Technology and   
Information Strategy

2019-2023

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The Department acknowledges the traditional owners of country throughout Australia and their continuing connection to land, sea and community. We pay our respects to them and their cultures and to their elders both past and present.

Contents

[Foreword 3](#_Toc19114851)

[About this strategy 4](#_Toc19114852)

[The Department’s business requirements 5](#_Toc19114853)

[Goals 7](#_Toc19114854)

[Fit for purpose 7](#_Toc19114855)

[Mobility and collaboration 8](#_Toc19114856)

[Flexible 8](#_Toc19114857)

[Lights on 8](#_Toc19114858)

[Information at the core 9](#_Toc19114859)

[Secure 9](#_Toc19114860)

[Environment 9](#_Toc19114861)

[Approach 10](#_Toc19114862)

[Business transformation and staff capability 12](#_Toc19114863)

[Governance 13](#_Toc19114864)

[Appendix 1 - Alignment to Corporate Plan 15](#_Toc19114865)

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# Foreword

This strategy will guide how the Department transforms its business to leverage the opportunities that advances in technology and information present, while also managing the new risks that will be a part of that journey. It is a journey the whole of the Department must undertake. It requires reconsidering how we do our business and how we support our people to gain new skills and capability.

The pace of change in information and communication technology is astonishing. Today’s mobile phones contain processors that are exponentially more powerful than the computers that filled entire rooms only a few short decades ago. Where computers were once limited to a small number of big businesses, now there are approximately four connected devices per person in Australia.

Wireless communication technologies, such as 4G broadband cellular, Wi-Fi and Bluetooth have revolutionised the way we consume and share information. The convenience of wireless technology has shaped expectations that services should be available anywhere, any time, on any device. This includes the services that government provides.

Information is at the core of all these changes, and as the volume of data continues to grow, so too does its value. Governments must be able to protect the integrity of data from increasingly sophisticated and frequent cyber-threats, while improving access to data.

New technologies have emerged to manage the ever-increasing volume of data. Machine learning gives computers the ability to make predictions based on patterns in datasets that are too large to be analysed by humans (big data) and artificial intelligence enables machines to imitate the decision-making process of humans. This level of automated data analysis must be well-governed to increase transparency around the data and reasoning used for decision making and to reduce bias.

The Department of the Environment and Energy is enhancing its ability to exploit this evolving technology and information capability. We will do this by delivering fit for purpose and secure ICT services. By taking an enterprise approach and standardising common elements, we will drive reuse and enable greater insights into the range of services the Department delivers.

New technologies and ways of working enable us to better meet the changing expectations of staff, stakeholders, governments and the public, and to improve the way we collect, share and use data. This strategy will drive how the Department realises these benefits.



Finn Pratt AO PSM

Secretary, Department of the Environment and Energy

# About this strategy

This strategy seeks to strengthen the Department of the Environment and Energy’s (the Department’s) capability to achieve business objectives through better use of technology and information. The strategy was informed by the Department’s [Corporate Plan 2018-19](http://www.environment.gov.au/about-us/publications/corporate-plan-2018-19) (refer to Appendix 1 - Alignment to Corporate Plan) and engagement with business areas to understand their technology and information needs. It is driven by our changing business needs, resource constraints, advances in technology and the whole-of-government Digital Transformation Agenda and [Digital Continuity 2020 Policy](http://www.naa.gov.au/information-management/digital-transition-and-digital-continuity/digital-continuity-2020/index.aspx). It supports the whole-of-government move to shared services for common business needs (such as human resources, finance and grants) and the drive to consume off-the-shelf cloud services to meet the Department’s other business needs.

The strategy describes the current state of technology and information assets in the Department and the needs of the Department’s diverse workforce and stakeholders. It outlines a vision for the future and how the Department will get there. Through this strategy, the Department aims to deliver fit for purpose technology and information solutions that are flexible and secure, maximise the value of information, enhance mobility and collaboration and reduce the Department’s environmental footprint, while providing continuity of services. The Department will make use of existing governance committees to ensure that these goals are realised through strategic investment, with an initial focus on building foundational capability that can be leveraged in the future.

