Final Business Case Evaluation Summary

John Hunter Health and Innovation Precinct

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About this report

This report summarises the final business case for the development of the John Hunter Health and Innovation Precinct (JHHIP). The JHHIP project has been identified on Infrastructure Australia's Priority List as a 'Priority Initiative' because for several years the John Hunter Hospital (JHH) has experienced significant and growing service and infrastructure pressure. The hospital is currently operating at 98% capacity despite initiatives and operational improvements such as increased telehealth capabilities.

This growth has been driven by increased demand for critical care, related in part to a growing older population and a First Nations population that, relative to NSW, is older, more socioeconomically disadvantaged and has higher rates of complex chronic disease.

The John Hunter Health and Innovation Precinct Clinical Services Plan (CSP) projects that by 2031, demand will grow beyond current capacity across intensive care services by 49%; Emergency Department admissions by 39%; and theatre and procedural activities by 38% (see Figure 1).

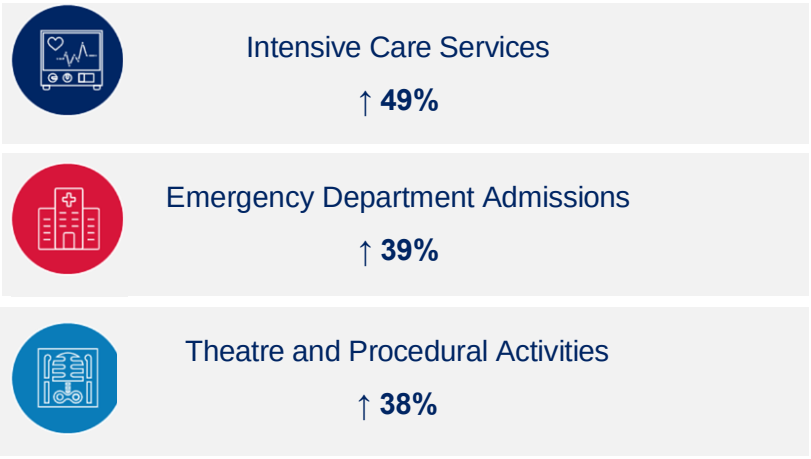

Figure 1: Projected hospital demand over existing capacity by 2031

To support this growth, the NSW Government has announced an $835 million capital investment to deliver infrastructure that can address the demand for Level 6 tertiary and referral services at John Hunter Hospital.

The final business case for the project proposes:

- a new Acute Services Building (ASB) that will include a new emergency department, intensive care units and other services, as well as 4 levels of underground car parking
- refurbishment and expansion of adult inpatient care, pharmacy and administration support.

This business case summary has been prepared by Infrastructure NSW, the Government's independent infrastructure advisory agency. It has been developed in accordance with the NSW Health Facility Planning Process and the NSW Treasury Guidelines for Capital Business Cases, and involved assessment from modelling, engineering and financial experts.

Strategic context

Regional strategic goals

The Hunter Regional Plan (2036) identifies the need for growth in health and medical research in Greater Newcastle and notes the opportunities this will provide in supporting the regional economy, unlocking opportunities for future economic and employment growth and providing diverse health services for a globally competitive city. The Greater Newcastle Metropolitan Plan (2036) further identifies the JHHIP as a priority growth area detailing the opportunity to significantly enhance the city's economy through the addition of 1700 full-time equivalent (FTE) jobs by 2036.

The JHHIP Business Case has been developed to respond to these plans to improve health outcomes and establish a world-class health and innovation precinct. In addition, it provides a road map for future major and minor capital investment to expand the John Hunter Hospital and John Hunter Children's Hospital.

Existing hospital services reaching capacity

The current John Hunter Health Campus (JHHC) regularly operates at 98% occupancy, compared with the NSW Ministry of Health's (MoH) service planning guidance of 80–85%, with the inpatient bed base, operating theatres and emergency department treatment spaces working beyond capacity. The John Hunter Health and Innovation Precinct CSP estimates that JHHC will see growth that will exceed current capacity in multiple areas, such as intensive care services by 49%; emergency department admissions by 39%; and theatre and procedural activities by 38%.

