



ACT Public Hospital Services: Delivery of Additional Hospital Beds

Options Analysis

ACT Department of Treasury
ACT Health
February 2011

Executive Summary

The existing ACT public health care system is at capacity and needs to expand to meet future health demand created by an ageing and growing population, changing technology and consumer expectations.

Recent investments by the ACT Government to enhance the capacity of community health centres and the introduction of the nurse led Walk-in-Centre, are focused on reducing demand on public hospital services. Notwithstanding these initiatives, the pressure on acute beds will continue with projections estimating a 50 per cent increase in admissions up to 2022.

This paper provides an analysis of five options for the delivery of an additional 400 public hospital beds:

- *Option A – Expand on existing the Canberra Hospital and Calvary Campus*
- *Option B – Consolidation on the Canberra Hospital Campus*
- *Option C – Build a New North side Hospital on a Greenfield Site*
- *Option D – A Fully Networked and Specialised Hospital System – New Acute Hospital*
- *Option E – A Fully Networked and Specialised Hospital System – New Sub-Acute Hospital*

This analysis considers both service delivery impacts as well as cost and demonstrates that there are considerable benefits in seeking to achieve a fully networked hospital system.

The analysis is not conclusive and requires further examination following community consultation and more detailed cost estimation based on definitive bed numbers, bed configuration and timeframes.

1. INTRODUCTION

The factors driving the increasing pressures on health care systems across Australia, and indeed across the industrialised world, are well known – the ageing of the population, the impact of new technologies, escalating global workforce shortages and increasing consumer demands.

The ACT has the youngest and the healthiest population of all the jurisdictions in Australia. It has a modern, well-equipped and effective public health care system. It is, however, not isolated from demand pressures and capacity constraints. The challenge is to ensure this high standard of health and health care continues into the future to support a healthy community and a productive economy.

In 2007, the ACT Government undertook a detailed examination of the future needs of health care services in the Territory. This highlighted the requirement for a significant increase in service capacity to meet the health care needs of the community over the coming decade. The Capital Asset Development Plan (CADP) is the blueprint for the redevelopment of the total ACT Health care system to meet those needs, and incorporates models of care, workforce, information and communications technology, and infrastructure.

In recognition of the need to build a sustainable and modern health care system, the ACT Government commenced a long term program of investments, with \$300 million allocated in the 2008-09 Budget¹, and further investments of over \$200 million in the following Budgets.

A core feature of these investments is the enhancement of community-based services such as those provided in community health centres and the piloting of a nurse-led Walk-in-Centre. The intention of these initiatives is to facilitate the provision of the right care in the right place and to reduce the demand on public hospital services.

Notwithstanding these investments, the demand for public hospital services will continue to grow. The number of public hospital overnight admissions is projected to increase by around 50 per cent in 2022 from their 2006-07 level². Considerable increases are projected to be required for spaces in emergency departments, high dependency suites, and acute and sub-acute care beds³.

projection
ns

Compounding these demand pressures is ageing health infrastructure. Many health assets are costly to maintain due to their age and the current physical capacity of the existing hospital facilities is being fully utilised. It is also clear that the possibilities for incremental additions to existing infrastructure will soon be exhausted.

ageing
health
infrastructure

Expansion of the scale mentioned above is challenging for any system, but more so for a public hospital system. Physical constraints of the existing sites, changing technologies, capacity to provide services in non-hospital facilities and above all, continuity of safe and uninterrupted services need to be carefully considered.

¹ *Your Health – Our Priority: Stage 1*; ACT Health (2008).

² Demand projections undertaken as part of the broader CADP modelling process incorporated estimates of achievable efficiency gains across the entire health care system, a significant shift in community preferences towards private provision, and a continuing focus on expanding preventative health care services. The projections also incorporated target bed occupation rates to maintain public hospital bed use at an efficient level, given anticipated demand.

³ *Your Health – Our Priority: Stage 2*; ACT Health (2009). This document provides an overview of the increase in capacity required to meet the increase in demand.

Nevertheless, refurbishment and expansion of this scale, if properly planned, also provides opportunities to provide better access for patients to efficient, effective and higher quality services. Before embarking on such an initiative, there are a number of practical questions that need to be answered, for example:

- *where should the additional beds be provided?*
- *is it possible to provide those beds within the existing footprints of the current facilities?*
- *is there a need to distribute some services geographically to provide more equitable access in the future?*
- *is it possible to consolidate some services or specialties to improve their efficiency and quality?*

This paper provides an analysis of the options for the delivery and configuration of the additional beds in the Territory over the coming decade.

Given the long time horizon with continually changing circumstances both on the demand side (from changing demographics, expectations, patterns of disease and new technologies) and the supply side (from emergent technologies, workforce pressures and models of care), this paper analyses the options from a long term sustainability perspective.

