21st Century Healthcare

eHealth Investment
Strategy

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A message from the **Minister**

Global healthcare models are continually evolving in complexity and sophistication and the demand for digital health service innovation is greater than ever. Strategic investment in eHealth and Information Communications Technology (ICT) is a fundamental requirement for delivering a patient-centric system that enables alternative models of care, as close to the home as possible. As such, I am proud to release this inaugural eHealth Investment Strategy as part of our broader and ongoing commitment to delivering accessible, quality and value for money health services for all Queenslanders.

This strategy has been developed in partnership with all 16 Hospital and Health Services (HHSs) and represents a statewide view of eHealth investment priorities. Through the eHealth Investment Strategy, Queensland Health is establishing the foundations of a digital health system that offers integrated services with timely, secure and reliable access to patient information across both public and private care providers.

The balanced investment approach outlined in this strategy will address both legacy system risks and ensure a greater level of integration between health providers and the community. Equally, investing in innovative digital technologies will better support our clinicians delivering front line services, maximising not only the value of our quality workforce, but offering a degree of mobilisation that will sustain new models of care and offer increased access to health services.

I am confident that our considered and strategic approach to eHealth investment, coupled with sustainable industry partnerships will derive significant value for the health system, but more importantly, for Queenslanders.

The Hon. Cameron Dick MP

Minister for Health and
Minister for Ambulance Services

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A message from the Director-General

Information and Communication Technology (ICT) is continually transforming the delivery of healthcare and system administration services, here and around the world. As such, investing in ICT and innovation is a significant cornerstone of Queensland Health's commitment to improving the healthcare of all Queenslanders.

The Queensland Health eHealth Investment Strategy provides a cohesive and considered plan for our ICT investment priorities—from systems that increase health literacy, promote community education, and empower our communities to have greater control over their own healthcare; to upgrading core infrastructure to enable cutting-edge health service delivery—now and into the future. This will require strong and meaningful partnerships with our Hospital and Health Services (HHSs).

Through this document, we will look to address the establishment of a digital health system that enables secure access and sharing of medical records for every patient—an initiative that will change the way consumers and healthcare professionals interact with health information and services. Our investment in electronic medical records and digital hospitals means that key information about a patient will be available wherever they present in the health system, across all HHSs and in Queensland's private health facilities as well.

Our commitment to a fully integrated health system also recognises that a mobile workforce—who can access information as quickly and as closely to the patient as possible—will be vital in increasing clinical efficiency, clinical time with patients, and ultimately, improving the patient experience.

I invite you to familiarise yourself with the Strategy and see how we will strengthen Queensland's health system through the integrated, innovative use of ICT. This is an opportunity for us to do things differently and position Queensland Health to best meet the needs of our communities.

Michael Walsh

Director-General
Department of Health

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Executive summary

ICT is an increasing enabler of integrated, quality and safe health services. The eHealth Investment Strategy (the Strategy) ensures that investments form part of a considered and cohesive plan between the Hospital and Health Services (HHSs) and the department to better enable the delivery of quality and efficient health services.

The Strategy is the mechanism through which Queensland Health identified the need for a significant investment in ICT—more than a billion dollars—to support healthcare delivery in Queensland.

The Strategy provides greater health system context around Queensland Health's proposed investment in ICT and outlines our plan for investing in the digital future of Queensland Health. In Queensland there is a growing demand for, and cost in supply of, health services.

Key factors increasing pressure on the health system and the Queensland economy include:

- increasing population
- growth in an ageing population
- longer life expectancies
- increasing burden of disease in conditions, such as cardiovascular disease, cancers and diabetes
- the challenge of providing equity of health service provision in regional, rural and remote communities.

The investment priorities in this Strategy not only include foundational elements such as ICT infrastructure, but also the strategic initiatives required for a more integrated health system and enables patients to access healthcare services in new and innovative ways. It also lays the foundations for providing greater integration across the health system through increased access to patient information.

Queensland Health's investment priorities include:

- new ICT infrastructure utility to provide contemporary network and data centre foundations that support contemporary systems and increase the mobility of the workforce
- a contemporary desktop environment to support a consistent user experience, and access to common systems and tools across the health system
- establishing a secure environment to share information and images, and consult with others through an information interoperability platform
- renewing enterprise systems, including those for patient administration, finance and laboratories
- investing statewide in electronic medical records and enabling digital hospitals.

Other priorities include investment in business intelligence, and systems to support integrated care with primary and community healthcare partners.

These investment priorities were identified through extensive ICT planning engagements with HHSs. Prioritisation by Health Service Chief Executives (HSCEs), Deputy Directors-General, the Chief Health Information Officer and the Chief Technology Officer was also formally conducted as part of the ICT planning process.

This investment is in line with worldwide trends where ICT is critical to the delivery of healthcare services, including:

- population health-focused outcomes
- accountable healthcare services
- consumer-centric health services delivered closer to or within consumers' homes
- seamless integration of health services involving interdisciplinary healthcare teams that cross organisation and jurisdictional boundaries
- a knowledge empowered, flexible and mobile workforce with changing professional profiles
- a population both healthy and capable of using ICT.

The investment outlined in this Strategy is indicative and represents the total estimated costs.

The proposed investment priorities have been selected to progress to business case development, to confirm the need for investment (risk, value and benefits) and confirm the ultimate cost estimates.

The identified investment priorities will be governed through the department's new Investment Management Framework and gated assurance processes. This is to ensure performance, return on investment and the delivery of benefits are robustly assessed and actively monitored.

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What is the eHealth **Investment Strategy?**

Frontline public health services in Queensland are provided through 16 HHSs, each of which, operate as a statutory body with a governing Hospital and Health Board (HHB). The department supports HHSs with the overall management of the public health system, including the monitoring and performance of HHS performance.

It is crucial that Queensland Health operates as a cohesive health system in a federated environment. Together, the department and HHSs must:

- co-design strategic direction
- examine challenges, risks and service delivery needs
- determine the investment priorities which will deliver the greatest value.

The Strategy is a comprehensive view of the collectively identified ICT investment priorities across the health system. These priorities have been indicatively costed, and includes contextual information that underpins the prioritisation order and overarching plan, to which each investment priority aligns. Further to this, the Strategy has been developed to ensure a more equitable distribution of ICT funding across the state, leveraging collective solutions to better address the varying levels of capability and enable a more consistent standard of care, particularly in rural and remote health services.

Working with HHSs, the ICT Portfolio Office has introduced a new process for facilitating the definition and development of ICT strategies, plans and roadmaps. Individual HHS and collective health system challenges, risks and ICT priorities have been collaboratively identified through the contributions from HHB members, HSCEs, chief information officers, executive teams, clinicians and community representatives. The production of this document and resultant prioritisation of ICT investment has been supported by contributions from Queensland Treasury, the Department of the Premier and Cabinet, and the Queensland Government Chief Information Officer.

The outcomes of the new process will be used as the basis for preparing a robust and defensible case for ICT investment, and detailing the greatest areas of need (risk) and innovation (value). The identified investment priorities noted in this Strategy will be subject to a gate-assured Investment Management Framework to ensure performance, return on investment and benefits realisation is assessed and monitored.

The cost outlined in the Strategy are indicative and the value of the proposed investments will be further analysed as part of business case development.

Queensland Health's investment categories outlined in this Strategy are summarised below.

Figure 1: eHealth Investment Strategy categories and indicative costings

$130m
Digital future

$300m
ICT infrastructure

$100m
Business systems

$730m
Clinical systems

eHealth Investment Strategy categories

Digital future
- Information interoperability
- eHealth foundations

ICT infrastructure
- Infrastructure utility
- Contemporary desktop

Clinical systems
- Patient administration system
- Integrated Electronic Medical Record and digital hospitals
- Pathology system renewal
- Primary and community care
- Digital imaging and transmission

Business systems
- Finance system renewal

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The health ecosystem
in Queensland

In keeping with global trends, there are significant cost implications surrounding the growing demand for the provision of health services in Queensland. Key factors increasing pressure on the health system and Queensland economy include:

- population growth and ageing—the current population of 4.7 million is projected to be 7.1 million by 2036, with a 50 per cent increase in the number of persons aged 65 years and over, and 100 per cent increase in those persons aged 85 years and older

- longer life expectancy—people are living longer, with an increase in correlative chronic disease, including cardiovascular disease, cancers and diabetes

- geographically dispersed population—in 2011, 62 per cent of the population lived in major cities, 20 per cent lived in regional areas and 18 per cent lived in outer regional or remote areas

- the rising cost of service provision—health continues to be the Queensland Government's single largest area of investment, increasing by six per cent in 2014–15 to $13.6 billion. This trend in health spending is projected to continue, with an estimated 50 per cent increase in the next 40 years (as a proportion of Gross Domestic Product).

At the same time, global healthcare models are shifting focus from episodic, provider-centric service delivery to patient-centric, accountable health management. Queensland Health recognises the need for a more sustainable approach to health service delivery, with a distinct focus on outcomes and accountability. This paradigm shift is becoming increasingly reliant on ICT for support, enablement and innovation, as evidenced by the growing demand for online services, alternative models of care, evolving clinical practice and advances in biomedical equipment.

The changing models coupled to our current ICT challenges, including out-of-date infrastructure, ageing technology and highly-customised bespoke systems place increased pressure on striking the right balance between investment to mitigate ICT risk and investment to upgrade ICT foundations.

Spotlight on health in Queensland

Queensland Health

16 Hospital and Health Services

3.1 million patient bed days annually

>100,000 episodes of healthcare per month

120 acute hospitals

73 primary healthcare centres

86,000 total Queensland Health staff

9,300 doctors

36,000 nurses

Queensland's population growth

7.1 million in 2036

4.7 million in 2014

Queenslanders aged 65 and over

14% in 2014

21.1% in 2044

Burden of disease

Chronic disease is the cause of

80% of deaths, hospitalisations and allocated expenditure

Hospitalisations

are expected to double over a 20 year period

1.9 million — 2011–12

4.13 million — 2031–32

Health challenges in Queensland

Queensland Health is working to achieve a high degree of patient satisfaction, hospital efficiency and reduced wait lists, with a central focus on patient safety.

