has been built into the revenue modelling which have provided a sensitivity test of funding impacts on the ASaTS project. The scenarios that have been modelled are listed below:

- Survey, title, and search transaction volumes modelled at the low, medium and high NZIER forecasts (which cover an 80 percent confidence interval). From FY 2019 onwards, transactions grow at a low case (zero percent growth rate), central case (one percent growth rate) and a high case (two percent growth rate). As noted above, a point between the low and central case has been used.
- A scenario has been included to model the percentage by which all survey and title transaction fees would need to increase to fund the ASaTS project and to maintain a sufficient level of cash reserves under the funding options. If transaction volumes are lower than forecast, this price increase may need to be larger and may need to occur earlier.

To ensure LINZ has sufficient funds to meet its costs with normal property market fluctuations, it is assumed that $10 million in cash is required to be held as a reserve in the survey and title memorandum account for normal cycle fluctuations (which is consistent with the LINZ cash reserves policy).

Table 37 details the fee increase required under the three funding options for both the mid (used as the high revenue scenario comparison to the scenario used for ASaTS) and low revenue scenarios, as well as the year the fee increase will need to be introduced to ensure sufficient funding is available. The fee increases have been calculated on the QRA 50th percentile ASaTS costs.

Table 37: Fee increase required under each funding option (at QRA 50th percentile)

Fee increase required	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26
NZIER mid + 1% ongoing (High revenue scenario)											
Capital injection not repaid							[redacted]%				
Capital loan repaid							[redacted]%				
Third party funded with Crown loan – fee increase FY19				[redacted]%							
Third party funded with Crown loan – fee increase FY21						[redacted]%					
NZIER low + 0% ongoing (low revenue scenario)											
Capital injection not repaid							[redacted]%				
Capital loan repaid							[redacted]%				
Third party funded with Crown loan – fee increase FY19				[redacted]%							
Third party funded with Crown loan – fee increase FY21						[redacted]%					

EXPENDITURE

This section considers the expenditure incurred by LINZ over the forecast period. This section is broken into:

- baseline operating expenditure
- baseline capital expenditure.

Baseline operating expenditure

Baseline operating expenditure has been modelled at an output and category level, with the survey and title system category broken down by cost centre. Baseline operating expenditure is expenditure that takes place in the absence of the base case and the ASaTS project.

The operating expenditure categories and assumptions are set out in Table 38.

Table 38: Baseline operating expenditure assumptions

Category	Assumptions
Personnel expenditure	Personnel costs for all outputs and categories are assumed to grow at CPI, based on the *2014 Treasury Budget: Economic and Fiscal Update*. Any increases in survey and title FTEs have been taken from the survey and long-term LINZ resource plan.
Fixed IT service provider contract	IT outsourced fixed contract costs are forecast to grow by CPI per annum, [redacted].
IT outsourced expenditure	IT outsourced expenditure is primarily comprised of: • Landonline application development • software and licenses • Dimension Data contractual costs • IT infrastructure projects and enhancements. Landonline application development and maintenance is assumed to grow by [redacted]percent per annum, which is consistent with the expected releases and maintenance resourcing required and prior year trends. All other costs in the expenditure category are assumed to grow by CPI per annum.
Property costs	• Property expenditure covers the associated property costs of the three LINZ offices based in Wellington, Christchurch and Hamilton and is assumed to grow by CPI per annum.
Depreciation and amortisation	• For existing fixed and intangible assets, the baseline depreciation and amortisation has been calculated using LINZ forecasts. • Depreciation of new assets is based on asset additions from LINZ's long-term capital plan, with an assumed asset useful life per asset type.
Capital charge	• LINZ incurs a capital charge annually on its equity balance of taxpayer funds. • Capital charge is calculated on taxpayer funds at a rate of 8 percent per annum. From discussions with Treasury, this is held flat over the forecast period.

Category	Assumptions
One-off adjustments	• A number of one-off adjustments have been included in the financial modelling, which mainly relate to: • The removal of one-off Crown funded expenditure transfers from the FY16 expenditure forecasts, which have been included in the FY15 forecast. • The removal of one-off expenditure (e.g. the replacement of key Landonline components). • The removal of the pre-implementation ASaTS associated project costs from the FY17 baseline. These costs will only be incurred up until the expected ASaTS project commencement in January 2017.

THE OVERHEAD ALLOCATION MODEL

- LINZ's allocation of overhead expenditure is split, based on front facing FTEs in the directly allocated Crown and third party outputs and categories. Table 39 shows the basis for the corporate overhead allocation charge –the Survey and title revenue stream will be charged 65.6 percent of the corporate overhead expenditure in FY 2018 (based on 246 FTEs in the survey and title area over a total of 375 FTEs).

Table 39: Baseline FTE used for overhead allocation purposes

BAU FTE - for overhead allocation purposes	Jun 2016	Jun 2017	Jun 2018	Jun 2019	Jun 2020	Jun 2021	Jun 2022	Jun 2023	Jun 2024	Jun 2025	Jun 2026	Jun 2027	Jun 2028
The Survey & Title System	215	227	246	244	241	246	248	249	249	249	249	249	249
LINZ Location Based Information Infrastructure (Crown)	35	35	35	35	35	35	35	35	35	35	35	35	35
Leading the NZ Geospatial Programme (Crown)	13	13	13	13	13	13	13	13	13	13	13	13	13
Management of Crown Land (Crown)	41	41	41	41	41	41	41	41	41	41	41	41	41
Ministerial Services	2	2	2	2	2	2	2	2	2	2	2	2	2
Policy Advice Outputs	11	11	11	11	11	11	11	11	11	11	11	11	11
Administration of the NZ Geographic Board	4	4	4	4	4	4	4	4	4	4	4	4	4
Ratings Valuation	3	3	3	3	3	3	3	3	3	3	3	3	3
Valuation Registration Board	2	2	2	2	2	2	2	2	2	2	2	2	2
Centralised Clearance Service for Acquisitions & Disposals	5	5	5	5	5	5	5	5	5	5	5	5	5
Administration of the Overseas Investment Regime	12	12	12	12	12	12	12	12	12	12	12	12	12
LINZ Biosecurity Programme	1	1	1	1	1	1	1	1	1	1	1	1	1
Total	344	356	375	373	370	375	377	378	378	378	378	378	378

BASELINE CAPITAL EXPENDITURE

Baseline capital expenditure has been calculated based on the FY 2014 fixed asset register and LINZ's long-term capital plan.

Capital expenditure has been split by both output/category area and asset type, based on the opening net book value of LINZ's assets. This enables the depreciation to be charged against the correct funding source and an average useful life applied to each asset type for annual depreciation calculation. Capital expenditure has also been separated into survey and title assets and non-survey and title assets.

The average asset life for each asset type is set out in Table 40.

Table 40: Assumed asset life/depreciation rate for fixed asset additions

Fixed Asset Additions Asset Type	Assumed Asset life (Full Years)	Straight line Depreciation Rate
Software\General	5 Years	20%
Furniture and Fittings\General	10 Years	10%
EDP\General	5 Years	20%
Plant and Equipment\General	5 Years	20%
Leasehold Improvements\General	8 Years	13%
S&T Software\General	5 Years	20%
S&T Software\Landonline	5 Years	20%
S&T Furniture and Fittings\General	10 Years	10%
S&T EDP\General	5 Years	20%
S&T EDP\Landonline	5 Years	20%
S&T Plant and Equipment\General	5 Years	20%
S&T Leasehold Improvements\General	8 Years	13%

LINZ depreciation funding is separated between Landonline and non-Landonline depreciation. This separates the available depreciation funding it is proposed to use for ASaTS Landonline capital expenditure from depreciation funding used to cover the replacement of non-Landonline assets.

