2 February 2021

Version (2.2 Final)

Preliminary Cost Benefit Analysis Framework

Ministry of Health

Contents

1 Background 7
1.1 Capital planning process in NSW Health 7
1.2 Preliminary cost benefit analysis 7
2 Methodology 9
2.1 Determine key infrastructure types 9
3 Hospital infrastructure benefits 16
3.1 Summary 16
3.2 Quantified benefits 18
3.3 Not quantified benefits 24
4 Primary and integrated care facilities benefits 27
4.1 Summary 27
4.2 Quantified benefits 28
4.3 Not quantified benefits 34
5 Multi-purpose services 37
5.1 Summary 37
5.2 Quantified benefits 39
5.3 Not quantified benefits 43
6 NSW Ambulance 47
6.1 Summary 47
6.2 Quantified benefits 49
6.3 Not quantified benefits 51
7 Information and communication technology 55
7.1 Summary 55
7.2 Quantified benefits 57
7.3 Not quantified benefits 61
8 Research and development 63
8.1 Summary 63
8.2 Quantified benefits 65
8.3 Not quantified benefits 66
9 Major medical equipment 68
9.1 Summary 68
9.2 Quantified benefits 70
9.3 Not quantified benefits 71
Appendix A: Benefits by category and infrastructure type 73
Appendix B: DRG'S flagged as 'sameday' 77

Figures

Figure 1-1: NSW Health State-wide prioritisation process 7
Figure 2-1: Summary of overall methodology 9
Figure 3-1: Hospital infrastructure benefits 17
Figure 4-1: Summary of primary and integrated care benefits 28
Figure 5-1: Summary of MPS benefits 38
Figure 7-1: ICT infrastructure benefits 56
Figure 8-1: Research and development infrastructure 64
Figure 9-1 Summary of medical equipment benefits 69

Tables

Table 2-1: Infrastructure project categories 10

Table 2-2: Number of benefits by infrastructure type, and by 'ability to be quantified' 12
Table 2-3: Costs by infrastructure type 13
Table 2-4: Benefits profile template 14
Table 3-1: Hospital infrastructure benefits – admitted, ED and ambulatory 16
Table 3-2: Reduction in morbidity for patients as a result of additional hospital capacity (hospital infrastructure) 18
Table 3-3: Reduction in mortality for patients as a result of additional hospital capacity (hospital infrastructure) 18
Table 3-4: Avoided hospital costs from a reduction in hospital-acquired infections and inpatient falls as a result of hospital redevelopment (hospital infrastructure) 19
Table 3-5: Reduction in mortality for ED admissions due to expanded ED capacity and hence reduced overcrowding (hospital infrastructure) 19
Table 3-6: Avoided cost of hospital admissions as a result of increased ambulatory care capacity (hospital infrastructure) 20
Table 3-7: Reduction in travel time as a result of renal dialysis satellite services (hospital infrastructure) . 20
Table 3-8: Increased productivity (hospital infrastructure) 21
Table 3-9 Avoided cost of workplace injuries (hospital infrastructure) 21
Table 3-10: Residual value of new build assets (hospital infrastructure) 22
Table 3-11: Sale of unrequired land assets (hospital infrastructure) 22
Table 3-12: Avoided base case capital costs (hospital infrastructure) 22
Table 3-13: Avoided operating costs (hospital infrastructure) 23
Table 3-14: Reduction in recruitment costs due to better retention of staff (staff accommodation) 23
Table 3-15: Improved equity of access to hospital treatments (hospital infrastructure) 24
Table 3-16: Improved patient experience (hospital infrastructure) 24
Table 3-17 Improved hospital amenity (hospital infrastructure) 24
Table 3-18: Improved dynamic efficiency (hospital infrastructure) 25
Table 3-19: Greater workforce satisfaction – improved amenity (hospital infrastructure) 25
Table 3-20: Reverse flow impacts (hospital infrastructure) 25
Table 3-21: Improved environmental sustainability (hospital infrastructure) 26
Table 4-1: Primary and integrated care facilities benefits 27
Table 4-2: Additional life years for patients resulting from increased capacity (primary and integrated care facilities) 28
Table 4-3: Avoided cost resulting from a reduction in potentially preventable hospitalisations due to increased capacity (primary and integrated care services) 29
Table 4-4: Reduction in length of stay resulting from increased capacity (primary and integrated care services) 29
Table 4-5: Travel time and vehicle cost savings resulting from better access (primary and integrated care facilities) 30
Table 4-6: Increased productivity (Primary and integrate care facilities) 30
Table 4-7 Avoided cost of workplace injuries (Primary and integrate care facilities) 31
Table 4-8: Residual value of new build assets (Primary and integrated care facilities) 31
Table 4-9: Sale of unrequired land assets (primary and integrated care facilities) 32
Table 4-10: Avoided base case capital costs (primary and integrated care facilities) 32
Table 4-11: Avoided operating costs (primary and integrated care facilities) 32
Table 4-12: Improved patient experience (primary and integrated care facilities) 34
Table 4-13: Avoided admissions – patient benefit (primary and integrated care facilities) 34
Table 4-14: Improved equity of access to primary and integrated care health services (primary and integrated care facilities) 34
Table 4-15: Improved dynamic efficiency (primary and integrated care facilities) 35
Table 4-16: Greater workforce satisfaction (primary and integrated care facilities) 35
Table 4-17: Reverse flow impacts (primary and integrated care facilities) 35
Table 4-18: Improved environment sustainability (primary and integrated care facilities) 36
Table 5-1: Multi-purpose services benefits 37
Table 5-2: Improved health outcomes as a result of access to MPS (MPS) 39

Table 5-3: Avoided cost resulting from reduction in potentially preventable hospital admissions (MPS).... 39
Table 5-4: Avoided cost as a result of reduced length of stay (MPS)..... 40
Table 5-5: Travel time and vehicle cost savings (MPS)..... 40
Table 5-6: Increased productivity (MPS) 41
Table 5-7 Avoided cost of workplace injuries (MPS) 41
Table 5-8: Residual value of new build assets (MPS) 42
Table 5-9: Sale of unrequired land assets (MPS)..... 42
Table 5-10: Avoided base case capital costs (MPS) 42
Table 5-11: Avoided operating costs (MPS)..... 43
Table 5-12: Improved patient experience (MPS)..... 43
Table 5-13: Avoided admissions – patient benefit (MPS)..... 44
Table 5-14: Improved equity of access to services provided by MPS' (MPS) 44
Table 5-15: Improved amenity (MPS)..... 44
Table 5-16: Improved dynamic efficiency (MPS)..... 44
Table 5-17: Greater workforce satisfaction (MPS)..... 45
Table 5-18: Reverse flow impacts (MPS) 45
Table 5-19: Improved environment sustainability (MPS)..... 45
Table 5-20: Increased quality of life and care provision - elderly (MPS) 46
Table 6-1: NSW Ambulance infrastructure benefits..... 47
Table 6-2: Improved health outcomes as a result of improved response times (NSW Ambulance) 49
Table 6-3: Increased paramedic productivity (NSW Ambulance)..... 49
Table 6-4: Avoided operating costs (NSW Ambulance) 49
Table 6-5: Residual value of new build assets (NSW Ambulance)..... 50
Table 6-6: Sale of unrequired land assets (NSW Ambulance) 50
Table 6-7: Avoided base case capital costs (NSW Ambulance)..... 50
Table 6-8: Improved equity of access to ambulance services (NSW Ambulance) 51
Table 6-9: Improved availability of ambulance services (NSW Ambulance) 51
Table 6-10: Improved patient experience (NSW Ambulance) 52
Table 6-11: Greater workforce satisfaction (NSW Ambulance)..... 52
Table 6-12: Improved environmental sustainability (NSW Ambulance)..... 52
Table 6-13: Reduced risk of legal action (NSW Ambulance)..... 53
Table 6-14: Improved paramedic educational outcomes as a result of improved ICT and capital infrastructure (NSW Ambulance)..... 53
Table 6-15: Reduced costs and improved staff welfare from improved OH&S standards (NSW Ambulance)53
Table 6-16: Increased operational efficiency as a result of reduced call out costs 54
Table 7-1: ICT infrastructure benefits 55
Table 7-2: Reduced overtime hours as a result of increased productivity – clinical systems only (ICT)..... 57
Table 7-3: Reduced overtime hours as a result of increased productivity – corporate systems only (ICT). 57
Table 7-4: Improved health outcomes as a result of improving treatments and safety and quality of care – clinical systems only (ICT)..... 58
Table 7-5: Reduction in length of stay due to a reduction adverse drug events – clinical systems only (ICT)58
Table 7-6: Avoided costs due to a reduction in redundant or unnecessary diagnostic tests – clinical systems only (ICT) 59
Table 7-7: Avoided software licence costs (ICT) 59
Table 7-8: Avoided maintenance costs (ICT) 59
Table 7-9: Avoided base case capital costs (ICT) 60
Table 7-10: Avoided staff costs (ICT) 60
Table 7-11: Improved equity of access to health services (ICT)..... 61
Table 7-12: Improved reliability of the network (ICT)..... 61
Table 7-13: Improved patient experience (ICT)..... 61
Table 7-14: Improved GP / clinician experience (ICT)..... 62
Table 7-15: Greater workforce satisfaction (ICT)..... 62
Table 8-1: Research and development infrastructure benefits..... 63

Table 8-2: Improved health outcomes (research and development) 65
Table 8-3: Wider economic gains (research and development) 65
Table 8-4: Residual value of new build assets (research and development) 65
Table 8-5: Development of less costly treatments (research and development) 66
Table 8-6: Improved patient experience (research and development) 66
Table 8-7: Greater workforce satisfaction (research and development) 66
Table 8-8: Improved environmental sustainability of buildings (research and development) 67
Table 9-1: Medical equipment benefits 68
Table 9-2: Avoided costs resulting from reduction in unnecessary or duplicate pathology tests caused by inaccurate pathology results (major medical equipment) 70
Table 9-3: Reduction in length of stay as a result of improved turnaround time for diagnostic tests (pathology and imagining) (major medical equipment) 70
Table 9-4: Improved patient experience 71
Table 9-5: Greater workforce satisfaction 71
Table 9-6: Improved occupational health and safety 71
Table 9-7: Improved training outcomes 71

Glossary

AIHW	Australian Institute for Health and Welfare
ALOS	Average length of stay
BCR	Benefit Cost Ratio
CISP	Capital Investment Strategic Plan
ED	Emergency Department
EHUI	Expected Health Utilisation Index
eMR	Electronic Medical Records
FF&E	Furniture, fittings & equipment
FTE	Full-time equivalent
GP	General Practitioner
HAI	Hospital-acquired infection
HDU	High Dependency Unit
HETI	Health Education and Training Institute
HIHI	Health Infrastructure
ICT	Information and Communications Technology
ICU	Intensive Care Unit
IHPA	Independent Hospital Pricing Authority
LHD	Local Health District
MPS	Multipurpose Service
NHCDC	National Hospital Cost Data Collection
NHPA	National Health Performance Authority
NSW	New South Wales
NWAU	National Weighted Activity Unit
OECD	Organisation for Economic Co-operation and Development
OH&S	Occupational Health & Safety
PCBA	Preliminary Cost Benefit Analysis
PPH	Potentially Preventable Hospitalisation
PYLD	Prevalent years lived with disability
RBA	Reserve Bank of Australia
SHN	Specialty Health Network
SRG	Service Related Group
The Ministry	The NSW Ministry of Health
VSLY	Value per statistical life year

1 Background

1.1 Capital planning process in NSW Health

Decisions about public funding of health infrastructure require consideration of relative costs and benefits of the options. Some of the benefits and costs associated with different health infrastructure investments (particularly those relating to health outcomes) are difficult to value and quantify. Both benefits and costs are driven by changes in the services delivered, which can be difficult to determine at an early stage.

The NSW Health Preliminary Cost Benefit Analysis (PCBA) framework and associated tool were developed in 2015 to align with the Infrastructure NSW Investor Assurance Framework, within the broader annual Asset Strategic Planning (ASP) process. The PCBA tool calculates the net present benefits and costs of the investment proposals submitted to the Ministry by Health Organisations for consideration in the 10-Year Capital Investment Strategic Plan (CISP).

1.2 Preliminary cost benefit analysis

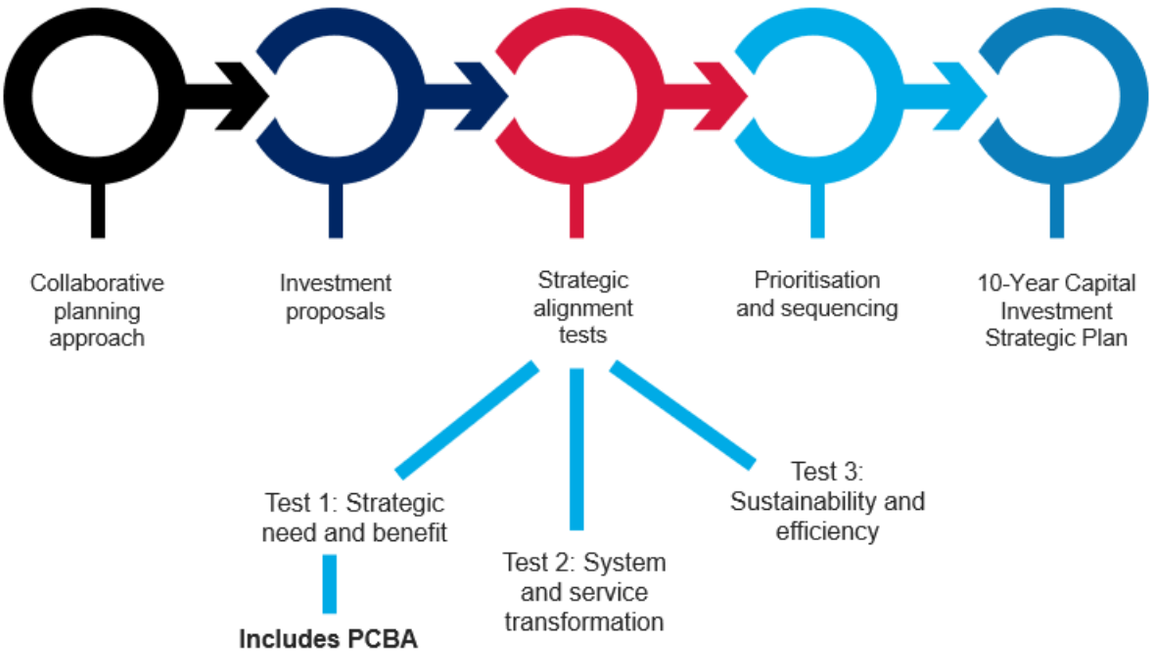
The PCBA is a simplified economic evaluation that is used as a threshold test for projects submitted for capital funding consideration and to determine whether a project's benefits outweigh the costs. It is included as part of the NSW Health State-wide Investment and Prioritisation Framework. Those projects with a benefit-cost ratio (BCR) greater than 1 will be considered in the statewide prioritisation of health infrastructure projects. The tool is not intended to be a prioritisation tool across infrastructure projects, nor across health services.

The purpose of the PCBA tool is to provide greater indication to the Ministry on the net social value of health infrastructure projects at an early stage. This ensures better alignment between service planning, capital planning, the Health Infrastructure business case process, and the development of the infrastructure project. Projects that have gone through the PCBA and the subsequent statewide prioritisation process are then considered for inclusion in the CISP along with other statewide priorities.

This PCBA is not designed to compare alternate models of care and clinical redesign with capital investment. Quantifying benefits of models of care is complex as models of care vary by location, local community needs and service type. The impact of models of care should be considered as part of service planning. However, the framework does consider that health infrastructure projects can enable alternate models of care and clinical redesign, and this is captured in the benefits and costs.

Figure 1-1 shows how the PCBA fits within the overarching prioritisation process. Further detail can be found in the NSW Health State-wide Investment and Prioritisation Framework.

Figure 1-1: NSW Health State-wide prioritisation process



1.2.1 Alignment to other cost benefit processes

Any infrastructure project that passes the threshold test using the PCBA tool will be considered in the statewide prioritisation of health infrastructure projects. Both a preliminary and final business case will then be required by Health Infrastructure (HI) at an appropriate time for projects that are identified in the forward budget years.

The PCBA takes into account the NSW Health *Guide to Cost-Benefit Analysis of Health Capital Projects October 2018*. The PCBA tool seeks to align broadly with these methodologies; however, it differs where additional research was identified that could better support the health infrastructure projects assessed by The Ministry. As the evidence base underpinning the tool evolves, alignment with HI NSW tools will be monitored to avoid inconsistency in project assessment.