The health system in Queensland continues to face a number of strategic challenges that demand new and innovative delivery approaches.

Preventable disease in the community

Queensland's increasing burden of preventable chronic disease, including cancer, diabetes, obesity, heart disease, smoking and alcohol-related health issues, continue to stretch health service delivery. With an ageing population in many regions, the demand for acute and sub-acute chronic disease services is rising. Adding to the total burden of disease across the state is a range of mental health disorders—with the provision of inpatient mental health unit beds proving a current and future challenge in many HHSs.

Queensland's population of Aboriginal and Torres Strait Islander people also has a recognised burden of disease in many regions that require separate and specific management. The relative burden of disease for Indigenous Queenslanders is more than two times that of non-Indigenous Queenslanders. A greater proportion of the Queensland Indigenous population live in regional and remote areas where they experience a disease burden 47 per cent greater than those in major cities.

Health for the bush

Distance is a challenge for many HHSs based outside of the metropolitan areas, where large geographic boundaries encompass a number of rural and remote communities. Often, access to immediate 24-hour clinical services is not possible. The state's health services play a dual role of providing emergency and acute care as well as frontline primary healthcare in rural areas. This places an increased burden on the availability of resources, particularly skilled clinicians and facilities.

Alternative methods of health service delivery, such as Telehealth and Telemedicine have proved highly successful in reducing the:

- tyranny of distance
- cost of travel—for both the public health system and the patient
- provision of close to home healthcare
- enablement of more effective clinical networking.

Queensland Health is keen to continue investing in the core infrastructure, which will widen the scope of services to expand in rural and remote regions.

'We must invest wisely in ICT to support better care practices and models of healthcare suited to rural and remote settings.'

Michel Lok
Chief Executive,
Central West Hospital and Health Service

People and partnerships

The historical trend of declining workforce participation and productivity rates must be addressed in order to grow capacity. The ability to recruit and retain appropriately skilled staff to provide safe, sustainable services, close to the consumer, continues to be a significant strategic challenge, particularly in rural and remote regions where there is a geographic distribution of the health workforce.

Queensland Health needs a contemporary ICT platform, state-of-the-art systems and an appetite for innovation to attract and retain a productive healthcare workforce.

A range of optimisation strategies are being introduced in partnership with primary healthcare services to strengthen accountability and reporting systems, and develop integrated care pathways.

HHSs and health partners require systems that securely share patient and clinical information to ensure the patient experience and integration of services is seamless across the continuum of care.

Children's Health Queensland is committed to working in partnership with other HHSs, child and youth services, universities and research centres across the state to ensure market-leading paediatric healthcare provision, teaching and research. This requires a strengthened network of services and increased partnerships to provide more streamlined and coordinated care for children and families.

Demand for integrated care

Information is central to improving healthcare outcomes and providing integrated care for Queensland patients in the community. Queensland Health needs to easily, accurately and comprehensively share patient and clinical information with the HHS, across regional boundaries and with relevant healthcare partners.

Improved data integrity, assurance and access will better support the fair and equitable distribution of

Queensland Health needs a contemporary ICT platform, state-of-the-art systems and an appetite for innovation to attract and retain a productive healthcare workforce.

'This eHealth Investment Strategy is a collaborative effort to inform our investment in ICT with an appropriate balance of addressing our complex legacy systems with investing in transformative digital capabilities for a healthier Queensland.'

Mal Thatcher
Chief Health Information Officer,
Queensland Health

services in a close to home model. Benefits include higher patient satisfaction, reduced healthcare costs and reduced hospital inpatient length of stay.

Designing flexible services with access to contemporary and relevant operational planning information will enable HHSs to respond quickly to changing healthcare demands and population fluctuations.

Patients are demanding more participatory, informed decisions in their care journey. They require access to referral pathways, scheduling information across the continuum of care, an ability to select their healthcare providers and the services as part of their treatment plan.

The digital consumer

In the age of the consumer, service delivery channels are driven by the consumer. Where time saving is a precious commodity and ICT provisioning is measured in hours and minutes, the need for agility and responsiveness is greater than ever. Traditionally, the decision-making paradigm was clear—the seller controlled the product and the information about the product, whereas the buyer generally controlled the purchasing decision. In the 'age of the consumer' however, lines are now blurred. There has been a strong shift in consumer control over product and service information and the consumer, together with consumer technology is now the major disruptor in determining business strategy.

According to Gartner research, more than 80 per cent of companies now believe customer experience is their primary basis for competition, compared with 36 per cent in 2010. Future models of healthcare will need to enable consumers to take greater responsibility for their healthcare, which will subsequently inform investment decisions in clinical systems.

Systems and infrastructure

Increased fiscal pressure in the Queensland Public Sector has resulted in ageing ICT infrastructure across the health system. The risk of compromising health service delivery is significantly increased with antiquated systems, architecture, policies and equipment—markedly impacting the timeliness, quality and efficiency of frontline service delivery.

Future-proofing the healthcare system necessitates striking a balance between the challenges described earlier and the technological advances likely to materialise. New technologies and an increase in the variety of services available from the ICT industry create an opportunity to develop a highly interoperable and flexible ICT environment.

Large complex systems are less resilient to change. The combination of statewide and independent, local systems with low levels of interoperability decrease the capability of the system and reduce the sharing of information. As medical practices and technologies continue to evolve, Queensland Health will employ a flexible approach that advocates innovation, to ensure quality healthcare outcomes, without overhauling entire systems.

In the current environment, information is not sufficiently standardised and systems are not sufficiently integrated to enable the secure sharing of information. Electronic health information must be readily available and easily accessed to derive maximum benefit. Patients with adequate access to information will be empowered to take greater responsibility and a more participatory role in their healthcare.

Health literacy

Health literacy is the skills, knowledge, motivation and capacity of a person to access, understand and make effective decisions about health and healthcare, and to take appropriate action. Health literacy is a significant issue in Australia. The direct relationship between low levels of individual health literacy and the higher use of healthcare services is well documented, as is the relationship between low health knowledge and lower overall health outcomes.

The Queensland health system is committed to increasing health literacy, promoting community education and empowering patients to take greater responsibility for their personal healthcare. Access to medical records and care plans are fundamental to this aim, in order to provide patients with a mechanism to be proactive in managing their health. Our health system needs to increase health literacy, promote community education and empower Queenslanders to take greater responsibility for their healthcare. They also require equitable access to healthcare services delivered as close as possible to their home to increase the capacity of our local hospitals and health centres.

Like many other developed countries, almost 60 percent of adult Australians have low individual health literacy, which means they may not be able to effectively exercise their choice or voice when making healthcare decisions.

'ICT affords the opportunity to establish regional centres of excellence that provide a high standard of healthcare across the state, focused on the health service needs of people in regional Queensland.'

Clare Douglas
Chief Executive,
Mackay Hospital and Health Service

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Building a high quality sustainable health system

World healthcare models are shifting towards agile, consumer-centric health management, optimised for quality and patient safety. Queensland Health has a vision to build a high quality, sustainable health system that exhibits the following characteristics:

- effective—quality and outcome focused
- responsive to changing macro and micro system variables and population health profiles
- efficient
- affordable
- innovative.

This vision requires a paradigm shift in healthcare delivery, foundationally supported by high quality ICT infrastructure.

Trends in world healthcare

Internationally, the trend in healthcare delivery is shifting toward:

- accountable care services
- consumer-centric health services delivered closer to or within consumers' homes
- seamless integration of care in managing multiple chronic conditions involving an interdisciplinary care team that crosses organisation or even jurisdictional boundaries
- knowledge empowered, flexible, mobile workforce with changing professional profiles. For example, devolution of professional responsibilities from medical to nursing and allied health; increasingly ICT engaged generation of professionals
- enabled and empowered consumers with mixed ICT capability profiles and health literacy.

These global trends present an opportunity to reshape attitudes towards ICT investment and the resultant impact on healthcare provision in Queensland. To keep pace with international healthcare leaders, Queensland Health must embrace innovation and adopt more agile approaches to implementation.

> *'Clinicians need increased access to patient history in the health record, irrespective of where care was provided. ICT will enable service linkages between all service providers as people move between rural, regional and metropolitan service providers for their clinical care.'*

Glynis Schultz,
Chief Executive,
South West Hospital and Health Service

Some of the relevant global innovation opportunities include:

- **Electronic medical records**—patients and clinicians can access appropriate medical information at the point of care, throughout the life of the patient and across the continuum of care.

- **Portals**—these provide the basis of integrated information exchange across the healthcare system and a mechanism to access services, patient information and preventative health information.

- **Information interoperability**—the secure exchange of information between care settings and providers improves the health system's ability to work with health service partners and improves the integration of health services across care settings.

- **Mobile health**—remote and mobile monitoring of patient telemetry and other vital signs can increase patient safety, reduce the risk of adverse medical events and potentially reduce unnecessary hospitalisation.

- **Mobile telecommunications technologies**—deliver health services in, or as close to home as possible reducing travel costs for patients and providers, as well as offer access to a more equitable distribution of health services.

- **Integrated scheduling and eReferrals**—streamline the patient pathway with options for patient input and the transfer of patients.

'The emergency departments in Metro North HHS are hampered by a continuing struggle to get the relevant information to support immediate clinical care. We are constantly chasing information from multiple different databases which costs dearly when time is critical. We need accurate and up to date information from across the health services on current medications, recent tests and clinical history so that our hard working doctors and nurses are supported to provide the best care for their patients.'