10.6.2 Baseline balance sheet assumptions

This section summarises LINZ's opening balance sheet and the assumptions made regarding assets, liabilities, and equity. Capital expenditure assumptions that have an impact on non-current assets are summarised above.

Table 41 summarises LINZ's opening balance sheet for FY 2015.

Table 41: LINZ's budgeted FY 2015 opening balance sheet

LINZ Budgeted opening balance sheet	FY15 $m
Assets	
Current Assets	
Cash and cash equivalents balance	32.9
Inventory	0.4
Prepayments	1.3
Receivables	8.2
Total Current Assets	*42.8*
Non-Current Assets	
Fixed assets (inc intangibles)	37.6
Total Non-Current Assets	*37.6*
Total Assets	**80.4**
Liabilities	
Current Liabilities	
Accounts Payable	6.5
Tax payable	1.4
Employee benefits	3.6
Other liabilities	0.3
Total Current Liabilities	*11.7*
Non-Current Liabilities	
Employee benefits (non-current)	2.9
Total Non-Current Liabilities	*2.9*
Total Liabilities	**14.6**
Net Assets	**65.8**
Equity	
General Funds	44.7
Equity - Memorandum Accounts	21.0
Equity	**65.8**

Key items in the opening balance sheet are set out below.

CURRENT ASSETS

Cash and cash equivalents

Cash and cash equivalents have been split in the balance sheet by survey and title, non-survey and title, Landonline depreciation and non-Landonline depreciation funding pools, and are shown in Table 42.

Table 42: Split for cash and cash equivalents

Survey and title	Non-survey and title	Landonline	Non-Landonline
53%	19%	19%	9%

This split shows where the available cash and cash equivalents lie, to ensure the ASaTS funding assessment is based on appropriate cash available and the ring-fencing of non-Landonline depreciation.

Accounts receivable

Accounts receivable days are assumed to be 40 days and to remain flat over the forecast period. This means LINZ takes 40 days on average to collect income owing from its customers.

Other current assets

- Other current assets include prepayments, inventory, and other debtors.
- Prepayments are assumed to remain flat at $1.3 million over the forecast period.
- LINZ inventory is primarily comprised of excess stock of hardcopy maps. The opening inventory value of $0.4 million is expected to fall by 10 percent per year over the forecast period, as maps are written-off and sold.

FIXED ASSETS (INCLUDING INTANGIBLES)

LINZ's fixed and intangible assets are mostly comprised of software and electronic systems. Survey and Title Operations holds approximately 80 percent of LINZ's fixed and intangible assets, which is mostly attributable to the Landonline application and its components.

- The forecast FY 2014 closing fixed asset register has been taken as a starting point for the FY 2015 opening balance.
- Fixed assets have been split by asset category.
- Fixed asset depreciation is based on useful life at asset category level.

These are shown in Table 43.

Table 43: Useful life of fixed asset categories

Software - general	Software – Landonline (S&T)	Furniture & fittings	Hardware – general & Landonline	Plant & equipment	Leasehold improvements
5 years	5 years	10 years	5 years	5 years	8 years

LIABILITIES

Accounts payable

- Accounts payable days are assumed to be 23 days and to remain flat over the forecast period. This means LINZ takes 23 days on average to pay its suppliers.
- This has been calculated based on current LINZ payables as at FY 2014.

Tax payable

- Tax payable relates to goods and services tax (GST) commitments payable to Inland Revenue (IR).
- This is calculated based on the net amount of GST recoverable and payable.
- The opening balance for GST in FY 2014 is $1.4 million and this is assumed to remain flat over the forecast period.

Employee entitlements

- Employee entitlements are split between long-term and short-term liabilities and are expected to grow by CPI over the forecast period. This is consistent with salary inflation forecasts.

Other liabilities

- The opening balance of all other liabilities is $0.3 million and this is assumed to remain flat over the forecast period.

EQUITY

LINZ's equity is comprised of the following:

- *Three memorandum accounts:* Landonline (relating to the survey and title category), the Overseas Investment Office and Crown Property Clearances (which is the centralised clearance service for the acquisitions and disposals category)..
- *The balance of the remaining unofficial memorandum accounts*: These memorandum accounts are notional accounts to record the accumulated balance of surpluses and deficits incurred for outputs and categories operating on a full cost recovery basis. This provides a long-term perspective to the pricing of third party outputs.
- *General funds*: This reflects the Crown investment in LINZ.

The annual balance in the official and notional memorandum accounts is driven from the surpluses and deficits incurred within third party outputs and categories.

10.6.3 Incremental base case operating and capital expenditure assumptions

The incremental base case operating expenditure is based on the expected expenditure incurred from converting PowerBuilder to a more modern language, enabling LINZ to maintain its current service offering.

LINZ does not have the in-house capability to deliver the base case. Therefore it is assumed LINZ will outsource this to a third party provider.

The main expenditure elements incorporated into the base case costing are as follows:

- A cost estimate to convert the PowerBuilder code to a more modern language [redacted]
- Incremental LINZ personnel required to support the delivery of the base case. LINZ staff costs are based on total direct costs for the role type. Direct costs are based on associated salary costs with a 15 percent uplift for backfilling requirements, along with all incremental staff related consumable costs (printing, training, IT equipment and licences, phone use, and recruitment). This process has also been applied to the preferred investment option.

Table 44 shows the LINZ FTE requirements.

Table 44: Base case FTE summary by role type

Average FTE summary by role by year - base case	Jun 2017	Jun 2018	Jun 2019	Jun 2020	Jun 2021
PMO Coordinator and Project Coordinator	0.5	1.0	1.0	1.0	0.5
ICT Test Manager	-	0.3	0.3	0.3	0.3
Senior testing analysts	-	0.1	0.5	0.1	0.5
Programme Board	0.1	0.1	0.1	0.1	0.1
Survey Trainer - Internal	0.2	0.3	0.3	0.3	0.2
Title Trainer - Internal	0.2	0.3	0.3	0.3	0.2
Change Communications specialist	0.1	0.2	0.2	0.2	0.1
Team Leader Landonline	0.2	0.5	0.5	0.5	0.3
Senior Landonline Application Title Specialist	1.0	2.0	2.0	2.0	1.0
Senior Landonline Application Survey Specialist	1.0	2.0	2.0	2.0	1.0
Total	3	7	10	7	6

The costing estimate assumes:

- a complete rewrite of the PowerBuilder code without redesign or enhancement into a PowerBuilder-like development tool
- the development times for any such PowerBuilder-like tool would be approximately the same as for PowerBuilder
- no use of an automated tool to support the rewrite process
- no change to the Spatial Blade code
- no change to specialist components integrated with and/or used by Landonline, such as the component for digital signing
- limited impact on stored procedure code.

10.6.4 Incremental ASaTS operating and capital expenditure

This section addresses the assumptions used in the development of costs for the preferred investment option.

LINZ does not have the in-house capability to design, construct and provide ongoing maintenance and support for the new solution. Therefore it will need to outsource these functions. It is assumed that the investment bundle will be procured using a model similar to the current procured model for Landonline with Datacom.

Under this procurement assumption LINZ will outsource the design, construction, support, and maintenance functions. The third party provider will own the supporting hardware and software, but LINZ will continue to own the Landonline application and source code.

The third party will provide two services to LINZ:

- The use of the assets/system
- Maintenance services that will cover any incremental changes to the application.

DEVELOPMENT OF COST ESTIMATES

The costing of the ASaTS solution is based on a bespoke build with an element of COTS. This assumption is a conservative approach and reduces the complexity of the estimation process. The resource and cost estimates have been put together by:

- developing an architecture transaction plan which defines the approach to the project implementation across five project phases – Foundational capabilities, Geodetic, Survey, Title, and Decommissioning
- identifying the required LINZ personnel resource types, along with the number of resources and expected usage by project phase and stage
- identifying contractor days and abstracting the number of resources from the contractor days to support an understanding of the accommodation and seating needs
- identifying non-personnel resources required for both delivering the future state COTS as well as the COTS that enables the project delivery.