2 Methodology

The overall methodology used in developing this framework and tool involved research to:

- determine the key infrastructure types
- identify benefits by infrastructure types
- categorise benefits
- identify costs
- develop benefit profiles

Figure 2-1: Summary of overall methodology

Determine key infrastructure types	Identify benefits	Categorise benefits	Identify costs	Develop benefit profiles

• Based on CISP 10 year plan	• Benefits split by infrastructure type
	• Sources include:
	  • Review of NSW Health and Health Infrastructure NSW guidelines and methodologies
	  • Academic and other government research
	  • Existing Deloitte research
		• Prioritise based on:
		  • Likelihood of benefit realisation
		  • Quantifiability:
		  • Quantitative and quantified
		  • Quantitative and not quantified
		  • Qualitative
		  • Relative potential impact of benefit
			• Costs split by capital, whole-of-life and operating costs
			• Based on NSW Health cost templates
				• Develop method for quantification for each benefit
				• Identify data sources
				• Confirm assumptions

2.1 Determine key infrastructure types

There is a wide range of health infrastructure investments that NSW Health is responsible for. These infrastructure project types range from new hospital builds to ICT. Each infrastructure category has a specific set of costs and benefits associated with investment. As a result, the CBA framework considers each infrastructure category independently to ensure all relevant costs and benefits are captured.

Project categories were determined by reviewing all infrastructure projects in the Ministry of Health's current 10 Year CISP, as well as considering other potential areas of investment based on stakeholder consultations each year. This ensures that all health infrastructure projects over the next ten years can be assessed using the PCBA tool. The categories identified, and agreed with the Ministry of Health are presented in Table 2-1.

Each infrastructure type has different investment triggers. These triggers include:

- **new capital project (with additional capacity):** building of a completely new structure or facility (whether the structure is attached to an existing building or not), or implementation of a new ICT system, that increases capacity or throughput

- **new capital project (with no increase in capacity):** building of a completely new structure or facility (whether the structure is attached to an existing building or not), or implementation of a new ICT system, that does not increase throughput capacity
- **refurbishment or upgrade (with additional capacity):** the refurbishment/refit/upgrade of a space within an existing structure which has increased throughput capacity (includes a range of activities that increase throughput capacity in addition to other activities such as work associated with repurposing a structure to provide a different clinical service; painting and new carpet; putting in ensuites; moving walls), or upgrade/refresh of an existing ICT system that increases patient activity or throughput
- **refurbishment or upgrade (with no increase in capacity):** the refurbishment/refit/ upgrade of a space within an existing structure which does not increase throughput capacity (includes a range of activities from painting and new carpet; putting in ensuites; moving walls; to work associated with repurposing a structure to provide a different clinical service), or upgrade/refresh of an existing ICT system that does not increase capacity or throughput

Different investments will trigger different associated benefits and costs. New builds, upgrades or refurbishments that increase capacity will reduce morbidity and mortality through additional treatment, while refurbishments that do not increase capacity may improve infection control and therefore decrease hospital-acquired infections. Avoided base case costs are included, where, without project investment, capital investment would likely be required in the base case, to keep safe and operational, and/or replace assets at end of useful lives.

Table 2-1: Infrastructure project categories

Infrastructure categories	Inclusions	Investment triggers
Hospital infrastructure	Hospital infrastructure includes infrastructure related to inpatient hospital services as well as outpatient facilities. Sub-categories include: • Intensive Care Unit (ICU) • Operating theatres • Specialised and general wards / beds • Emergency Department • Staff accommodation • Ambulatory care (including outpatient, allied health, dental, mental health, chemotherapy, renal and pathology)	• New capital project (with additional capacity) • New capital project (with no additional capacity) • Refurbishment or upgrade (with additional capacity) • Refurbishment or upgrade (with no additional capacity)
Primary and Integrated Care Facilities	Primary and integrated care facilities provide healthcare in the community for people seeking medical treatment and are typically the first level of contact with the health system. Primary health care facilities include Community Health Centres, General Practitioners (GPs), pharmacies, allied health and preventative care providers. Integrated care facilities combine multiple aspects of primary health provision in a single centre.	• New build (with additional capacity) • New build (with no additional capacity) • Refurbishment (with additional capacity) • Refurbishment (with no additional capacity)
Multi-Purpose Services (MPS)	MPS' are integrated health and aged care services that provide flexible and sustainable service options for small rural and remote communities. The MPS model integrates emergency, ambulatory, primary health care, acute, sub-acute, and residential aged care services.	• New build (with additional capacity) • New build (with no additional capacity) • Refurbishment (with additional capacity)

Infrastructure categories	Inclusions	Investment triggers
		• Refurbishment (with no additional capacity)
NSW Ambulance infrastructure	For the purpose of the preliminary cost benefit analysis tool, NSW Ambulance infrastructure refers to NSW Ambulance stations only. All other infrastructure, including fleet, is managed by NSW Ambulance and hence is out of scope.	• New build (with additional capacity) • New build (with no additional capacity) • Refurbishment (with additional capacity) • Refurbishment (with no additional capacity)
Information and Communication Technology	• ICT infrastructure includes major software installations and system upgrades. This category covers all ICT projects related to: • Workforce and business management systems including 'back-office' finance, asset and facilities, and workforce management • Clinical systems such as electronic medical records (EMR) and eMEDS, and analytics and informatics systems that support clinical decision making	• New ICT system • Upgrade of existing ICT system
Major medical equipment	This includes major medical equipment used in pathology and radiology. Other minor medical equipment and robotic equipment are out of scope.	• New equipment • Upgrade of existing equipment
Research and Development facilities	Research and development infrastructure incorporates the building and/or refurbishment of facilities to be utilised primarily for medical research.	

2.1.1 Identify and categorise benefits

Ongoing desktop reviews are required to identify key benefits for each infrastructure type. In order to identify key drivers of benefits for health infrastructure at a holistic level and identify synergies between infrastructure types, each identified benefit was clustered according to the following definitions:

- **Health:** improvement in health outcomes for patients resulting in reduced mortality, morbidity and increased quality of life;
- **Efficiency:** reduced costs and improvements in productivity resulting from new buildings, improved functionality, and travel time savings;
- **Access:** availability of quality services within reasonable reach of those who need them and of opening hours, appointment systems and other aspects of service organization and delivery that allow people to obtain the services at the right place and time;
- **Workforce:** improvements in working conditions and work satisfaction arising from improved amenity, better facilities and greater workplace effectiveness; and
- **Other:** all other benefits not captured in the above categories e.g. patient satisfaction, residual value of assets.

Appendix A summarises all identified benefits by category and infrastructure type.

2.1.2 Prioritisation of benefits for tool development

Each identified benefit was assessed and ranked in terms of its likelihood and impact, as well as its ability to be quantified. A description of each is as follows:

- **Likelihood** – what is the probability of the benefit being realised? (ranked 1-5, with 1 being highly unlikely and 5 being highly likely). This was assessed based on the strength of evidence to show causality of benefits (as in the case of preventative services leading to improved health outcomes) or the amount of external factors that may influence the achievement of outcomes;
- **Relative potential impact** – how large are the potential benefits? (ranked 1-5, with 1 being very low expected impact and 5 being very high expected impact). This was an initial assessment of the potential size of the benefit to determine whether it should be included as part of the tool; and
- **Ability to be quantified** – is there a method of quantifying the benefit and is there available and relevant data? (two categories included – quantified and not quantified).

This assessment process was used to prioritise and determine the benefits that would be quantified in the preliminary cost benefit analysis tool, and which would be included as non-quantified benefits. The criterion with the most weight in the prioritisation process was "ability to be quantified", which required detailed methodology and sufficient and reliable data to be included in the tool.

Benefits that are not quantified but had a high likelihood and impact rating should be explored and developed further in the future as better data and evidence become available. This may involve new primary data collection (e.g. through surveys).

Table 2-2 summarises the number of benefits identified for each infrastructure type, broken down by those that are quantified in the tool and those that are not quantified but included in the tool as qualitative benefits.

Table 2-2: Number of benefits by infrastructure type, and by 'ability to be quantified'

Infrastructure type	Quantified	Not quantified	Total benefits
Hospital	13	7	20
Primary and Integrated Care Facilities	11	7	18
Multi-Purpose Services	12	9	21
NSW Ambulance	6	9	15
Information and Communication Technology	8	5	13
Research and Development	3	4	7
Medical Equipment	2	4	6
Total	55	45	100

2.1.3 Identify costs

The cost of each infrastructure project will need to be accounted for in order to estimate a benefit cost ratio. The cost estimates should include:

- **Capital costs** – the upfront costs incurred to create future benefits e.g. acquisition of the infrastructure asset that will have a useful life beyond the tax year; and
- **Operating costs** – the expenditures required for the day-to-day functioning of the project including wages, utilities, maintenance and repairs. Consideration should be given to the increasing maintenance costs that may be required for aging facilities.

Capital cost categories were determined based on the most recent HI Costing Template. Capital costs will be estimated by LHDs/SHNs using their historical benchmark data.

Operating costs will be estimated by LHDs/SHNs based on historic benchmark data for both the base case and project case. For the base case, LHDs/SHNs should consider increasing maintenance costs as a result of ageing infrastructure, while for the project case, decreasing operating costs resulting from more energy and water efficient facilities should be taken into account. Default operating costs in the

case of hospital infrastructure (including inpatient, emergency department and ambulatory services) is available, which is the National Weighted Activity Units (NWAUs) multiplied by the average cost. The cost categories taken into consideration for each infrastructure type are presented in Table 2-3.

Table 2-3: Costs by infrastructure type

Infrastructure type	Capital costs	Net operating costs[1]
Hospital infrastructure	• Design and Construction costs • Furniture, Fittings and Equipment (FF&E) • ICT • Land acquisition and property settlement • HI management fees • Program and change management	• Operating costs (including clinicians and staff, and ongoing maintenance costs, based on NWAU data) • Life-cycle capital maintenance
Primary and integrated care facilities	• Construction cost • FF&E • ICT • Land acquisition and property settlement • HI management fees • Program and change management	• Operating costs (including clinicians and staff, and ongoing maintenance costs) • Life-cycle capital maintenance
Multi-Purpose Service	• Construction cost (including fees) • FF&E • ICT • Land acquisition and property settlement • HI management fees • Program and change management	• Operating costs (including clinicians and staff, and ongoing operating maintenance costs) • Life-cycle capital maintenance
NSW Ambulance	• Construction cost (including fees) • FF&E • ICT • Land acquisition and property settlement • HI management fees • Program and change management	• Operating costs (including clinicians and staff, and ongoing maintenance costs) • Life-cycle capital maintenance
ICT	• Design costs • Software licence costs • Hardware costs (including end-of-life replacement costs) • Telecommunications costs • Program and change management costs (including implementation costs) • Organisational change costs (including training) • Program and change management	• Operating costs (including IT support staff, implementation, management and maintenance costs, refresh cycle costs, and ongoing training costs)

[1] Net operating costs including revenue (e.g. retail rent)

Infrastructure type	Capital costs	Net operating costs[1]
Research and Development facilities	• Construction cost (including fees) • FF&E • ICT • Land acquisition and property settlement • HI management fees • Program and change management	• Operating costs (including clinicians and staff, and ongoing maintenance costs) • Life-cycle capital maintenance
Medical Equipment	• Initial acquisition costs (delivery charges, capital works, installation) • Integration and interface costs • Spare parts and accessories	• Repair costs • Maintenance costs • Waste disposal • Life cycle capital management • Insurances and utilities • Accreditation and certification • Staff training and education

In line with NSW Treasury Guidelines for Economic Appraisal (NSW Treasury, 2017), escalation is excluded from the economic analysis.

Both base case and project costs are required in order to identify any cost savings and/or cost increases as a result of investment in health infrastructure. Base case and project costs need to incorporate upfront capital costs and operating costs.

The cost categories for all infrastructure types, with the exception of ICT, incorporate the same categories of expenditure. As a result, a standardised cost input template has been developed for LHDs/SHNs to populate.

2.1.4 Develop benefit profiles

For each prioritised benefit, detailed benefit profiles have been developed. This involved developing the methodology for quantification for each benefit and outlining the LHD input and assumptions involved. The ranking of likelihood and impact was also included in each profile.

The full benefit profile template is provided in Table 2-4 below with a description of each section.

Table 2-4: Benefits profile template

Benefit: Name of benefit	**Key beneficiary:** Recipient who derives advantage from the benefit
Benefit type	**Investment trigger**
Type of benefit by cluster including: health, efficiency, access, workforce and other.	The nature of the investment that creates the benefit such as: new builds, refurbishments, and expansions.
Benefit description	
Outline of the benefit and explanation of how the infrastructure investment will lead to the benefit.	
LHD input	
The data from the completed PCBA template that is used to generate this benefit.	

Likelihood of realising benefit (Out of 5)	Impact of realising benefit (Out of 5)
Ranking from 1 (low likelihood) to 5 (high likelihood) of benefit being realised.	Ranking from 1 (low impact) to 5 (high impact). This refers to the impact realising a benefit will have on $ / lives / access / reputation.

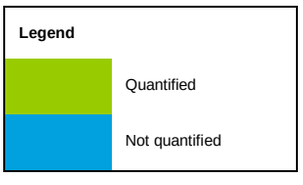
3 Hospital infrastructure benefits

3.1 Summary

The benefits for hospital infrastructure are summarised in Table 3-1.

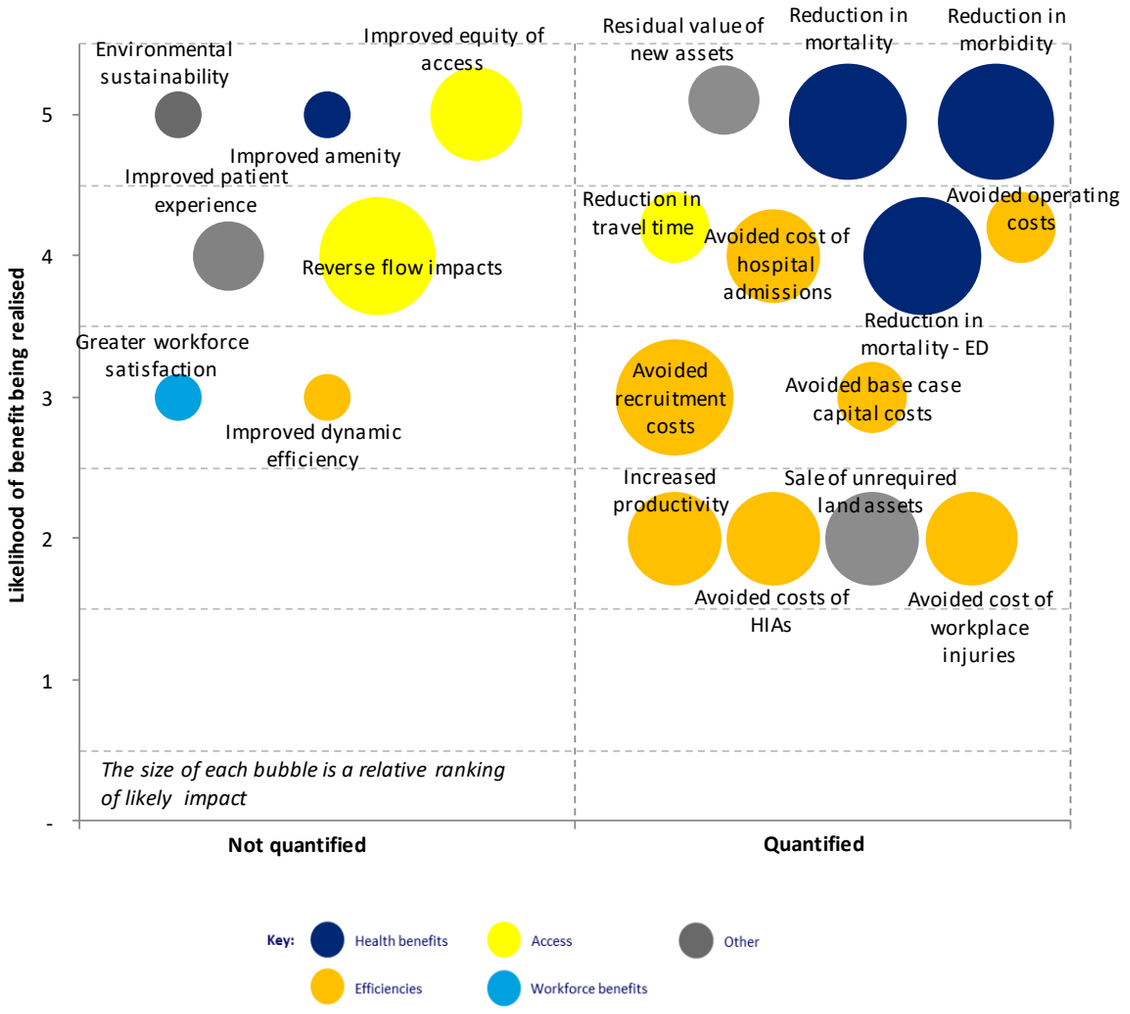
Table 3-1: Hospital infrastructure benefits – admitted, ED and ambulatory

Benefit category				
Health	**Efficiency**	**Access**	**Workforce**	**Other**
Reduction in morbidity	Avoided hospital costs resulting from reduction in hospital-acquired infections and inpatient falls	Reduction in travel time – renal dialysis satellite services	Greater workforce satisfaction – amenity	Residual value of new build assets
Reduction in mortality	Avoided cost of hospital admissions (ambulatory)	Improved equity of access	Improved occupational health and safety	Sale of unrequired land assets
	Avoided base case capital costs			
Improved hospital amenity	Avoided operating costs	Reverse flow impacts		Improved patient experience
	Avoided recruitment costs (hospital accommodation - adequate staffing)			
	Avoided staff injury and workers compensation costs			
	Improved staff productivity			
	Improved dynamic efficiency			
	Improved environmental sustainability			



Hospital infrastructure benefits are largely driven by the additional capacity generated by new builds and expansions of hospitals. This increases the number of patients that can be treated, and hence improved health outcomes are derived, including reduction in morbidity and mortality. On the other hand, refurbishments that do not increase capacity still have the potential to generate health benefits in the form of a reduction in hospital-acquired infections due to better infection control. Figure 3-1 summarises the hospital infrastructure benefits by benefit category and the prioritisation rankings.