Project need

Growing need for hospital services and limited capacity

Over several years, JHHC has experienced significant service and infrastructure pressure, which is driven by a growing demand for critical care, related in part to a growing older population and a First Nations population that, relative to NSW, is older, more socioeconomically disadvantaged and has higher rates of complex chronic disease. Despite a range of measures to manage this increasing demand, this pressure on services and infrastructure is expected to continue if the existing infrastructure is not improved.

Key project drivers

The final business case identifies the project drivers as a combination of limited infrastructure capacity coupled with an increased demand for tertiary services (specialist care for patients referred to JHHC by other hospitals). Specifically, the key project drivers include the following:

- The level of population growth, and in particular the ageing of the local, and broader tertiary, catchment populations will significantly increase demand for emergency, acute and sub-acute inpatient services, and for non-inpatient ambulatory care services, that the campus does not currently have the capacity to provide.
- JHH's capacity to meet medium to high acuity adult patient demand remains at breaking point, regularly operating at 98% occupancy.
- The existing infrastructure was not designed to deliver the tertiary services that were transferred from the Royal Newcastle Hospital. Additionally, it does not support contemporary models of care.
- There are recurring situations where JHH cannot fulfil its tertiary roles due to lack of Intensive Care Unit beds, resulting in frequent unmet requests from a number of services including the Emergency Department, inpatient units and other Hunter New England Local Health District (HNELHD) facilities in the region.
- The volume of inpatients leads to patients routinely overflowing to other wards (outside the admitted specialty), resulting in inefficiencies in ward rounds and ward care.
- The Emergency Department is constantly under pressure to manage the increasing demand from within the constrained footprint.
- The Medical Imaging Department was not designed for the current high level of throughput and there is little surge capacity to cater for unexpected peaks in workload.
- The physical layout and space constraints of the existing infrastructure prevent an effective integration of research and educational activities on the site.

The preferred option proposed by the final business case will deliver infrastructure that can address this substantial forecast demand.

Project objectives and design

Objectives

The core objectives of the project are to:

- support the development of services centred around patient, carer and staff needs
- deliver increased service capacity to meet current and future growth of acute services as a principal NSW tertiary referral hospital
- enable the implementation of contemporary models of care, supporting core clinical relationships and patient focused service delivery
- provide an environment that supports transformational service delivery necessary to respond to future demands
- create and support the growth of an integrated campus for clinical innovation, education and research
- align with HNELHD's Sustainability Strategy 2030 and enable the vision to become carbon and waste neutral in operation
- develop and support a master plan beyond 2031.

Design

The project will include the construction of:

- a new Acute Services Building (ASB) housing:
    - an expanded and enhanced Emergency Department (ED)
    - expanded and enhanced Intensive Care Unit (ICU) services – Adult, Paediatric and Neonatal
    - expanded and enhanced operating theatres including interventional suites
    - an expanded Clinical Sterilising Department (CSD)
    - women's services including a Birthing Unit, Day Assessment Unit and inpatient units
    - expanded support services
    - associated retail spaces
    - 4 levels of parking within the basement levels
- expansion and refurbishment within the existing JHH facility to provide:
    - additional adult inpatient units
    - Nexus Child & Adolescent Mental Health Unit (funded separately)
    - pharmacy services
    - food services
    - office administration space
    - support services.

Capital cost

The final business case estimates the project will require the announced $835 million capital investment.

Options identification and assessment

Service priorities

Delivery of the complete CSP scope is not affordable within the $835 million capital budget. The project team therefore undertook a process with stakeholders to identify and rank the service priorities at JHH:

1. Emergency Department
2. Adult Intensive Care Unit/Paediatric Intensive Care Unit, operating theatres, interventional and procedural
3. Central Sterilising Department (CSD), medical imaging, helipad landing service, security services, inpatient units
4. Cardiac Close Observation Unit, birthing
5. Neonatal ICU/Special Care Unit
6. maternity and antenatal/Gynaecology IPU
7. Nexus Unit, pharmacy, Outpatients Department

It should be noted that the HNELHD Asset Strategic Plan, Investment Decision Document and CSP all identified the Emergency Department as the highest service priority for the JHHC. This is predominantly driven by the fact that JHH is a major trauma centre for residents of north and north-western NSW.