An important contextual note is the current public hospital configuration in the ACT. The Canberra Hospital (TCH) is a tertiary level referral hospital providing services for the ACT and surrounding south-east NSW region. Calvary Hospital is a general acute hospital that delivers around 30 per cent of the Territory's public hospital services.

Since 2009 until recently, the Government had been in negotiations with the Little Company of Mary Health Care to purchase the Calvary Public Hospital. For reasons, the discussion of which is beyond the scope of this paper, the sale did not eventuate.

The current ownership arrangements of the Calvary Public Hospital, however, are well recognised in the options analysis.

The options also need to be considered against the backdrop of the current national health reform agenda. The *Heads of Agreement*, signed by all Governments at the most recent COAG meeting, and the *National Health and Hospitals Network Agreement*, agreed at the April 2010 COAG meeting, place a strong emphasis on the principles of improving patient outcomes, accessibility and access to timely care⁴.

⁴ *National Health and Hospitals Network Agreement*, Appendix 1 – Re-endorsement of National Healthcare Agreement Principles, pg 43.

This options paper is organised as follows:

Section 2 outlines the broad options identified by ACT Health. Given the large set of variables that could be considered, it is possible to construct numerous options and variants of those options. The focus, however, is on broad strategic options. This is important to set the general direction for the public hospital system, with specific details to be determined progressively over the coming years, and as resource allocation decisions are undertaken.

Section 3 outlines the analytic framework, including the criteria utilised to assess and compare the options. The criteria include financial impacts as well as service delivery considerations such as patient centred care, access, safety and quality.

Section 4 provides assessment of the options against the criteria. Considerable effort has been made to provide reasonable and robust information on the comparative financial impacts of the options. The analysis is comparative in nature rather than absolute. However, where necessary, information in absolute terms has also been provided.

Section 5 provides a summary of results and conclusions.

2. STRATEGIC OPTIONS FOR THE PUBLIC HOSPITAL SYSTEM

2.1 The Current Public Hospital System

The current public hospital system comprises the Canberra Hospital in Garran and the Calvary Hospital in Bruce⁵.

The Canberra Hospital is the largest public hospital in the region with over 600 beds. It provides general and specialist care to a population over 500,000 from the ACT and surrounding region.

The Canberra Hospital is the major trauma referral centre for the region and delivers a comprehensive range of services. These include acute inpatient care in medical, surgical, integrated maternity and paediatric services (including neonatal intensive care and the Canberra Midwifery Program), overnight and day services, and outpatient treatment.

The Canberra Hospital is a teaching hospital of the University of Canberra and the Australian National University Medical School. It is also affiliated with a range of other tertiary institutions.

The Calvary campus has over 200 beds and provides a range of acute care, including inpatient, outpatient and emergency department services. Calvary Public Hospital is operated by Calvary Health Care ACT Limited which is owned by the Sisters of the Little Company of Mary.

The public hospital operations are fully funded by the ACT Government through an annual performance agreement. Calvary Public Hospital provides a wide range of services in both admitted and non-admitted settings. The level and nature of these services are negotiated with ACT Health and are based on Government priorities, clinical need and service demand.

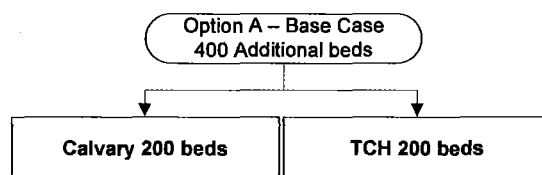
2.2 Options for the Delivery of Additional Hospital Beds

The service planning, previously referred to, identified the need for a significant increase in acute beds to meet the projected demand to 2022. The following options identify possible solutions for delivering 400 additional hospital beds to facilitate the provision of the right care in the right place. These additional hospital beds will roughly comprise a mix of 350 acute beds and 50 sub-acute beds⁶.

⁵ The Clare Holland House and QE II are also gazetted hospitals with 19 and 10 beds respectively. Due to their relatively small size and specialist services, their future role is reasonably assumed to be the same under all options.

⁶ This mix of acute and sub-acute beds is broadly in line with ACT Health's planning outcomes.

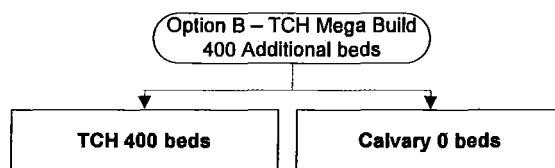
Option A: Expand on existing TCH and Calvary Campus (Business as Usual)



This option will maintain the current model of acute hospital care in the ACT. The Canberra Hospital will continue to provide the tertiary level services for the ACT and region as well as meeting the general acute needs for residents of southern ACT.