Improvements to the Department’s technology and information cannot be made in isolation. All areas of the Department can contribute to rethinking the way we do business to take advantage of our information assets and the opportunities that new technology offers. By standardising core services and taking an enterprise approach to how we adopt new technologies we can meet more business needs with our limited resources. We also must have an enterprise approach to how we manage data and a platform to support intelligence and analytics functions. This is needed to improve data management maturity, gain more insights from our data and share these insights more widely to inform business decisions across the Department.

As important as technology and information are, our people are our greatest assets. To improve our ICT capability we must simultaneously invest in our people. Provision of training, ongoing support and ease of use is critical to the success of this strategy.

| Image of Beth Brunoro, First Assistant Secretary, Knowledge & Technology Divison.  Beth Brunoro  First Assistant Secretary  Knowledge & Technology Division | Image of Sebastian Hood, Chief Information Officer.  Sebastian Hood  Chief Information Officer | Image of Greg Terrill, Chief Data Officer.  Greg Terrill  Chief Data Officer |
| --- | --- | --- |

# The Department’s business requirements

The Department has a broad remit and operates across geographically diverse locations. It operates from 25 offices around Australia and in locations as remote as Antarctica and Kakadu. The Department’s role spans the conservation and sustainable management of Australia’s biodiversity, ecosystems, environment and heritage as well as advancing Australia’s strategic, scientific, environmental and economic interests in the Antarctic region. It supports the reliable, sustainable and secure operations of energy markets and developing a national response to climate change.

The Department delivers these outcomes through policy, programs, regulation, on-ground management and science functions. It accredits, permits, licenses and approves activities. It incentivises, partners and designs policy to minimise environmental impacts and support positive change. Across these actions, the ability to capture, analyse and report both what we do and where we do it, is a key enabler for the Department. Figure 1 provides a snapshot of the diversity of the Department and current demands on its technology and information.

Figure 1 - Snapshot of the Department (July 2018-April 2019)

Staff are located in 25 offices across Australia and Antarctica.
2700 staff across envirnoment, climate change, energy, regulation and corporate functions.
1.2 petabytes is used out of 1.6 petabytes of storage capacity.
Approximately one million emails per month.
Approximately 334 business systems.
Approximately 70 transactional business processes.
Approximately 44 corporate business processes.
4,021 domestic and international trips during 2018-2019.
Approximately 55,000 help desk tickets per year.

Technology solutions are needed to help deliver the broad remit of policy, program and regulatory functions and to mitigate the geographical barriers that can hinder collaboration and access to data. The high level business requirements of the Department are captured in Figure 2.

The Department’s current technology and information landscape reflects a strong focus on individual business requirements, with many single use systems, and further variety and complexity added through multiple Machinery of Government changes over the years. Significantly constrained capital resources have led to ageing hardware and software, and a design approach based around single use and ageing functionality. Collectively we face a challenge, with no simple pathway to integrate data or get reuse from our systems. This lack of standardisation and integration limits our capability to achieve our business objectives, particularly in the face of constrained resources.

The ageing nature of hardware and software was demonstrated by the recent performance degradation of our virtual desktop infrastructure (VDI). While steps have been taken to remediate the performance of the network, more is needed to transition and modernise the Department’s technology and information.

Figure 2 - High level technology and information business requirements of the Department

Diagram showing the business needs of the Department grouped by broad functions.

All Department staff:
- Reliable and responsive network including Wi-Fi.
- Access to systems at anytime from anywhere from any device.
- A reliable and modern desktop and productivity tools.
- Stakeholder engagement management tools.
- User-friendly virtual meeting, video conferencing and collaboration tools for internal and external stakeholders.
- Digital briefing tools.
- Data analysis, modelling, reporting and sharing tools.
- Digital records management including Unclassified 
and Protected environments.
- Data management services.
- Single view of client/stakeholder.

Any staff required to conduct fieldwork:
- Data collection tools, including GPS and maps.
- Transmit real time data.
- Reporting systems for data capture and incident reporting (available offline).
- Durable and portable field equipment that enables remote access.
- Increased storage and compute (for field data).

Science and Research:
- Analysis of complex datasets.
- Analysis, reporting and visualisation tools.
- Publishing, design and presentation tools.
- Coordinated access to digital research articles.
- Access to data and data collection (including visual data).
- Interactive spatial tools.

Policy and Program:
- Workflow system for application and assessment processing, integration with spatial systems, online portal, payment gateway and records management.
- Classified document sharing
Stakeholder consultation/survey tools.
- Project and program management tools.
- Parliamentary document management.
- Interactive spatial tools.

