LOGAN HOSPITAL EXPANSION

BUSINESS CASE/COST BENEFIT ANALYSIS SUMMARY

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PURPOSE OF THIS DOCUMENT	This document provides an overview of the Logan Hospital Expansion Detailed Business Case. The primary objective of this document is to outline the economic analysis undertaken and the key outcomes.
STATUS	This summary was prepared based on the contents of the detailed business case presented to the Building Queensland Board in Q1 2019. The information presented may be subject to change as the proposal progresses through future stages of development, delivery and operations.

CONTENTS

1 SUMMARY INFORMATION

PROJECT NAME	Logan Hospital Expansion	
LOCATION	South East Queensland	
PROPOSAL OWNER	Metro South Hospital and Health Service	
PROPOSED DELIVERY AGENCY	Metro South Hospital and Health Service	
P90 COST ESTIMATES	NOMINAL[1]	PRESENT VALUE[2]
CAPITAL COST	$461 million	$415 million
INCREMENTAL ONGOING COST	$8,337 million[3]	$2,261 million
NET PRESENT VALUE		$2,369 million
BENEFIT COST RATIO		2.05

2 PROPOSAL OVERVIEW

Logan Hospital is one of five hospitals that service an estimated population of one million people living in the Metro South Hospital and Health Service (MSHHS) catchment. This hospital along with others in the MSHHS catchment provides emergency, medical, surgical and birthing services to residents of diverse suburbs from the Brisbane River in the north to Redland City in the east, south to Logan and the eastern portion of the Scenic Rim to the border of New South Wales.

Logan is one of the fastest growing regions in the state and a major growth corridor for South East Queensland. The population is forecast to continue to grow at 2.2 per cent per annum (compared to the Queensland growth rate of 1.7 per cent) reaching over 429,000 by 2031. As a result, the Local Government Area will accommodate the greatest number of additional dwellings in expansion areas within the Brisbane Metro sub-region and will be second only to Brisbane Local Government Area in terms of overall additional dwellings (consolidation and expansion) to 2041.

Logan Hospital is the main acute facility for the region and has grown from a 48-bed community hospital in 1990 to 426 beds and bed alternatives as at 2018. The hospital provides predominantly Level 4 services and operates under a networked approach with other MSHHS facilities including the Princess Alexandra Hospital, Queen Elizabeth II Jubilee Hospital, Redland Hospital and Beaudesert Hospital. The majority of MSHHS hospitals in the network are operating at over 90 per cent occupancy for acute overnight beds, above the Queensland Health benchmark of 85 per cent.

Demand for services at Logan Hospital is significant; total separations for both adults and paediatrics for overnight and same day care at the hospital have increased from 37,300 (2010-11) to 57,783 (2014-15), an increase of 20,483 separations or 54.9 per cent within 4 years, or 13.7 per cent per annum. Logan Hospital has also experienced a rapid annual growth in admissions of 4.6 per cent per annum forecasted between 2016-2026 for the Logan Local Government Area, compared to 1.5 per cent for MSHHS.

[1] Financial, to the nearest $ million
[2] Discounted at 7 per cent
[3] Total, over evaluation period

The limited clinical capacity of some services at Logan also means that a proportion of residents are required to travel elsewhere to access public hospital services. In 2014-15, the self-sufficiency rate for Logan Hospital (representing the proportion of public demand able to be met at Logan Hospital) was 52 per cent, excluding renal dialysis, chemotherapy, neonatal services and mental health—resulting in additional pressure on other hospitals in the network.

The detailed business case highlights the service need for the project and incorporates the following key considerations:

- a reference project which provides an additional 195 beds and 11 treatment spaces, to better meet the health needs of the growing Logan region
- timing that is cognisant of and does not delay progress of other key projects being progressed at Logan Hospital which are outside the scope of Building Queensland's detailed business case including the carpark and maternity expansion project
- recognition of the importance of timely approval and delivery of the carpark project with appropriate capacity to ensure Logan Hospital patients and carers can access the expanded hospital.

The Queensland Government has committed $460.9 million to the Logan Hospital Expansion project.

The expansion aligns with the policy and planning framework of Queensland Government, Department of Health, MSHHS and Logan Hospital.

3 SERVICE NEED

MSHHS is Queensland's most populated health service and takes in three of the state's fastest growing local government areas. Demand for health services is outstripping capacity across the catchment, with a shortfall of 733 beds predicted across all MSHHS major health facilities by 2022.

Logan Hospital is situated in a major regional growth and development corridor and is expected to support significant residential development in the future. Population growth combined with population health and demographic trends is driving increased demand for health care services at Logan Hospital. The population is ageing and has high levels of socio-economic disadvantage and chronic disease. It is also culturally and linguistically diverse, with a high reliance on public hospital services.