Dr Colin Myers
Executive Director Critical Care Stream,
Metro North Hospital and Health Service

Electronic medical records

Greater access to complete and longitudinal patient health information is integral to improving the quality, efficacy and safety of healthcare delivery. The general public is rapidly adopting new and innovative technologies to manage various aspects of their lives, including their health and wellbeing.

Patient access to electronic medical records is an essential part of self-managing health-related decisions and responsibility. Equally, clinician decision making is better supported with timely and easy access to results, medications, medical referrals and other clinical documents within an integrated electronic medical record (ieMR).

Portals

Portals will provide patients with a 'one-stop-shop' solution to manage their healthcare data and interact securely online with the health system. They allow patients to communicate with their healthcare providers to:

- make medical appointments
- view their medical records and ongoing healthcare plans
- renew prescriptions
- access their prescribed medications.

Portals provide an additional channel through which to access health services as well as public health information. Further to increased access for patients, clinicians can retrieve and enter medical information and access networks of clinical best practice and practitioners. The fast and accurate dissemination of health information can improve outcomes for community health and increase health literacy.

Information exchange between healthcare settings and providers

There is an expectation that patients, clinicians and other healthcare providers will have consistent and timely access to standardised health information that can be easily and securely shared between primary care providers, specialists, hospitals, mental health and other community health providers, where appropriate.

The ability to exchange information between systems and the ability to find and use information from a variety of systems is essential when looking to realise a patient-centred health record and value-driven health system. Information sharing is essential to improving the quality of healthcare, developing healthier communities and lowering health costs.

Mobile health

Mobile technology can improve patient convenience and safety, enhance treatment outcomes and reduce the cost of care. The ICT market is rapidly expanding into wireless and mobile technology that can transform the way healthcare is delivered at the point of care. The ability to access patient records, conduct mobile consultations, monitor vital signs and track patients anywhere, at any time is transforming the way clinicians practice medicine and engage with patients.

Mobile telecommunications technologies

Telehealth involves the use of telecommunications technology to deliver healthcare when patients and healthcare providers are not in the same physical location. The system improves access to services, clinical networks, specialist practitioners and provides a more personalised method of healthcare delivery in rural and remote care settings.

Electronic referrals and scheduling

Electronic referrals (eReferrals) and scheduling assist clinicians to manage the transfer of patients and integrated scheduling of appointments across the health system. eReferrals reduce the current reliance on paper-based referrals, improving the quality of care and providing instant access to the complete and relevant information required by treating clinicians.

Clinicians also benefit from being able to review recent patient services as well as future scheduled services across care settings and systems, through a scheduling gateway. Patients benefit from integrated scheduling by having a longitudinal view of the services they are receiving, including the ability to make changes to their schedule via a patient portal.

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A plan for **better healthcare**

The Department of Health *Strategic Plan 2014–2018* defines the vision for structural and cultural improvements in the healthcare system across six strategic objectives:

Healthy Queenslanders
Promote and protect the health and wellbeing of current and future generations of Queenslanders.

Safe, equitable and quality services
Ensure there is access to safe, equitable and quality services that maintain dignity and consumer empowerment.

Department of Health Strategic Plan

A well-governed system
Sound management of funding and delivery of performance for the whole system.

Strategic policy leadership
Develop, implement and evaluate evidence-based policy that sets system-wide direction.

Broad engagement with partners
Build partnerships with all levels of the community to plan, design, deliver and oversee health services.

Engaged people
Cultivate a culture that harnesses capability and values our people.

'We want a connected community and health system where people are empowered to manage their health, make healthy and informed choices, receive their care in or as close to home as possible, and where healthcare providers can collaborate to produce the best health plan and outcomes for people in the region.'

Julie Hartley-Jones
Chief Executive,
Cairns and Hinterland Hospital and Health Service

The strategic plan details the actions required to support the provision of the right services, at the right time, as close to home as possible and in ways that better suit the consumer. It has been crafted with a sustainable, long-term view of delivering recognisable improvements in the health system for generations to come.

Queensland Health has already begun to revitalise frontline services. Increased access to patient information through initiatives, such as ieMR and information interoperability will support the national Personally-Controlled Electronic Health Record (PCEHR).

The ICT investment priorities outlined in this Strategy support the achievement and enablement of the department's strategic direction and service delivery requirements. Planned, strategic investment will ensure a platform from which Queensland Health will transform the way frontline healthcare services are delivered, in line with the strategic plan and changing nature of healthcare globally.

A plan for better healthcare

Healthy Queenslanders

A primary driver for Queensland Health is the fair and equitable distribution of health service provision across HHSs irrespective of size and population.

ICT is an integral enabler of seamless health service delivery across care settings, HHSs and public/private healthcare provider boundaries. Central to achieving health service equality and patient-driven decision making across the state, is the move from paper-based records to electronic records, with comprehensive health information that can be easily accessed.

Safe, equitable and quality services

The foundations of present day medical practice are based on electronic health systems (eHealth). Information can be rapidly disseminated through electronic access to medical journals, texts and patient data which is increasingly stored electronically. While having this information available electronically has numerous benefits, the delivery of this information to medical staff has been less than ideal, requiring doctors to be tied down to devices, including immobile desktop computers.

The next stage in digital informatics is to gain rapid access in both storing and creating material in a convenient manner and the increased use of mobile devices. The use of mobile technology will increase the efficiency of health service delivery and alternative models of care.

A well governed system

Enabling equitable access to affordable health services and timely health information for all Queenslanders is paramount. Investment in infrastructure will establish an ICT platform with foundational capability that will enhance clinical networks and renew service delivery, and present opportunities to launch new models of care with integrated systems that will generate significant value for the health system and patients.

Strategic policy leadership

Over the next five years, Queensland Health will invest in broadening capability in many areas including business intelligence, centres of innovation and global clinical research to build a foundation of improved strategic planning and service delivery.

Investment in digital exemplar hospitals will support high quality, Queensland-based, tertiary facilities to transform services, transition to new and innovative, alternative and sustainable models of healthcare.

Broad engagement with partners

Sharing information and the integration of services between HHSs and other healthcare providers is critical to supporting guided care pathways best suited to health consumer needs. Systems need to seamlessly manage the administration and transfer of patients, and the sharing of information across care providers and clinical settings.

To reduce patient risk and improve the quality of care, patient information must be readily available to clinicians and carers across the system. This will be enabled through increased information interoperability and the integration of systems, services and clinical networks.

Engaged people

Queensland Health is committed to recruiting and maintaining a flexible and experienced health workforce. Increased connectivity, standardisation of systems and the introduction of best practice care models, such as improved clinical practices and systems, will further aid the recruitment and retention of high quality healthcare professionals.

Contemporary business tools will enable an efficient, effective and mobile workforce, with the ability to access patient information anywhere, at any time, with integrated scheduling and ordering to streamline the delivery of care.

Figure 2: eHealth Investment Strategy strategic alignment

Health system objective	Challenge	Investment	Outcome
Healthy Queenslanders	Disparate patient information that is paper-based and not accessible at the point of care, across care settings or by patients themselves.	ieMR	One patient, one record accessible by clinicians at the point of care across care settings, as well as by third party providers and patients, enabling them to take better responsibility for their healthcare.
	Inability to share information across care settings and between third party providers.	Primary and community care	Patient and clinical information can be shared across primary, community and acute care settings.
Safe, equitable and quality services	Ageing systems that are no longer supported or are barriers to contemporary practice.	Systems renewal	Reduction in patient risk and improved operational efficiency.
A well-governed system	Ageing infrastructure and increasing demand for services.	Infrastructure utility	Increase access to services and a reliable ICT platform across all HHSs that support new systems and models of care.
	Inability to access or share results of diagnostic imaging electronically, resulting in duplication of tests and orders.	Sharing of digital images	Enable a patient-centric view of high quality, high resolution digital images and reports across a range of clinical services enabling electronic access by authorised clinicians, healthcare partners and the patient.
Strategic policy leadership	Paper-based.	Digital hospitals	Effective and quality healthcare delivery across digital hospitals through ieMR, scheduling and referrals, results and medications management.
	A lack of common ICT standards and architecture across the health systems to enable transformation in healthcare delivery.	eHealth architecture foundations	Establishment of eHealth architecture foundations to optimise the investment in infrastructure utility and ieMR through associated systems and services including patient and provider identify, knowledge hubs, portals, business intelligence, scheduling and clinical terminology services.
Broader engagement with partners	Ability to share information across the care continuum.	Information interoperability	Increased ability to share information across the care continuum, between HHSs and across the health system.
Engaged people	Attraction and retention of skilled people.	Contemporary desktop	Contemporary productivity suite enables mobility to support an evolving efficient workforce.

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eHealth vision

Complementing the Department of Health Strategic Plan 2014–2018 is the eHealth architecture, detailing the logical representation of elements and underpinning ICT capability required to integrate and support health service delivery across the state. Through the eHealth architecture and the Strategy, Queensland Health will effectively prioritise and realise the eHealth vision for health service delivery.

eHealth architecture provides a framework for a target state of ICT in Queensland Health and enables strategic and service delivery priorities and address key risks and challenges within the current ICT environment.

Underpinning eHealth architecture will be roadmaps, standards and best practice guidelines that establish the boundaries in which the HHSs and the department can plan, design and implement ICT investment priorities. The strategies and roadmaps will ensure consistency, interoperability and integration across the health system, while maintaining the flexibility needed in a federated environment dedicated to servicing local requirements.

The investment priorities outlined in the Strategy not only include foundational elements, such as ICT infrastructure and increased access to patient information, but also priorities necessary for a more integrated health system that changes the way patients access healthcare services.

A summary of how the investments outlined in the Strategy align to eHealth architecture is shown in Figure 3: Proposed investment aligned to eHealth architecture.

'By establishing technical enablers of eHealth, we can design new clinical models of consumer-centred care that uses state-of-the-art integrated clinical systems that also build and maintain a clinical knowledge hub that allows the health ecosystem to access health information portals to deliver better health outcomes.'