Calvary Hospital will continue to provide general acute and sub-acute care for the residents of north Canberra. The role delineation of both hospitals remains unchanged and the additional beds are shared equally across both campuses. The assumptions underpinning the bed configuration are: the net increase of 200 beds at TCH will be a mix of acute (150) and sub-acute (50) and the 200 beds at Calvary will be acute.

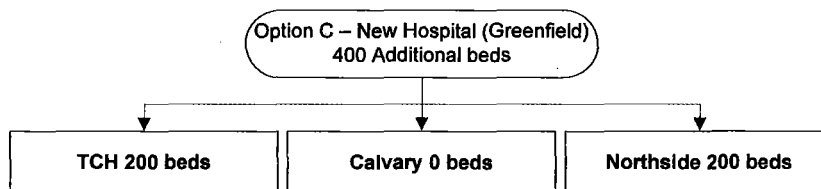
Option B – Consolidation on TCH Campus (One Hospital Model)



This option places all the additional public hospital beds (ranging from acute to sub-acute care) at the Canberra Hospital. This would result in a larger facility than currently planned for the Canberra Hospital site⁷. The mix of the additional beds at TCH would comprise 350 acute and 50 sub-acute.

This option assumes that Calvary Hospital would continue to provide acute and sub-acute services with casemix and volume remaining largely unchanged.

Option C – Build a New North Side Hospital (Three Hospital Model)



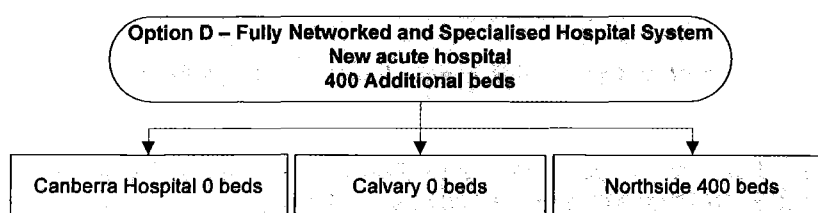
⁷ Under this option, the Canberra Hospital could reach around 1,200 beds once the normal growth, and the beds planned for north side services were included.

This option will increase the beds at the Canberra Hospital by 200 and build a new general acute hospital on the north side of Canberra to deliver the remaining 200 beds as proposed.

The bed configuration of this model would add 150 acute and 50 sub-acute beds at TCH, and 200 acute beds would be provided in the new hospital. The Canberra Hospital's current role will continue. The new north side hospital will provide general acute public hospital services to residents on the north side of Canberra.

Similar to Option B, the current mix of beds and services at Calvary Hospital will continue. This option encapsulates three acute hospitals, with three emergency departments.

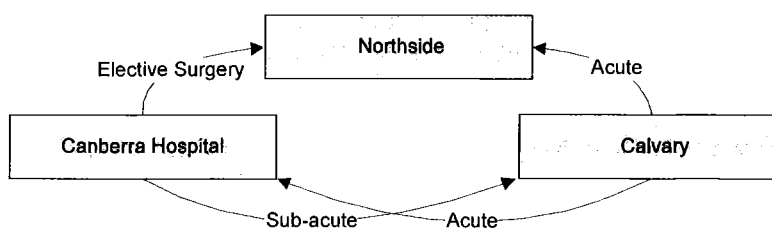
Option D – Fully Networked and Specialised Hospital System – New Acute Hospital



This option creates a network of three separate public hospitals with clearly delineated roles and specialties:

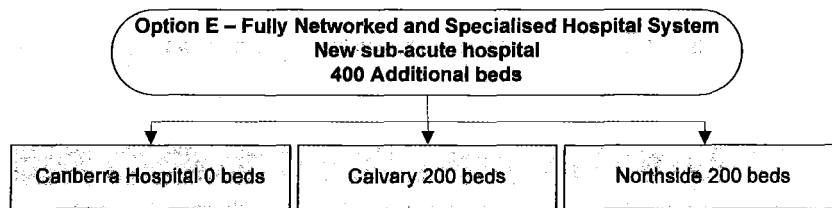
- A tertiary referral hospital, being the Canberra Hospital – this hospital will meet the tertiary referral hospital needs for the ACT and region as well as meeting the acute general needs for residents of southern ACT.
- A new acute general hospital located in northern Canberra – this facility will be approximately 400 acute beds and will meet the acute general needs for north side residents⁸;
- A specialised sub-acute and rehabilitation centre at Calvary Hospital – this centre would utilise existing infrastructure and maintain the current hospital as a 200 bed facility.

To create a specialised networked system, responsibilities would need to be transferred between facilities. The diagram below illustrates the changed roles of the hospitals.