Regulation and Compliance:
- Case management tools.
- Accurate and classified information repositories and registers.
- Compliance intelligence tools.
- Interactive spatial tools.

Enabling Services:
- Corporate financial and HR services.
- Integration for records management including Unclassified and Protected environments.
- Technology management, development, testing and monitoring software and tools.
- Asset management and monitoring software.
- Single consolidated view of a client/stakeholder (including enterprise search functionality).
- Project and program management tools.
- Risk, WHS and incident management.

# Goals

To overcome the complex business challenges faced by the Department we need to embrace change and new opportunities. At the heart of this strategy is a vision for the future, where opportunities are leveraged, and innovation is enabled.

The Department’s technology and information future foundations are dependable, data driven, enterprise solutions that meet our business needs.

Our technology must reliably enable our business activities, just as our information must be reliable to inform decisions. An enterprise approach to technology and information solutions will enable us to operate more cohesively and efficiently as a Department.

The goals in Figure 3 guide the transition and modernisation of the Department’s technology and information and help us realise our vision for the future.

Figure 3 - Technology and Information Goals

Diagram showing icons for the Department's seven technology and information goals:
- Fit for purpose
- Mobility and collaboration
- Lights on
- Secure
- Flexible
- Environment
- Information at the core.

## Image of the "fit for purpose" goal icon.Fit for purpose

Support business needs with contemporary and easy to use technology and information solutions

* Focus on business needs and end user experience to get the most out of investments in technology and information services and systems.
* Provide common, industry standard hardware and software to all staff to improve performance and interoperability and simplify support arrangements.
* Prioritise enterprise solutions to common business needs to optimise investments and reap the benefits of standardisation.
* Redesign services to reduce system outages and downtime.

## Image of the "mobility and collaboration" goal icon.Mobility and collaboration

Simple ways to partner and collaborate

* Provide each staff member with a mobile workspace (device and software) that can access the information and applications needed to do their jobs in the office, at offsite meetings and in the field (instead of being limited to a single desk or geographic location).
* Deliver a new standard suite of software, including a modern desktop and cloud enabled productivity suite, to improve productivity.
* Use simple online collaboration tools to remove the need for teams to be co-located and make it easier for our stakeholders to work with us.
* Provide staff with easy access to a range of approved business applications through a self-service app store to more rapidly meet business needs.

## Image of the "flexible" goal icon.Flexible

Rapidly transform and reuse technology and information at minimal cost

* Drive an enterprise approach through standardisation and rationalisation of business processes, information, applications and infrastructure in a way that enables changes like machinery of government moves to be handled more efficiently.
* Establish clear governance arrangements to determine the most appropriate hosting environment to support business needs cost effectively and without duplication.
* Consider ease of integration as a core factor in the purchase or development of new applications to enable data sharing and minimise support costs.
* Build applications from easily adaptable and reusable components to support integration and reduce future development costs.
* Build internal capability around brokerage, integration and management of contracted services to support the Department’s move from bespoke development to consumption of off the shelf services.
* Consolidate the existing portfolio of applications and software platforms, based on what is required to run the business, to minimise costs.

## Image of the "lights on" goal icon.Lights on

Continuity of services as we build the foundations of the future

* Enable predictability of performance through continuity of technology and information services as we build the foundations for the future and explore new possibilities.

## Image of the "information at the core" goal icon.Information at the core

Maximise the value of data to inform decisions

* Systematically manage the Department’s information and data across its entire lifecycle, from acquisition to retirement.
* Use analytics to maximise the value of data.
* Provide single points of truth for data and information – stored once, reused many times.
* Describe information with rich metadata to make it easier to find.
* Publish non-sensitive data in easily searchable public information repositories by default to improve accessibility for external stakeholders.
* Expand the Department’s collection and usage of data to provide new ways to integrate, analyse and report data.
* Provide training and guidance to support staff to derive more meaningful insights from data and apply those insights effectively.
* Streamline and automate analytics with machine learning and artificial intelligence, where data maturity allows, to enable more rapid analysis of large datasets.

## Image of the "secure" goal icon.Secure

Secure systems and information with the right access at the right time

* Integrate cyber security into business processes and educate and inform staff about security risks to reduce the Department’s exposure to these.
* Continually strengthen the security of our technology and information, along with our ability to detect and respond to threats.
* Implement stronger identity management by default, including multi-factor authentication, to improve the user experience and ensure that the right people can access the right information.