A proportion of residents in the Logan Hospital catchment requiring hospital care currently travel to other hospitals, particularly the Princess Alexandra Hospital (17 per cent) or Queen Elizabeth II Jubiliee Hospital (10 per cent).

Logan Hospital's Emergency Department is the second busiest in Queensland (as at 2017–18) and has the state's highest access block, longest median waiting time from arrival at the Emergency Department to admission, and second lowest percentage of patients-off-ambulance-stretchers within 30 minutes. This is primarily due to a lack of inpatient beds and results in longer waiting lists for elective surgery.

High acute overnight bed occupancy at Logan Hospital (90 per cent) creates system-wide impacts, particularly on MSHHS hospitals also operating at high occupancy levels such as Queen Elizabeth II Jubilee Hospital and Princess Alexandra Hospital.

Hospital avoidance and substitution service strategies have been implemented in MSHHS hospitals, including Logan Hospital, to minimise impacts on existing infrastructure. Assuming Logan Hospital's self-sufficiency rates can be increased, Logan Hospital is forecast to require a further 215 overnight beds by 2026–27, consisting of 199 acute and subacute beds and 16 mental health beds.

Key drivers of the service need are as follows:

- Logan City's average annual growth rate is forecast to be 2.2 per cent between 2011 and 2036 compared to an anticipated Queensland growth rate of 1.7 per cent. The highest growth period is forecast to be 2021–2026 with 2.5 per cent annual growth.
- Logan resident's utilisation of some hospital services is considerably higher than the state average.
- About 26 per cent of the population were born overseas and 13 per cent speak a language other than English at home.
- About 80 per cent of Logan residents do not have private hospital insurance cover.
- There are high rates of potentially preventable hospitalisations, which increase with socio-economic disadvantage and lower health literacy.
- There are high rates of disability and death for conditions including coronary heart disease, stroke, diabetes, lung cancer, melanoma, chronic obstructive pulmonary disease and injuries such as road transport, falls and suicide.
- The 65+ age group in Logan is expected to have the highest population growth at eight per cent per annum compared to Logan population growth for all ages at three per cent per annum.
- Approximately 31 per cent of the population is in the most disadvantaged socio-economic quintile compared to 20 per cent in Queensland.

The key benefits sought in response to the identified service need are to:

- improve accessibility to health services
- improve overall safety of patients and staff
- improve clinical and operational efficiencies via enhanced patient flow
- mitigate clinical and safety risks
- improve patient and staff satisfaction.

4 OPTIONS ASSESSMENT

Analysis of options for the reference project was undertaken in two phases: 1—formal options analysis and 2—refinement of the preferred option.

While the preliminary evaluation undertaken by MSHHS identified preferred options, due to a change in underlying service demand between the preliminary evaluation and the completed business case, options were comprehensively reconsidered. Detailed comparative analysis was completed for the longlisted and shortlisted options to facilitate the selection of a reference project.

The preferred option (refer Section 6—Reference project) was selected as it meets the project objectives, addresses key strategic issues and aligns with key benefits, specifically:

- meets the current and projected (to 2024) service needs of the primary catchment population
- increases self-sufficiency of the hospital for local demand reducing pressure on other MSHHS hospitals
- enhances delivery of current evidence-based models of care to improve access to health services
- improves patient safety and reduces the risk of clinical errors associated with models of care, infrastructure and facilities.

The preferred option is considered the first stage of Logan Hospital's expansion. Planning and business case development will start immediately to identify medium to longer term options to enable MSHHS to manage the significant increases in demand anticipated to 2026 and beyond.

5 BASE CASE

The base case modelling acknowledges the current infrastructure is at capacity and the volume serviceable by this infrastructure is limited. Activity is capped to FY2016–17 profile. Capital and operational expenditure is limited to maintenance activities and expenses needed to ensure the safety and security of existing infrastructure, and can be self-funded by MSHHS.

The total cost of the base case (the delivery of health and hospital services in the absence of the project) over the 30-year evaluation period trends upwards. The total P90, risk adjusted nominal cost of the base case is $18.09 billion (or $10.98 billion at net present cost (NPC) at 1 July 2017), of which $17.81 billion (or $10.8 billion at NPC) is recurrent costs and $315.39 million (or $181.15 million at NPC) is lifecycle capital costs.

Under the base case, by 2021–22 Logan Hospital will face a shortfall of 98 beds (overnight and same day, excluding surgical same day) and 45 other treatment spaces (treatment chairs, theatres, surgical recovery spaces and birthing suites).