Key inputs for the estimation process

The following inputs have informed the estimation process:

- RFI responses
- Current LINZ personnel and non-personnel costs
- Discussions with LINZ SMEs about resources required for previous Landonline implementation projects
- ASaTS future state architecture and ASaTS high level transition plan
- PWC experience on large technology-enabled projects.

Key cost elements for ASaTS

The following shows the main cost elements incorporated into the ASaTS preferred investment option:

- Incremental LINZ personnel required to support the delivery of the ASaTS solution.
- Contractor resources dedicated to the ASaTS project.
- Non-personnel resources required to enable the delivery of the project and ongoing operations. Budgeted resources include software licences, hardware (assumed to be

provided through infrastructure as a service), additional floor space (fit out and ongoing rental) and travel and associated accommodation.

DETAILED RESOURCING AND COST ASSUMPTIONS

Further details relating to the costs can be found in the 'Advanced Survey and Title Services (ASaTS) Project & Production Resource and Cost Estimates document' that was finalised on 28 July 2014. If you wish to view a copy, please contact LINZ.

FTE REQUIREMENTS FOR THE PREFERRED INVESTMENT OPTION

LINZ's internal incremental personnel requirements to support the delivery of the ASaTS preferred investment option are set out in Table 45.

Table 45: ASaTS preferred investment option FTE per year by role type

Average FTE summary by role by year - preferred option	Jun 2017	Jun 2018	Jun 2019	Jun 2020	Jun 2021	Jun 2022	Jun 2023	Jun 2024	Jun 2025	Jun 2026	Jun 2027	Jun 2028
[redacted]												

10.6.5 Option 6A operating and capital expenditure assumptions

OPTION 6A COSTINGS

Option 6A costings were based on the costings for the preferred investment option. The service requirements were prioritised based on the benefit they delivered and on the investment drivers they contributed to. An impact assessment was undertaken on reducing the number of services delivered by option 6A (compared to the preferred investment option) and the impact it would have on project phases 1–4 (the decommissioning phase would remain the same). The impact of the reduction in services was assessed against the resources required to deliver each phase to derive a variance factor (variance from the preferred investment option) which was applied across the ASaTS phases to derive the costs of option 6A.

FTE REQUIREMENTS FOR OPTION 6A

LINZ's incremental internal personnel requirements to support the delivery of option 6A are set out in Table 46.

Table 46: Option 6A FTE per year by role type

Average FTE Summary by role by year - alternative option 6A	Jun 2017	Jun 2018	Jun 2019	Jun 2020	Jun 2021	Jun 2022	Jun 2023	Jun 2024	Jun 2025	Jun 2026	Jun 2027	Jun 2028
[redacted]												

10.6.6 Funding options

PRIMARY FUNDING OPTIONS

The DBC proposes three potential funding options for ASaTS.

Option 1: Crown capital injection (not repaid)

The Crown provides a capital injection of up to $[redacted], with accumulated depreciation funds held by LINZ also being used to fund capital costs. This injection will not be repaid, and LINZ will instead accumulate depreciation related revenues from survey and title fee payers in reserves to fund future asset replacement and enhancements.

Option 2: Crown capital loan repaid with ASaTS accumulated depreciation

Under this option the Crown provides a repayable capital loan of up to $[redacted], with a further capital injection of $[redacted] relating to the Crown-owned land register (which will not be repaid). It is proposed that LINZ will repay the capital loan with ASaTS depreciation charged to survey and title fee payers throughout the life of the investment. To be fiscally neutral to the Crown this loan will need to be repaid by the end of FY [redacted]

Option 3: Third party funded, supplemented with a repayable Crown capital loan for the funding shortfall

Under this option ASaTS capital costs will be funded through $[redacted] in depreciation reserves, third party memorandum account reserves and surpluses and a repayable Crown capital loan for any funding shortfall during the project period. The Crown capital injection will be repaid in full through charges to third party users by the end of FY [redacted]. It is likely an increase in third party user fees will be required. If fees are increased in FY [redacted], a Crown capital loan of $[redacted] will be required; if fees are increased in FY [redacted], a Crown capital loan of $[redacted] is required.

FORECAST FINANCIAL STATEMENTS UNDER THE FUNDING OPTIONS

The income statement, balance sheet, cash flow and memorandum account statements for LINZ as a whole are presented below for each funding option. The below statements include necessary fee increases under each funding option to ensure the memorandum account balance stays above $[redacted] over the forecast period. These tables reflect the QRA at the 50th percentile, which has been adopted as the expected project cost for the preferred investment option. For funding option 3 there are two sets of financial tables which reflect the variable fee increase scenarios (a [redacted] percent fee increase in FY [redacted], or a [redacted] percent fee increase in FY [redacted]).

FORECAST FINANCIAL STATEMENTS UNDER FUNDING OPTION 1 – CROWN CAPITAL INJECTION NOT REPAID

Table 47: LINZ Income Statement under funding option 1 (Crown capital injection not repaid) [42]

LINZ Income Statement	FY17 $	FY18 $	FY19 $	FY20 $	FY21 $	FY22 $	FY23 $	FY24 $	FY25 $	FY26 $	FY27 $	FY28 $
[redacted]												

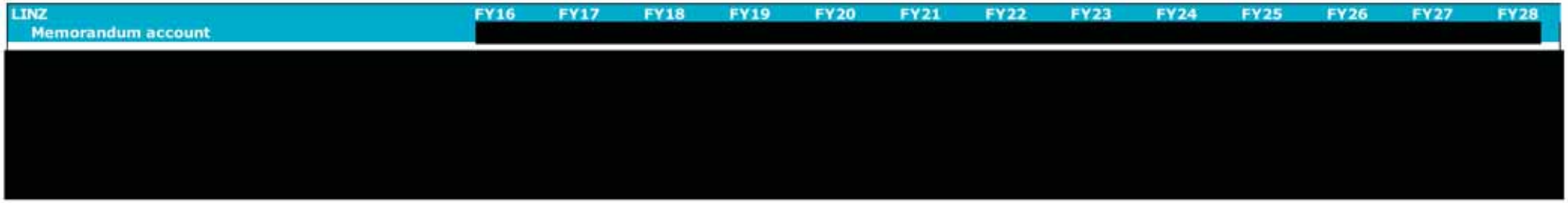
[42] This scenario includes a fee increase of 24 percent in FY 2022 – note that this is based on the QRA 50th percentile.

Table 48: LINZ Balance Sheet under funding option 1 (Crown capital injection not repaid)

LINZ Balance Sheet	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28
[redacted]													

Table 49: LINZ Cash Flow Statement under funding option 1 (Crown capital injection not repaid)

Table 50: LINZ Memorandum Account Statement under funding option 1 (Crown capital injection not repaid)



FORECAST FINANCIAL STATEMENTS UNDER FUNDING OPTION 2 – CROWN CAPITAL LOAN REPAID WITH ASaTS ACCUMULATED DEPRECIATION

Table 51: LINZ Income Statement under funding option 2 (Crown capital loan repaid)[43]

LINZ Income Statement	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28
[redacted]												

[43] This scenario includes a fee increase of 17 percent in FY 2022 – note that this is based on the QRA 50th percentile.