Figure 3-1: Hospital infrastructure benefits



Detailed benefits profiles for those quantified and not quantified benefits are set out in the subsequent sections.

3.2 Quantified benefits

3.2.1 Admitted patients (incl. ICUs and operating theatres)

Table 3-2: Reduction in morbidity for patients as a result of additional hospital capacity (hospital infrastructure)

Benefit: Reduction in morbidity for patients as a result of additional hospital capacity	**Key beneficiary:** Patient
Benefit type	**Investment trigger**
Health	New builds and refurbishment of hospitals including ICUs and operating theatres that increase capacity
Benefit description	
It is assumed that there will be an increased number of beds and capacity due to the hospital new build and/or refurbishment (including HDUs, ICUs and operating theatres). This means more patients able to access treatment, and hence a reduction in morbidity for these patients.	
LHD input	
Additional number of separations by SRG: Input from LHD - number of additional separations occurring due to the build, expansion or refurbishment of hospital infrastructure by SRG. **Average number of separations per patient per year:** Default of 2 separations per patient. To be refined by the Ministry of Health input at LHD level.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
5	5

Table 3-3: Reduction in mortality for patients as a result of additional hospital capacity (hospital infrastructure)

Benefit: Reduction in mortality for patients as a result of additional hospital capacity	**Key beneficiary:** Patient
Benefit type	**Investment trigger**
Health	New builds and refurbishment of hospitals including HDUs, ICUs and operating theatres that increase capacity
Benefit description	
It is assumed that there will be an increased number of beds and capacity due to the hospital new build or refurbishment (including HDUs, ICUs and operating theatres). This means more patients able to access treatment, and hence a reduction in mortality due to untreated conditions for these patients. This is valued as a reduction in premature mortality.	
LHD input	
Additional number of separations by SRG: Input from LHD - number of additional separations occurring due to the build, expansion or refurbishment of hospital infrastructure by SRG. **Average number of separations per patient per year:** Default of 2 separations per patient. To be refined by The Ministry input at LHD level	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
5	5

Table 3-4: Avoided hospital costs from a reduction in hospital-acquired infections and inpatient falls as a result of hospital redevelopment (hospital infrastructure)

Benefit: Avoided hospital costs as a result of a reduction in hospital-acquired infections and inpatient falls	**Key beneficiary:** NSW Health
Benefit type	**Investment trigger**
Efficiency	Refurbishment of hospital infrastructure that does not increase capacity
Benefit description	
Refurbishment of hospitals means improved facilities and amenities, which leads to better infection control. This reduces the rate of hospital-acquired infections (HAIs) which is associated with higher lengths of stay and associated costs. As well, improved ward layout reduces injuries associated with inpatient falls.	
LHD input	
Total number of separations (by LHD): Input from LHD	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
2	4

3.2.2 Emergency Departments

Table 3-5: Reduction in mortality for ED admissions due to expanded ED capacity and hence reduced overcrowding (hospital infrastructure)

Benefit: Reduction in mortality for ED admissions due to expanded ED capacity and hence reduced overcrowding	Key beneficiary: Patient
Benefit type	**Investment trigger**
Health	New builds and refurbishment of EDs that increase capacity
Benefit description	
New builds and refurbishment of EDs will result in an increased capacity and potential capability of the ED. This can reduce ED overcrowding and a larger proportion of presentations to admissions meeting the 4-hour rule. This reflects both in reduced mortality and reduced length of stay for admitted patients.	
LHD input	
Projected ED presentations by triage category: Input from LHDs/SHNs **Additional number of ED admissions:** Input from LHDs/SHNs, based on admission rates as a proportion of ED presentations.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
4	5

3.2.3 Ambulatory care (outpatient and non-admitted)

Table 3-6: Avoided cost of hospital admissions as a result of increased ambulatory care capacity (hospital infrastructure)

Benefit: Avoided cost of hospital admissions	**Key beneficiary:** NSW Health
Benefit type	**Investment trigger**
Efficiency	New builds and refurbishment of ambulatory care facilities in an outpatient/non-admitted setting that increase capacity
Benefit description	
New builds and refurbishment of ambulatory care facilities means some separations (incl. pathology, imaging, and procedures and treatments) can be performed in an outpatient or non-admitted setting rather than in an inpatient setting. Hence, the cost comparison is for DRGs that are flagged as 'same day' in the inpatient dataset. This list of DRGs used to estimate the average cost of admitted separations that could be provided in an outpatient setting is provided in Appendix B. This is then valued as a reduction in number of inpatient hospital admissions, which translates into an avoided operating and capital cost.	
LHD input	
Avoided operating costs **Additional number of occasions of service (by LHD):** Input from LHDs/SHNs – This is the additional (or growth) in activity as a result of the new build, expansion or refurbishment by service type. E.g. if it is a new build, the growth will be the capacity of the new facility. **Avoided capital costs (one-off)** Captures the decreased need for new beds due to ability to deliver services in an outpatient/non-admitted setting **Additional number of occasions of service:** Input from LHDs/SHNs – This is the additional (or growth) in activity as a result of the new build, expansion or refurbishment by service type. E.g. if it is a new build, the growth will be the capacity of the new facility.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
4	4

Table 3-7: Reduction in travel time as a result of renal dialysis satellite services (hospital infrastructure)

Benefit: Reduction in travel time as a result of renal dialysis satellite services	**Key beneficiary:** Patient
Benefit type	**Investment trigger**
Access	New builds and refurbishment of renal dialysis satellite services that increase capacity
Benefit description	
New builds and refurbishment of renal dialysis satellite services in an outpatient/non-admitted setting can improve access for patients, particularly those in regional and rural areas. Given patients are required to go to a dialysis centre three times a week for 3 to 5 or more hours per visit, a reduction in travel time as a result of a new, expansion or refurbishment of a satellite dialysis service will be significant over the course of one year.	

LHD input	
Number of additional renal dialysis chairs: Input from LHDs/SHNs – This is the additional (or growth) in activity as a result of the new build, expansion or refurbishment. E.g. if it is a new build, the growth will be the capacity of the new facility. **Average travel distance avoided per trip:** Return trip by those patients who would have had to travel to a neighbouring hospital in the absence of the project. Input from LHD **Average travel time avoided per trip:** Return trip by those patients who would have had to travel to a neighbouring hospital in the absence of the project. Input from LHD	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
4	3

3.2.4 Benefits accruing to all hospital infrastructure including ED and ambulatory

Table 3-8: Increased productivity (hospital infrastructure)

Benefit: Improved productivity	**Key beneficiary:** NSW Health
Benefit type	**Investment trigger**
Efficiency (financial benefit)	New builds and refurbishments of hospitals, ED and ambulatory care facilities.
Benefit description	
A new or refurbished hospital will have improved facilities and better amenities, creating a better workplace environment. This will improve employee satisfaction and increase in productivity, reducing the amount of overtime that staff need to work.	
LHD input	
Number of staff impacted by improved conditions: LHD input.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
2	4

Table 3-9 Avoided cost of workplace injuries (hospital infrastructure)

Benefit: Avoided cost of workplace injuries	**Key beneficiary:** NSW Health
Benefit type	**Investment trigger**
Efficiency (financial benefit)	New builds and refurbishments of hospitals, ED and ambulatory care facilities
Benefit description	
An improved workplace environment with better safety conditions will reduce the number of workplace injuries, which translates into an avoided cost to NSW Health through fewer compensation claims.	
LHD input	
Number of staff impacted by improved conditions: LHD input.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**

2	4

Table 3-10: Residual value of new build assets (hospital infrastructure)

Benefit: Residual value of new build assets	**Key beneficiary:** NSW Health
Benefit type	**Investment trigger**
Other	New builds of hospitals, EDs and ambulatory care facilities
Benefit description	
Residual value of new build assets where the useful asset life exceeds the evaluation period and a residual value exists.	
LHD input	
Total capital cost: LHD input	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
5	3

Table 3-11: Sale of unrequired land assets (hospital infrastructure)

Benefit: Sale of unrequired land assets	**Key beneficiary: NSW Health/Government**
Benefit type	**Investment trigger**
Other	Refurbishment of hospitals, ED and ambulatory care facilities
Benefit description	
Financial benefit resulting from sale of unrequired land assets, if applicable.	
LHD input	
Asset sale value: LHD estimate based on specialist advice privately (such as RP Data) or through Health Infrastructure NSW. May be based on historical land valuations, or any estimates of land value in capital planning documentation.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
2	4

Table 3-12: Avoided base case capital costs (hospital infrastructure)

Benefit: Avoided base case capital costs	**Key beneficiary:** NSW Health
Benefit type	**Investment trigger**
Efficiency (captured in costs) (financial benefit)	New builds and refurbishments of hospitals, ED and ambulatory care facilities.
Benefit description	

Without project investment, capital investment will likely be required in the Base Case, to keep safe and operational, and/or replace assets at end of useful lives.
LHD input
Avoided base case capital costs: Input from LHD.

Likelihood of realising benefit (Out of 5)	Impact of realising benefit (Out of 5)
3	3

Table 3-13: Avoided operating costs (hospital infrastructure)

Benefit: Avoided operating costs (including operational efficiencies)	**Key beneficiary:** NSW Health
Benefit type	**Investment trigger**
Efficiency (captured in costs) (financial benefit)	New builds and refurbishments of hospitals, ED and ambulatory care facilities.
Benefit description	
Operational cost savings may be realised as a result of operational efficiencies, such as improved layout, connectivity and patient flow, as well as modernisation of facilities. Whilst per unit separation costs may decrease due to efficiencies, if hospital capacity is increased, this will result in additional net operating costs.	
LHD input	
Base case operating costs: input from LHDs/SHNs. To account for ageing infrastructure, consider increasing costs for maintenance component of ageing infrastructure. An example of a maintenance profile from the education sector is: Year 16 – 40: 56% increase in maintenance costs Years 40+: 32% increase in maintenance costs *Default option: based on NWAU data.* **Project case operating costs:** input from LHDs/SHNs. Consider operating cost savings in the case of a new building / expansion or refurbishment, which is water and energy efficient. An example of operating cost reductions for green buildings is: - Up to 14% (5 year average) for a new green building - Up to 13% (5 year average) for a green retrofit / refurbishment (SmartMarket Report - World Green Building Trends 2018: Australia) *Default option: based on NWAU data*	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
4	3

3.2.5 Staff accommodation

Table 3-14: Reduction in recruitment costs due to better retention of staff (staff accommodation)

Benefit: Reduction in recruitment costs due to better retention of staff	**Key beneficiary: NSW Health**
Benefit type	**Investment trigger**
Efficiency	Refurbishment of hospital staff accommodation

Benefit description	
Refurbishment of staff accommodation could reduce the staff turnover resulting in a decrease in recruiting costs which would have been incurred if the staff transferred to another region.	
LHD input	
Number of staff the facility accommodates: LHD input	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
3	3

3.3 Not quantified benefits

The benefits below include other benefits that have not been quantified in the PCBA tool but have been included in a qualitative way.

Table 3-15: Improved equity of access to hospital treatments (hospital infrastructure)

Benefit: Improved accessibility	**Key beneficiary: Patient**
Benefit type	**Investment trigger**
Access	New builds of hospitals, ED and ambulatory care infrastructure.
Benefit description	
New hospitals, ED and ambulatory care facilities will improve accessibility for semi-rural, rural and regional patients reducing the need to travel or go without treatment. Equity of access is a key area of focus for The Ministry.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
5	4

Table 3-16: Improved patient experience (hospital infrastructure)

Benefit: Improved patient experience	**Key beneficiary:** Patient
Benefit type	**Investment trigger**
Other	New builds and refurbishments of hospitals, ED and ambulatory care infrastructure.
Benefit description	
Improved amenity, additional treatments and reduced waiting times will lead to a better patient experience. Integrated and more co-ordinated care will also lead to better patient outcomes and experience.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
4	3

Table 3-17 Improved hospital amenity (hospital infrastructure)

Benefit: Improved hospital amenity and associated health outcomes	**Key beneficiary: Patient**
Benefit type	**Investment trigger**
Health	New builds and refurbishments of hospitals
Benefit description	
Redevelopment and new builds of hospitals will improve the functionality and quality of the building. This has also been shown to lead to better health outcomes (Lawson and Phiri, 2003).	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
5	2

Table 3-18: Improved dynamic efficiency (hospital infrastructure)

Benefit: Improved dynamic efficiency	**Key beneficiary: Patients, NSW Health**
Benefit type	**Investment trigger**
Efficiency	New builds and refurbishments of hospitals
Benefit description	
Upgrades of hospital facilities and new builds will have better potential to adopt new models of care as they arise. This has the potential to improve health outcomes for patients, workforce satisfaction for staff and cost savings for NSW Health.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
3	2

Table 3-19: Greater workforce satisfaction – improved amenity (hospital infrastructure)

Benefit: Greater workforce satisfaction	**Key beneficiary: Clinicians , NSW Health**
Benefit type	**Investment trigger**
Workforce	New builds and refurbishments of hospitals
Benefit description	
Improved amenity of buildings and upgraded facilities, including the ability to adopt new models of care, will lead to greater workforce satisfaction and a better ability to attract and retain staff.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
3	2

Table 3-20: Reverse flow impacts (hospital infrastructure)

Benefit: Reverse flow impacts	**Key beneficiary: NSW Health**
Benefit type	**Investment trigger**
Access	New builds of hospitals and ambulatory care facilities.

Benefit description	
Additional capacity at hospitals and ambulatory care facilities as a result of hospital refurbishment or new builds will result in the reverse flow of patients, freeing up capacity at hospitals where this reverse flow occurs from.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
4	5

Table 3-21: Improved environmental sustainability (hospital infrastructure)

Benefit: Improved environmental sustainability of buildings	**Key beneficiary: NSW Health**
Benefit type	**Investment trigger**
Efficiency	New builds and refurbishments of hospitals, ED and ambulatory care facilities.
Benefit description	
New hospital builds and refurbishments will adhere to the latest environmental guidelines and hence are likely to be more energy efficient and environmentally sustainable. This has the potential to reduce operating costs. Where possible however this will be captured as a reduced operating cost.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
5	2

4 Primary and integrated care facilities benefits

4.1 Summary

The benefits for primary and integrated care facilities are summarised in Table 4-1.