## Image of the "environment" goal icon.Environment

Reduce the Department’s environmental footprint

* Replace paper-based workflows for approval of documents with auditable digital authorisations to enable data to be digital throughout its lifecycle, reducing the Department’s usage of paper.
* Implement digital first with print on demand options to reduce printing.
* Integrate paperless record keeping into systems to simplify compliance with legislative requirements and make it largely invisible to staff.
* Make device management more energy efficient and consolidate Department-owned infrastructure to reduce energy consumption.
* Consider sustainable procurement principles for ICT procurements.

# Approach

Realising the goals identified in this strategy will require fundamental changes to the technology and information services we provide. Delivering a change in state, while at the same time maintaining continuity of service to our business areas, is a key area of tension this strategy needs to manage.

Two distinct horizons have been defined in the approach for delivery. The first horizon, core services, identifies the foundational capability required to enable a shift to modern services while delivering continuity of existing services (until services can be rationalised and replaced).

To prepare for modern services the following foundational capability is needed:

* a mobile workspace (device and software) for staff
* a new digital identity to provide integrated access across departmental ICT services
* an enterprise approach to core business applications (e.g. customer relationship management, data management, business intelligence and analytics systems) to deliver enterprise wide business capability (e.g. single view of customer)
* governed hybrid networks – the capability to use either cloud, shared services or Department-owned infrastructure and storage to service our ICT needs
* a new operating model for ICT services with greater in-house service integration and control.

Foundational capability must be in place before shifting workloads, or on-boarding processes to modern services under the second horizon (e.g. governance and integration of cloud services).

Horizon 2, future pathways, is the ability to leverage foundational capability to rationalise, transform and modernise our technology and information services. Figure 4 identifies the key activities that must occur in each horizon.

Continuity: Maintain and sustain existing services and systems until they are rationalised and replaced.

Foundation: Prepare the Department for adoption of modern services by building reusable capabilities and analysing existing services and systems to inform rationalisation and replacement.

Modernisation: Deliver new services and systems in a contemporary and rationalised way, informed by the current state.

Figure 4 - Technology and Information Strategy Horizons

Diagram showing how investment in technology and information will be structured to move the Department from current state to future state. Three investment streams are split across two horizons.

Horizon 1: Core Services
Continuity stream:
- Investment to maintain current services.
- Minimise investment in existing systems and services by looking for opportunities to build Foundation.
Foundation stream:
- Rollout new device and desktop for end users.
- Implement new digital identity for simplified access.
- Establish enterprise application capability for core business and corporate services, including data management and analytics.
- Setup governed hybrid networks (on-premises, shared services and cloud services).
- Establish new service delivery and operating model for ICT services.

Horizon 2: Future pathways
Modernisation stream:
- On-board new services.
- Switch off legacy services that are no longer required.
- Leverage adaptable and reusable services for lower cost and higher return on investment.
- Consider total cost of ownership when making ICT investment decisions.

Investment in continuity should decrease over time as foundational capability is built and investment in modernisation increases.

# Business transformation and staff capability

The Australian Public Service has been given the challenge of reshaping to be more nimble, modern, connected and responsive. Harnessing new and powerful technology and information capability can help us meet this challenge by, at the least, automating more of our business and, at the most, providing fundamentally different ways to deliver a service. However, the opportunities to reshape how the Department delivers its outcomes is not realised by technology alone—business transformation needs to be driven by all areas of the Department and well supported by information technology.

For the Department, this transformation means a move from our current fragmented and single use approach to an enterprise approach that focuses on commonalities and core elements that can be standardised and reused. Standardisation enables more cost effective and rapid deployment of technology and information solutions. More commonality means it is easier for staff to interact with and move between business areas.

The interaction the Department has with stakeholders to issue permits, licenses, approvals and certifications have many elements in common. The information needs driving these processes are varied, but the underlying business process—receiving, assessing and issuing approvals—is common. As the Department looks to transform these transactional business processes, our success will be shaped by the extent to which we are prepared to relook at how we deliver our business; to exploit common ways of delivering services. Many areas of the Department are involved in helping to shape our business operating environments and can have a role in transforming how we deliver our business:

* Staff with expertise in program logic help policy officers redescribe how activities contribute to desired policy outcomes.
* Evaluation experts help establish monitoring and evaluation measures as part of program design, to enable the Department to collect meaningful information during implementation and correct course if required.
* Risk experts help guide where more effort should be applied to higher risk activities, and a lighter administrative approach applied to lower risk activities.
* Data experts help establish appropriate data collection arrangements and maximise the value of data through analytics to inform development of policy, programs and regulatory, compliance and reporting initiatives.
* Communications experts help tailor engagement and feedback mechanisms to the target audiences of policy, programs, regulatory and compliance activities.