Mal Thatcher
Chief Health Information Officer,
Queensland Health

Figure 3: Proposed investment aligned to eHealth architecture

Highest priority (green)   **High priority** (blue)

Portals	Clinical portal(s)	Research portal(s)
	Patient portal(s)	Performance portal(s)
Knowledge hub	Business intelligence/analytics/research toolsets	
	Enterprise data stores	
Integrated Clinical systems	Integrated eMR trajectory	Multi/Best of breed trajectory

Clinical models of consumer-centre care

eHealth enablers	Infrastructure stack (secure and reliable)		Interoperability stack		Clinical knowledge stack	
		Ubiquitous end-user access — Identity driven access, any device, anywhere, anytime, data, voice, video		Patient identity Provider identity Scheduling gateway		Human genome
		Persuasive IP network — Medical grade network to support the 'Healthcare of Things'		Clinical terminology services		Medical imaging
				PCEHR interoperability services		Pathology results
		Agile data centre services — Infrastructure as a service model for virtualised server, storage, backup and desktop services, private/public/hybrid cloud		Messaging and integration engine		Medications history
				Web services catalogue		Allergies and alerts

Clinical knowledge stack items: Human genome · Medical imaging · Pathology results · Medications history · Allergies and alerts · Drug formulary · Clinicians knowledge network · Other knowledge resources

Patient reference stack   Resource stack

Clinically-driven policy, standards and governance

9 Investment priorities

The investment priorities outlined in this Strategy represent 'priorities for the health system, by the health system'. They represent a collective ICT investment prioritisation agreement between HHSs and divisions within the department, cognisant of current financial pressures and the capacity and capability of the health system to deliver.

Investment prioritisation is based on a two-stage process with HSCEs and senior departmental executives. Candidates for investment were identified through extensive ICT strategic planning engagements and consultation with all 16 HHSs, ensuring all of the investment priorities identified were aligned to the overarching strategic direction of Queensland Health and the individual strategic service provision priorities of the HHSs.

High priority investments include:

- infrastructure utility
- contemporary desktop
- information interoperability
- high risk systems
  - patient administration system
  - pathology system renewal
  - finance system renewal
  - electronic medical records
- digital hospitals
- eHealth architecture foundations
- primary and community care
- digital imaging and transmission.

Each of the priorities in the Strategy align to the individual HHS ICT investment roadmaps.

Investments were prioritised based on the following principles:

- alignment to strategic intent (e.g. improve access to healthcare)

- delivery of greatest benefit (value) to the healthcare system

- contribution to risk mitigation/reduction to the patient and the broader healthcare system

- balance between remediation versus transformation

- arising urgent and non-discretionary (unavoidable)

- capacity (internal and external) to deliver the investment

- sustainability

- organisational readiness.

10

ICT **infrastructure**

$300 million

24%
OF TOTAL
INVESTMENT
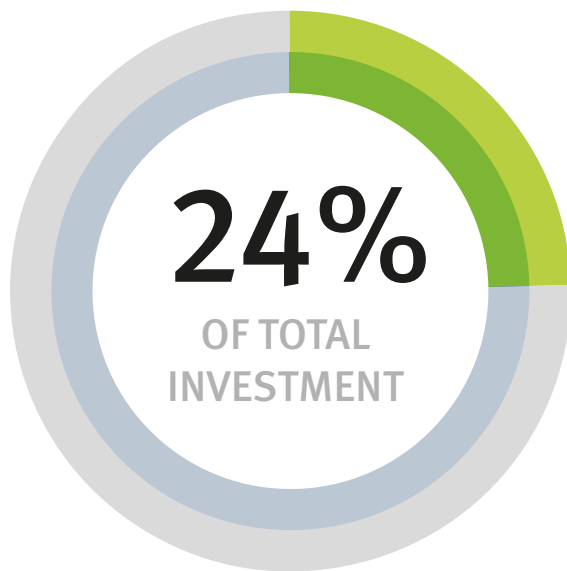
One of the greatest areas of investment need is the renewal and enhancement of core infrastructure. Ageing technology coupled with advancements in healthcare delivery necessitates an ICT environment capable of supporting digital hospitals, with contemporary, responsive and flexible equipment and business tools.

ICT infrastructure components

- Infrastructure utility
- Contemporary desktop

Providing new infrastructure utility

- Total investment
  $1.260b
- ICT infrastructure
  $300m
- **Infrastructure utility**
  $270m
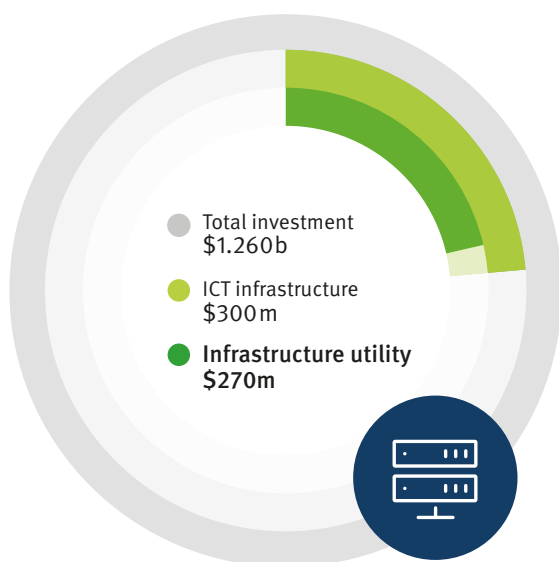
STATEWIDE ACROSS 16 HHSs

Infrastructure utility

- Capital asset renewal.

- Pre-requisite infrastructure required for digital hospital.

- Infrastructure to enable a contemporary platform including identity management.

- Infrastructure to enable and enhance Telehealth.

Years of under investment in ICT and poor ICT project delivery performance has resulted in out-of-date infrastructure, ageing technology, and highly customised and heavily integrated bespoke systems. These are costly to renew and difficult to sustainably support.

Currently, inconsistency in the network speed and connectivity across the regions, coupled to ageing infrastructure and standard operating environments, impedes the ability to innovate and improve services. The uptake of commonly accepted peripheral devices is also limited. The age, stability and scope of ICT capability available also varies greatly between HHSs. ICT infrastructure requirements vary widely across the state ranging from the need to renew and replace, to leveraging the Cloud computing and introducing new capability.

Queensland Health has an increasingly mobile workforce that is largely supported by an immobile technology platform. Some current licensing arrangements tie users to a particular device, resulting in administrative overheads for software licence management and auditing. Mobile devices, remote monitoring of patients, integration with biomedical devices at the bedside and improved access to online patient information and clinicians requires high grade, high availability digital connectivity, supported by appropriate mobile, point of care technologies.

The current state of ICT infrastructure in rural and remote areas impacts health service delivery through poor performance, unplanned outages, the inability to securely share patient information and limited or no access to health systems in some areas. Telehealth and clinical networking are the strategic enablers of healthcare services in rural and remote communities. Queensland Health must guarantee the availability and reach of this model

of care in more isolated communities to provide healthcare as close to the patient's home as possible. Investment in foundation infrastructure will also enable rural and remote HHSs to maximise the advantages offered by emerging technologies, such as the National Broadband Network (NBN).

Improved identity management is required so Queensland Health can accurately and consistently identify the people, organisations and other entities involved in the access and sharing of patient information. Investment in improved identity management will enable Queensland Health to uniquely identify patients and service providers, and improve the integration with national identifier services, such as:

- Medicare's Health Identifier Service
- the National Health Service Directory
- Healthcare Identifier and the PCEHR.

Success will be achieved when we have a stable and reliable ICT infrastructure platform across all regions and communities that support new systems and models of care that provide increased access to healthcare for all Queenslanders.

Benefits

- Healthcare providers can securely share patient clinical records and collaborate on patient care within the HHS and across other providers.
- Reduced unexpected system outages.
- Increased availability of core infrastructure.
- Increased patient safety by consistently identifying a patient across the continuum of care.
- Increased patient privacy through the secure and controlled access and sharing of patient information.

'The lack of WiFi capability in Redcliffe hospital impacts our ability to move forward on many fronts – staff access to clinical information at point of care such as bedside observation and monitoring, decision support, patient support services, clinical audit as well as automated and controlled medication Pyxis. WiFi is a foundational ICT enabler for us and without it we are hamstrung.'

Lexie Spehr
Executive Director,
Redcliffe Hospital and
Director of Nursing

Investing in contemporary business tools

- Total investment $1.260b
- ICT infrastructure $300m
- **Contemporary desktop $30m**
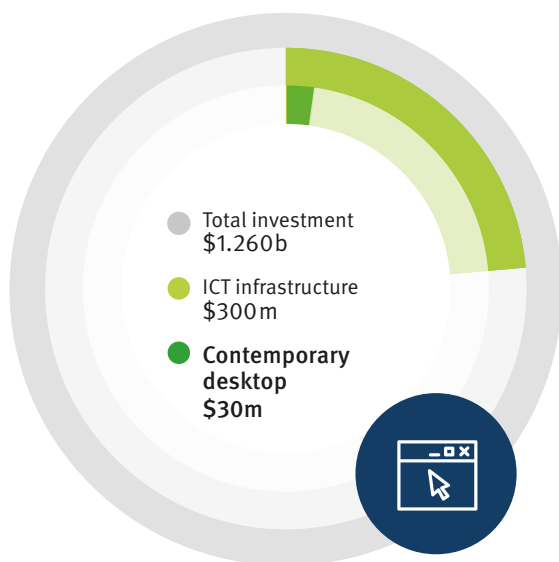
STATEWIDE ACROSS 16 HHSs

Contemporary desktop

- Introduction of a cloud-based, integrated device and user productivity suite to enable connectivity and functionality anywhere any time.