Table 4-1: Primary and integrated care facilities benefits

Benefit category				
Health	Efficiency	Access	Workforce	Other
Reduction in morbidity (additional life years)	Avoided cost resulting from reduction in potentially preventable hospitalisations	Improved equity of access	Greater workforce satisfaction	Residual value of new build assets
Avoided hospital admissions – patient benefit	Reduction in length of stay	Reverse flow impacts		Sale of unrequired land assets
	Travel time and vehicle cost savings			Improved patient experience
	Avoided base case capital costs			
	Avoided operating costs			
	Avoided staff injury and workers compensation costs			
	Improved staff productivity			
	Improved dynamic efficiency			
	Improved environmental sustainability			

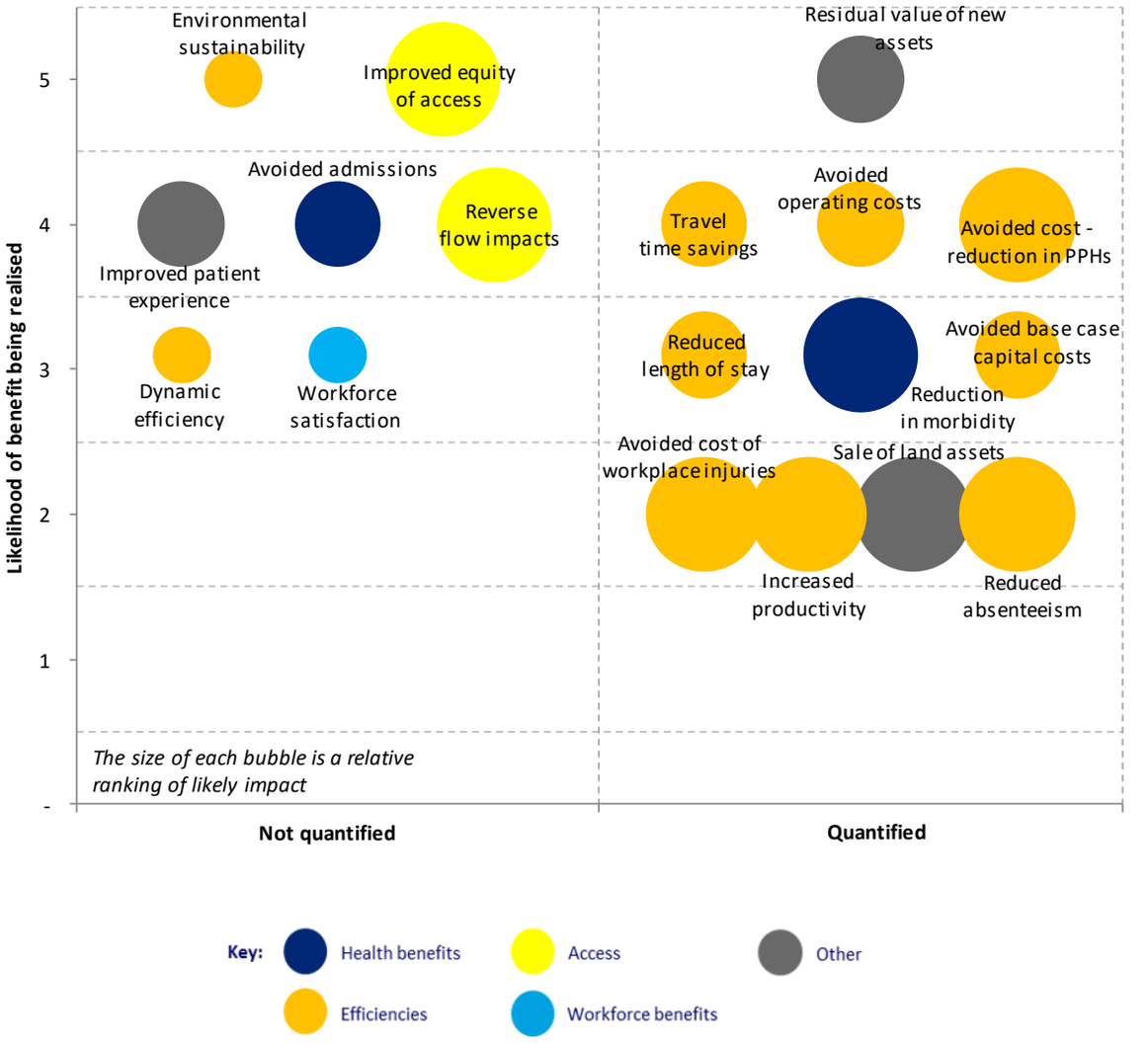
Legend

Quantified

Not quantified

While health benefits are potentially large, it is difficult to attribute primary and community-based health care services to health outcomes. Hence, the likelihood of realising health benefits is medium, while efficiency benefits such as travel time savings are more likely to be realised (particularly in rural and regional areas). Figure 4-1 summarises the primary and integrated care facilities infrastructure benefits by benefit category and the prioritisation ranking.

Figure 4-1: Summary of primary and integrated care benefits



Detailed benefits profiles for those quantified and not quantified benefits are set out in the subsequent sections.

4.2 Quantified benefits

Table 4-2: Additional life years for patients resulting from increased capacity (primary and integrated care facilities)

Benefit: Additional life years for patients resulting from increased capacity in primary and integrated care facilities	**Key beneficiary: Patient**
Benefit type	**Investment trigger**
Health	New builds and refurbishments of primary and integrated care facilities that increase capacity
Benefit description	

Investment in primary and integrated care facilities will improve access to health services in the community setting, particularly in rural and remote areas. For a proportion of people who access these primary and integrated care services, there will be an improvement in health outcomes. This is quantified as 'additional life years gained' as a result of additional primary health services.
LHD input
Additional number of occasions of service at primary and integrated care facility: Input from LHD.

Likelihood of realising benefit (Out of 5)	Impact of realising benefit (Out of 5)
3	4

Table 4-3: Avoided cost resulting from a reduction in potentially preventable hospitalisations due to increased capacity (primary and integrated care services)

Benefit: Avoided cost resulting from a reduction in potentially preventable hospitalisations due to increased capacity of primary and integrated care services	**Key beneficiary: NSW Health**
Benefit type	**Investment trigger**
Efficiency (financial benefit)	New builds and refurbishment of primary and integrated care facilities that increase capacity
Benefit description	
New builds, expansions and refurbishments of primary and integrated care facilities will increase access for patients who currently have limited access to primary health care. This in turn will reduce hospitalisation for potentially preventable conditions (either through prevention and early intervention, or ability to receive treatment in a primary care setting).	
LHD input	
Avoided operating costs **LHD population**: LHD input **Avoided capital costs (once-off)** **LHD population:** LHD input	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
4	4

Table 4-4: Reduction in length of stay resulting from increased capacity (primary and integrated care services)

Benefit: Reduction in length of stay resulting from increased capacity of primary and integrated care services	**Key beneficiary: NSW Health / patient**
Benefit type	**Investment trigger**

Efficiency (financial benefit) / health	New builds and refurbishment of primary and integrated care facilities that increase capacity
Benefit description	
New builds, expansions and refurbishment of primary and integrated care facilities will increase access for patients who currently have limited access to primary health care. Access to prevention and early intervention health services in a primary care setting may reduce the acuity of a patient's condition. In turn, if the patient eventually requires hospital treatment for that condition, their length of stay may be reduced.	
LHD input	
Number of primary health care occasions of service: LHD input - number of occasions of service projected to occur at the proposed primary and integrated care facility.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
3	3

Table 4-5: Travel time and vehicle cost savings resulting from better access (primary and integrated care facilities)

Benefit: Travel time and vehicle cost savings resulting from better access to primary and integrated care facilities	**Key beneficiary: Patient**
Benefit type	**Investment trigger**
Efficiency	New builds and refurbishment of primary and integrated care facilities
Benefit description	
New builds and refurbishment of primary care facilities in a non-admitted setting can improve access for patients, particularly those in regional and rural areas. Travel time savings will be realised as a result of patients attending primary care facilities in closer proximity to their residence.	
LHD input	
Number of primary health care occasions of service (by LHD): LHD input - number of occasions of service projected to occur at the proposed primary and integrated care facility. **Average travel distance avoided per trip:** Return trip, by those patients who would have travelled to a neighbouring hospital in the absence of the proposed project. Input from LHD. **Average travel time avoided per trip:** Return trip, by those patients who would have travelled to a neighbouring hospital in the absence of the proposed project. Input from LHD.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
4	3

Table 4-6: Increased productivity (Primary and integrate care facilities)

Benefit: Improved productivity	**Key beneficiary: NSW Health**
Benefit type	**Investment trigger**
Efficiency	New builds and refurbishments primary and integrated care

Benefit description	
A new or refurbished hospital will have improved facilities and better amenities, creating a better workplace environment. This will improve employee satisfaction and increase in productivity, reducing the amount of overtime that clinicians need to work.	
LHD input	
Number of staff impacted by improved conditions: LHD input.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
2	4

Table 4-7 Avoided cost of workplace injuries (Primary and integrate care facilities)

Benefit: Avoided cost of workplace injuries	**Key beneficiary: NSW Health**
Benefit type	**Investment trigger**
Efficiency (financial benefit)	New builds and refurbishments primary and integrated care
Benefit description	
An improved workplace environment with better safety conditions will reduce the number of workplace injuries, which translates into an avoided cost benefit to The Ministry through fewer compensation claims.	
LHD input	
Number of staff impacted by improved conditions: LHD input.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
2	4

Table 4-8: Residual value of new build assets (Primary and integrated care facilities)

Benefit: Residual value of new build assets	**Key beneficiary: NSW Health**
Benefit type	**Investment trigger**
Other	New builds of primary and integrated care facilities
Benefit description	
Residual value of new build assets where the useful asset life exceeds the evaluation period and a residual value exists.	
LHD input	
Total capital cost: LHD input	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
5	3

Table 4-9: Sale of unrequired land assets (primary and integrated care facilities)

Benefit: Sale of unrequired land assets	**Key beneficiary: NSW Health/Government**
Benefit type	**Investment trigger**
Other	Refurbishment of primary and integrated care facilities
Benefit description	
Financial benefit resulting from sale of unrequired land assets, if applicable.	
LHD input	
Asset sale value: LHD estimate based on specialist advice privately (such as RP Data) or through Government Property NSW. May be based on historical land valuations, or any estimates of land value in capital planning documentation.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
2	4

Table 4-10: Avoided base case capital costs (primary and integrated care facilities)

Benefit: Avoided base case capital costs	**Key beneficiary: NSW Health**
Benefit type	**Investment trigger**
Efficiency (captured in costs) (financial benefit)	New builds and refurbishments of primary and integrated care facilities
Benefit description	
Without project investment, it is likely that capital investment will be required in the base case, to keep existing primary and/or integrated care facilities safe and operational, or replace assets at the end of their useful lives.	
LHD input	
Avoided base case capital costs: input from LHDs/SHNs – expected required capital investment if the infrastructure investment does not proceed.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
3	3

Table 4-11: Avoided operating costs (primary and integrated care facilities)

Benefit: Avoided operating costs (including operational efficiencies)	**Key beneficiary:** NSW Health
Benefit type	**Investment trigger**
Efficiency (captured in costs) (financial benefit)	New builds and refurbishments of primary and integrated care facilities
Benefit description	

Operational cost savings may be realised as a result of operational efficiencies, such as improved layout, connectivity and patient flow, as well as modernisation of facilities. Integrated care facilities may also deliver operational efficiencies by sharing administrative costs across the different care providers.

Whilst per unit treatment costs may decrease due to efficiencies, if primary and integrated care capacity is increased, this will result in additional net operating costs.

LHD input

Base case operating costs: input from LHDs/SHNs.

To account for ageing infrastructure, consider increasing costs for maintenance component of ageing infrastructure. An example of a maintenance profile from the education sector is:

Year 16 – 40: 56% increase in maintenance costs

Years 40+: 32% increase in maintenance costs

Project case operating costs: input from LHDs/SHNs.

Consider operating cost savings in the case of a new building / expansion or refurbishment, which is water and energy efficient. An example of operating cost reductions for green buildings is:

- Up to 14% (5 year average) for a new green building
- Up to 13% (5 year average) for a green retrofit / refurbishment

(SmartMarket Report - World Green Building Trends 2018: Australia)

Likelihood of realising benefit (Out of 5)	Impact of realising benefit (Out of 5)
4	3

4.3 Not quantified benefits

Table 4-12: Improved patient experience (primary and integrated care facilities)

Benefit: Improved patient experience	**Key beneficiary: Patient**
Benefit type	**Investment trigger**
Other	New builds and refurbishments of primary and integrated care facilities
Benefit description	
Improved amenity, additional treatments and reduced waiting times will lead to a better patient experience and greater confidence in The Ministry. Integrated and more co-ordinated care will also lead to better patient outcomes and experience.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
4	3

Table 4-13: Avoided admissions – patient benefit (primary and integrated care facilities)

Benefit: Avoided admissions – patient benefit	**Key beneficiary: Patient**
Benefit type	**Investment trigger**
Health	New builds of primary and integrated care facilities
Benefit description	
Primary and integrated care facilities will reduce the need for hospital admissions for patients, leading to a better patient experience and reduced risk of infection when admitted.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
4	3

Table 4-14: Improved equity of access to primary and integrated care health services (primary and integrated care facilities)

Benefit: Improved accessibility	**Key beneficiary: Patient**
Benefit type	**Investment trigger**
Access	New builds of primary and integrated care facilities
Benefit description	
New primary facilities will improve accessibility for semi-rural, rural and regional patients reducing the need to travel or go without treatment. Equity of access is a key area of focus for The Ministry.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
5	4

Table 4-15: Improved dynamic efficiency (primary and integrated care facilities)

Benefit: Improved dynamic efficiency	**Key beneficiary: Patients / Clinicians /NSW Health**
Benefit type	**Investment trigger**
Efficiency	New builds and refurbishments of primary and integrated care facilities
Benefit description	
Redevelopment or new build for primary and integrated care facilities will have better potential to adopt new models of care as they arise. This has the potential to improve health outcomes for patients, workforce satisfaction for staff and cost savings for The Ministry.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
3	2

Table 4-16: Greater workforce satisfaction (primary and integrated care facilities)

Benefit: Greater workforce satisfaction	**Key beneficiary: Clinicians / NSW Health**
Benefit type	**Investment trigger**
Efficiency	New builds and refurbishments of primary and integrated care facilities
Benefit description	
Improved amenity of buildings and upgraded facilities will lead to greater workforce satisfaction and a better ability to attract and retain staff.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
3	2

Table 4-17: Reverse flow impacts (primary and integrated care facilities)

Benefit: Reverse flow impacts	**Key beneficiary: NSW Health**
Benefit type	**Investment trigger**
Access	New builds of primary and integrated care facilities
Benefit description	
Additional capacity at primary and integrated care facilities as a result of refurbishment or new builds will result in the reverse flow of patients, freeing up capacity at hospitals where this reverse flow occurs from.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
4	4

Table 4-18: Improved environment sustainability (primary and integrated care facilities)

Benefit: Improved environmental sustainability of buildings	**Key beneficiary: NSW Health**
Benefit type	**Investment trigger**
Efficiency	New builds and refurbishments of primary and integrated care facilities
Benefit description	
New primary and integrated care facility builds and refurbishments will adhere to the latest environmental guidelines and hence are likely to be more energy efficient and environmentally sustainable. This has the potential to reduce operating costs. Where possible however this will be captured as a reduced operating cost.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
5	2

5 Multi-purpose services

5.1 Summary

The benefits for multi-purpose services are summarised in Table 5-1.