This expertise needs to be harnessed and focussed around shaping modern business services for the Department that are streamlined, outcomes focused and ready to exploit technology and automated ways of doing business.

Delivering new tools and ways of delivering business will affect our people. Change management, training and support are critical components to the success of this strategy. Investments in new technology and information solutions must be accompanied by investment in staff capability—training and development.

# Governance

As key enablers for the Department, our technology and information assets and supporting business processes cannot be changed without commitment from the entire Department—executive and staff. Based on current arrangements, specific committees and personnel have governance responsibilities and accountabilities for the suite of investments in technology and information.

The Department’s Executive Board is responsible for endorsing the directions of this strategy and the Multi-year Investment Plan that translates strategy into implementable actions. The Investment Sub-committee is responsible for recommending broad allocations of capital and operational funding to the Executive Board, including investments in technology and information. The Investment Sub-committee also endorses the program level business cases that sit underneath the Multi-year Investment Plan.

The Knowledge and Technology Division (KTD) Program Board has governance oversight of the program level business cases and endorses the project plans for projects that sit within those business cases. The KTD Project Management Office has responsibility for project assurance.

The Governance and Performance Committee has a role in aligning this strategy with the Department’s other strategies, and vice versa, to ensure a cohesive strategic direction for the Department.

Figure 5 shows the governance arrangements for this strategy and how the strategy will translate into investments in technology and information. The Chief Information Officer and the Chief Data Officer will consult appropriate committees and stakeholders about any changes to this strategy and the Multi-year Investment Plan.

Figure 5 - Governance arrangements

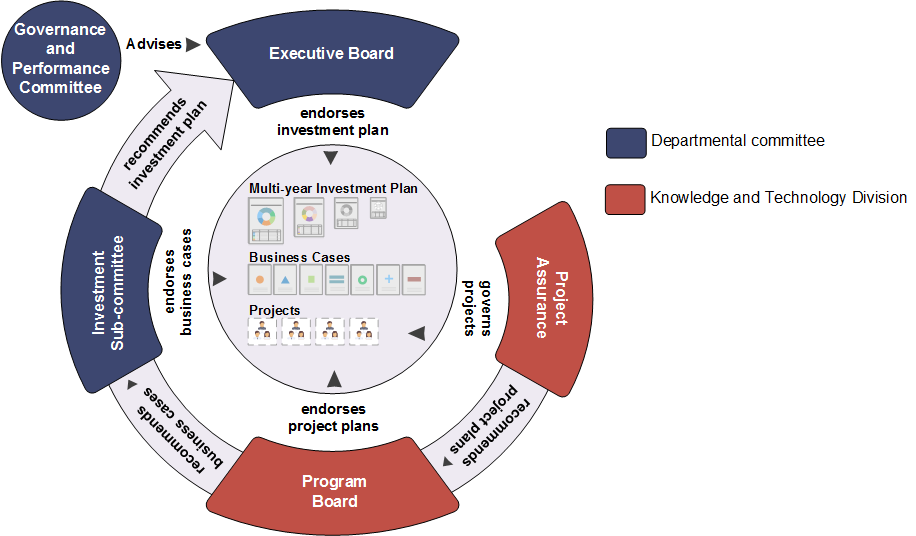


Figure 6 illustrates how actions flow from strategy to implementation at the project level.

Figure 6 - Technology and Information Strategy from strategy to implementation

Diagram outlining how the Technology and Information Strategy will be implemented.

The Technology and Information  Roadmap informs a Multi-year Investment Plan. Business cases are developed to provide more detail about the investment plan. Projects are developed from these business cases.

1. Technology and Information Roadmap:
Roadmap of activities to meet business needs and enterprise technology and information requirements.
- KTD engages with divisions throughout the year to understand business needs.
- Aligned with Corporate Plan priorities, business plans and associated strategies.
- Updated annually and as required.