Table 52: LINZ Balance Sheet under funding option 2 (Crown capital loan repaid)

LINZ Balance Sheet	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28
[redacted]													

Table 53: LINZ Cash Flow Statement under funding option 2 (Crown capital loan repaid)

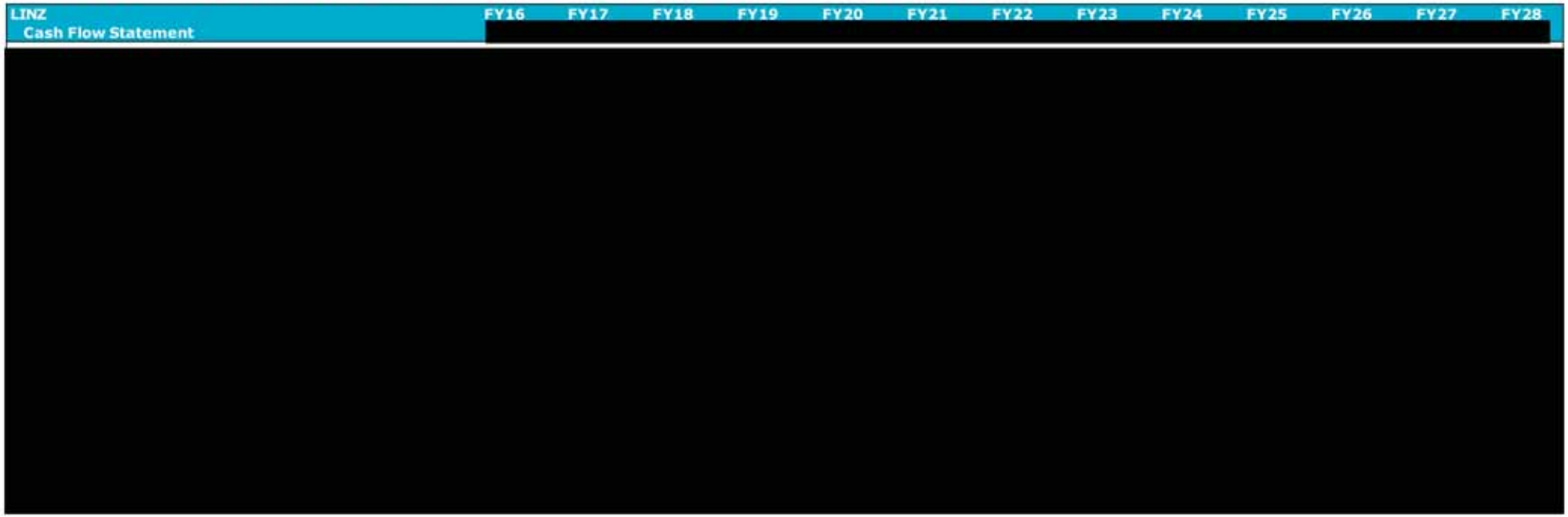
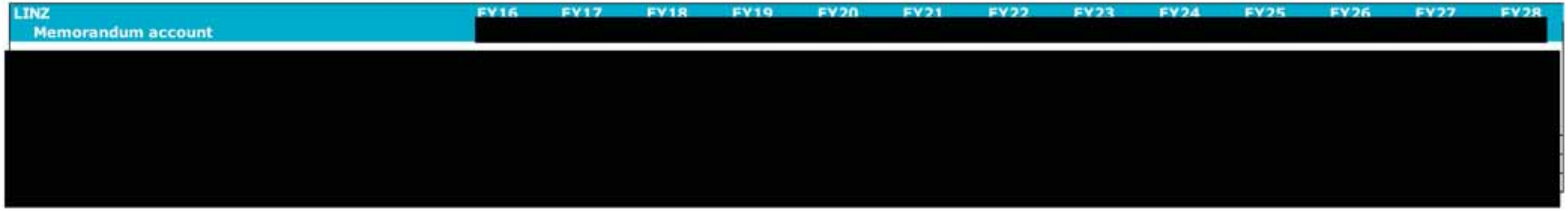


Table 54: LINZ Memorandum Account Statement under funding option 2 (Crown capital loan repaid)



FORECAST FINANCIAL STATEMENTS UNDER FUNDING OPTION 3 – THIRD PARTY FUNDED, SUPPLEMENTED WITH A REPAYABLE CROWN CAPITAL LOAN (FEE INCREASE IN FY 2019)

Table 55: LINZ Income Statement under funding option 3 (third party funded, supplemented with a repayable Crown capital loan – Fee increase in FY 2019)[44]

LINZ Income Statement	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28
[redacted]												

[44] This scenario assumes fees are increased by 23 percent in FY 2019 – note that this is based on the QRA 50th percentile.

Table 56: LINZ Balance Sheet under funding option 3 (third party funded, supplemented with a repayable Crown capital loan – Fee increase in FY 2019)

LINZ Balance Sheet	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28
[redacted]													

Table 57: LINZ Cash Flow Statement under funding option 3 (third party funded, supplemented with a repayable Crown capital loan – Fee increase in FY 2019)

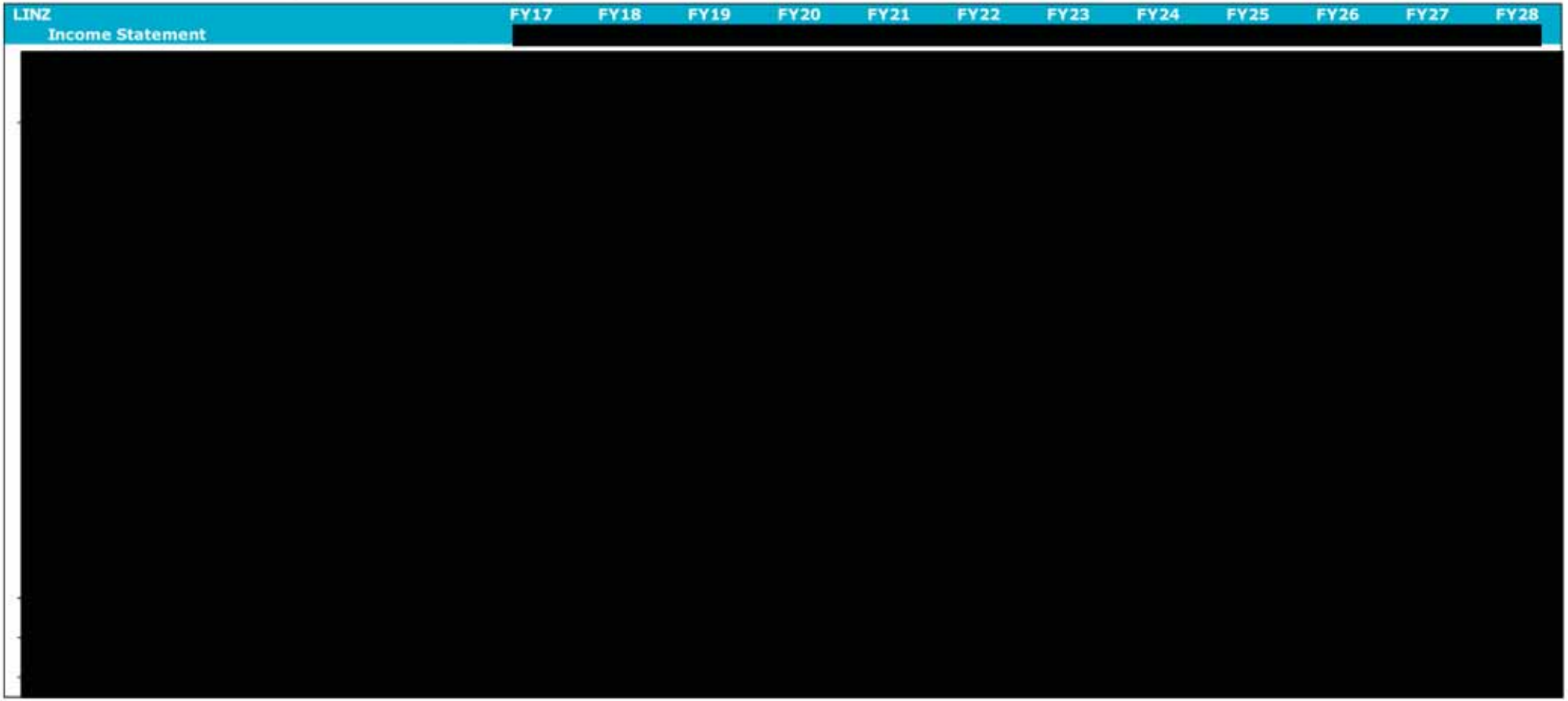
LINZ Cash Flow Statement	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28
[redacted]													