Frontline service providers are the face of healthcare and crucial to the delivery of valued, effective, efficient, safe and contemporary healthcare in Queensland. Supporting staff in responsible and timely decision making, providing tools to streamline processes, and reduce time spent on administrative activities will maximise time spent with the patient. A consistent user experience and access to common systems and tools across the healthcare system is necessary to support improvements in clinical practice and business processes.

Queensland Health is committed to recruiting and maintaining a flexible, experienced and supported health workforce. There is an ever-present need to attract and retain the highest-calibre health service professionals who will grow the quality of care. Having an innovative approach to healthcare in an environment where staff are supported with contemporary tools and networked communities of clinical practice are important incentives.

Queensland Health's desktop environment is ageing. Trends in desktop services and software have changed considerably with the increasing emergence of Cloud-based services. The current desktop environment, based on Microsoft's Windows XP, is no longer supported and inhibits upgrades to existing clinical and system support applications.

Cloud-based solutions offer an integrated device and user productivity suite that enables the connectivity of information and functionality. Queensland Health has conducted a pilot of Cloud-based services and now needs to provision the connectivity, access and integration of the user productivity suite across the ICT system. Leveraging whole-of-government arrangements in-situ will provide a platform that supports a federated organisational structure.

Success will be achieved when we have a flexible and contemporary productivity suite that enables mobility and supports an evolving workforce.

Benefits

- A flexible modern platform for increased user productivity (via device interactions), application modernisation and choice of level of service and device.

11

Business **systems**

$100 million

8%
OF TOTAL
INVESTMENT
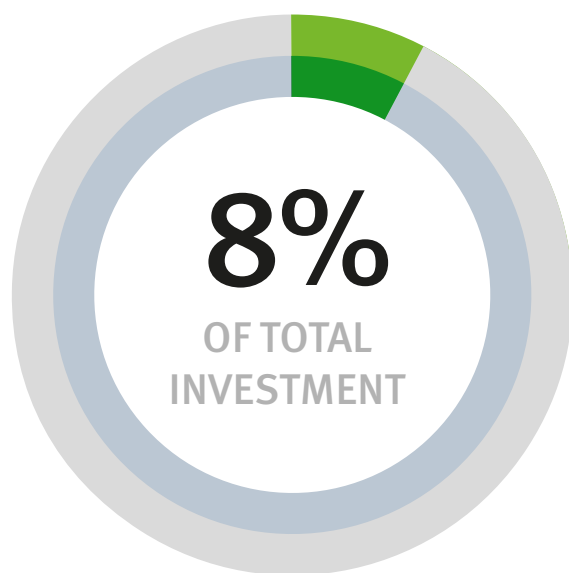
Queensland Health has more than 30 enterprise-wide support systems across the ICT portfolio. High levels of customisation and interfacing have resulted in cumbersome, inflexible systems that no longer support the needs of the health system. A comprehensive review of the risks associated with key systems has prioritised the need for a system wide financial management system.

Renewing and reducing the risk of the financial management system

Financial management system

Total investment
$1.260b

Business systems
$100m

Financial management system $100m
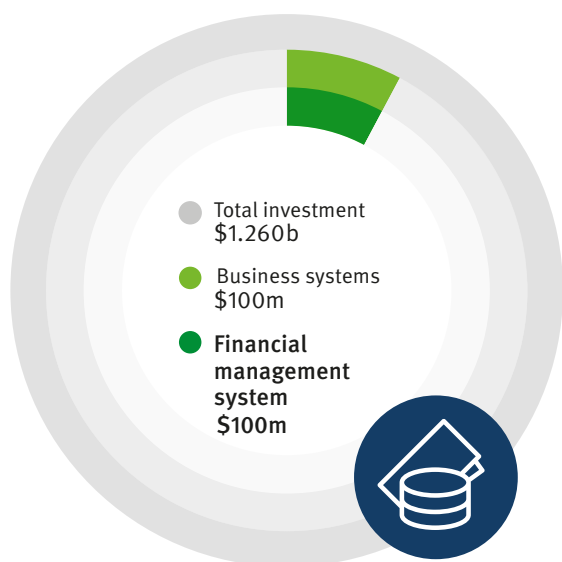
STATEWIDE ACROSS 16 HHSs

Queensland Health uses a customised version of an old Enterprise Resource Planning (ERP) system to support financial and material management functions. The current system is currently provided to all HHSs through a centralised model, but has been unsupported by the vendor under standard support arrangements since 2006.

Implementation of a new financial system provides the HHS network with the ability to access, control, manage and report on their own financial data. This will improve local decision making and mitigate a high strategic system risk within Queensland Health.

The renewal of the financial management system will be a significant investment. Prior to statewide deployment, the solution will be initially implemented at two HHSs and the department.
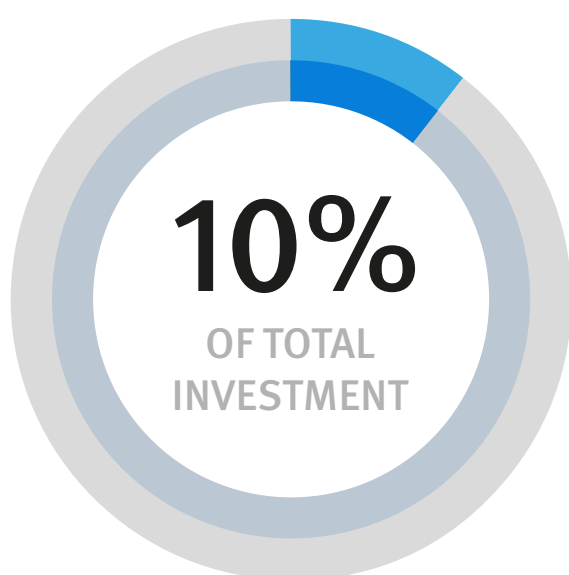
Success will be achieved when the risk of outdated systems and technology are reduced, and Queensland Health has a proactive plan in place to renew the functions supported by its legacy systems.

Benefits

- Reduced ongoing support and system maintenance costs of legacy systems.
- Increased system integration.

12

Digital **future**

$130 million

10%
OF TOTAL
INVESTMENT

Having access to the right information, at the right time, in the right place is crucial to ensuring quality health service provision and patient safety. Investing in eHeath architecture and information interoperability will develop Queensland Health's ability to accurately, cost-effectively and seamlessly store and share data across the continuum of care.

Digital future

- Information interoperability
- eHealth foundations

eHealth architecture foundations

- Total investment
  $1.260b
- Digital future
  $130m
- **eHealth architecture foundations
  $100m**
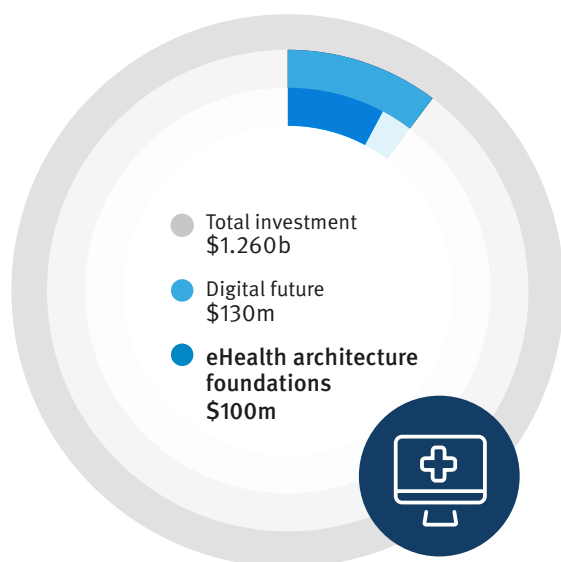
STATEWIDE ACROSS 16 HHSs

eHealth architecture foundations

Establishment of eHealth foundations to optimise the investment in infrastructure utility and ieMR through associated systems and services, including:

- patient and provider identity
- knowledge hubs
- portals
- business intelligence
- scheduling
- clinical terminology services.

Access to the right information (quality, longitudinal) at the right place (point of care, secure), at the right time (when needed) is key to the provision of high quality, valued healthcare services, improved patient outcomes and reduced patient risk. In addition, the collection, processing, analysis and dissemination of data is fundamental to both operational delivery and health service planning.

Currently, there is a mixed approach to how data is sourced, managed, aggregated and presented for the purpose of analysis and reporting. Many of the processes require manual data handling and manipulation, using standard office tools that detract from time spent on planning and corrective action.

There is a need for clinical data repositories and business intelligence solutions to support research, analytics, and performance monitoring and planning. Contemporary business intelligence solutions coupled with a knowledge hub of health and patient information from multiple sources will enable the capture and analysis of accurate patient, community and healthcare service information. This information will better inform healthcare planning, disease prevention and early intervention with the ability to support disaster and emergency response strategies.

The existence of enterprise data stores and business intelligence solutions will support patient, community and clinician portals by publishing accurate, timely and relevant health information in communities and across the wider health system.

In addition, business intelligence will enhance Queensland Health's ieMR and digital hospital investment by using the large and complex datasets managed by these systems in a meaningful and integrated manner.

Success will be achieved when information to support operational planning and performance reporting is relevant, timely and supports agile operational decision making.

Benefits

- Reduction in labour costs and effort required to manually collect, analyse and report data.

- Proactive and informed decision making based on real time data and predictive analysis.

- Increased access to timely information to support decision making and proactive planning.