2. Multi-year Investment Plan:
Rolling T&I investment plan covering multiple years, with the current and next year having greater detail than out years. The plan will identify key activities to deliver a program of work. 
- Updated annually in alignment with corporate budgeting processes
- May be revised based on MYEFO and Budget requirements
- Endorsed by the Executive Board, following recommendation by the Investment Sub-committee

3. Business cases:
Business cases developed to refine the T&I initiatives including costing, benefits, risks and implementation approach. Business cases that support the implementation of the Investment Plan effectively target program level investments.
- Updated as fundamental assumptions or plans change.
- Endorsed by the Investment Sub-committee (significant changes require re-approval by the Sub-committee).
- Implementation oversight by the Knowledge and Technology Division Program Board.

4. Implementation:
Delivery of T&I projects aligned with the business cases. Detailed project plans in accordance with project management and delivery methodology. 
- Project plans endorsed by Knowledge and Technology Division (KTD) Program Board.
- Projects governed by KTD Project Management Office.
- Major variations may require updates to business cases and re-approval.

# Appendix 1 - Alignment to Corporate Plan

Table 1 shows how the Technology and Information Strategy contributes to the eight areas of capability identified in the Department’s

[Corporate Plan 2018-19](http://www.environment.gov.au/about-us/publications/corporate-plan-2018-19).

Table 1 - Alignment to Corporate Plan

| Area of capability | Goals | Technology and Information Strategy contribution |
| --- | --- | --- |
| Preparing our workforce for the future | * Lights on * Flexible * Environment * Information at the core | * All staff training to support rollout of new software, hardware and services * All staff training to support information management skills and security awareness * Develop specialist IT skills in-house, to reduce reliance on contractors * Refocus IT staff development on future state skills * Digitise paper-based workflows and embed paperless record keeping * Enhance data analytics capability |
| Partnering for better outcomes | * Mobility and collaboration * Information at the core | * Improve user experience for stakeholders interacting with departmental IT systems * Improve accessibility of information for stakeholders, including spatial data * Improve our ability to collaborate with our stakeholders and partners |
| Maintaining a positive risk culture | * Secure * Information at the core * Mobility and collaboration | * Improve the Department’s cyber security, including staff awareness * Preventive controls (e.g. budget for ongoing maintenance when costing new systems) * New identity management arrangements * Improve information management to better inform risk assessments * Enhance collaboration tools to support risk conversations, regardless of location |
| Making evidence-based decisions and providing evidence-based advice | * Information at the core | * Maximise the value of data to inform decisions * Improve information management practices * Provide better access to our data through technology * Provide structure to unstructured information and digitise research outputs * Provide user-centric interfaces to facilitate interrogation of data and information * Use of machine learning and artificial intelligence to analyse large volumes of disaggregated data * Actively participate in Commonwealth led efforts to harness the value of data, such as the Data Integration Partnership for Australia |
| Fostering innovation | * Flexible * Information at the core * Mobility and collaboration | * Enhance the Department’s ability to achieve its objectives through adoption of new technologies (e.g. cloud services) * Increase accessibility of information * Create best practice and innovative digital products that are engaging * Enable new uses of data through better information management and spatial tagging * Modernise the way we work |
| Improving our technology and digital capabilities | * Fit for purpose * Mobility and collaboration * Flexible * Information at the core * Secure * Environment * Lights on | * Implement an enterprise approach to ICT investment * Increase reliability of IT services, including at our local, regional and remote sites * Standardise business processes to enable rationalisation of IT systems * Improve cyber security * Improve productivity tools * Increase support for mobile devices * Enhance collaboration capabilities * Simplify the way stakeholders engage with the Department through improvements to ICT * Improve the integration and quality of our information * Make device management more energy efficient * Consolidate on-premises infrastructure to reduce energy consumption * Improve quality assurance processes by implementing better testing and automation tools |
| Communicating and engaging effectively | * Mobility and collaboration * Information at the core | * Explore new channels and digital partnerships to better engage the community * Improve user experience for stakeholders interacting with departmental IT systems, websites and digital products * Improve access to information for stakeholders and users |
| Pursuing regulatory maturity | * Flexible * Information at the core | * Better management of information * Reduced red tape, complexity and duplication for stakeholders through use of homogeneous cloud services and better access to information * Reliable and current single point of truth for data and information |