Table 58: LINZ Memorandum Account Statement under funding option 3 (third party funded, supplemented with a repayable Crown capital loan – Fee increase in FY 2019)

LINZ Memorandum account	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28
[redacted]													

FORECAST FINANCIAL STATEMENTS UNDER THE FUNDING OPTION 3 – THIRD PARTY FUNDED, SUPPLEMENTED WITH A REPAYABLE CROWN CAPITAL LOAN (FEE INCREASE IN FY 2021)

Table 59: LINZ Income Statement under funding option 3 (third party funded, supplemented with a repayable Crown capital loan – Fee increase in FY 2021)[45]



[45] This scenario assumes fees are increased by [redacted] percent in FY [redacted] – note that this is based on the QRA 50th percentile.

Table 60: LINZ Balance Sheet under funding option 3 (third party funded, supplemented with a repayable Crown capital loan – Fee increase in FY 2021)

LINZ Balance Sheet	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28
[redacted]													

Table 61: LINZ Cash Flow Statement under funding option 3 (third party funded, supplemented with a repayable Crown capital loan – Fee increase in FY 2021)

LINZ Cash Flow Statement	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28
[redacted]													

Table 62: LINZ Memorandum Account Statement under funding option 3 (third party funded, supplemented with a repayable Crown capital loan – Fee increase in FY 2021)

LINZ Memorandum account	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28
[redacted]													

10.7 Inputs to the Quantitative Risk Assessment

Table 63: Inputs to the Quantitative Risk Assessment

Risk	Probability of occurring	Credible lowest possible	Optimistic (10th percentile)	Most likely	Pessimistic (90th percentile)	Credible highest possible	Comments
[redacted]							

10.8 Economic benefits modelling assumptions and outputs

This section contains the assumptions used for estimating the quantifiable marginal benefits that will be realised from the ASaTS project, including how these assumptions link to the areas of improvement ASaTS will deliver.

10.8.1 Approach

As part of the development of the DBC, LINZ undertook a survey of Landonline users to inform estimates of the time savings the proposed ASaTS services will deliver. The time savings estimates were applied to values of time to assign a dollar value to the benefit. It is assumed that any time savings to conveyancers or cadastral surveyors will be passed on to their clients in the way of lower fees.

The period used for the benefits modelling is 11.5 years from the start of the ASaTS project in January 2017. This period is based on the first asset being deployed 18 months into the project period, and then a further 10 year estimated asset life. This forecast period is consistent with that used for financial modelling purposes.

10.8.2 Assumptions used in quantification of economic benefits

GENERAL ASSUMPTIONS

- The value of time applied to conveyancing activities is assumed to be $200 to $250 an hour in FY 2014 based on discussions with the New Zealand Law Society's Property Law Group and the Auckland District Law Society. This reflects a blended average charge out rate, taking account of both legal secretaries and conveyancers carrying out parts of the transaction.
- The value of time applied to surveying activities is assumed to be $125 to $150 an hour in FY 2014 based on information obtained from the New Zealand Institute of Surveyors.
- For benefits resulting in savings of LINZ staff time, only the direct staff costs have been quantified. Direct staff costs are costs associated with salary, superannuation, ACC, printing, training, IT and phone use. All indirect overhead costs (e.g. corporate overhead costs) have been excluded.
- It is assumed that all charge out rates and salaries will grow by CPI per annum from FY 2016 onwards over the forecast period. No inflation adjustment has been assumed between FY 2014 and FY 2015. CPI is based on forecasts from the 2014 Treasury Budget: Economic and Fiscal Update and is approximately two percent per annum.
- The assumed growth rate for survey and title transactions is based on the NZIER survey and title forecasts, which go out to FY 2018. From FY 2019 onwards, it is assumed that all transactions grow at one percent per annum.

ASSUMPTIONS SPECIFIC TO THE CUSTOMER SURVEY

The customer survey posed a number of multi-choice questions about services being offered as part of ASaTS. For example:

- "As part of the Detailed Business Case we are investigating how Landonline could better link with conveyancing software. We would like to understand how much time you currently spend duplicating effort between your software and Landonline.
- On average, for each DTM transaction how much time do you estimate is spent repeating activities already undertaken in your conveyancing software? For example, re-entering the name and address of the property purchaser.
- Less than 5 minutes
- 5-9 minutes
- 10-14 minutes

- 15-19 minutes
- 20 minutes or more."

Survey responses were treated as follows:

- Time savings estimates used in quantifying benefits associated with a better interface between customers' software and Landonline is based on the total responses to those questions.
- Weighted average time savings are calculated based on the time saving ranges and the number of responses for each range. This weighted average is assumed as the time savings per transaction.
- The time saving used in the benefit quantification is the mid-point of each range (e.g. the time saving for '5-9 minutes' is assumed to be 7.5 minutes).
- If the lower end of the range is zero, the mid-point is still taken. This means the assumed time saving for the 'less than 5 minutes' range is assumed to be 2.5 minutes.
- For upper range options, the assumed time saving is 25 percent on top of the starting saving (e.g. the assumed saving for the '20 minutes or more' range is 25 minutes).

One of the key ASaTS benefits relates to reducing the duplication of time by creating a better interface between the software used by customers and Landonline. This benefit will be realised by those customers who used specialised conveyancing and cadastral surveying software. The customer survey responses capture the current state use of specialised software (27 percent for conveyancers and 96 percent for cadastral surveyors). However, the use of such software is likely to change over the forecast period. It is assumed the improved interface ASaTS will introduce and the greater use of software by younger generations will lead to an increased uptake of specialised software use. Table shows the assumed uptake rate of software applied to the analysis. Between FY 2025 and FY 2028 the update rate is assumed to stay at the FY 2024 level.

Table 64: Forecast customer uptake in specialised conveyancing and cadastral surveying software

Software uptake	Current	Assumed software customer uptake growth								
	FY14	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24
Conveyancing software	27%	35%	40%	45%	50%	60%	70%	80%	90%	95%
Cadastral surveyor software	96%	96%	96%	96%	96%	98%	98%	98%	98%	98%

ASSUMPTIONS SPECIFIC TO CUSTOMER BENEFITS

The key benefits expected to accrue to customers as a result of ASaTS are the value of time savings as a result of:

- a better interface with customer systems
- reduced survey requisition rates
- notice of sale information being sent directly to territorial authorities
- direct notification of mortgage registration to lending institutions
- obtaining a more accurate picture of Crown-owned land (the establishment of a Crown-owned land register)
- improvements in interactions with the Māori Land Court
- easier searching of property information with web-based search.

Table 65 outlines the assumptions that have been applied to quantify the value of these time savings and the source of the assumptions.