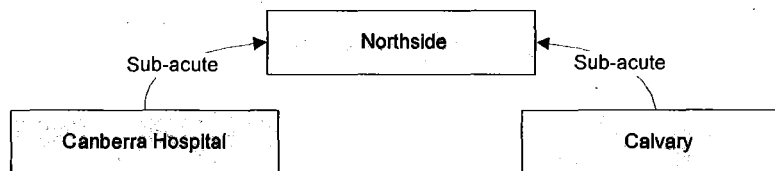
⁸ Additional sub-acute beds will be delivered through changed responsibilities at Calvary Hospital.

Option E – Fully Networked and Specialised Hospital System – New Sub-Acute Hospital



This option mirrors Option D, but with Calvary becoming the general acute care hospital and the new north side facility delivering sub-acute care beds.

Similar to Option D, this requires a transfer of responsibilities between facilities. The diagram below illustrates the changed roles of the hospitals.



3. ANALYTIC FRAMEWORK

3.1 Principles

The following principles underpin health service planning activities by ACT Health:

Table 1: Principles and Core Elements

Principle	Core Descriptive Element
Patient Centred	• Care is delivered in the right place at the right time • Have consideration of the needs of families and carers • Respect and promote patient and carer choice
Intra-disciplinary and Collaborative	• Involve a systems approach to services facilitating linkages and coordination • The workforce will be configured to deliver integrated care • Organisation of services will support funding and accountability arrangements
Accessible to all ACT Residents	• Service delivery will be timely, equitable and appropriate
Safe and High Quality	• Services will be evidence based • Services will be provided in the ACT where there is an appropriate level of demand to ensure ongoing clinical competence, or will be referred elsewhere as necessary
Efficiency and Cost	• Capital construction cost impacts should be minimised • Recurrent cost savings should be sought

These principles have been used to undertake a qualitative assessment of each of the five options. An implicit assumption underpinning the use of these principles in the following assessment methodology is an equal weighting or level of importance. There are two reasons for this.

First, individuals will place a different level of importance on each principle depending on how they interact with the public hospital system. For example, an elderly person who regularly attends hospital may place a greater emphasis on accessibility than a new mother, whose preference may be for a greater patient centred focus and continuity of care.

Second, it is difficult to identify the relative importance of any principle in isolation. In all cases the principles interact. For example, intra-disciplinary care can deliver efficiencies and reduce costs. Efficiencies and cost reductions can lead to greater available resources and an increased number of services, thus improving accessibility.

Outside these considerations however, it would be possible to attach different weightings to each of the principles to reflect a particular set of preferences.

3.2 Approach and Methodology

This analysis identifies the key service impacts and financial costs of delivering public hospital services under each of the five scenarios. The analysis is not geared towards determining a preferred option. Under the framework employed, the ratings of different options may vary across criteria. Choosing a preferred option may involve balancing outcomes between criteria.

The purpose of the analysis is to highlight the differences in costs and benefits between the options, to assist with public consultation and decision making by the Government.

- *Option A – Expand on existing TCH and Calvary Campus*
- *Option B – Consolidation on TCH campus*
- *Option C – Build a new north side hospital on a greenfield site*
- *Option D – A fully networked and specialised hospital system – New Acute Hospital*
- *Option E – A fully networked and specialised hospital system – New Sub-Acute Hospital*

Each of the options above present a different way to distribute 400 additional public hospital beds, and configure hospital services, across the Territory. The number of beds used in the analysis is a reasonable indication of the order of magnitude by which the capacity of the hospital system will need to be increased, relative to the current capacity, in order to meet the projected growth in demand over the coming decade.

The unit cost measures developed through this analysis could be reasonably applied for small changes in bed numbers or distributions⁹.

Across all options, beds have been approximately allocated between acute and sub-acute services on the basis of 350 and 50 beds respectively, that is, the level of services is assumed to be reasonably similar across all options.

The analysis does not seek to calculate a benefit to cost ratio, as in a typical cost-benefit analysis. Such an approach is not considered suitable for analysing the issues at hand.

Calculation of impacts on the financial statements of the Territory is not considered relevant in this case, as the analysis is not concerned with different ownership or financing arrangements. Differences in capital and recurrent costs for the Territory, however, are estimated.

The framework utilises both quantitative and qualitative tools to evaluate the proposed options against each assessment criteria. The options are given a number of ticks or crosses to reflect how well they meet the stated objectives in the criteria, as following:

Table 1: Rating Score Sheet

✓✓✓✓✓	Excellent	✓	Adequately
✓✓✓	Very well	✗	Very badly
✓✓	Quite well	✗✗	Extremely badly

⁹ This is simply because the marginal costs (both capital and recurrent) can change depending upon the scale.

Most assessment criteria required some level of judgement to be exercised in determining how well the options achieve the desired objectives. This is particularly the case where qualitative measures are involved.