Table 5-1: Multi-purpose services benefits

Benefit category				
Health	**Efficiency**	**Access**	**Workforce**	**Other**
Reduction in morbidity	Avoided cost resulting from reduction in hospital admissions	Improved equity of access	Greater workforce satisfaction	Residual value of new build assets
Avoided hospital admissions – patient benefit	Avoided cost as a result of reduced length of stay	Reverse flow impacts		Sale of unrequired land assets
Increased quality of life and care provision for residential aged care residents	Travel time and vehicle cost savings			Improved patient experience
	Avoided base case capital costs			Improved amenity
	Avoided operating costs			
	Productivity improvements			
	Avoided staff injury and workers compensation costs			
	Improved dynamic efficiency			
	Improved environmental sustainability			

Legend

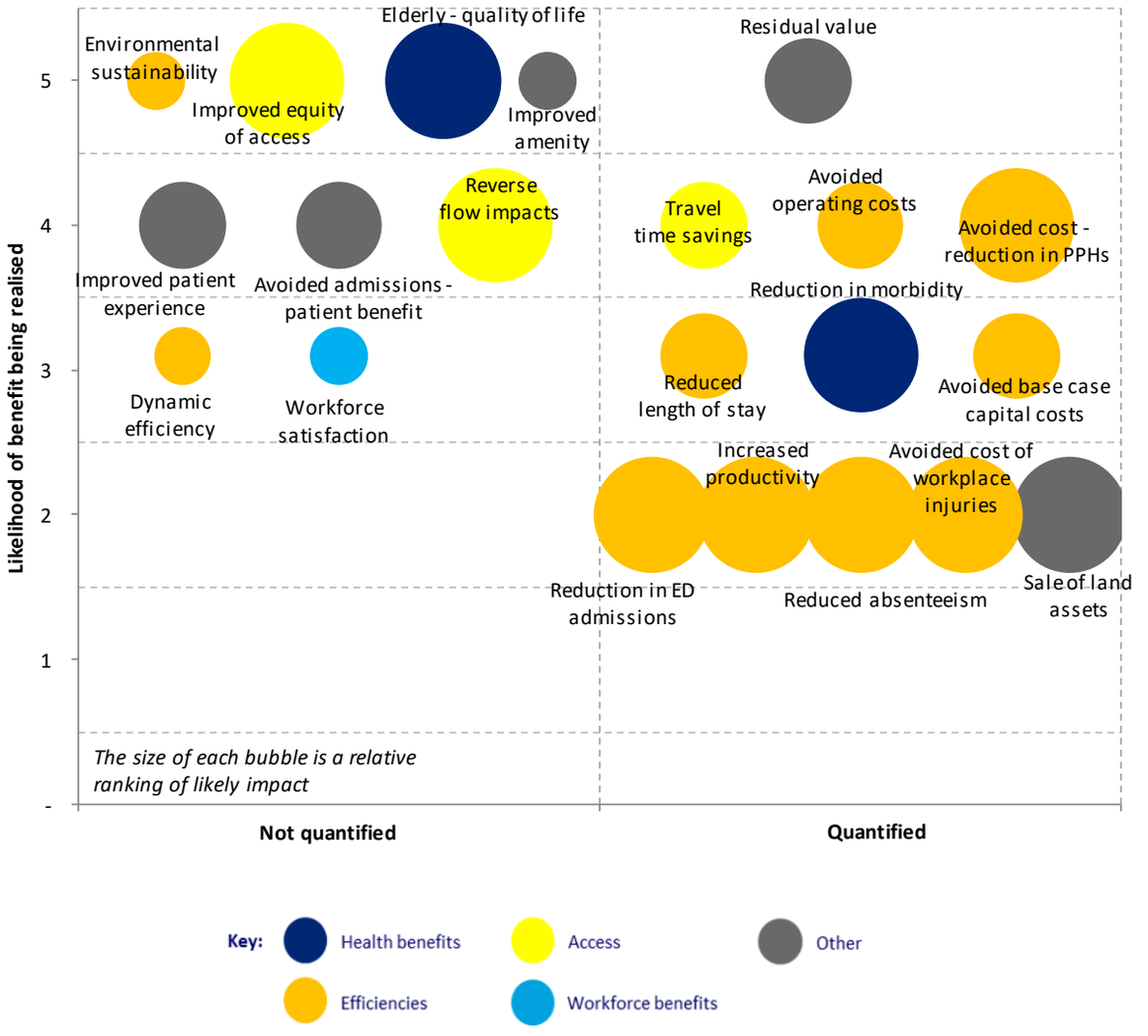
Quantified

Not quantified

Similar to primary health and integrated care facilities, the attribution of health outcomes to MPS is difficult. Hence, while the health benefits are potentially large, the likelihood of realising health benefits is medium, while efficiency benefits such as travel time savings are more likely to be realised (particularly in rural and regional areas). In addition, MPS may consist of inpatient services, community health services and residential aged care, and the tool allows different benefits to be triggered by these different services.

Figure 5-1 summarises the MPS infrastructure benefits by benefit category and the prioritisation rankings.

Figure 5-1: Summary of MPS benefits



Detailed benefits profiles for those quantified and not quantified benefits are set out in the subsequent sections.

5.2 Quantified benefits

Table 5-2: Improved health outcomes as a result of access to MPS (MPS)

Benefit: Reduction in morbidity	**Key beneficiary: Patient**
Benefit type	**Investment trigger**
Health	New builds and refurbishments of MPS facilities relating to community and inpatient services that increase capacity
Benefit description	
Investment in MPS' will improve access to health services in the community or outpatient setting, particularly in rural and remote areas. For inpatient and community health services this will improve morbidity and gain additional life years as more people will be able to access these services.	
LHD input	
Aged care **Commonwealth funding received per age care patient**: Input from LHD **Additional number of aged care places:** Input from LHD **Inpatient services (including planned procedure centres and overnight stays)** **Additional number of separations by SRG:** Input from LHD - number of additional separations occurring due to the build, expansion or refurbishment of hospital infrastructure by SRG. **Average number of separations per patient:** The Ministry input at LHD level **Community health services** **Additional number of occasions of service at MPS facility:** Input from LHD.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
3	4

Table 5-3: Avoided cost resulting from reduction in potentially preventable hospital admissions (MPS)

Benefit: Avoided cost resulting from reduction in hospital admissions	**Key beneficiary: NSW Health**
Benefit type	**Investment trigger**
Efficiency	New builds and refurbishment of MPS facilities – for community health services only that increase capacity
Benefit description	
Investment in MPS' will improve access to health services in the community or outpatient setting, particularly in rural and remote areas. A proportion of people who access MPS medical care will improve their health outcomes (either through more prevention or earlier intervention). This in turn reduces the number of potentially preventable hospital admissions, which translates into an avoided cost to The Ministry.	
LHD input	
Nil	

Likelihood of realising benefit (Out of 5)	Impact of realising benefit (Out of 5)
4	4

Table 5-4: Avoided cost as a result of reduced length of stay (MPS)

Benefit: Avoided costs arising from reduced length of stay (LOS) in hospital	**Key beneficiary: NSW Health**
Benefit type	**Investment trigger**
Efficiency (financial benefit)	New builds and refurbishment of MPS facilities – for community health services only that increase capacity
Benefit description	
Increasing the availability of community health services as a result of a MPS facility may decrease the length of stay for patients who are eventually admitted to hospital. This may be due to better access to diagnostics and imaging as well as to preventative and early intervention health services.	
LHD input	
Community health services **Additional number community health occasions of service:** LHD input - number of OOS projected to occur at the proposed MPS.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
3	3

Table 5-5: Travel time and vehicle cost savings (MPS)

Benefit: Travel time and vehicle cost savings for patients	**Key beneficiary: Patient**
Benefit type	**Investment trigger**
Access	New builds and refurbishment of MPS facilities – inpatient, community health services and residential aged care facilities (RACFs)
Benefit description	
New builds and refurbishment of MPS' will improve access for patients in regional and rural areas. This means patients travel less distance to access acute and primary health services as well as residential aged care services.	
LHD input	
Number of MPS treatments: LHD input - number of treatments projected to occur at the proposed MPS. **Average travel distance avoided per trip:** Return trip, by those patients who would have travelled to a neighbouring hospital, MPS or primary facility in the absence of the proposed project. Input from LHD. **Average travel time avoided per trip:** Return trip, by those patients who would have travelled to a neighbouring hospital, MPS or primary facility in the absence of the proposed project. Input from LHD.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
4	3

Table 5-6: Increased productivity (MPS)

Benefit: Improved productivity	**Key beneficiary: NSW Health**
Benefit type	**Investment trigger**
Efficiency (financial benefit)	New builds and refurbishments of MPS
Benefit description	
An improved workplace environment will improve employee satisfaction with work conditions and lead to an increase in productivity.	
LHD input	
Number of staff impacted by improved conditions: LHD input.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
2	4

Table 5-7 Avoided cost of workplace injuries (MPS)

Benefit: Avoided cost of workplace injuries	**Key beneficiary: NSW Health**
Benefit type	**Investment trigger**
Efficiency (financial benefit)	New builds and refurbishments of MPS
Benefit description	
An improved workplace environment with better safety conditions will reduce the number of workplace injuries, which translates into an avoided cost benefit to The Ministry through fewer compensation claims.	
LHD input	
Number of staff impacted by improved conditions: LHD input.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
2	4

Table 5-8: Residual value of new build assets (MPS)

Benefit: Residual value of new build MPS assets	**Key beneficiary:** NSW Health
Benefit type	**Investment trigger**
Other	New builds of MPS facilities.
Benefit description	
Residual value of new build assets where the useful asset life exceeds the evaluation period and a residual value exists.	
LHD input	
Total capital cost: LHD input	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
5	3

Table 5-9: Sale of unrequired land assets (MPS)

Benefit: Sale of unrequired land assets	**Key beneficiary:** NSW Health/Government
Benefit type	**Investment trigger**
Other (financial benefit)	Refurbishments of MPS facilities.
Benefit description	
Financial benefit resulting from sale of unrequired land assets, if applicable.	
LHD input	
Asset sale value: LHD estimate based on specialist advice privately (such as RP Data) or through Government Property NSW. May be based on historical land valuations, or any estimates of land value in capital planning documentation.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
2	4

Table 5-10: Avoided base case capital costs (MPS)

Benefit: Avoided base case capital costs	**Key beneficiary:** NSW Health
Benefit type	**Investment trigger**
Efficiency (captured in costs) (financial benefit)	New builds and refurbishments of MPS facilities.
Benefit description	
Without project investment, it is likely that capital investment will be required in the Base Case, to keep safe and operational, and/or replace assets at end of useful lives.	
LHD input	

Avoided base case capital costs: input from LHDs/SHNs – expected required capital investment if the infrastructure investment does not proceed.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
3	3

Table 5-11: Avoided operating costs (MPS)

Benefit: Avoided operating costs (including operational efficiencies)	**Key beneficiary:** NSW Health
Benefit type	**Investment trigger**
Efficiency (captured in costs) (financial benefit)	New builds and refurbishment of MPS facilities.
Benefit description	
Operational cost savings may be realised as a result of operational efficiencies, such as improved layout, connectivity and patient flow, as well as modernisation of facilities. Whilst per unit separation costs may decrease due to efficiencies, if capacity is increased, this will result in additional net operating costs.	
LHD input	
Base case operating costs: input from LHDs/SHNs. To account for ageing infrastructure, consider increasing costs for maintenance component of ageing infrastructure. An example of a maintenance profile from the education sector is: Year 16 – 40: 56% increase in maintenance costs Years 40+: 32% increase in maintenance costs **Project case operating costs:** input from LHDs/SHNs. Consider operating cost savings in the case of a new building / expansion or refurbishment, which is water and energy efficient. An example of operating cost reductions for green buildings is: - Up to 14% (5 year average) for a new green building - Up to 13% (5 year average) for a green retrofit / refurbishment (SmartMarket Report - World Green Building Trends 2018: Australia)	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
4	3

5.3 Not quantified benefits

Table 5-12: Improved patient experience (MPS)

Benefit: Improved patient experience	**Key beneficiary:** Patient
Benefit type	**Investment trigger**
Other	New builds and refurbishments of MPS facilities.
Benefit description	
Improved amenity, additional treatments and reduced waiting times will lead to a better patient experience and greater confidence in The Ministry. Integrated and more co-ordinated care will also lead to better patient outcomes and experience.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
4	3

Table 5-13: Avoided admissions – patient benefit (MPS)

Benefit: Avoided admissions – patient benefit	**Key beneficiary:** Patient
Benefit type	**Investment trigger**
Other	New builds of MPS facilities.
Benefit description	
MPS' will reduce the need for hospital admissions for patients, leading to a better patient experience and reduced risk of infection when admitted.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
4	3

Table 5-14: Improved equity of access to services provided by MPS' (MPS)

Benefit: Reduction in travel time to travel to services provided by MPS'	**Key beneficiary:** Patient
Benefit type	**Investment trigger**
Access	New builds of MPS facilities.
Benefit description	
MPS' will improve accessibility for semi-rural, rural and regional patients reducing the need to travel or go without treatment. Equity of access is a key area of focus for The Ministry.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
5	4

Table 5-15: Improved amenity (MPS)

Benefit: Improved amenity	**Key beneficiary:** Clinicians / Patient
Benefit type	**Investment trigger**
Other	Refurbishment of MPS facilities.
Benefit description	
Upgrades of MPS' will improve the functionality and quality of buildings.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
5	2

Table 5-16: Improved dynamic efficiency (MPS)

Benefit: Improved dynamic efficiency	**Key beneficiary:** Patients / Clinicians / NSW Health
Benefit type	**Investment trigger**
Efficiency	New builds and refurbishments of MPS facilities.

Benefit description	
New builds and refurbishment for MPS will have better potential to adopt new models of care as they arise. This has the potential to improve health outcomes for patients, workforce satisfaction for staff and cost savings for The Ministry.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
3	2

Table 5-17: Greater workforce satisfaction (MPS)

Benefit: Greater workforce satisfaction	**Key beneficiary:** Clinicians / NSW Health
Benefit type	**Investment trigger**
Workforce	New builds and refurbishments of MPS facilities.
Benefit description	
Improved amenity of buildings and upgraded facilities will lead to greater workforce satisfaction and a better ability to attract and retain staff.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
3	2

Table 5-18: Reverse flow impacts (MPS)

Benefit: Reverse flow impacts	**Key beneficiary:** NSW Health
Benefit type	**Investment trigger**
Access	New builds and refurbishments of MPS facilities.
Benefit description	
Additional capacity at MPS' as a result of refurbishment or new builds will result in the reverse flow of patients, freeing up capacity at hospitals where this reverse flow occurs from.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
4	4

Table 5-19: Improved environment sustainability (MPS)

Benefit: Improved environmental sustainability of buildings	**Key beneficiary:** The NSW Health
Benefit type	**Investment trigger**
Efficiency	New builds and refurbishments of MPS facilities.
Benefit description	
New MPS builds and refurbishments will adhere to the latest environmental guidelines and hence are likely to be more energy efficient and environmentally sustainable. This has the potential to reduce operating costs. Where possible however this will be captured as a reduced operating cost.	

Likelihood of realising benefit (Out of 5)	Impact of realising benefit (Out of 5)
5	2

Table 5-20: Increased quality of life and care provision - elderly (MPS)

Benefit: Increased quality of life and care provision for the elderly	**Key beneficiary:** Patient
Benefit type	**Investment trigger**
Health	New builds and refurbishments of MPS facilities.
Benefit description	
By providing access to both accommodation and medical treatment, additional MPS' improve the quality of life and care provision for residents.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
5	4

6 NSW Ambulance

6.1 Summary

The benefits for NSW Ambulance infrastructure projects are summarised in Table 6-1

Table 6-1: NSW Ambulance infrastructure benefits

Benefit category				
Health	**Efficiency**	**Access**	**Workforce**	**Other**
Improved health outcomes	Increased paramedic productivity	Improved equity of access	Greater workforce satisfaction	Residual value of new build assets
	Avoided base case capital costs	Improved availability of ambulance services	Improved paramedic educational outcomes as a result of improved ICT and capital infrastructure	Sale of unrequired land assets
	Avoided operating costs		Reduced costs and improved staff welfare from improved occupational health and safety standards	Improved patient experience
	Improved environmental sustainability			
	Reduced risk of legal action			
	Increased operational efficiency as a result of reduced call out costs			