Table 65: Assumptions specific to customer benefits

Benefit area	Beneficiary	Assumptions used and source
Better interface with customer systems	Clients of conveyancers	• In FY13, there were 243,087 discharge, transfer, mortgage (DTM) transactions and 9,475 new title transactions (Landonline extract). • Weighted average time savings is 7.06 minutes per DTM transaction and 8.19 minutes per new title transaction (from customer survey).
	Clients of surveyors	• In FY13, there were 5,636 relevant CSD transactions (Landonline extract). • Weighted average time savings is 114.55 minutes per CSD transaction (from customer survey).
Reduced time spent on re-work following requisition	Clients of surveyors	• In FY13, 3,441 CSD transactions were requisitioned (Landonline extract). • Improvements offered by ASaTS will reduce the survey requisition rate by 40% (from discussions with LINZ SMEs). • The average time a cadastral surveyor spends addressing a requisition is 60 minutes (LINZ SMEs).
Notice of sale information being sent directly to territorial authorities	Clients of conveyancers	• In FY13, 192,413 notifications to territorial authorities were required (Landonline extract). • Weighted average time spent currently notifying councils is 6.77 minutes (from customer survey). • ASaTS will reduce the time taken to notify councils by 75% (from discussions with LINZ SMEs).
	Territorial authorities	• In FY13, 192,413 notifications to territorial authorities were required (Landonline extract). • On average 30% of council notifications require re-work solely as a result of the current double handling process (from discussions with Auckland, Wellington and Christchurch city councils). • The time spent addressing the re-work is 5 minutes on average (from discussions with Auckland, Wellington and Christchurch city councils). 100% of this time will be saved as a result of ASaTS. • For FY14, the value of time applied to council staff resource is $40 an hour (from discussions with Auckland, Wellington and Christchurch city councils). It is assumed this rate will increase by CPI from FY14.
Direct notification of mortgage registration to lending institutions	Clients of conveyancers	• In FY13, 161,136 notifications to lending institutions were required (Landonline extract). • Weighted average time savings is 6.87 minutes (from customer survey).
	Lending institutions	• Two FTEs are currently required for bank staff to manually update bank records. 100% of this time will be saved as a result of ASaTS and this is assumed to apply to the four largest banks. • For FY14, the value of time applied to bank staff resources is $65k per annum (based on discussions with the four largest banks). It is assumed this will increase by CPI from FY14.
Obtaining a more accurate picture of Crown-owned land	Clients of conveyancers	• It is assumed the answers from the customer survey questions on the frequency of transactions associated with Crown-owned land are representative of all conveyancers that use Landonline. • In FY14, there were 6,721 title transactions involved with Crown-owned land (from the customer survey). • The weighted average time savings per transaction is 16.20 minutes (from customer survey).

Benefit area	Beneficiary	Assumptions used and source
	Clients of surveyors	• It is assumed the answers from the customer survey questions on the frequency of transactions associated with Crown-owned land are representative of all surveyors that use Landonline. • In FY14, there were 2,768 survey transactions with Crown-owned land involvement (from customer survey). • Weighted average time savings per transaction is 19.88 minutes (from customer survey).
Obtaining automatic confirmation of Māori Land Court confirmation	Clients of conveyancers	• It is assumed the answers from the customer survey questions on the frequency of transactions associated with Māori land are representative of all conveyancers that use Landonline. • In FY14, there were 7,153 title transactions with Māori land involvement (from customer survey). • Weighted average time savings per transaction is 19.25 minutes.
	Clients of surveyors	• It is assumed the answers from the customer survey questions on the frequency of transactions associated with Māori land are representative of all surveyors that use Landonline. • In FY14, there were 1,265 survey transactions with Māori land involvement (from customer survey). • Weighted average time savings per transaction is 19.65 minutes (from customer survey). • In FY14 the surveyor charge out rate is $125 to $150 an hour.
Easier searching of property information through web-based searching	Manual search customers (cheaper web search fees for manual search customers)	• In FY12, 28,105 manual search transactions were done (Landonline extract). • Manual search transactions are assumed to grow by the NZIER growth rate for searches from FY12. • 80% of manual search transactions are assumed to transfer to web searching (from discussions with LINZ SMEs). • Fees for web-based searching are set at $5 (GST inclusive) per electronic transaction and $15 (GST inclusive) per manual transaction.
	Customers using third party providers of property information (cheaper fees to obtain a certificate of title)	• It is assumed that 10–20% of properties sold use a third party provider of property information to obtain two guaranteed title searches for each sale (LINZ SMEs). • In FY14, there were 77,161 houses sold in New Zealand (obtained from REINZ). This number is assumed to grow at the NZIER growth rate of titles from FY14. • The price for a 'guaranteed title' search from third party providers of property information is estimated to be $13.95 (from LINZ searches of third party providers) compared to $5 through LINZ. The difference between the two ($8.95) is the economic benefit per transaction (passed on to the customer).
	E-search users save on digital certificate cost	• In FY14, there were 1,193 Landonline customers who had an e-search licence (Landonline extract). • 80% of e-search users are assumed to transfer to web-based searching (from discussions with LINZ SMEs). • The current annual license fee for a digital certificate is $56 (GST inclusive).
	E-search users (time saving on annual down-load of digital certificate)	• In FY14, there were 1,193 Landonline customers with an e-search licence (Landonline extract). • 80% of e-search users are assumed to transfer to web-based searching. • It is assumed customers spend 10 minutes downloading the digital certificate (from discussions with LINZ SMEs). • The value applied to e-search customers' time is based on what was used to value territorial authorities' staff time ($40 an hour in FY14). This is assumed to grow by CPI from FY14.

Benefit area	Beneficiary	Assumptions used and source
	E-search users (reduced time spent on customer support calls)	• There were 3,361 calls to the LINZ call centre made by e-search customers (from LINZ customer support statistics). • The average call time is 4.04 minutes (based on customer support statistics). • The value applied to e-search customers' time is based on what was used to value territorial authorities' staff time ($40 an hour in FY14). • 80% of e-search users are assumed to transfer to web-based searching. • It is expected that, once e-search customers migrate to web-based searching, e-search customer calls will reduce by 90% as they will no longer need to annually renew their digital certificates and the new system will be easier to use.

Benefits to LINZ

The key benefits to accrue to LINZ as a result of ASaTS are the value of time savings as a result of:

- reduced survey requisition rates
- obtaining a more accurate picture of Crown-owned land (establishment of a Crown-owned land register)
- improvements in interactions with the Māori Land Court
- survey and title process efficiencies
- improved survey and title business reporting
- easier searching of property information through web-based searching
- increased testing automation and a more componentised design.

Table 66 outlines the assumptions used to quantify the value of time savings.