For some criteria however, a quantitative dimension has also been developed and included where benefits or costs could be reliably estimated and the numerical results provided a more meaningful comparison.

There is one criterion that relies entirely on quantitative measures - effectiveness and efficiency. A quantitative financial approach has been adopted for this aspect of the analysis. The examination compares the capital construction costs between the options.

Construction costs have been calculated based on space estimates derived through a benchmarking methodology. The methodology has used evidence and dimensions from the *Canberra Hospital Project Definition Plan*, the *Hospital Capital Planning Module* (developed by Victoria's Department of Human Services) and estimated requirements based on recent clinical and planning experience¹⁰.

Space and designated areas required for clinical and non-clinical support services have been included in facilities nominated for expansion, or construction, on the same basis that additional beds have been allocated. In some cases, less area for support services was required in some facilities when compared to others due to existing capacity.

Capital costs include allowances for travel and engineering, consultancy fees for design and supervision and other development costs, such as feasibility studies and site investigations. Costs do not include land acquisition. Land would need to be acquired before bed numbers could be increased at the Calvary campus. Any purchase decision concerning land at that campus would require negotiations with Little Company of Mary Health Care. The outcome of any negotiations is unknown and thus, no value has been placed on the land that would need to be acquired.

Although capital costs have been calculated using a detailed 'bottom-up' approach, they should be viewed as preliminary costs only. Further detailed planning will be required to finalise bed numbers, bed configuration and continuity of service, and thus, cost requirements once a preferred option has been identified. The focus of comparison should therefore be on the relative differences between options rather than the absolute costs.

In developing the analytic framework and applying the assessment criteria to each of the options, expert advice was sought from KPMG, Ernst and Young, and Dr Lesley Russell of Macroeconomics.

Finally, it is useful to point out that a traditional options analysis would involve comparison of options against a base case scenario of 'doing nothing'. However, in essence, 'doing nothing' is not considered in this analysis since a significant increase in the capacity of the system is a starting premise.

¹⁰ Thinc Health

4. OPTIONS ANALYSIS

The following analysis provides a quantitative and qualitative evaluation of the proposed options. The options are rated according to the stated objectives in the assessment criteria.

4.1 Patient Centred

Options D and E maximise the opportunities for rational role delineation between networked health facilities and therefore are the highest rated options in terms of providing patient centred care. These options also provide a designated facility directly focussed on elective surgery services. This supports the Government's efforts to achieve one of the objectives of the current health reforms, namely the *Elective Surgery Waiting List Reduction Plan*¹¹.

Option C is rated higher than A, because a new hospital would deliver a purpose built facility which is better able to accommodate new models of care than a refurbished facility.

Table 2: Patient Centred

Option	A	B	C	D	E
	Expand on existing TCH and Calvary Campus	Consolidation on TCH Campus	Build a new north side hospital on a greenfield site	Networked and specialised hospital system - new acute hospital	Networked and specialised hospital system - new sub-acute hospital
Rating	✓	✓	✓✓	✓✓✓	✓✓✓

4.2 Intra-disciplinary and Collaborative

Options D and E would allow for a clearer role delineation than a two-hospital model. Under both options the Canberra Hospital would focus on emergency and complex elective surgery, and acute medical care. For Option D the new north side facility would focus on less complex surgery and acute medical care, whilst Calvary would become a sub-acute hospital, enabling a clear role and focus on sub-acute services. Option E is similar with the roles of the new north side facility and Calvary reversed.

Whilst it could be argued that managing staff in a small geography across three hospital sites may reduce rather than improve collaboration, evidence suggests that the most effective organisation of hospital services is achieved where each hospital has a clearly delineated role, and is able to specialise in specific areas of service delivery¹².

Option A would not have a material impact on the existing levels of integration across facilities and individual hospitals' role delineation. The addition of beds may allow for some streamlining of the roles of both hospitals, as services could be redistributed between both hospitals. However, under this option both hospitals would continue to provide a mix of emergency and elective acute services. Equally, at least one hospital would need to maintain a mix of acute and sub-acute services.

¹¹ For details of the plan see: http://www.federalfinancialrelations.gov.au/content/national_partnership_agreements/health/elective_surgery_waiting_lists/elective_surgery_waiting_list_reduction_plan.pdf

¹² Dwyer, J: *Fixing the problems that beset the Australian hospital system*. MJA 2008; 189(4): 220-221

Option B is similar to option A in that there would be no direct impact on integration or role delineation. Consistent with Option A, transferring services between facilities may lend itself to greater clarity of the hospitals' roles. However, the concentration of new beds at the Canberra Hospital limits the extent to which this could be achieved.