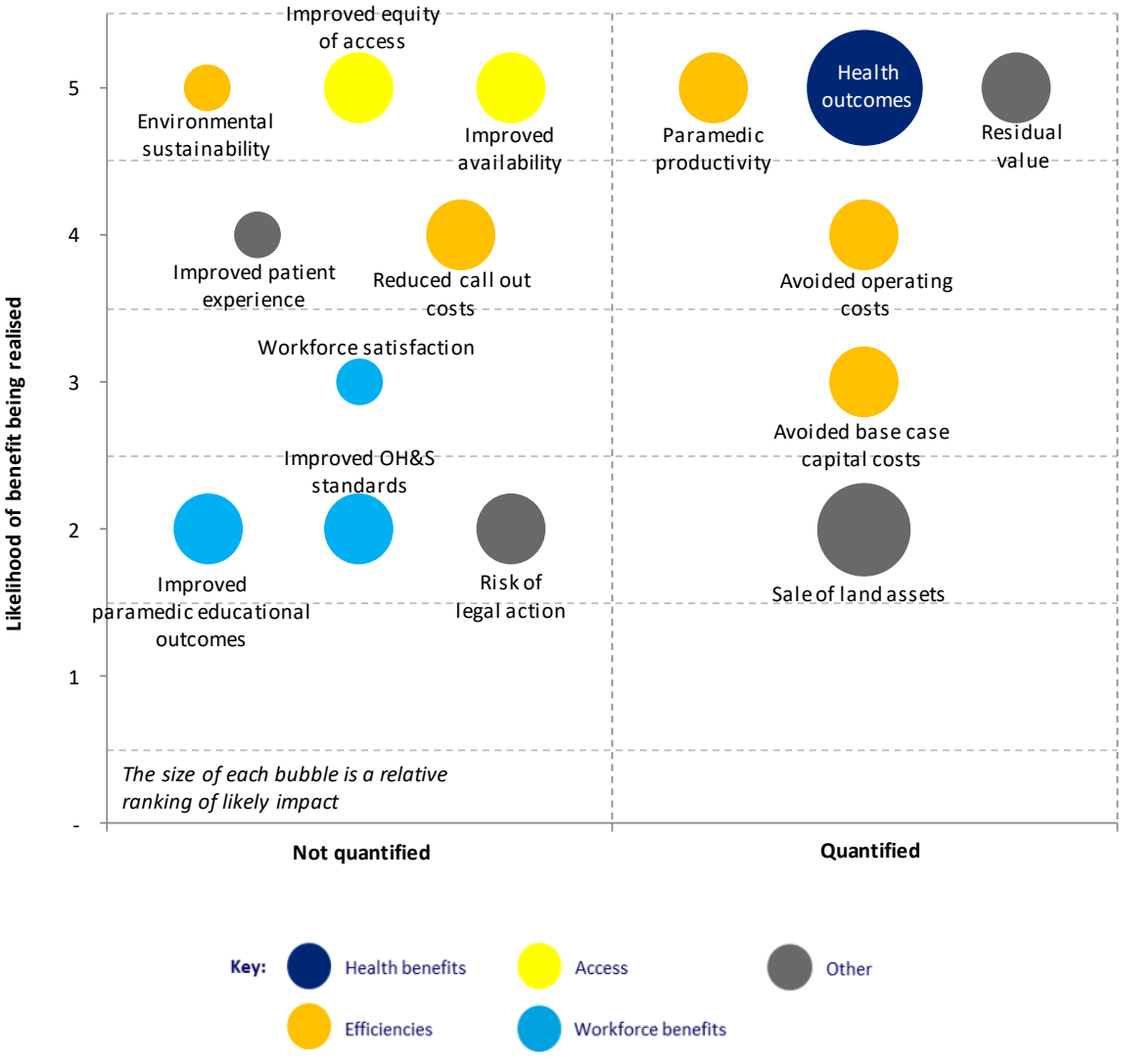
Legend

Quantified

Not quantified

NSW Ambulance infrastructure is likely to generate significant improvements to health outcomes as well as improve paramedic productivity. Health outcomes result from an improvement in response times, which is particularly important for patients requiring urgent and critical care such as stroke, trauma, acute cardiac events and acute medical emergencies. A number of NSW Ambulance infrastructure benefits are quantitative but not necessarily able to be translated directly into a dollar benefit such as improvement in paramedic education and training outcomes. Figure 6summarises the NSW Ambulance infrastructure benefits by benefit category and the prioritisation rankings.

Figure 6 Summary of NSW Ambulance infrastructure benefits



Detailed benefits profiles for those quantified and not quantified benefits are set out in the subsequent sections.

6.2 Quantified benefits

Table 6-2: Improved health outcomes as a result of improved response times (NSW Ambulance)

Benefit: Improved health outcomes as a result of improved response times – for time critical conditions (incl. stroke)	**Key beneficiary:** Patient
Benefit type	**Investment trigger**
Health	New builds of ambulance facilities
Benefit description	
Additional or more appropriately located NSW Ambulance stations or hubs reduces response times for patients leading to improved health outcomes.	
LHD input	
Annual number of time-critical patients: Input from NSW Ambulance **Estimated number of minutes improvement in response time:** Input from NSW Ambulance	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
5	5

Table 6-3: Increased paramedic productivity (NSW Ambulance)

Benefit: Increased paramedic productivity	**Key beneficiary:** NSW Health / Paramedics
Benefit type	**Investment trigger**
Efficiency	New builds of ambulance facilities
Benefit description	
Additional or more appropriately located NSW Ambulance stations/hubs will decrease travel time to and from incidents for paramedics, which translates into increased productivity for paramedics.	
LHD input	
Average avoided time travelling to and from base per incident: Input from NSW Ambulance **Average number of paramedics per incident**: Input from NSW Ambulance **Annual number of incidents:** Input from NSW Ambulance	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
5	3

Table 6-4: Avoided operating costs (NSW Ambulance)

Benefit: Avoided operating costs (including operational efficiencies)	**Key beneficiary:** NSW Health
Benefit type	**Investment trigger**
Efficiency (captured in costs) (financial benefit)	New builds of ambulance facilities

Benefit description	
Operational cost savings may be realised as a result of operational efficiencies, such as improved layout and modernisation of facilities.	
LHD input	
Base case operating costs: Input from NSW Ambulance **Project case operating costs:** Input from NSW Ambulance	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
4	3

Table 6-5: Residual value of new build assets (NSW Ambulance)

Benefit: Residual value of new build assets	**Key beneficiary:** NSW Health
Benefit type	**Investment trigger**
Other	New builds of ambulance facilities
Benefit description	
Residual value of assets.	
LHD input	
Total capital cost: NSW Ambulance input	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
5	3

Table 6-6: Sale of unrequired land assets (NSW Ambulance)

Benefit: Sale of unrequired land assets	**Key beneficiary:** NSW Health/Government
Benefit type	**Investment trigger**
Other (financial benefit)	Refurbishments of ambulance facilities
Benefit description	
Financial benefit resulting from sale of unrequired land assets, if applicable.	
LHD input	
Asset sale value: NSW Ambulance estimate based on specialist advice privately (such as RP Data) or through Government Property NSW. May be based on historical land valuations, or any estimates of land value in capital planning documentation.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
2	4

Table 6-7: Avoided base case capital costs (NSW Ambulance)

Benefit: Avoided base case capital costs	**Key beneficiary:** NSW Health
Benefit type	**Investment trigger**
Efficiency (captured in costs) (financial benefit)	New builds and refurbishments of ambulance facilities
Benefit description	
Without project investment, capital investment will likely be required in the Base Case, to keep safe and operational, and/or replace assets at end of useful lives.	
LHD input	
Avoided base case capital costs: Input from NSW Ambulance.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
3	3

6.3 Not quantified benefits

Table 6-8: Improved equity of access to ambulance services (NSW Ambulance)

Benefit: Improved accessibility	**Key beneficiary:** Patient
Benefit type	**Investment trigger**
Access	New builds of ambulance facilities.
Benefit description	
New ambulance stations will improve accessibility for semi-rural, rural and regional patients to ambulance services in a timely manner. Equity of access is a key area of focus for The Ministry.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
5	3

Table 6-9: Improved availability of ambulance services (NSW Ambulance)

Benefit: Improved accessibility	**Key beneficiary:** Patient
Benefit type	**Investment trigger**
Access	New builds and refurbishments of ambulance facilities
Benefit description	
New ambulance stations and improvements in facilities will increase capacity, the scheduling of services and the operation of the ambulance network. This will lead to additional availability of ambulance services to the general population. Equity of access is a key area of focus for The Ministry.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
5	3

Table 6-10: Improved patient experience (NSW Ambulance)

Benefit: Improved patient experience	**Key beneficiary:** Patient
Benefit type	**Investment trigger**
Health benefit	New builds and refurbishments of ambulance facilities
Benefit description	
Improved response times will lead to a better patient experience and greater confidence in NSW Ambulance.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
4	2

Table 6-11: Greater workforce satisfaction (NSW Ambulance)

Benefit: Greater workforce satisfaction	**Key beneficiary:** NSW Health
Benefit type	**Investment trigger**
Workforce benefit	New builds and refurbishments of ambulance facilities
Benefit description	
Improved amenity of stations and upgraded NSW Ambulance infrastructure will lead to greater workforce satisfaction and a better ability to attract and retain NSW Ambulance staff.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
3	2

Table 6-12: Improved environmental sustainability (NSW Ambulance)

Benefit: Improved environmental sustainability of buildings	**Key beneficiary:** NSW Health
Benefit type	**Investment trigger**
Efficiency	New builds and refurbishments of ambulance facilities
Benefit description	
New buildings or refurbishment of buildings for Ambulance stations and facilities will adhere to the latest environmental guidelines and hence are likely to be more energy efficient and environmentally sustainable. This has the potential to reduce operating costs. Where possible however this will be captured as a reduced operating cost.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
5	2

Table 6-13: Reduced risk of legal action (NSW Ambulance)

Benefit: Reduced risk of legal action	**Key beneficiary:** NSW Health
Benefit type	**Investment trigger**
Efficiency	New builds and refurbishments of ambulance facilities
Benefit description	
Improved NSW Ambulance response times have the potential to reduce the risk of legal action, as well as coronial inquiries, resulting in productivity and cost savings.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
2	3

Table 6-14: Improved paramedic educational outcomes as a result of improved ICT and capital infrastructure (NSW Ambulance)

Benefit: Improved paramedic educational outcomes as a result of improved ICT and capital infrastructure	**Key beneficiary:** Paramedics
Benefit type	**Investment trigger**
Workforce	New builds and refurbishments of ambulance facilities
Benefit description	
Additional, upgraded, and enhanced ICT and educational infrastructure at training units and stations improves paramedic access to online, blended, and face-to-face educational courses. This access is essential to improve patient care and efficient delivery of compulsory and specialist education to the states paramedic workforce. Improved access to facilities and services to facilitate distance education would reduce travel and associated costs currently incurred. Potential methods to track: • Total accommodation and travel cost incurred at station level for completion of mandatory training • Avoided travel and accommodation costs for modules delivered by distance education per station • Annual number of CTP points claimed by paramedics/ number of paramedics employed, for a given area. • % compliance of paramedics as having met educational requirements in a given zone • % of paramedics completed mandatory and recommended training modules within 6 months of their release • % of paramedics completed mandatory HETI online training modules in a given zone.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
2	3

Table 6-15: Reduced costs and improved staff welfare from improved OH&S standards (NSW Ambulance)

Benefit: Improved paramedic educational outcomes as a result of improved ICT and capital infrastructure	**Key beneficiary:** Paramedics
Benefit type	**Investment trigger**
Workforce	New builds and refurbishments of ambulance facilities

Benefit description	
• NSW Ambulance facilities, equipment, and fleet has direct impact on paramedic safety and subsequently associated OH&S costs. Improvements in this area can directly reduced the number of staff injured, the severity of those injuries and subsequently the associated financial and operational cost for NSW Ambulance. • Potential methods to track: • Measured reduction in the annual number of workers compensation claims relevant to the intervention (e.g. a reduction in shoulder injuries linked to lifting heavy cardiac monitors) • AND/OR • Average duration of leave due to work injury as calculated by proportion of FTE loss from date of leave until return to full duties AND/OR • Average costs associated with each claim	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
2	3

Table 6-16: Increased operational efficiency as a result of reduced call out costs

Benefit: Increased operational efficiency as a result of reduced call out costs	**Key beneficiary:** NSW Health
Benefit type	**Investment trigger**
Efficiency	New builds and refurbishments of ambulance facilities
Benefit description	
Increased operational efficiency as a result of building or relocating new NSW Ambulance stations closer to demand, resulting in reduced number of call outs to patients hence reduced spending on call out overtime.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
4	3

7 Information and communication technology

7.1 Summary

The benefits for ICT infrastructure projects are summarised in Table 7-1. The two categories include clinical systems, data analytics and informatics and corporate systems.

Table 7-1: ICT infrastructure benefits

Benefit category				
Health	**Efficiency**	**Access**	**Workforce**	**Other**
Improved health outcomes – clinical systems, data analytics and informatics only	Productivity gains – both	Improved equity of access	Improved GP/clinician experience	Improved patient experience
	Avoided costs arising from reduced length of stay in hospital – clinical systems, data analytics and informatics only		Greater workforce satisfaction	
	Avoided costs from les redundant diagnostic tests			
	Avoided software licence - both			
	Avoided maintenance costs of older systems - both			
	Avoided base case capital costs - both			
	Avoided staff costs - both			
	Improved reliability of the network			

Legend

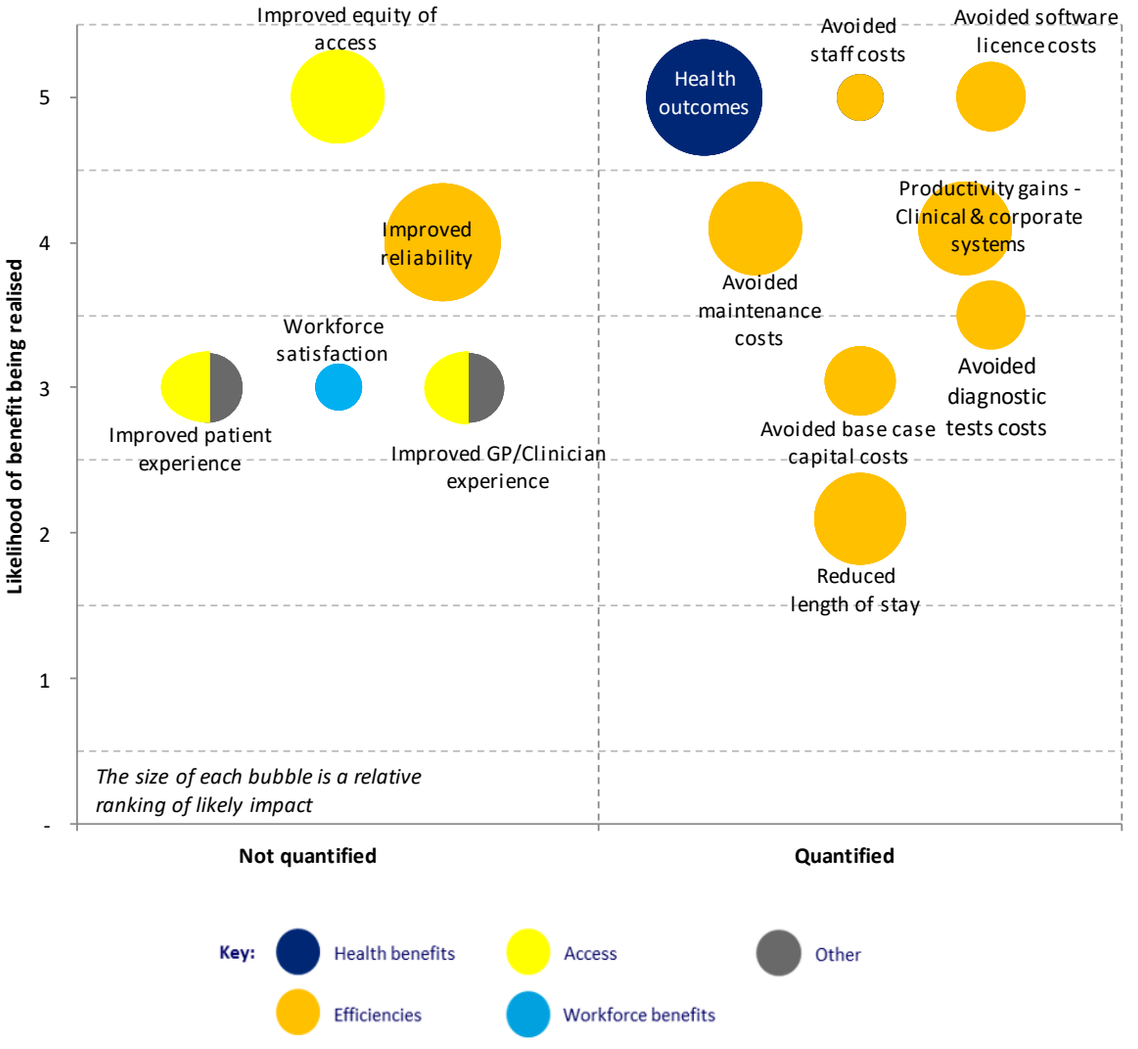
Quantified

Not quantified

Two broad ICT categories are considered including clinical systems, data analytics and informatics, as well as corporate systems which includes workforce and financial management. The benefits associated with ICT are predominantly efficiency benefits. However, improved health outcomes associated with clinical systems including electronic medical records (EMR) and HealtheNet as well as clinical data analytics and informatics are also expected to be a significant benefit. In addition, there is no residual value for ICT, given asset life is ten years (in line with NSW Treasury Guidelines) and the appraisal period is 20 years. This means that the residual value of the ICT upgrade (installed upon end

of useful life for commencement of year 11) will be zero. Figure 7-1 summarises the ICT infrastructure benefits by benefit category and the prioritisation rankings.