Table 66: Assumptions specific to LINZ benefits

Benefit area	Assumptions used and source
Reduced survey requisition rates	• In FY13, 3,441 CSD transactions were requisitioned (Landonline extract). • Estimated time LINZ spends per requisition is 72.5 minutes. • In FY14, LINZ employee direct cost was $45 an hour. • Improvements offered by ASaTS will reduce the survey requisition rate by 40% (LINZ SMEs).
Obtaining a more accurate picture of Crown-owned land	• It is estimated that LINZ spends $60k per annum undertaking manual exercises to establish a picture of land owned by the Crown (estimate based on $600k spent over a 10 year timeframe, of historic Crown-owned land projects undertaken by LINZ that were able to be quantified). • CPI assumed for annual $60k cost, from FY14.
Obtaining automatic confirmation of Māori Land Court confirmation	• In FY14, there were 3,000 transactions that flagged Māori land, requiring manual checks with the Māori Land Court (Landonline extract). • It is estimated LINZ employees spend 10 minutes per transaction to verify these transactions with the Māori Land Court (LINZ SMEs). • In FY14, LINZ employee direct cost to undertake checking was $59k per annum.
Survey and title process efficiencies	• In FY14, direct staff operating costs from survey and title transactions was $12.1 million. • It is estimated there is a 50/50 work effort split between the survey and title workload (LINZ SMEs). • It is assumed there will be 8% process efficiency in survey staff resources and 3% process efficiency in titles staff resources realised as part of the business process optimisation from ASaTS.
Improved survey and title business reporting	• 80% of Survey and Title Operations' Reporting Analyst staff time is assumed to be saved through the increase in automation as a result of ASaTS. • The value applied to survey and title operations reporting staff is estimated to be $80k per annum.
Easier searching of property information through web-based searching	*Time savings from reduced processing of manual searches* • In FY14, survey and title operations staff costs were $59k per annum for staff involved in manual search transactions. • Current resourcing for manual searches is 1 FTE per annum. • 80% of manual search transactions are assumed to be automated by web-based searching. • The assumed LINZ FTE reduction from reduced manual searching is 0.8 FTE (LINZ SMEs).
	Time savings from reduced e-search call centre volumes • In FY12, there were 9,361 calls from e-search customers to the LINZ call centre (Landonline extract). • In FY14, there was $59k of direct LINZ staff cost associated with answering calls. • It is assumed 80% of e-search customers will transfer to web-based searching. • It is expected that, once e-search customers migrate to web-based searching, e-search customer calls will reduce by 90% as they will no longer need to annually renew their digital certificates and the new system will be easier to use.
Increased testing automation and a more componentised design	• In FY14, $85k was spent on functional regression testing completed as a result of maintenance and infrastructure upgrades to Landonline. • It is expected this cost (which is assumed to increase in line with personnel cost increases) can be saved each year.

WHEN BENEFITS ARE ASSUMED TO BE REALISED

The timeline for when benefits are assumed to be realised is based on the ASaTS transition plan (discussed in more detail in Section 8.2.1) and is shown in Table 67.

Table 67: Timing for realising benefits

Who benefits?	Benefit area	When benefit is assumed to begin		
		FY19	FY20	FY21
Customers	Better interface with customer systems			
	• Conveyancers			1 December 2020
	• Cadastral surveyors		1 June 2020	
	Reduced survey requisition rate		1 June 2020	
	Notification of sales to territorial authority	1 July 2018		
	Notification of mortgage registration to lending institutions	1 July 2018		
	A Crown-owned land register			1 December 2020
	Improvements in interactions with the Māori Land Court			1 December 2020
	Easier searching of property information through web-based searching	1 July 2018		
LINZ	Reduced survey requisition rate			1 December 2020
	A centralised Crown-owned land register			1 December 2020
	Improvements in interactions with the Māori Land Court			1 December 2020
	Survey and title process efficiencies			1 December 2020
	Improved survey and title business reporting			1 December 2020
	Easier searching of property information through web-based searching	1 July 2018		
	Testing time savings	1 July 2018		

10.8.3 Results

Table 68 shows the range of present value whole-of-life quantified economic benefits, summarised by both the benefit area and the beneficiary.

Table 68: Present value of the range of whole-of-life quantified economic benefits

Benefit area	PV of Benefits to Customers ($millions)		PV of Benefits to LINZ ($millions)	Total PV of benefits ($millions)	
	Low range	High range	Total	Low range	High range
Better interface with customer systems	[redacted]				
Reduced survey requisition rate					
Notification of sale to territorial authorities					
Notification of mortgage registration direct to lending institutions					
Crown-owned land register					
Improved interactions with the Māori Land Court					
Easier searching of property information through web-based searching					
Survey and title process efficiencies					
Improved survey and title business reporting					
Testing time savings					
Total					

10.8.4 Cost Benefit Analysis

The cost of the project is offset against the benefits across the life of the asset. Some of the benefits will start to be realised following the implementation of phase 2 and the remainder will start to be realised following the implementation of phase 3 and phase 4. Table 67 provides a view of when the benefits are expected to be realised.

It should be noted that the direct cost and benefits of a single service cannot be accurately quantified at this stage as further engagement needs to be made with vendors. In addition, there are cost synergies in implementing services that share common components and therefore a breakdown at this level is unlikely to be available.

It should also be noted that the scope of each phase has been determined to develop this business case. During the course of the procurement phase of ASaTS this may be updated to reflect the best (business priorities paired with technical risk and complexity) way to phase the implementation of the solution. This view will be validated as part of the implementation business case.

10.9 Benefits Register

Note, a number of the baselines will need to be redone in June 2015, before work on the implementation of ASaTS begins.

Table 69: Benefits Register

Benefit number	Title	Benefit description	Quantified benefit	Benefit owner	Measure description	Baseline measure	Target measure	Measurement frequency	Measurement owner
1.	Better use and development of resources	Supports improved quality of decision making for land and resources		Manager Survey and Title Operations	The Crown-owned land register is implemented and populated with Crown-owned land information from 10 agencies	0	10 (2019)	Measured in 2019	STCP Director
2.	Better use and development of resources	Supports improved quality of decision making for land and resources		Manager Survey and Title Operations	The number of working days to adjust 98% of cadastral survey datasets into the survey network following approval	52 working days	60 working days	Quarterly	STCP Director
3.	Better use and development of resources	Supports improved quality of decision making for land and resources		Manager Survey and Title Operations	Case studies demonstrate that stakeholders are using survey and title information to inform their decision making	N/A	Survey and title information is being used to support and improve decision making (2020)	Quarterly	STCP Director
4.	Better use and development of resources	Supports improved quality of decision making for land and resources		LINZ Data Service Manager	An increase in the number of downloads of survey and title information from the LINZ Data Service	95,131 downloads of survey, title and geodetic data	An increase	Quarterly	STCP Director

Benefit number	Title	Benefit description	Quantified benefit	Benefit owner	Measure description	Baseline measure	Target measure	Measurement frequency	Measurement owner
5.	Improved interactions with government	Number of transactions using the new web search interface to search for property information	✓	Manager Survey and Title Operations	An increase in the number of search transactions using web-based searching for property information	0	<0	Annually	STCP Director
6.	Maximise the economic use of land and resources	Economic use of land and resources will be maximised through reduced processing time and costs		Registrar-General of Land	The percentage of Māori land transactions flagged with Māori freehold land status	Baseline January 2017	100%	Annually	STCP Director
7.	Increased completeness of survey and title information	Economic use of land and resources will be maximised through reduced processing time and costs		Registrar-General of Land	The number of cases of non-compliance with Māori Land Court confirmation requirements	30 (2012/2013)	0	Annually	STCP Director
8.	Increased completeness of survey and title information	Economic use of land and resources will be maximised through reduced processing time and costs		Manager Survey and Title Operations	The amount of time LINZ spends on undertaking large manual exercises to obtain a picture of Crown-owned land	Case studies 2003–2012 for # of FTEs and weeks to find Landonline parcel data (one large manual exercise every 1–2 years)	Less than one manual exercise every 2 years	Annually	STCP Director
9.	Improved interactions with government	Improved responsiveness of the service to changing requirements		Manager Survey and Title Operations	Time and costs spent on end-to-end system releases (system development lifecycle) are used more efficiently	Whole system must be considered for development and requirements	Only the component part affected requires change	Annually	STCP Director