Option C would deliver three acute hospitals in the Territory. This is likely to reduce the clarity of role delineation between the hospitals and result in some level of unnecessary duplication.

Table 3: Intra-disciplinary and Collaborative

Option	A	B	C	D	E
	Expand on existing TCH and Calvary Campus	Consolidation on TCH Campus	Build a new north side hospital on a greenfield site	Networked and specialised hospital system - new acute hospital	Networked and specialised hospital system - new sub-acute hospital
Rating	✓✓✓	✓✓	✓	✓✓✓✓	✓✓✓✓

4.3 Accessible to all ACT Residents

A principle driver for accessibility is the distribution of public hospital capacity between the north and south sides. The current population is split fairly evenly between north and south but is expected to shift to the north side over the next decade as a result of residential developments.

Option A would maintain the current two hospital system. Currently, the majority of public hospital beds in the Territory are on the Canberra Hospital campus. Distributing additional beds evenly between the Canberra Hospital and Calvary would not substantially affect the balance of beds between the north and south sides of Canberra. Accordingly, while services would be accessible to all ACT residents under Option A, access would remain slightly less for north side residents.

Option B would further reduce the accessibility of services for north side residents. By locating all additional beds at the Canberra Hospital, the prevailing distribution of public hospital capacity would be further skewed toward the south.

Option C is similar to Option A, however, its level of accessibility would depend on the location that is found for the new hospital. Preliminary assessment of possible sites indicates it would be possible to find a site for the new hospital that would improve accessibility for many areas of north Canberra. Based on this, Option C would provide a more desirable level of access than Options A and B.

Options D and E significantly expand public hospital capacity on the north side. Both options result in a more equitable distribution of beds between the north and south sides and result in appreciably greater access for north side residents.

Table 4: Accessible to all ACT residents

Option	A	B	C	D	E
	Expand on existing TCH and Calvary Campus	Consolidation on TCH Campus	Build a new north side hospital on a greenfield site	Networked and specialised hospital system - new acute hospital	Networked and specialised hospital system - new sub-acute hospital
Rating	✓✓	✓	✓✓✓	✓✓✓✓	✓✓✓✓

Annual travel time savings for each option, compared to Option A, have been calculated and are provided in the table below. These savings, or dissavings in the case of Option B, accrue to the community, not the Government. Thence, these values have not been included in the financial analysis.

Table 5: Annual Travel Time Differences and Costs Compared to Base Case

Option	B	C	D	E
Hours	10,862	2,200	-14,833	2,740
Costs	\$162,925	\$33,002	-\$222,488	\$41,099

Although the time savings may appear small in nominal terms, they should be viewed in the context of the consumer groups accessing public hospital services. Over many years, individuals who need to regularly access care may potentially benefit significantly from Option D. Further detail concerning travel time differences is provided in Appendix A.

4.4 Safe and High Quality

Option B has risks associated with locating a significant cluster of health infrastructure in one location. The obvious risk is in the event of a disaster, the Territory's primary public hospital could be rendered unavailable for an extended period. For Options D and E there is a strong argument that it is more efficient to locate sub-acute services away from acute settings in a more "homely" environment.

Sub-acute and non-acute beds require more associated space than acute beds. However, the cost of this associated space is less than for acute beds. Acute clinical space (including associated infrastructure) is expensive and if sub-acute spaces are included in the same 'space' then this impacts on the capacity / efficiency of this acute clinical space infrastructure and operational flows.

Unless designed on a greenfield site where there is clear separation between acute and sub-acute areas that allows for acute area growth then there will be 'competition' for available space leading to operational inefficiencies. This is the current situation on the Canberra Hospital site.

Option C has a higher rating than option A as a new hospital can be designed to facilitate safer working practices and patient safety features can also be enhanced.

Table 6: Safe and high quality

Option	A	B	C	D	E
	Expand on existing TCH and Calvary Campus	Consolidation on TCH Campus	Build a new north side hospital on a greenfield site	Networked and specialised hospital system - new acute hospital	Networked and specialised hospital system - new sub-acute hospital
Rating	✓✓	✓	✓✓✓	✓✓✓✓	✓✓✓✓