In the absence of capacity expansions or more aggressive demand management programs, the hospital risks significant deterioration of its service delivery through:

- impacts to clinical operations—a shortfall in the required clinical capacity to meet service demand will result in increased waiting times
- impacts to patient health outcomes—impacts from Emergency Department overcrowding, patient recovery and availability of elective surgery
- significant limitations on the current hospital operating conditions—logistical difficulties, inadequate purpose-built rooms and system infrastructure capacity constraints requiring renewal, replacement or expansion
- increasing pressure on staff to accommodate patients without adequate resources—negative impacts on service quality and the ability to attract and recruit medical specialists.

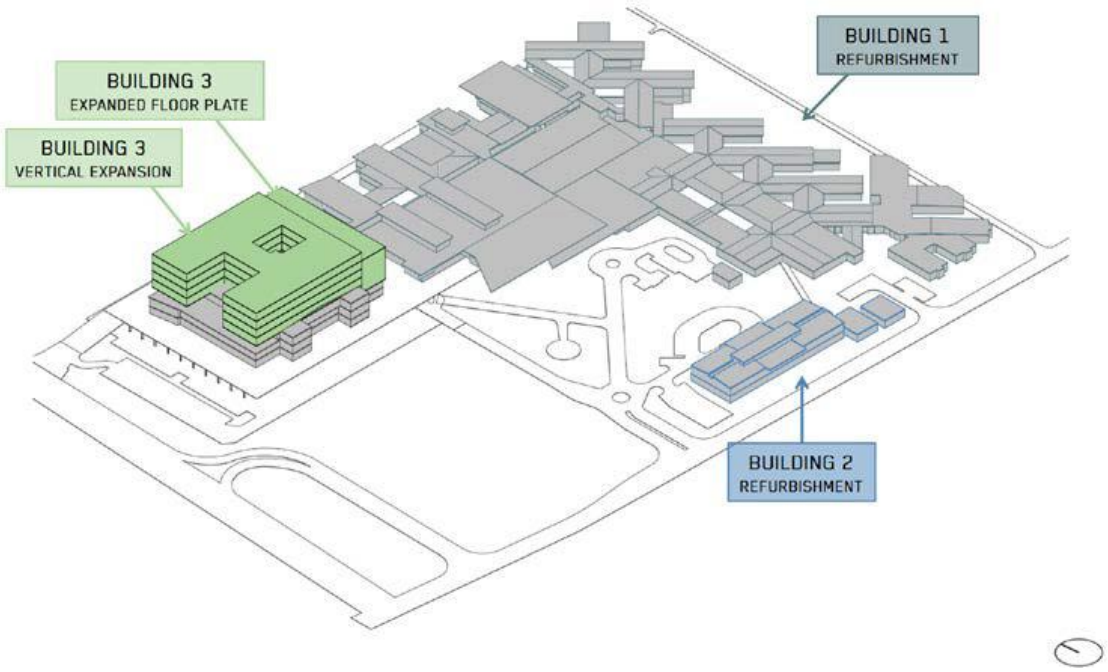
The estimated health benefit over the next 30 years under a seven per cent discount rate is $12.36 billion (present value).

6 REFERENCE PROJECT

The key components of the reference project include:

- a vertical expansion of Building 3 (refer Figure 1) by three additional clinical levels with an additional level for plant, infill at ground level for transit, medical imaging and ancillary services and some refurbishment of the other levels
- extensive refurbishment of Building 1 and selected refurbishment of Building 2 (refer Figure 1)
- some upgrades to services infrastructure.

Figure 1 Logan Hospital Expansion Project Stage 1—Site plan



The expansion will:

- deliver a well-considered suite of new and refurbished assets and an additional 195 beds and 11 treatment spaces
- meet current service constraints and address demand until 2024–25
- upgrade ageing and supporting services and infrastructure
- unlock capacity at other MSHHS hospital facilities that have reached or exceeded capacity, as part of a MSHHS system-wide strategy.

7 METHODOLOGY

The economic analysis method applied to the business case was based on the New South Wales Health Infrastructure (2017) *Toolkit for cost-benefit analysis of health capital projects*. This method provides for a monetary valuation of the anticipated health benefits through a reduction in mortality and morbidity. The costs and benefits of the base case and reference project were then compared in a cost benefit analysis.

The key general assumptions and parameters used in the cost benefit analysis are:

- Evaluation period: The evaluation period used for this appraisal is from 2018/19 to 2048/49 (a 30-year evaluation period).
- Base year: The evaluation has used the financial year 2018/2019 as the base year. All costs and benefits have been discounted to arrive at a present value for 2018/19.
- Unit of account/price year: The economic analysis is conducted in real terms (i.e. it excludes the effects of inflation). All benefits and costs are expressed in constant 2018/19 prices.