These service priorities were then used to inform options development.

Options lists

The clinical service priorities were used to inform the development of a long list of options. The project team, in consultation with LHD Executive, undertook a review of the long list of options and applied a pass/fail assessment to each. This process discounted options that were either not affordable within the project budget (within plus or minus 10% of the budget) or did not deliver sufficient capacity to meet the projected demand for the top 3 service priorities.

From the long list, a shortlist of 3 options was produced. These options were assessed against the objectives of:

- addressing predicted growth in priority services
- minimising disruption to the hospital during construction
- providing greater flexibility for future services
- more meaningfully sustainable and cost-effective service provision

- enhancing returns on taxpayer investment
- aligning with the JHHC master plan and JHH innovation precinct (JHHIP) vision.

Option 1

- This option addressed the top 3 service priorities plus partial medical imaging.
- It would involve construction of new facilities or refurbishing all priority areas, with the exception of no change to the existing Nuclear Medicine Unit.
- It was assessed to provide **good** to **great** outcomes against all assessment criteria.

Option 2

- This option would provide new medical imaging facilities and expanded nuclear medicine, while retaining theatres at RNC.
- While this option addressed future growth, it was not pursued further due to a lack of alignment with the JHHC master plan, and overall poorer outcomes.

Option 3

- This option included expansion of medical imaging and nuclear medicine; expansion of ICU into existing JHH theatres; refurbishment of JHH theatres and retention of theatres at RNC.
- As with Option 2, this option addressed future growth but provided poor outcomes in all categories and particularly poor value for the investment cost. Option 3 was not pursued further.

Option 1 was then further discussed with working groups involving key stakeholders, and refined into 2 new options with the following differences:

Option 4

- Construction of a new Intensive Care Services (ICS) unit, new perioperative services, and a refurbishment/upgrade of Child and Adolescent Services.

Option 5

- Refurbishment of ICS, refurbishment of perioperative services, and retention of the existing Child and Adolescent Services building.

A Base Case scenario (**Option 0**) was also considered for comparison against the development options. It involved the maintenance and refurbishment of existing facilities only. This option was not pursued due to a combination of increasingly limited clinical services predicted through to 2031, as well as the increased asset maintenance cost of old facilities.

Through two value management studies (VMS) and options analysis workshops, Option 5 was identified as the preferred option. It addressed the top 3 service priorities (ED, ICU and operating

theatres) plus the inclusion of Women's Inpatient and Birthing Services. It would deliver new and enhanced critical care services, integrated perioperative services (including Central Sterilising Department (CSD) and interventional services) and provide an additional 136 hospital inpatient beds.

Option 5 was subsequently named **Option 5a**, and a separate Option 5b was split out for consideration:

- **Option 5b – Additional Scope**. This is Option 5 with the following additional items:
    - Construction of two additional inpatient units within level 6 of the new Acute Services Building.
    - Construction of the eastern portion of the northern access road to further enable precinct connectivity.

The cost of these additional scope items under **Option 5b** was found to exceed the capital cost limit for the project.

For these reasons, **Option 5a is the preferred option** presented by the final business case.

A summary of the options development process is shown in Figure 2.