Benefit number	Title	Benefit description	Quantified benefit	Benefit owner	Measure description	Baseline measure	Target measure	Measurement frequency	Measurement owner
10.	Improved interactions with government	Improved quality, efficiency and type of interactions customers have with LINZ	✓	Manager Survey and Title Operations	Average time per CSD transaction spent by survey customers duplicating data inputs in their systems and LINZ's decreases	114.55 minutes weighted average of time wasted per CSD transaction	Decrease in wasted time by 100% from FY20 onwards	Annually from 2019	STCP Director
11.	Improved interactions with government	Improved quality, efficiency and type of interactions customers have with LINZ	✓	Manager Survey and Title Operations	Average time spent by conveyancing customers duplicating inputs and data with their systems and LINZ when new titles are registered and DTMs are processed decreases	8.19 minutes per new title transaction and 7.06 minutes per DTM transaction	Decrease in wasted time by 100% from FY21 onwards	Annually from 2019	STCP Director
12.	Improved interactions with government	Improved quality, efficiency and type of interactions customers have with LINZ	✓	Manager Survey and Title Operations	Time spent on workarounds by team members to process work decreases	Baseline June 2017	No process workarounds	Annually	STCP Director
13.	Improved interactions with government	Improved quality, efficiency and type of interactions customers have with LINZ	✓	Manager Survey and Title Operations	Time savings to conveyancers from the notice of sale channel being available	6.77 minutes spent per council notification	75% of baseline measure saved from FY19 onwards	Annually from 2018	STCP Director
14.	Improved interactions with government	Improved quality, efficiency and type of interactions customers have with LINZ	✓	Manager Survey and Title Operations	Time savings to conveyancers for direct notification of lending institutions of sale information	6.87 minutes spent per lending institution notification	100% of baseline measure saved from FY19 onwards	Annually from 2019	ASaTS Programme Director

Benefit number	Title	Benefit description	Quantified benefit	Benefit owner	Measure description	Baseline measure	Target measure	Measurement frequency	Measurement owner
15.	Improved interactions with government	Improved quality, efficiency and type of interactions customers have with LINZ	✓	Manager Survey and Title Operations	Savings to lending institutions from direct notification of sale information	2 FTEs per bank spent on manually updating bank records	2 FTEs savings per bank for each of the 4 NZ large banks from FY19 onwards	Annually from 2019	STCP Director
16.	Improved interactions with government	Improved quality, efficiency and type of interactions customers have with LINZ	✓	Manager Survey and Title Operations	Time savings accruing to conveyancers and surveyors from improved accuracy of Crown-owned land information	Currently spend 16.20 minutes for conveyancers and 19.88 minutes for surveyors per Crown-owned land transaction	100% of baseline measure saved from FY21 onwards	Annually from 2020	STCP Director
17.	Improved interactions with government	Improved quality, efficiency and type of interactions customers have with LINZ	✓	Manager Survey and Title Operations	Time savings accruing to conveyancers and surveyors from automated confirmation from the Māori Land Court	Currently spend 19.25 minutes for conveyancers and 19.65 minutes for surveyors per transaction with Māori land involvement	100% of baseline measure saved from FY21 onwards	Annually from 2020	STCP Director
18.	Improved interactions with government	Improved quality, efficiency and type of interactions customers have with LINZ		Manager Survey and Title Operations	Percentage of customers who agree that LINZ's current service levels meet their business needs	78% (2012/2013)	90%	Monthly	STCP Director

Benefit number	Title	Benefit description	Quantified benefit	Benefit owner	Measure description	Baseline measure	Target measure	Measurement frequency	Measurement owner
19.	Improved interactions with government	Improved quality, efficiency and type of interactions customers have with LINZ		Registrar-General of Land	The total percentage of land title instruments that are non-compliant decreases	13.9% title non-compliance rate (2012/2013)	10% title rejection rate	Annually	STCP Director
20.	Improved interactions with government	Improved quality, efficiency and type of interactions customers have with LINZ		Registrar-General of Land	The total percentage of land title dealings that are non-compliant decreases	9.3% title requisition rate (2012/2013)	8% title requisition rate	Annually	STCP Director
21.	Improved interactions with government	Improved quality, efficiency and type of interactions customers have with LINZ	✓	Manager Survey and Title Operations	A decrease in the proportion of surveys that are non-compliant	41.1%	25% from FY20 onwards	Quarterly	STCP Director
22.	Maintain integrity and certainty for the property market	Confidence is maintained in property rights		Chief Information Officer	No system failures or breaches	0 (2012/2013)	0	Quarterly	STCP Director
23.	Maintain integrity and certainty for the property market	Confidence is maintained in property rights		Manager Landonline and Geospatial Services	The percentage of Landonline system availability to customers between published operating hours	99.5 % (2012/2013)	99.5%	Quarterly	STCP Director
24.	Maintain integrity and certainty for the property market	Confidence is maintained in property rights		Manager Landonline and Geospatial Services	All system components are on a version supported by the vendor	100%	100%	Quarterly	STCP Director
25.	Maintain integrity and certainty for the property market	Confidence in the quality of property rights information is maintained		Manager Survey and Title Operations	The number of title registrations that require amendment	0.12% (2011/2012)	0.12%	Annually	STCP Director

Benefit number	Title	Benefit description	Quantified benefit	Benefit owner	Measure description	Baseline measure	Target measure	Measurement frequency	Measurement owner
26.	Maintain integrity and certainty for the property market	Confidence in the quality of property rights information is maintained		Manager Survey and Title Operations	The percentage of survey transactions requiring correction	0.5%	0.5% or less	Quarterly	STCP Director
27.	Maintain integrity and certainty for the property market	Confidence in the quality of property rights information is maintained		Registrar-General of Land	Level of compensation paid for registration errors made by LINZ post-ASaTS	Baseline 2017	The same or lower than historical average (over the 10 years prior to ASaTS)	Annually	STCP Director
28.	Maintain integrity and certainty for the property market	Confidence in the quality of property rights information is maintained		Registrar-General of Land	Nil to low number of upheld High Court challenges under section 216 of the Land Transfer Act 1952	Nil (2012/2013)	Nil to low	Annually	STCP Director

10.10 List of stakeholders engaged with during the development of the DBC

CENTRAL GOVERNMENT ORGANISATIONS

Engagement on multiple aspects of the project

- Department of Internal Affairs (Office of the Government Chief Information Officer and Policy Group)
- Department of Prime Minister and Cabinet
- Office of the Privacy Commissioner
- Ministry of Business, Innovation and Employment
- State Services Commission
- The Treasury (Vote Land team and ÍMAP/Major Project Assurance)

Engagement on establishment of a Crown-owned land register

- Canterbury Earthquake Recovery Authority
- Department of Conservation
- Department of Corrections
- Housing New Zealand Corporation
- Inland Revenue
- Māori Land Court/Ministry of Justice
- Ministry of Education
- Ministry of Health
- Ministry of Māori Development (Te Puni Kōkiri)
- Ministry of Social Development
- Ministry for Culture and Heritage
- Ministry for Primary Industries
- New Zealand Defence Force
- New Zealand Police
- New Zealand Transport Agency

CONVEYANCERS' AND SURVEYORS' PROFESSIONAL BODIES – ENGAGED ON MULTIPLE ASPECTS OF THE PROJECT

- Auckland District Law Society
- Cadastral Surveyors Licensing Board
- Institute of Cadastral Surveyors
- New Zealand Institute of Legal Executives
- New Zealand Institute of Surveyors
- New Zealand Law Society
- New Zealand Society of Conveyancers

IWI – ENGAGED PRIMARILY ON ESTABLISHING A CROWN-OWNED LAND REGISTER

- Te Runanga O Ngāi Tahu
- Waikato-Tainui

LOCAL GOVERNMENT – ENGAGED IN RELATION TO THE COLLECTION OF SALE INFORMATION

- Auckland Council
- Christchurch City Council
- Wellington City Council

POTENTIAL ASaTS VENDORS – ENGAGED ON SOLUTION DESIGN AND COSTINGS

As outlined in Section 7.3, a formal market engagement process was undertaken. The project team engaged directly with five of the organisations that responded to the RFI.

SUPPLIERS OF SOFTWARE TO CONVEYANCERS AND SURVEYORS – ENGAGED ON CREATING A BETTER INTERFACE BETWEEN LANDONLINE AND USERS' SOFTWARE

- 12d NZ Ltd
- ActionStep
- Conveyancing Solutions
- Propel-lc