4.5 Efficiency and Cost

4.5.1 Capital Costs

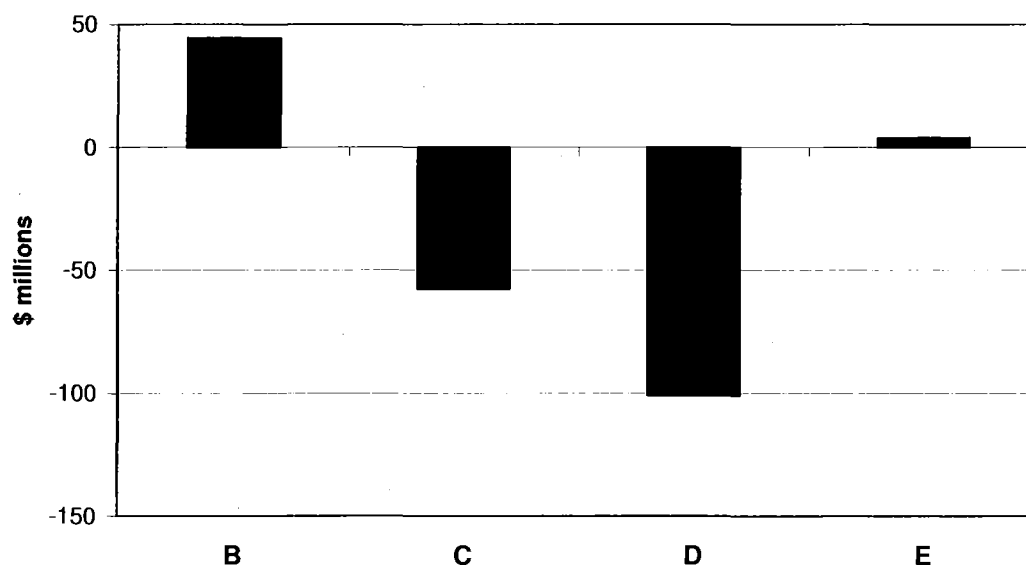
Construction cost estimates have been developed for each of the five scenarios. These are provided in Table 7 below.

Table 7: Construction Cost Estimates¹³

Option	Location	Cost
A - Expand on existing TCH and Calvary Campus (Business as Usual)	200 beds Canberra Hospital 200 beds Calvary Hospital	\$788,460,000
B - Consolidation on TCH Campus (One Hospital Model)	400 beds Canberra Hospital	\$832,840,000
C - Build a New North side Hospital (Three Hospital Model)	200 beds North side Hospital 200 beds Canberra Hospital	\$730,810,000
D - Networked and Specialised Hospital System – new acute hospital	400 beds North side Hospital	\$687,650,000
E - Networked and Specialised Hospital System – new sub-acute hospital	200 beds North side Hospital 200 beds Calvary Hospital	\$792,320,000

The estimates indicate that Option D has the lowest capital requirement followed by Option C. Chart 1 shows the capital cost savings for Option D are \$101 million from the business as usual approach of Option A. Option B has the highest cost being \$44 million above Option A.

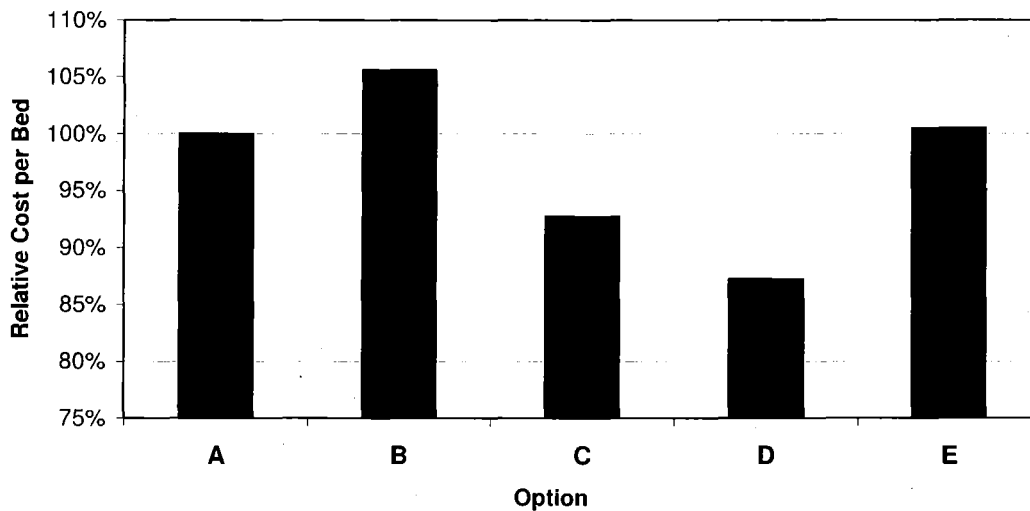
Chart 1: Capital Cost Differential from Option A



The relative cost per bed in Chart 2 shows Option D is 13 per cent cheaper and Option B is 6 per cent more expensive than Option A.

¹³ Gross floor area estimates and facility planning undertaken by Thinc Health. Construction cost estimates provided by Rider Levitt Bucknall.

**Chart 2: Capital Cost Comparison
Relative Cost Per Bed (Option A Base)**



In summary, Options A, B and E have higher costs than Options C and D due to site constraints with Brownfield developments. This is partly due to higher costs associated with staging and decanting, increased complexity necessitating a larger contingency, and higher escalation allowances due to longer construction time frames.