Information interoperability

Total investment
$1.260b

Digital future
$130m

**Information interoperability
$30m**
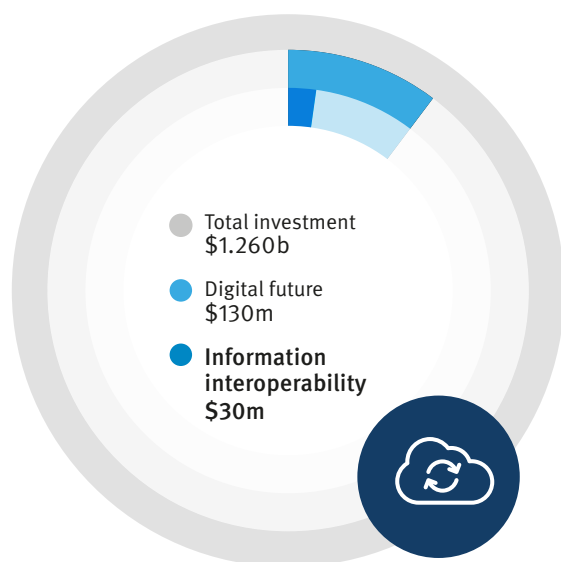
STATEWIDE ACROSS 16 HHSs

Information interoperability

- Introduction of a scalable, reliable and flexible information-sharing capability that allows integration with new and existing systems, across care settings.

- Enhancements to The Viewer application.

Healthcare consumers expect a health system that works cohesively across care settings, between public and private boundaries. This is particularly important when referring or transferring patient care to another provider. Queensland Health needs to build a trusted, secure environment for the sharing of information, images and to consult with others in order to provide higher quality patient outcomes and better quality service provision. Patients will be encouraged to take greater responsibility for their healthcare and planning. In doing so, they will need access to their personal health records, health provider(s) and health service information.

Sharing information between HHSs and other healthcare providers will become increasingly important, as will the consequent need for Queensland Health systems to manage the administration and transfer of patients, clinicians and health information across care settings.

In order to meet current and future information sharing requirements, Queensland Health needs a scalable, information-sharing capability that is open-standards based, reliable, flexible and allows interoperability between new and existing systems (preferably as 'plug-and-play' components). This needs to have minimal fragile and expensive integrations that is also highly-secure to ensure data integrity and protect patient privacy. An information interoperability platform will enable information sharing to be leveraged in a more efficient, flexible and agile manner that will help to reduce costs, improve the quality of patient care, and support technical, corporate and clinical innovation.

Success will be achieved when Queensland Health can share information with individuals, the community and healthcare partners regardless of systems and software.

Benefits

- Improved patient identification and sharing of information with third parties from a trusted source of truth.
- Reduced time and cost to develop and maintain interfaces.
- Improved performance of integration environment by allowing the seamless flow of information between systems.
- Increased ability to share information across the care continuum, including external entities.

13

Clinical **systems**

$730 million

58%
OF TOTAL
INVESTMENT
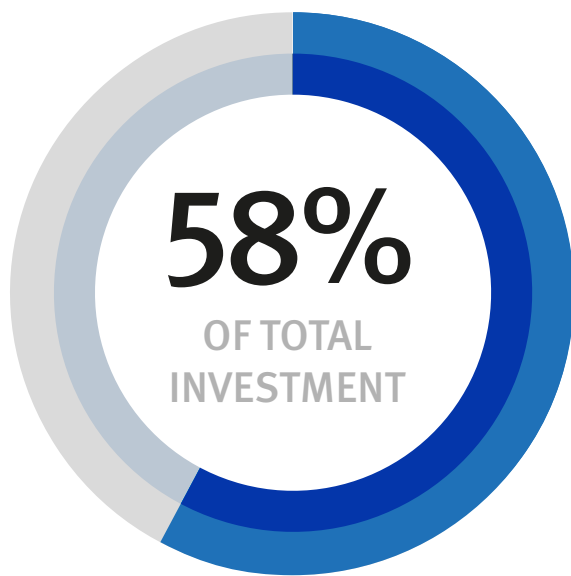
Frontline health service provision is reliant on a number of clinical systems to inform effective service planning and decision making at the point of care. Five distinct areas have been prioritised for ICT investment to ensure quality healthcare outcomes and patient safety, both now and into the future—patient administration system renewal, electronic Medical Record (eMR) and digital hospital enablement, pathology information system renewal, primary and community care capability development, and digital imaging and transmission.

Queensland Health has more than 55 enterprise clinical systems across the ICT portfolio. Historically, investment has centred on ensuring key healthcare systems, such as the patient administration system operate with a high-level of availability.

Queensland Health is systematically reviewing the risk of ageing systems from a technical perspective and the level of functional fit, with changing core systems, and new capability and services introduction. A review of ICT systems has been undertaken with system owners to identify priority investment areas that represent a service delivery risk to Queensland Health and ultimately the patient.

Significant clinical systems components

- Patient Administration System
- ieMR or equivalent
- Digital hospitals
- Primary and community care
- Digital imaging and transmission

These systems are widely used across the health system and will be core to the delivery of effective and efficient healthcare. These systems will optimise the investments already made in digital exemplar hospitals and the ieMR. Further investment in more contemporary solutions and ICT services will enable easier integration with other core systems within HHSs.

Patient administration system

Patient administration system

- Total investment
  $1.260b
- Clinical systems
  $730m
- **Patient administration
  system
  $210m**
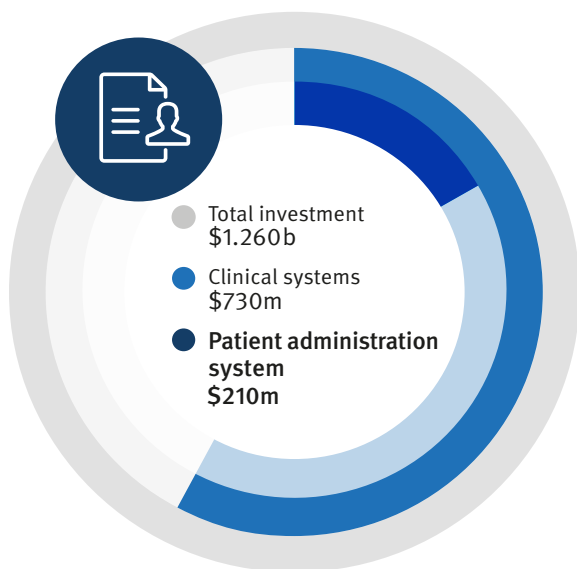
STATEWIDE ACROSS 16 HHSs

The current patient administration system has been extensively tailored to meet Queensland Health requirements and can no longer support a modern patient administration system. As healthcare has evolved, the current system has not kept pace with the more modern products with new functions, workflow and business rules. The use of the current system is now at a point where it constrains how a healthcare facility can administer care. Queensland Health intends to renew the current system with a modern patient administration solution that builds on the current clinical and supply chain capabilities to:

- provide a comprehensive, up-to-date and accurate patient administration record across the patient journey
- work seamlessly with specialised scheduling systems, clinical information systems and clinical support systems
- enable a patient to actively participate and control their care
- support new models of care and care delivery
- reduced duplication and allow limited resources to focus on frontline delivery without comprising the quality of patient care
- support more accurate costing of activity and billing for improved work practices and increased revenue protection.

Success will be achieved when HHSs have a contemporary patient administration capability suited to the health service delivery model of the HHS.

Benefits

- Reduced patient risk and reduced organisational risk due to legacy systems.
- Reduced ongoing support and system maintenance costs of legacy systems.
- Increased system integration.

'The lack of a common patient administration system means we are working in the dark much of the time. We are dealing with inconsistent and incomplete information in patient files and this has the potential to impact on patient appointments and service delivery. Every day this hampers our ability to support connected care across the HHS.'

Maureen Hessmann
Administration Manager,
Royal Brisbane and Women's Hospital

Investing in an integrated electronic medical record (ieMR) to enable digital hospitals

Total investment
$1.260b

Clinical systems
$730m
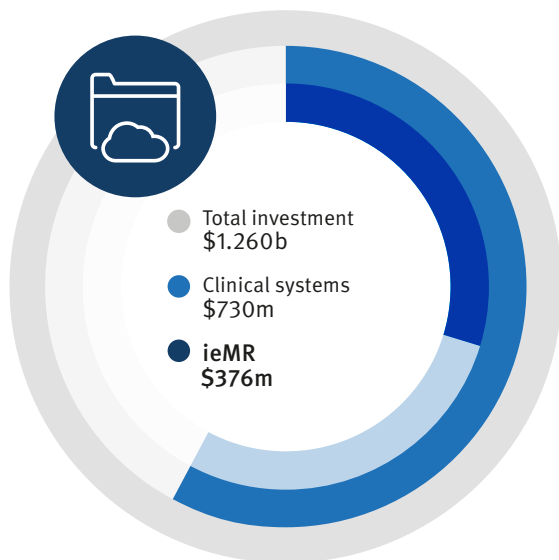
ieMR
$376m

STATEWIDE ACROSS 16 HHSs

ieMR and digital hospital

- ieMR digital release or equivalent.

- Four facilities for rural and remote HHSs.

- 20 facilities with the highest transaction volume across the state.

- Introduction of an electronic medical record to support clinical decision making at the point of care, as well as enhanced biomedical device integration, emergency department solution, mobility, community health, surgery anaesthesia, voice dictation, clinical trials and research.

The increased demand for healthcare requires our HHSs to implement contemporary models of care that ensure patient safety, quality of care, increased staff productivity and health system efficiency. Quality healthcare is directly supported by access to the accurate, complete and longitudinal view of patient health information across the care continuum.

Transitioning from paper to electronic patient clinical records will improve the ability to quickly locate relevant information and support clinical decision making at the point of care. Investing in the ieMR has the ability to share clinical information, and reduce patient risk and the cost of healthcare in the long-term by reducing duplication of processes and readmissions.

Queensland Health has already invested the ieMR across nine facilities and seven HHSs in Queensland, delivering capability, including:

- document scanning
- pathology and radiology orders entry and results reporting
- recording of medical alerts and allergies
- tailored patient management solution to support renal, cardiac and maternity related conditions
- structured clinical notes
- problem and diagnosis
- clinical risk assessments
- electronic patient discharge summaries
- integrated scheduling of outpatient appointments
- medications management and inpatient medications dispensing
- biomedical device integration.