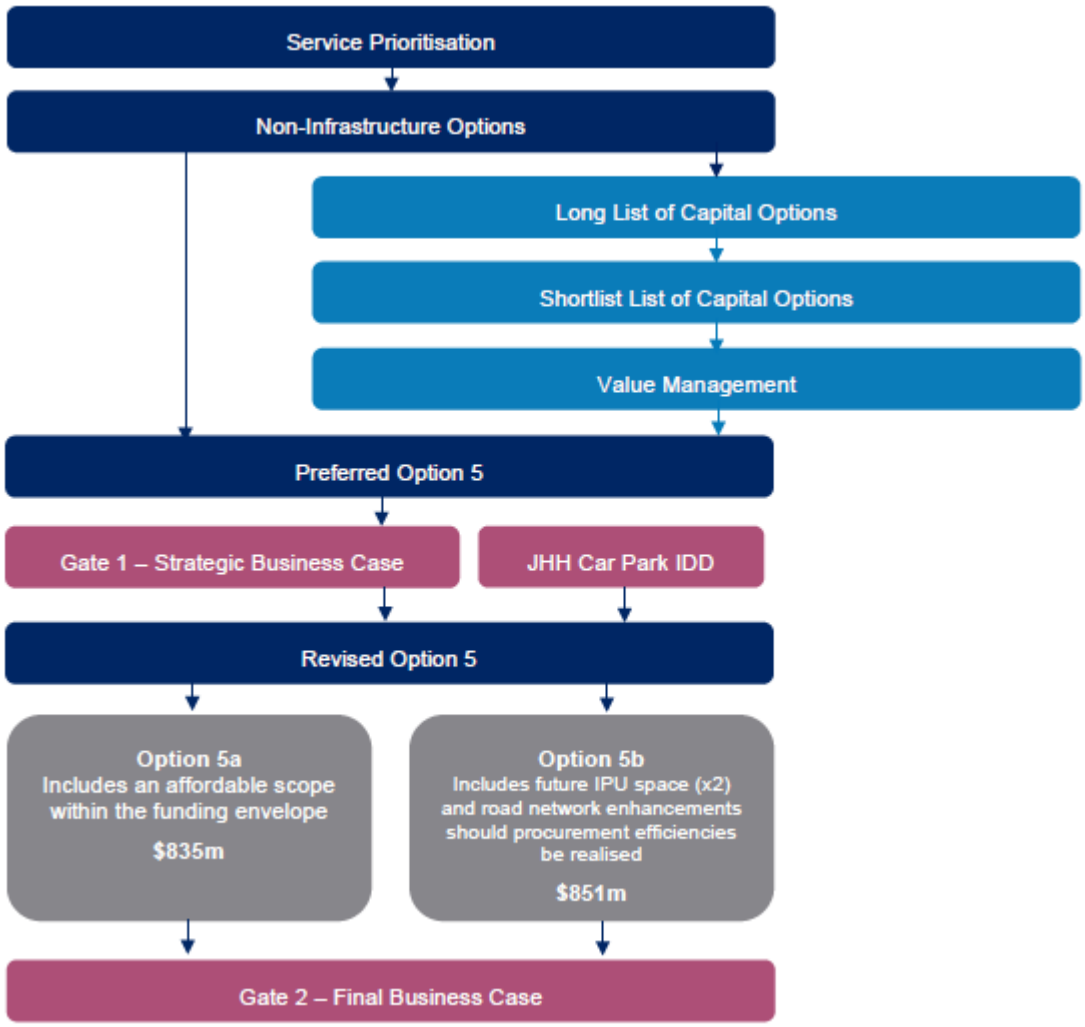

Figure 2: Options development process

Economic evaluation

PricewaterhouseCoopers (PwC) carried out a cost benefit analysis as part of the final business case. This economic evaluation included an analysis of the economic, social and environmental impacts of the Project.

Benefits

The proposed project addresses the top 3 identified service priorities (ED, ICU and operating theatres) plus the inclusion of Women's Inpatient and Birthing Services, integrated perioperative services (including Central Sterilising Department (CSD) and interventional services) and will provide an additional 136 hospital inpatient beds.

Capital cost value of the project

The capital cost setting out the forecast estimated total cost (ETC) for the project has been developed by the Cost Manager, Altus Group, utilising the schedule of accommodation and the schematic design documentation as detailed in the schematic design report.

The ETC for the project is $835 million. The cost plan has been developed in accordance with HI Cost Planning and Reporting Standards. The elemental costs have been benchmarked against similar projects.