- Discount rates: Consistent with Building Queensland's cost benefit analysis guideline, a real discount rate of 7 per cent per annum has been used. Note that this differs from the Financial/Commercial analysis, which used a government bond rate (specifically, the Queensland Treasury Corporation rate).
- Service commissioning: 2022/23 onwards.

The costs and benefits included in the cost benefit analysis are listed in Table 1.

Table 1 Overview of costs and benefits

COSTS	BENEFITS
Quantified and monetised	
Capital costs	Patient health gains
Asset maintenance costs	Productivity and efficiency (incorporated in operating costs)
Recurrent (operating) costs	
Residual asset value	
Not quantified	
Lost productivity during construction	Workforce – sustainability, staff retention, attraction, morale
Service disruptions	Safety—reduced clinical errors
Noise and air pollution	Patient and carer travel time and cost savings
	Salutogenic environment
	Amenities/green space
	Environmental
	Integration between services and partners

8 DEMAND FORECASTS

It is projected that by 2026–27, Logan Hospital will need a further 215 overnight beds, consisting of 199 acute and sub-acute beds and 16 mental health beds. This represents a significant increase from the current physical capacity, particularly for acute beds in the years between 2021–22 and 2026–27.

This project delivers capacity to meet some of this growth during this period, with the remainder to be met through service improvement, new models of care and hospital avoidance and substitution strategies including:

- ambulatory/urgent care unit
- 23-hour surgical ward
- admission and discharge patterns
- Relative Stay Index Optimisation
- peri-operative screening/preparation
- digital hospital implementation.

9 COST BENEFIT ANALYSIS RESULTS

Table 2 summarises the key cost benefit analysis results for the reference project.

Table 2 Cost benefit analysis results

COSTS AND BENEFITS	PRESENT VALUE ($M, 30 YEARS @7%)	
INCREMENTAL COSTS (Difference between base case and reference project)	P50	P90
Capital costs	333.1	349.9
Life-cycle capital maintenance costs	12.1	13.6
Recurrent costs	1,879.4	1,922.5
Residual value	-23.6	-24.8
Total incremental costs	2,200.9	2,261.2
INCREMENTAL BENEFITS (Difference between base case and reference project)		
Health benefits		
Acute admitted	3947.6	
Sub-acute and non-acute admitted	107.6	
Emergency Care	486.6	
Chemotherapy	88.0	
Total incremental benefits	4,629.9	
Incremental Net present value	2,429.0	2,368.6
Benefit cost ratio	2.10	2.05

10 SENSITIVITY ANALYSIS

Sensitivity tests were conducted to analyse the extent to which the results of the cost benefit analysis (i.e. the estimated net present value and benefit cost ratio for each option) are affected when some of the key assumptions underpinning the analysis are varied, including:

- discount rate (4 per cent and 10 per cent instead of 7 per cent, as per Building Queensland guidelines for cost benefit analysis)
- capital expenditure (20 per cent increase and 20 per cent decrease)
- recurrent expenditure (20 per cent increase and 20 per cent decrease).
- health benefits assumptions
  - Value of a Statistical Life Year (VSLY) (20 per cent decrease and 20 per cent increase)
  - proportion of patients treated elsewhere for inpatient services (5 per cent lower at 75 per cent and 5 per cent higher at 85 per cent)
  - proportion of patients averting mortality as a result of being treated at the hospital (lower at 0.6 per cent and higher at 1.4 per cent)
  - reduction in disability burden due to treatment (lower at 10 per cent and higher at 30 per cent)
  - remaining life expectancy post-Emergency Department admission (lower at 5 years and higher at 15 years).

The sensitivity scenarios were agreed as part of the cost benefit analysis methodology. The results of the sensitivity analysis are set out in Table 3.

Table 3 Sensitivity analysis results for the reference project

SENSITIVITY SCENARIO	P50 COSTS		P90 COSTS	
	NPV ($M)	BCR	NPV ($M)	BCR
Baseline	2,429.0	2.10	2,368.6	2.05
Discount rates				
Lower at 4%	5,993.2	2.89	5,908.9	2.81
Higher at 10%	957.0	1.59	911.4	1.55
Capital costs				
-20%	2,495.6	2.17	2,438.6	2.11
+20%	2,362.4	2.04	2,298.6	1.99
Recurrent costs				
-20%	2,804.8	2.54	2,753.1	2.47
+20%	2,053.1	1.80	1,984.1	1.75
Health benefits key assumptions				
VSLY (-20%)	1,520.6	1.69	1,460.2	1.65
VSLY (+20%)	3,337.3	2.52	3,227.0	2.45
Proportion of patients treated elsewhere (75%)	3,442.8	2.56	3,382.4	2.50
Proportion of patients treated elsewhere (85%)	1,415.2	1.64	1,354.8	1.60