Queensland Health has changed its approach to best leverage the investment to date in ieMR and maximise the financial benefits and digital hospitals across the health system by focusing on facilities with high occasions of service and high complexity, particularly those that support an emergency department—40 per cent of all admissions in a hospital are initiated through these departments.

In addition to the existing investment in the ieMR core build, Queensland Health is planning to invest in 21 digital hospitals and four 'lite' implementations, including:

- Cairns Hospital
- Townsville Hospital
- Mackay Hospital
- Rockhampton Hospital
- Bundaberg Hospital
- Hervey Bay Hospital
- Sunshine Coast Public University Hospital
- Royal Brisbane and Women's Hospital
- The Prince Charles Hospital
- Redcliffe Hospital
- Caboolture Hospital
- Princess Alexandra Hospital
- Logan Hospital

- QEII Jubilee Hospital
- Redland Hospital
- Lady Cilento Children's Hospital
- Toowoomba Hospital
- Ipswich Hospital
- Gold Coast University Hospital
- Robina Hospital
- Carrara Community Health Centre
- Thursday Island Hospital ('lite')
- Roma Hospital ('lite')
- Longreach Hospital ('lite')
- Mount Isa Hospital ('lite').

'We will create a step change, enabling Metro South to deliver more effective and efficient health services through innovative uses of information technologies to support optimised processes and practices in clinical operational and administration functions.'

Richard Ashby
Chief Executive,
Metro South Hospital and Health Service

The additional capability being delivered includes, but is not limited to:

- enhanced biomedical device integration with the ability to connect multiple devices at the bed side

- monitoring of vital statistics and organ dysfunction

- enhanced patient summaries

- complete workflow and documentation solution for critical care teams

- readmission prevention via a hospital readmission risk prediction algorithm

- early detection of patients at risk of developing Deep Vein Thrombosis (DVT) and Venous Thromboembolism (VTE)

- falls prevention and pressure injury prevention

- optimisation of patient flow through the hospital

- workforce management

- automation or supporting practices and processes for cardiac disease management through improved maintenance protocols across the continuum of care.

This investment will enhance delivery of healthcare in Queensland in line with modern standards and worldwide trends in healthcare. The use of innovative technologies and solutions will enable these facilities to optimise processes and practices across clinical, operational and administrative functions.

Digital hospitals are proven to deliver a wide spectrum of benefits in terms of increased patient safety, healthcare quality, early detection and monitoring of possible adverse clinical events, reductions in readmissions, improved patient flow and realisable cost savings.

The long-term strategy for Queensland is a digital HHS. This vision offers a fully integrated healthcare system across care settings enabling our HHSs to work seamlessly together and with healthcare providers and partners across the state.

Success will be achieved when Queensland has an international reputation and is an Australian leader in efficient and quality healthcare delivery across its digital hospitals.

Benefits

- Increased patient safety.
- Reduced inpatient length of stay.
- Reduced pathology and medication order errors.
- Reduced medication errors and adverse medical events.
- Reduced readmission rates.
- Improved access to diagnostic imaging.
- Rationalisation and reduced system maintenance costs of legacy systems.

'Technology is constantly evolving to enable better healthcare across all facets of the consumer healthcare journey. It is vital we adapt our clinical and business practices to leverage the benefits this brings while also recognising the sometimes confronting changes to the way we work. This eHealth Investment Strategy is a great collaborative effort to provide a plan for better healthcare for Queenslanders through targeted investment in the adoption of technology.'

Colin McCririck
Chief Technology Officer,
Queensland Health

Pathology information system renewal

Total investment
$1.260b

Clinical systems
$730m

Pathology system
$75m
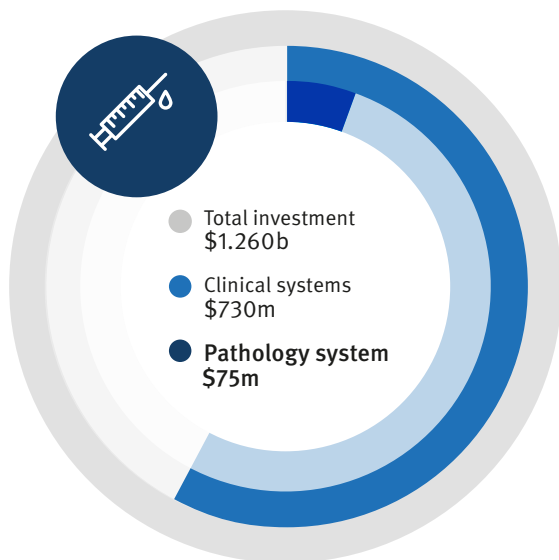
STATEWIDE ACROSS 16 HHSs

Pathology system

- An integrated pathology network to ensure safety and quality service improvements including direct financial benefits.

The pathology information system is the core operating system for the service provision of pathology, forensic and public health laboratory testing services. The system is no longer able to fully meet the current
and future needs of laboratory services, in particular Pathology Queensland.

Every day the system processes 52,000 pathology tests, sends over 100,000 messages to at least 14 other clinical systems and sends more than 400 claims to Medicare.

The system stores 17 years of clinical patient data or more than four billion patient tests and results. It delivers 1.2 million pathology results to HHSs per month and sends electronic result information to more than 10,000 private practitioners.

The timing of the pathology information system renewal lends itself to an opportunity to fully integrate with the ieMR and digital hospital initiative. The HHS benefits will be realised through the integration of pathology, medical imaging and medications interactions.

Success will be achieved when we have a contemporary system for testing and managing pathology results which is integrated to optimise the investment in the new generation of clinical systems.

Benefits

- Reduced laboratory system support and maintenance costs.

- Reduced cost in pathology testing.

- Reduced transcription, legibility and omission errors.

- Reduced time to locate and collect pathology samples.

- Improved data integrity and faster patient discharge times.

- Improved decision support for clinicians.

Investing in primary and community care capability

- Total investment
  $1.260b
- Clinical systems
  $730m
- **Primary and community care
  $7m**
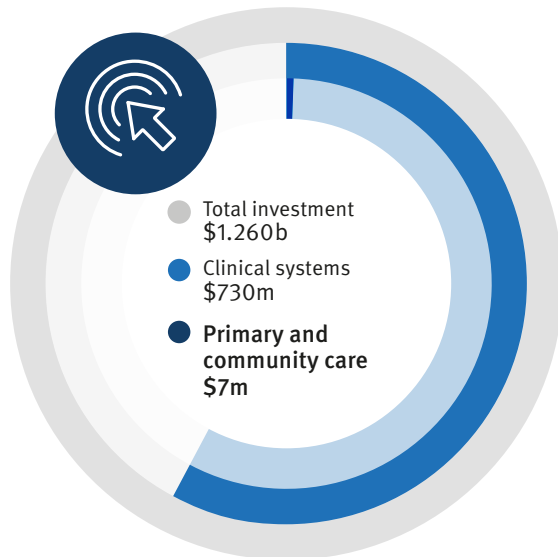
STATEWIDE ACROSS 16 HHSs

Primary and community care

Access to electronic health records from primary and community care sites. This will:

- enable the exchange of information with other facilities, service providers and across the health system

- reduce the needs for paper-based records.

Many community hospitals, multipurpose health services and outpatient clinics have individual business processes and information standards, supported by disparate ICT solutions, with some sites solely reliant on paper-based records to store patient and clinical information.

Current methods and systems of record keeping, information sharing, scheduling and coordination of services result in duplication of effort and fragmented information. This constrains a patient-centred and responsive approach to care delivery. Fragmented information does not support a holistic view of a patient's medical history or the care that

has been received, nor does it support care being delivered remotely, through Telehealth or other similar technologies. Consequently, issues of patient safety and quality escalate as information does not move with the patient throughout the healthcare system, which insufficiently supports appropriate planning.

Investment in primary and community care will ensure the responsive provisioning of seamless, effective and efficient care, connecting services through partnerships across many different (public, private and not-for-profit) providers in the primary, community and acute care settings.

**The range of capability delivered through investment in primary and community care settings includes:**

- access to electronic health records from all primary and community care sites reducing the need for paper-based records
- rationalisation of disparate ICT systems into a single solution at multiple sites that will provide opportunities for increased exchange and sharing of information with other health service providers, and improved integration across the public health system in Far North Queensland
- a platform to support more innovative care practices, such as Telehealth and home monitoring across primary and community settings.

Success will be achieved when patient and clinical information can be shared across primary, community and acute care settings, and Queenslanders have increased access to services and information delivery in an online environment.

Benefits

- Timely access to information to facilitate diagnosis and treatment.
- Reduced re-admissions due to improved community integration.
- Reduced duplication in diagnostic images.
- Increased availability of bed days.
- Reduced medication errors and adverse drug events.

Secure and reliable sharing of digital images

Total investment
$1.260b

Clinical systems
$730m

Digital imaging and transmission
$62m
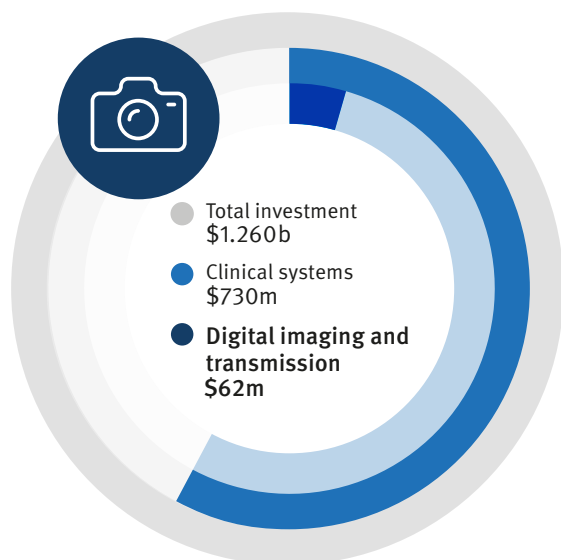
STATEWIDE ACROSS 16 HHSs

Digital imaging and transmission

- Investment in the secure exchange of digital images to enable a patient-centric view of reports and images across care settings and providers, that is integrated with the medical record.