Figure 7-1: ICT infrastructure benefits



Detailed benefits profiles for those quantified and not quantified benefits are set out in the subsequent sections.

7.2 Quantified benefits

Table 7-2: Reduced overtime hours as a result of increased productivity – clinical systems only (ICT)

Benefit: Reduced overtime hours as a result of increased productivity	**Key beneficiary:** NSW Health
Benefit type	**Investment trigger**
Efficiency	Implementation or upgrade of clinical systems, data analytics and informatics only
Benefit description	
Implementation of a new or upgraded system reduces time required for administrative or manual tasks and information reconciliation. This is assumed to reduce the number of overtime hours previously required to complete these tasks.	
LHD input	
Number of staff impacted by improved conditions: LHD input.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
4	4

Table 7-3: Reduced overtime hours as a result of increased productivity – corporate systems only (ICT)

Benefit: Reduced overtime hours as a result of increased productivity	**Key beneficiary:** NSW Health
Benefit type	**Investment trigger**
Efficiency	Implementation or upgrade of corporate systems only
Benefit description	
Implementation of a new or upgraded system reduces time required for administrative or manual tasks and information reconciliation. This is assumed to reduce the number of overtime hours previously required to complete these tasks.	
LHD input	
Number of staff impacted by improved conditions: LHD input.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
4	4

Table 7-4: Improved health outcomes as a result of improving treatments and safety and quality of care – clinical systems only (ICT)

Benefit: Improved health outcomes as a result of improving treatments and safety and quality of care	**Key beneficiary:** Patient
Benefit type	**Investment trigger**
Health	Implementation or upgrade of clinical systems, data analytics and informatics only
Benefit description	
Improved health outcomes (reduced morbidity and mortality) for patients as a result of clinical ICT systems which improve diagnosis, preventative care, treatment time and consistency in treatment, as well as a reduction in adverse drug events.	
LHD input	
Reduced morbidity **Additional patients receiving clinical services as a result of clinical system:** Input from LHD **Reduced mortality** **Number of mortalities averted as a result of ICT project:** Assumed to be zero unless LHDs/SHNs have evidence that connects the ICT project to reduction in mortalities. Should be assessed on a project by project basis.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
5	5

Table 7-5: Reduction in length of stay due to a reduction adverse drug events – clinical systems only (ICT)

Benefit: Reduction in length of stay due to a reduction adverse drug events	**Key beneficiary:** NSW Health
Benefit type	**Investment trigger**
Efficiency (financial benefit)	Implementation or upgrade of clinical systems, data analytics and informatics only
Benefit description	
Reduced length of stay in hospital, and hence costs, due to improvements in clinical system. For example, an e-health records system may improve efficiency of hospital functions, improve treatment and reduce errors.	
LHD input	
Number of separations: Input from LHD / eHealth. **Expected % reduction in adverse events as a result of ICT project:** LHD / eHealth assumption. **% of separations impacted:** LHD / eHealth assumption.	

Likelihood of realising benefit (Out of 5)	Impact of realising benefit (Out of 5)
2	4

Table 7-6: Avoided costs due to a reduction in redundant or unnecessary diagnostic tests – clinical systems only (ICT)

Benefit: Avoided costs due to a reduction in redundant or unnecessary diagnostic tests	**Key beneficiary:** NSW Health
Benefit type	**Investment trigger**
Efficiency (financial benefit)	Implementation or upgrade of clinical systems, data analytics and informatics only
Benefit description	
Clinical decision support and duplicate checking functionalities could speed up the ordering process, reduce errors from paper-based order transcriptions and reduce duplicate or unnecessary diagnostic tests	
LHD input	
Number of separations: Input from LHD **Average number of separations per patient per year:** Default of 2 separations per patient. To be refined by The Ministry input at LHD level.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
3.5	3

Table 7-7: Avoided software licence costs (ICT)

Benefit: Avoided software licence costs	**Key beneficiary:** NSW Health
Benefit type	**Investment trigger**
Efficiency (financial benefit)	Implementation or upgrade of clinical, workforce or business management system
Benefit description	
Where standardisation occurs or old systems are no longer needed, software licence costs will be avoided.	
LHD input	
Software licence costs under base case: Input from LHD / eHealth. **Software licence costs under project case**: Input from LHD / eHealth.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
5	3

Table 7-8: Avoided maintenance costs (ICT)

Benefit: Avoided maintenance costs of older systems	**Key beneficiary:** NSW Health
Benefit type	**Investment trigger**

Efficiency (financial benefit)	Implementation or upgrade of clinical, workforce or business management system
Benefit description	
New or upgraded system reduce maintenance costs associated with system made redundant by new or upgraded system.	
LHD input	
Maintenance costs under base case: Input from LHD / eHealth. **Maintenance costs under project case:** Input from LHD / eHealth.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
4	4

Table 7-9: Avoided base case capital costs (ICT)

Benefit: Avoided base case capital and asset replacement costs	**Key beneficiary:** NSW Health
Benefit type	**Investment trigger**
Efficiency (financial benefit)	Implementation of new ICT systems
Benefit description	
Without project investment, capital investment will likely be required in the Base Case, to keep safe and operational, and/or replace assets at end of useful lives.	
LHD input	
Avoided base case capital costs: Input from LHD / eHealth. **Avoided asset replacement costs:** Input from LHD / eHealth.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
3	3

Table 7-10: Avoided staff costs (ICT)

Benefit: Avoided staff costs	**Key beneficiary:** NSW Health
Benefit type	**Investment trigger**
Efficiency	Implementation of new ICT systems
Benefit description	
Improvements in efficiency from new ICT infrastructure may result in reduced staff costs.	
LHD input	
Reduction in FTE numbers by category: Input from LHD / eHealth.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
5	2

7.3 Not quantified benefits

The benefits below include other benefits that have not been quantified in the PCBA tool but have been included in a qualitative way.

Table 7-11: Improved equity of access to health services (ICT)

Benefit: Improved accessibility	**Key beneficiary:** Patient
Benefit type	**Investment trigger**
Access	Implementation or upgrade of systems
Benefit description	
Implementation of new systems which enable telehealth and remote access to health services will improve accessibility for semi-rural, rural and regional patients reducing the need to travel or go without treatment. Equity of access is a key area of focus for The Ministry.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
5	4

Table 7-12: Improved reliability of the network (ICT)

Benefit: Improved reliability of the network	**Key beneficiary:** NSW Health
Benefit type	**Investment trigger**
Efficiency	Implementation or upgrade of systems
Benefit description	
Certain infrastructure investments will result in increasing the reliability and availability of networks. This will lead to greater efficiencies for staff and improved outcomes for patients.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
4	5

Table 7-13: Improved patient experience (ICT)

Benefit: Improved patient experience	**Key beneficiary:** Patient
Benefit type	**Investment trigger**
Access / other	Implementation or upgrade of ICT infrastructure
Benefit description	
Improved ICT infrastructure will result in more efficient hospital administration requirements (reducing processing times for patients) and an overall improved patient experience in terms of treatment using e-health records and other systems.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
3	3

Table 7-14: Improved GP / clinician experience (ICT)

Benefit: Improved clinician experience	**Key beneficiary:** Clinicians
Benefit type	**Investment trigger**
Access / other	Implementation or upgrade of ICT infrastructure
Benefit description	
Improved ICT infrastructure will result in more efficient hospital administration requirements (reducing processing times for patients). Better ICT facilities will improve the overall experience of GPs and clinicians in providing healthcare by allowing access to other health professionals and facilities. This will particularly apply in rural and regional health facilities.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
3	3

Table 7-15: Greater workforce satisfaction (ICT)

Benefit: Greater workforce satisfaction	**Key beneficiary:** Clinicians / NSW Health
Benefit type	**Investment trigger**
Workforce benefit	Implementation or upgrade of ICT infrastructure
Benefit description	
Improved ICT infrastructure will lead to more efficient and effective work practices, and thus greater workforce satisfaction and a better ability to attract and retain staff.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
3	2

8 Research and development

8.1 Summary

The benefits for research and development infrastructure projects are summarised in Table 8-1.

Table 8-1: Research and development infrastructure benefits

Benefit category				
Health	**Efficiency**	**Access**	**Workforce**	**Other**
Improved health outcomes	Development of less costly treatments		Greater workforce satisfaction	Residual value of new build assets
	Improved environmental sustainability of buildings			Improved patient experience

Legend

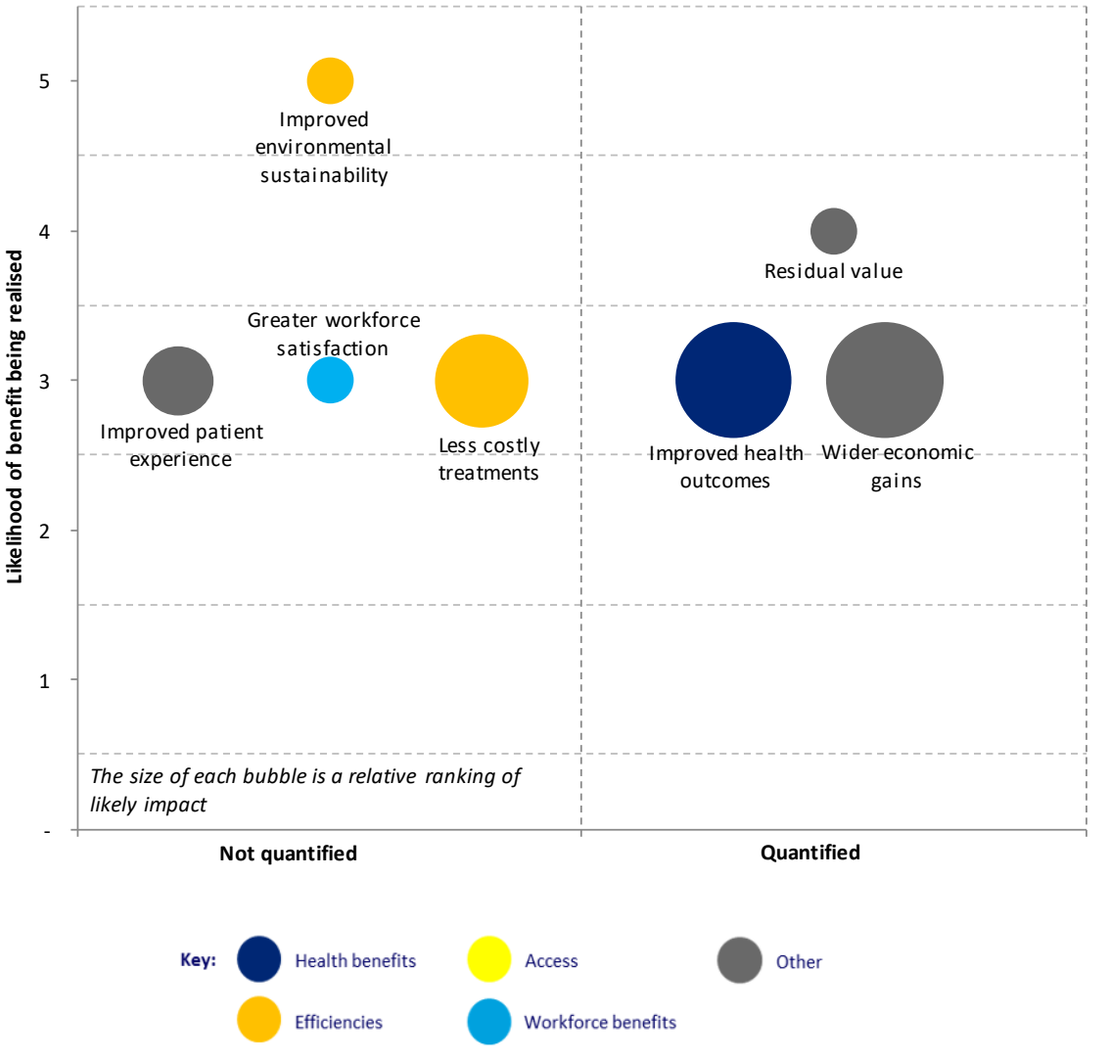
Quantified

Not quantified

Improved health outcomes are expected to be the most significant benefit associated with research and development, however, the likelihood of realisation is low to medium. This is because research and development investment is not directly translatable into health outcomes, and generally only covers certain health areas (such as cancer). A return on investment (ROI) is used to assess the quantifiable benefits of medical research. A return on investment (ROI) is the benefit cost ratio (BCR) of the costs and benefit associated with medical research.

Figure 8-1 summarises the research and development infrastructure benefits by benefit category and the prioritisation rankings.

Figure 8-1: Research and development infrastructure



Detailed benefits profiles for those quantified and not quantified benefits are set out in the subsequent sections.

8.2 Quantified benefits

Table 8-2: Improved health outcomes (research and development)

Benefit: Improved health outcomes	**Key beneficiary:** Patient
Benefit type	**Investment trigger**
Health	New research and development facilities and funding
Benefit description	
Additional research and development leads to improved treatment and reduced disabilities for diseases and thus health benefits in the related health field.	
LHD input	
Research grants: LHD input *Note: Research grants refers to medical research expenditure which includes theoretical and experimental work.*	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
3	5

Table 8-3: Wider economic gains (research and development)

Benefit: Wider economic gains	**Key beneficiary:** NSW
Benefit type	**Investment trigger**
Other	New research and development facilities and funding
Benefit description	
Additional research and development contributes to job creation, downstream and upstream linkages with other sectors and through the creation of knowledge	
LHD input	
Research grants: LHD input *Note: Research grants refers to medical research expenditure which includes theoretical and experimental work.*	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
3	5

Table 8-4: Residual value of new build assets (research and development)

Benefit: Residual value of new build assets	**Key beneficiary:** NSW Health
Benefit type	**Investment trigger**
Other	New builds of research and development facilities
Benefit description	

Residual value of assets	
LHD input	
Total capital cost: LHD / eHealth input.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
4	2

8.3 Not quantified benefits

The benefits below include other benefits that have not been quantified in the PCBA tool but have been included in a qualitative way.

Table 8-5: Development of less costly treatments (research and development)

Benefit: Development of less costly treatments	**Key beneficiary:** NSW Health
Benefit type	**Investment trigger**
Efficiency	New research and development facilities and funding
Benefit description	
Additional research and development activity is likely to identify new and less costly treatments. This will result in an overall productivity and/or cost savings for The Ministry.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
3	4

Table 8-6: Improved patient experience (research and development)

Benefit: Improved patient experience	**Key beneficiary:** Patient
Benefit type	**Investment trigger**
Other	New research and development facilities and funding
Benefit description	
The development of best practice approaches to treatment will lead to a better patient experience and outcome.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
3	3

Table 8-7: Greater workforce satisfaction (research and development)

Benefit: Greater workforce satisfaction	**Key beneficiary:** Clinicians / NSW Health
Benefit type	**Investment trigger**
Workforce	New research and development facilities and funding

Benefit description	
Improving treatments and adopting best practice processes will lead to greater staff satisfaction as well as attraction and retention of staff.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
3	2

Table 8-8: Improved environmental sustainability of buildings (research and development)

Benefit: Improved environmental sustainability of buildings	**Key beneficiary:** NSW Health
Benefit type	**Investment trigger**
Efficiency	New builds of research and development facilities
Benefit description	
New buildings or refurbishment of buildings for research and development will adhere to the latest environmental guidelines and hence are likely to be more energy efficient and environmentally sustainable. This has the potential to reduce operating costs. Where possible however this will be captured as a reduced operating cost.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
5	2

9 Major medical equipment

9.1 Summary

The benefits associated with major medical equipment are summarised in Table 9-1. Medical equipment includes pathology and radiology equipment. Medical equipment used for diagnostic testing does not change the ultimate health outcome of patients, but it does lead to earlier decisions and treatments (Hawkins 2007).