Proportion of patients averting mortality as a result of being treated at the hospital (0.6%)	2,119.3	1.96	2,058.9	1.91
Proportion of patients averting mortality as a result of being treated at the hospital (1.4%)	2,738.6	2.24	2,678.3	2.18
Reduction in disability burden due to treatment (10%)	804.3	1.37	744.0	1.33
Reduction in disability burden due to treatment (30%)	4,053.6	2.84	3,993.2	2.77
Remaining life expectancy after ED admission (5 years)	2,185.6	1.99	2,125.3	1.94
Remaining life expectancy after ED admission (15 years)	2,672.3	2.21	2,611.9	2.16

11 WIDER ECONOMIC IMPACTS

The Logan Hospital expansion is expected to deliver better value for money through implementation of contemporary models of care and improved facility functional relationships. Improvements in the model of care and functional relationships of the facilities are expected to increase the quantity of health services that the hospital is expected to be able to supply for a given quantity of resources (i.e. increase productivity by increasing technical efficiency). The improvements will also increase the efficiency with which the hospital manage and allocate its resources, thereby reducing the recurrent costs associated with supplying the increased outputs of health services.

By improving the health outcomes of patients who would otherwise not be treated in the absence of the proposal, the expansion will enable their return to the workforce sooner than otherwise possible, thus raising labour productivity and economic output within the hospital's catchment area.

In the absence of the expansion, an increasing proportion of sick persons and their carers from the hospital's catchment area will have to travel further afield to access care. In doing so, they will incur travel time costs and increased vehicle operating costs. These benefits of the expansion are small compared with patient health benefits. Accurately estimating these benefits will require making a detailed allocation of patients from different parts of Logan Hospital's catchment area to each surrounding hospital in the absence of the expansion.

In addition, the expansion will reduce the strain of rising patient demand on other hospitals in South East Queensland.

Improvements in the model of care and functional relationships of the facilities, as well as access to state-of-the-art equipment, will also make Logan Hospital a highly desirable workplace for hospital staff.

By delivering state-of-the-art health services in a contemporary and attractive setting, the redeveloped Logan Hospital will help ensure that its catchment area is viewed as a desirable region that offers a high quality of life, thereby assisting in the retention of existing residents and attraction of new residents to ensure economic vibrancy and sustainability.

12 SOCIAL IMPACTS

The results of the social impact evaluation indicate that the project will have a positive net social impact for the hospital's stakeholders and the Logan community.

The social impact evaluation identified 22 positive impacts, of which 21 are long-term benefits of operating the expanded hospital. In contrast, approximately two-thirds of the 19 negative impacts are short-term consequences of the construction and transition process.

Key material positive impacts include increased access to local hospital services, enhanced service reliability and increased cost-effectiveness, that will result as the project relieves pressure on existing infrastructure and services. These positive impacts will subsequently drive improved health outcomes for patients.

The negative impacts largely pertain to disruptions and risks that will be caused by the construction process, such as increased dust and noise.

Negative impacts that will be managed over the longer-term include increased traffic and demand for car parking, risks to pedestrian safety and community expectations. Mitigation and enhancements strategies that have been developed for the project or identified during consultations were examined for each impact and assessed to consider their effect.

Overall, implementing the proposed strategies would reduce the number of high negative impacts from 11 to three and increase the number of high positive impacts from 14 to 18.

Of particular importance to ensuring the realisation of the positive impacts will be the development of detailed models of care as well as operational and workforce strategies for new services.

In the absence of the expansion the baseline social issues identified can be expected to continue to deteriorate. However, in isolation the expansion is unlikely to be sufficient to forestall the current baseline issues over the longer-term.

To maximise the potential benefits of the expansion MSHHS will need to continue to pursue strategies to manage demand and support initiatives that enable the delivery of community-based health services that aim to reduce avoidable hospital admissions.

13 PROJECT IMPLEMENTATION

It is intended that MSHHS will manage the project from procurement through to construction and commissioning following government endorsement of the detailed business case.

The recommended delivery model is a two-stage Managing Contractor (MC) arrangement. Proposed implementation includes a high-level program for the procurement and delivery phases. It is assumed procurement will commence in late 2019. Building 3 works are expected to take approximately 19 months and refurbishment works in Buildings 1 and 2 will take approximately 18 months.