A range of medical imaging services is provided by both HHSs and through healthcare service partners. Of particular importance are the medical imaging services related to radiology, cardiology and oral health. Current Queensland Health systems do not support the timely and secure exchange of high quality digital imaging and reporting for the purpose of clinical decision making and diagnostic review.

To realise benefits in the delivery of medical imaging services, including the ieMR, additional investment is required in a range of services and technologies to:

- provide clinicians with an appropriate patient-centric view of patient records and examinations history, including reports and associated images within the wider healthcare community

- enable imaging studies to be readily available for clinical and diagnostic review, mark-ups and annotations

- support electronic order entry and results, reporting medical imaging services

- provide a centralised image and document repository combined with the ability to source relevant prior patient data from other systems

- easily support third party interfaces, external to Queensland Health, that enable the import and export of medical imaging studies from outsourced service providers

- provide external access to authorised users for medical images and reports.

Investment in the safe and secure exchange of digital information provides opportunities to leverage a broader spectrum of health services and provide opportunities to share learnings and solutions with healthcare partners. Complementing the ieMR, this investment enables a complete view of the patient history, including medical imaging and diagnostics, and results reporting, irrespective of location.

Success will be achieved when our HHSs and approved healthcare partners can exchange high quality, high resolution digital image information across a range of services that is accessible electronically by authorised clinicians and the patient.

Benefits

- Improved patient safety and a reduction in the likelihood of misdiagnosis.
- Enhanced reporting, including:
  - reduced turnaround time of diagnosis
  - mark-ups and annotation
  - reliable and automated critical results notifications.
- Streamlined workflow management for order entry, scheduling, reporting and results reporting and notification.

14

Improving our capability to deliver health services across the health system

The Strategy ensures equitable access to healthcare services for all Queenslanders, as well as increased capability across our HHSs to deliver healthcare services.

Disjointed, disproportionate and in some cases marked underinvestment has resulted in disparate levels of capability to deliver health services across the system.

The Strategy represents investment priorities for the health system as a whole. The resulting impact of this investment will provide the necessary ICT infrastructure uplifts, standardisation of systems and the introduction of new capability to enable significant optimisation and transformation in the way that healthcare is administered.

For HHSs, advancing integration through the digital hospitals initiative and additional strategic investment will provide a platform to introduce new and more innovative models of care, delivering an integrated health system, particularly in the metropolitan areas.

For those HHSs not yet advancing the digital hospitals initiative, the investment detailed in this document will provide essential foundational elements, such as ICT infrastructure uplifts and introduction of the ieMR.

The digital capability continuum (right) illustrates the shift from the current state of lower integration in health service delivery to the future state of more integrated health services across Queensland.

The eHealth Investment Strategy will enable HHSs to build a base-level of capability across the entire health system, optimise existing digital investment and continue on the pathway of integration and the introduction of new and innovative models of care.

Figure 4: Queensland Health digital continuum

Digital foundations	Digital optimisation	Digital integration	Digital transformation
Establishing core capability and infrastructure	Enhancing existing systems and services	integration within the HHS	Innovation, integration with partners and health system, new models of care

Lower integration
in health service delivery

High integration
in health service delivery

Metro South HHS

Metro North HHS

Gold Coast HHS

Children's Health Queensland

Sunshine Coast HHS

West Moreton HHS

Wide Bay HHS

Central Queensland HHS

Mackay HHS

Townsville HHS

Cairns and Hinterland HHS

Darling Downs HHS

South West HHS

Central West HHS

North West HHS

Torres and Cape HHS

● Current state   ● Future state after proposed investment

Queensland Health
ICT Portfolio

A balanced portfolio

Our investment priorities represent a balanced portfolio of investment in areas of capability that will:

- improve core infrastructure across the system that enables us to more effectively and efficiently run the business
- grow our health services by optimising existing systems and information to enable greater integration and interoperability
- enable the health system to deliver services in ways that consumers want to use them allowing us to transform the way we deliver services.

The planned proportion of investment to run, grow and transform health services in Queensland is represented in the adjacent diagram.

Figure 5: Portfolio balance (run, grow, transform)

8% Transformation
42% Optimisation
50% Foundation
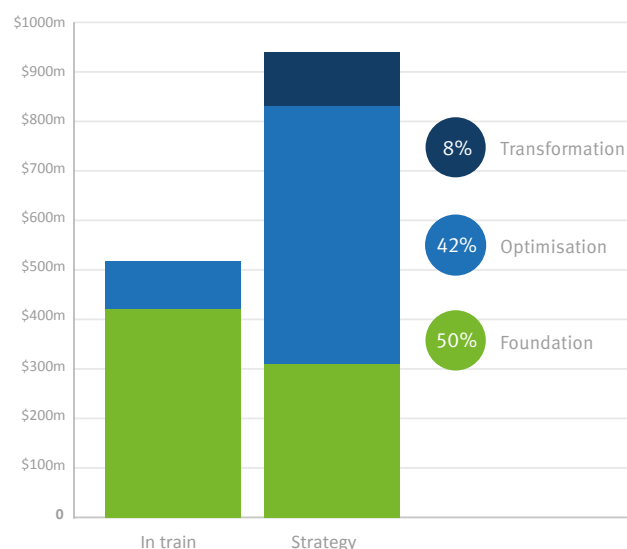
'In an environment where we are under increasing financial pressure high quality and fit-for-purpose ICT systems are critical to improving patient outcomes in an affordable way. What the eHealth Investment Strategy allows us to do is to identify the priorities for ICT investment across the Queensland Health system that will deliver the most cost-effective benefit for patients from the funding available.'

Malcolm Wilson
Chief Financial Officer,
Queensland Health

Managing our investment

Queensland Health has a limited amount of funding and capacity over and above operational funding to invest in improvements to health service delivery.

To ensure funding is allocated to areas where it will provide maximum benefit to the healthcare of Queenslanders, the department's portfolio governance program is introducing processes designed to guide and manage funding decisions, while ensuring fair and equitable distribution in accordance with health system priorities. These processes will ensure there is reliable, repeatable, transparent and proven measures in place to request, assess and prioritise funding. Effective investment management will ensure initiatives requiring capital funding are identified, selected, prioritised and managed to optimise performance and return on investment.

Funding for initiatives will be gated, based on stages in the investment lifecycle and subject to the ongoing assurance that initiatives are implemented effectively, risks are mitigated and planned benefits are realised.
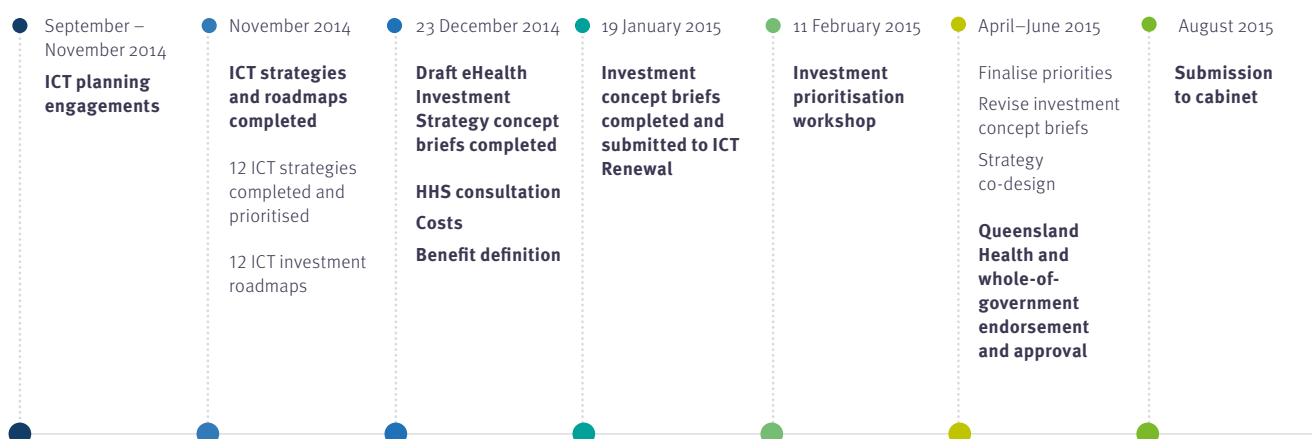
The planning process

The implementation of a new 'co-designed' approach to the development of this Strategy ensures the department and HHSs collaboratively identify, prioritise, select and review ICT investment priorities annually.

This Strategy has resulted from extensive HHS engagement and a co-design approach to prioritise individual HHS ICT investment. Twelve strategic planning engagements and more than 140 individual interviews with stakeholders have resulted in an ICT strategy and investment roadmap for each HHS. All 16 HHSs have participated in the development of this Strategy.

The priorities in this document were collectively agreed to by the 16 HSCEs, HHBs, and Department of Health divisions and agencies. Queensland Treasury, Department of the Premier and Cabinet, and the Department of Science Information Technology and Innovation also participated in the investment prioritisation process. As a result, this collective understanding of investment priorities, benefits, risks and options will place Queensland Health in the best position possible to move forward.

Figure 6: eHealth Investment Strategy timeline

September – November 2014	November 2014	23 December 2014	19 January 2015	11 February 2015	April–June 2015	August 2015
ICT planning engagements	**ICT strategies and roadmaps completed** 12 ICT strategies completed and prioritised 12 ICT investment roadmaps	**Draft eHealth Investment Strategy concept briefs completed** **HHS consultation** **Costs** **Benefit definition**	**Investment concept briefs completed and submitted to ICT Renewal**	**Investment prioritisation workshop**	Finalise priorities Revise investment concept briefs Strategy co-design **Queensland Health and whole-of-government endorsement and approval**	**Submission to cabinet**

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