Table 9-1: Medical equipment benefits

Benefit category				
Health	**Efficiency**	**Access**	**Workforce**	**Other**
	Avoided cost of retests		Greater workforce satisfaction	Improved patient experience
	Avoided readmissions		Improved occupational health and safety	
	Reduced length of stay		Improved training outcomes	

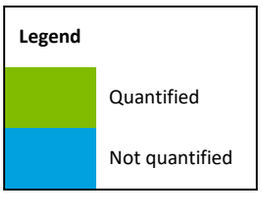
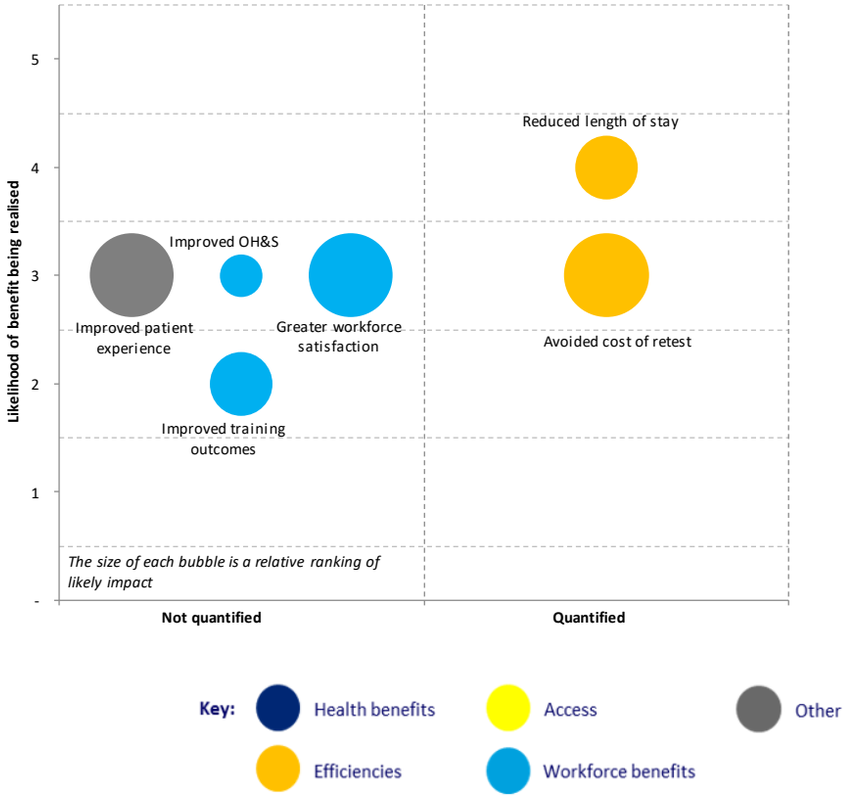


Figure 9-1 summarises the medical equipment infrastructure benefits by benefit category and the prioritisation rankings.

Figure 9-1 Summary of medical equipment benefits



Detailed benefits profiles for those quantified and not quantified benefits are set out in the subsequent sections.

9.2 Quantified benefits

Table 9-2: Avoided costs resulting from reduction in unnecessary or duplicate pathology tests caused by inaccurate pathology results (major medical equipment)

Benefit: Avoided costs of retests	**Key beneficiary:** NSW Health
Benefit type	**Investment trigger**
Efficiency (financial benefit)	Upgrade of pathology equipment already on site
Benefit description	
Upgrades to existing pathology equipment already on site will increase the accuracy of test and reduce the number of false positives and testing errors, which often leads to duplicate and/or unnecessary diagnostic tests.	
LHD input	
Number of separations: Input from LHD **Average number of separations per patient per year:** Default of 2 separations per patient. To be refined by The Ministry input at LHD level.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
3	4

Table 9-3: Reduction in length of stay as a result of improved turnaround time for diagnostic tests (pathology and imagining) (major medical equipment)

Benefit: Avoided readmissions	**Key beneficiary:** Patients / NSW Health
Benefit type	**Investment trigger**
Efficiency	New or upgrade of pathology and/or radiology equipment
Benefit description	
New or upgraded pathology and/or radiology equipment can reduce the turnaround time of diagnostic tests (pathology or imaging). This leads to less wait time for patients and therefore reduced length of stay in ED or in hospitals.	
LHD input	
In case of new/upgraded pathology equipment **Number of separations**: Input from LHD **Average number of separations per patient per year**: Default of 2 separations per patient. To be refined by The Ministry input at LHD level. **In case of new/upgraded radiology equipment** **Number of separations**: Input from LHD **Average number of separations per patient per year**: Default of 2 separations per patient. To be refined by The Ministry input at LHD level.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit(Out of 5)**
3	3

9.3 Not quantified benefits

Table 9-4: Improved patient experience

Benefit: Improved patient experience	**Key beneficiary:** Patients
Benefit type	**Investment trigger**
Other	New or upgraded pathology or radiology equipment
Benefit description	
Investment in pathology or radiology equipment and the development of best practice approaches will improve patient experience.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
3	4

Table 9-5: Greater workforce satisfaction

Benefit: Greater workforce satisfaction	**Key beneficiary:** Clinicians / NSW Health
Benefit type	**Investment trigger**
Workforce	New or upgraded pathology or radiology equipment
Benefit description	
Investment in pathology or radiology equipment and the development of best practice approaches will improve levels of staff satisfaction. This may support the attraction and retention of staff.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
3	4

Table 9-6: Improved occupational health and safety

Benefit: Improved occupational health and safety	**Key beneficiary:** Clinicians / NSW Health
Benefit type	**Investment trigger**
Workforce	New or upgraded pathology or radiology equipment
Benefit description	
Investment in new pathology and radiology equipment will enable the incorporation of, and compliance with, the most up-to-date occupational health and safety requirements, leading to fewer accidents and better safety outcomes for clinicians and support staff.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
3	2

Table 9-7: Improved training outcomes

Benefit: Improved training outcomes	**Key beneficiary:** Clinicians
Benefit type	**Investment trigger**

Workforce	New or upgraded pathology or radiology equipment.
Benefit description	
The provision of training using new pathology or radiology equipment will improve learning outcomes for clinicians, leading to improved quality testing and patient care.	
Likelihood of realising benefit (Out of 5)	**Impact of realising benefit (Out of 5)**
2	3

Appendix A: Benefits by category and infrastructure type

Infrastructure type	Benefit category				
	Health	Efficiency	Access	Workforce	Other
Hospital infrastructure – Admitted, ED and Ambulatory	Reduction in morbidity	Avoided hospital costs resulting from reduction in hospital-acquired infections and inpatient falls	Reduction in travel time – renal dialysis satellite services	Greater workforce satisfaction – amenity	Residual value of new build assets
	Reduction in mortality	Avoided cost of hospital admissions (ambulatory)	Improved equity of access	Improved occupational health and safety	Sale of unrequired land assets
		Avoided base case capital costs			
	Improved hospital amenity	Avoided operating costs	Reverse flow impacts		Improved patient experience
		Avoided recruitment costs (hospital accommodation - adequate staffing)			
		Avoided readmission costs (hospital accommodation - adequate staffing)			
		Avoided staff injury and workers compensation costs			
		Improved staff productivity			
		Avoided cost related to absenteeism			
		Improved dynamic efficiency			
		Improved environmental sustainability			
Primary and Integrated Care Facilities	Reduction in morbidity (additional life years)	Avoided cost resulting from reduction in potentially preventable hospitalisations	Improved equity of access	Greater workforce satisfaction	Residual value of new build assets
	Avoided hospital admissions – patient benefit	Reduction in length of stay	Reverse flow impacts	Improved occupational health and safety	Sale of unrequired land assets
		Travel time and vehicle cost savings			Improved patient experience
		Avoided base case capital costs			
		Avoided operating costs			

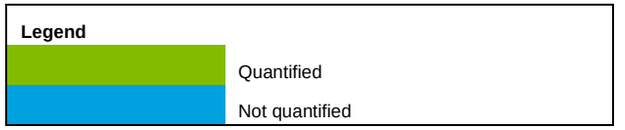
Preliminary Cost Benefit Analysis Framework

Infrastructure type	Benefit category				
	Health	Efficiency	Access	Workforce	Other
		Avoided staff injury and workers compensation costs			
		Improved staff productivity			
		Avoided cost related to absenteeism			
		Avoided costs resulting from reduced ED admissions			
		Improved dynamic efficiency			
		Improved environmental sustainability			
Multi-Purpose Services	Reduction in morbidity	Avoided cost resulting from reduction in hospital admissions	Improved equity of access	Greater workforce satisfaction	Residual value of new build assets
	Avoided hospital admissions – patient benefit	Avoided cost as a result of reduced length of stay	Reverse flow impacts	Improved occupational health and safety	Sale of unrequired land assets
	Increased quality of life and care provision for residential aged care residents	Travel time and vehicle cost savings			Improved patient experience
		Avoided base case capital costs			Improved amenity
		Avoided operating costs			
		Improved dynamic efficiency			
		Improved environmental sustainability			
NSW Ambulance	Improved health outcomes	Increased paramedic productivity	Improved equity of access	Greater workforce satisfaction	Residual value of new build assets
		Avoided base case capital costs	Improved availability of ambulance services	Improved paramedic educational outcomes as a result of improved ICT and capital infrastructure	Sale of unrequired land assets
		Avoided operating costs		Reduced costs and improved staff welfare from improved occupational health and safety standards	Improved patient experience
		Improved environmental sustainability			
		Reduced risk of legal action			

Preliminary Cost Benefit Analysis Framework

Infrastructure type	Benefit category				
	Health	Efficiency	Access	Workforce	Other
		Increased operational efficiency as a result of reduced call out costs			
Information and communication technology	Improved health outcomes – clinical systems, data analytics and informatics only	Productivity gains – both	Improved equity of access	Improved GP/clinician experience	Improved patient experience
		Avoided costs arising from reduced length of stay in hospital – clinical systems, data analytics and informatics only		Greater workforce satisfaction	
		Avoided costs from les redundant diagnostic tests			
		Avoided software licence - both			
		Avoided maintenance costs of older systems - both			
		Avoided base case capital costs - both			
		Avoided staff costs - both			
		Improved reliability of the network			
Research and development	Improved health outcomes	Development of less costly treatments		Greater workforce satisfaction	Residual value of new build assets
		Improved environmental sustainability of buildings			Improved patient experience
Major medical equipment		Avoided cost of retests		Greater workforce satisfaction	Improved patient experience
		Avoided readmissions		Improved occupational health and safety	
		Reduced length of stay		Improved training outcomes	

Preliminary Cost Benefit Analysis Framework



Appendix B: DRG'S flagged as 'sameday'

I82Z-OTHER +SD	G46C-COMPLEX GASTROSCOPY,SD	U60Z-MENTAL HEALTH TREAT -ECT +SD
B76C-SEIZURES +SD	Z61B-SIGNS AND SYMPTOMS +SD	B06C-CBL PSY,MUS DYSY,NPTHY PR +SD
I81Z-INJURIES +SD	F76C-ARRHY, CARD & COND DISDR +SD	D60C-EAR NOSE MOUTH&THROAT MAL +SD
K60C-DIABETES +SD	K64C-ENDOCRINE DISORDERS +SD	G66B-ABDMNL PAIN/MESENT ADENTS, SD
D62B-EPISTAXIS +SD	B67C-DEGNRTV NERV SYS DIS +SD	H60C-CIRRHOSIS & ALC HEPATITIS, SD
I40Z-INFUSIONS +SD	D63C-OTITIS MEDIA AND URI +SD	H63C-DSRD LVR-MAL,CIRR,ALC HEP, SD
G48C-COLONOSCOPY, SD	Q60C-RETICLENDO&IMNTY DIS +SD	J65C-TRAUMA TO SKN,SUB TIS&BST +SD
Y62C-OTHER BURNS +SD	E71C-RESPIRATORY NEOPLASMS +SD	L04C-KDY,URT&MJR BLDR PR N-NPM +SD
E42C-BRONCHOSCOPY +SD	O66C-ANTENATAL&OTH OBS ADM +SD	L67C-OTH KIDNY & URNRY TRCT DX +SD
D61C-DYSEQUILIBRIUM +SD	Q62B-COAGULATION DISORDERS +SD	Z01B-OTH CNT HLTH SRV +OR PROC +SD
V66Z-DRUG DISORDERS +SD	I27C-SOFT TISSUE PROCEDURES +SD	B71C-CRANIAL & PERIPHL NERV DSRD+SD
G47C-OTH GASTROSCOPY, SD	L64C-URINARY STONES & OBSTR +SD	D66C-OTH EAR,NOSE,MOUTH&THRT DX +SD
Q61C-RED BLOOD CELL DISDERS +SD	Z40Z-OTH CNT HLTH SRV +ENDO +SD	H61C-MALG HEPATOBILIAY SYS PANC, SD
R60C-ACUTE LEUKAEMIA +SD	D67B-ORAL & DENTAL DISORDERS +SD	H64C-DISORDERS OF BILIARY TRACT, SD
K40C-ENDO/INVEST PROC +SD	J08C-OTH SKN GRF&/DBRDMNT PR, SD	J62B-MALIGNANT BREAST DISORDERS, SD
P60B-NEO -OR, DIED/TR +SD	K62C-MISC METABOLIC DISORDERS SDAY	N07B-OTH UTRS & ADNEXA PR N MAL +SD
M40Z-CYSTOURETHROSCOPY +SD	R61C-LYMPHMA / N-A LEUKAEMIA +SD	O04C-POSTPARTUM&POST ABORTN +OR +SD
V65Z-ALCOHOL DISORDERS +SD	G70C-OTHER DIGESTIVE SYS DIAG -SD	Z64B-OTH FCTR INFL HEALTH STATUS+SD
F73C-SYNCOPE & COLLAPSE +SD	J63B-NON-MALIGNANT BREAST DIS, SD	B71C-CRANIAL & PERIPHL NERV DSRD+SD
D66C-OTH EAR,NOSE,MOUTH&THRT DX +SD	J08C-OTH SKN GRF&/DBRDMNT PR, SD	P60B-NEO -OR, DIED/TR +SD
H61C-MALG HEPATOBILIAY SYS PANC, SD	K62C-MISC METABOLIC DISORDERS SDAY	B65B-CEREBRAL PALSY +SD
H64C-DISORDERS OF BILIARY TRACT, SD	R61C-LYMPHMA / N-A LEUKAEMIA +SD	G47C-OTH GASTROSCOPY, SD
J62B-MALIGNANT BREAST DISORDERS, SD	U40Z-MENTAL HEALTH TREAT+ECT +SD	Q61C-RED BLOOD CELL DISDERS +SD
N07B-OTH UTRS & ADNEXA PR N MAL +SD	I27C-SOFT TISSUE PROCEDURES +SD	R60C-ACUTE LEUKAEMIA +SD
O04C-POSTPARTUM&POST ABORTN +OR +SD	L64C-URINARY STONES & OBSTR +SD	D61C-DYSEQUILIBRIUM +SD

Z64B-OTH FCTR INFL HEALTH STATUS+SD	Z40Z-OTH CNT HLTH SRV +ENDO +SD	V66Z-DRUG DISORDERS +SD
B06C-CBL PSY,MUS DYSY,NPTHY PR +SD	E71C-RESPIRATORY NEOPLASMS +SD	E42C-BRONCHOSCOPY +SD
B40Z-PLASMAPHERESIS + NEURO DIS SD	F42C-CRC DSRD-AMI+IC IN PR +SD	G48C-COLONOSCOPY, SD
D60C-EAR NOSE MOUTH&THROAT MAL +SD	O66C-ANTENATAL&OTH OBS ADM +SD	Y62C-OTHER BURNS +SD
G66B-ABDMNL PAIN/MESENT ADENTS, SD	Q62B-COAGULATION DISORDERS +SD	D62B-EPISTAXIS +SD
H60C-CIRRHOSIS & ALC HEPATITIS, SD	B67C-DEGNRTV NERV SYS DIS +SD	I40Z-INFUSIONS +SD
H63C-DSRD LVR-MAL,CIRR,ALC HEP, SD	D63C-OTITIS MEDIA AND URI +SD	B76C-SEIZURES +SD
J65C-TRAUMA TO SKN,SUB TIS&BST +SD	Q60C-RETICLENDO&IMNTY DIS +SD	I81Z-INJURIES +SD
L04C-KDY,URT&MJR BLDR PR N-NPM +SD	F76C-ARRHY, CARD & COND DISDR +SD	K60C-DIABETES +SD
L67C-OTH KIDNY & URNRY TRCT DX +SD	K64C-ENDOCRINE DISORDERS +SD	I82Z-OTHER +SD
Z01B-OTH CNT HLTH SRV +OR PROC +SD	F73C-SYNCOPE & COLLAPSE +SD	S65D-HIV +SD
G70C-OTHER DIGESTIVE SYS DIAG -SD	G46C-COMPLEX GASTROSCOPY,SD	V65Z-ALCOHOL DISORDERS +SD
J63B-NON-MALIGNANT BREAST DIS, SD	Z61B-SIGNS AND SYMPTOMS +SD	K40C-ENDO/INVEST PROC +SD
R03C-LYMPHMA LEUKMA+OTH OR PR +SD	M40Z-CYSTOURETHROSCOPY +SD	U60Z-MENTAL HEALTH TREAT -ECT +SD
D67B-ORAL & DENTAL DISORDERS +SD		