The outcomes of the analysis

A cost benefit analysis was carried out on the short list of options. This considered the improved health benefits that would be created by the project and provided as net present value (NPV) and benefit to cost ratio (BCR) figures. These values are provided as incremental to Option 0 (the Base Case) under a 7% real discount rate over a 20-year period, in accordance with NSW Treasury guidelines on capital project valuation.

Table 1: Cost benefit analysis of the options

Present value ($'m)	Option 1	Option 2	Option 3	Option 5a Affordable Scope	Option 5b Additional Scope
Incremental NPV	351.6	389.7	383.8	401.7	446.5
Incremental BCR	**1.35**	**1.39**	**1.38**	**1.39**	**1.42**

The results of the cost benefit analysis demonstrate that all options would generate positive economic outcomes, with positive net present values (NPV) and benefit cost ratios (BCR) greater than 1.

Option 5b is the highest-ranking option in terms of NPV and BCR, reflecting the additional benefits of this option that arise from the additional IPU shells. However, it currently exceeds the $835 million funding envelope and is therefore unaffordable.

Option 5a is the second highest-ranking option in terms of NPV and is the most affordable option as it fits within the available capital budget of $835 million. Option 5a also presents positive benefits of $401.7 million and a BCR of 1.39.

Deliverability

Procurement

The delivery strategy for the JHHIP project considered value for money, quality and patient outcomes, innovation, risk appetite and market capability.

The procurement strategy for the project has been prepared in consultation with Health Infrastructure (HI). The strategy has resulted in 4 packages of works for contractor procurement:

- Package 1A Early Works – Jacaranda Drive Intersection Upgrade
- Package 1B Early Works – JHH Emergency Department Interim Expansion
- Package 2 Enabling Works
- Package 3 Main Works.

The project will be delivered under a design finalisation and construct (DF&C) procurement method to reduce construction risk and to enable the successful contractor to finalise the design in partnership with HI and provide industry expertise and a value for money outcome.

Timeframe

Construction of Package 1A and Package 1B were completed in Q3 2020 and Q2 2021 respectively.

The successful tenderer for Package 2 was selected in Q3 2021, and the successful tenderer for Package 3 will be selected in 2022.

The completion of all construction is scheduled for April 2026. A staged approach to decommissioning existing services will be developed in response to ramping up services in the Acute Services Building. Commissioning planning will commence during detailed design and will set out the principles and approach.

Key risks and mitigation

Key risks associated with the main works scope include the construction of the concourse adjacent to the operational Kookaburra Circuit and the construction of the links to the existing JHH, which will impact some inpatient wards. Preliminary advice has been sought from a contractor with regard to buildability and is reflected in the preliminary market approach.

The enabling works scope is intended to de-risk the main works package and considers the construction of access roads, mine grouting, preliminary bulk excavation, some service infrastructure diversion and upgrade works.

As the hospital campus will remain operational during construction, measures to reduce impact on the adjacent facilities will be further developed during detailed design phase. A stakeholder engagement plan will be developed in conjunction with a contractor to identify potential impacts on relevant stakeholders including patients, staff and visitors, as well as the wider community.

Engagement with the hospital executive and operational staff at the JHH is ongoing to ensure the impacts are understood and appropriate mitigations are included in the strategy and supporting plan.

The Infrastructure NSW view

Infrastructure NSW undertook a review of the final business case for the JHHIP.

The final business case shows the JHHIP will address government, stakeholder and community health needs. With existing demand projected to significantly exceed capacity by 2031, the project will deliver modern infrastructure to meet this rising demand for health services and Government health objectives.

The **Preferred Option** (Option 5a) addresses the clinical service priorities outlined within the Clinical Services Plan and has been refined through a robust service prioritisation, options development and value management process. Options to further address the Clinical Services Plan have also been identified with the potential for them to be realised through the procurement process.

Option 5a is within the available capital budget of $835 million. Financial analysis of the option shows a positive benefit to cost ratio of 1.39.

Infrastructure NSW has found the need for investment is well articulated through evidence-based scientific studies and demonstrated alignment with Government policies. The options have been well considered and the preferred option is an appropriate response to the service need.