Option B the consolidated Canberra Hospital is most constrained with the longest construction timeframe. Options C and E costs are below Option B as it benefits from half of the development occurring on a greenfield site.

Greenfield sites are less complex, have reduced construction time frames and require no staging and decanting. For these reasons Option D, being built entirely on a new site, has the lowest construction cost.

The analysis assumes future refurbishment costs of existing hospital facilities to be equal for options A, B and C as the existing acute and sub-acute bed configuration in the Canberra Hospital and Calvary Hospital would broadly remain unchanged. Accordingly the analysis has not considered the costs associated with the refurbishment or redevelopment of existing facilities.

Options D and E, however, require the existing bed configuration to change, to reflect greater specialisation and changed roles for the facilities:

- under Option D, building a 400 acute bed facility would result in 50 less acute and 50 more sub-acute beds being provided in existing facilities than Options A, B and C; and
- Option E, building a 200 bed sub-acute facility requires 150 less sub-acute and 150 more acute beds being provided in existing facilities than Options A, B and C.

There will be a differential in the refurbishment cost between sub-acute and acute beds (excluding associated infrastructure). In order to determine the precise differential, further detailed scoping of the current facilities would be required. However, benchmarking indicates that a sub-acute bed requires around 50 per cent more space than an acute bed. Under Option D it is estimated that providing 50 additional sub-acute beds at the existing hospitals could increase future refurbishment costs by \$11 million. For Option E it is estimated that providing 150 additional acute beds at existing facilities could reduce future refurbishment costs by \$33 million.

The table below identifies the total cost incorporating potential changes to future refurbishment costs and savings. It is important to note that with the exception of Options A and E, the relative rankings of the options do not change.

Table 8: Potential Future Refurbishment Impact

	Option A \$m	Option B \$m	Option C \$m	Option D \$m	Option E \$m
Total Cost	788.46	832.84	730.81	687.65	792.32
Potential Future Refurbishment Impact (net)	-	-	-	11.00	(33.20)
Estimated Cost Impact	788.46	832.84	730.81	698.65	759.12

4.5.2 Recurrent costs

The analysis has not considered hospital staffing cost differences between the options. For Options A, and B it has been assumed that there is no differential in staffing costs between Calvary Hospital and the Canberra Hospital in providing the additional beds.

For Options D and E, staffing levels will be determined by the model of care, taking into consideration any efficiency gains from the impact of role delineation and specialisation, and the design of purpose built infrastructure. Increased staff requirements due to operating three distinct Hospitals may partially offset efficiency gains.

Staffing issues will be further examined and discussed as part of the public consultation process. The consultation process seeks to engage specialists who work in both the public and private sectors. This will provide a useful dialogue to explore staffing pressures that may be experienced in different service sectors, under proposed service delivery models and facility configurations. Including clinicians in discussions is an important aspect of ensuring a cooperative and positive outcome.

Notwithstanding staffing issues, where recurrent cost differentials could be reasonably expected to occur, calculations have been undertaken to identify the differential impact. The table below shows the estimated annual cost differentials for each option compared to Option A. This identifies Option D as having the lowest recurrent cost and Option B the highest.

Table 9: Recurrent Costs

Recurrent Costs	Option B \$m	Option C \$m	Option D \$m	Option E \$m
Depreciation ¹	0.59	(0.77)	(1.34)	0.05
Financing Costs ²	2.56	(3.33)	(5.82)	0.22
Maintenance ³	0.89	(1.15)	(2.02)	0.08
Building Operating Costs ⁴	0.07	0.31	(0.06)	0.52
Total Annual Cost/(Savings) Differential	4.11	(4.94)	(9.24)	0.88

Notes:

1. Depreciated over 75 years to provide an indicative estimate based on advice from independent valuer on the expected useful life of newly constructed hospital facilities.
2. Based on the Commonwealth 10 year bond rate of 5.77 per cent.
3. Maintenance costs are assumed at 2 per cent of the construction cost after the warranty period.
4. Building operating costs are assumed at \$135 per square meter annually. This includes equipment running and inspection costs (i.e., lifts, air-conditioning and fire protection), cleaning, electricity, water, security and building management staff.

The below ratings are reflective of the capital and recurrent costs of each option, with Option D receiving the highest rating and Option B the lowest.

Table 10: Efficiency and Cost

Option	A Expand on existing TCH and Calvary Campus	B Consolidation on TCH Campus	C Build a new north side hospital on a greenfield site	D Networked and specialised hospital system - new acute hospital	E Networked and specialised hospital system - new sub-acute hospital
Rating	✓✓	✓	✓✓✓	✓✓✓✓	✓✓

5. CONCLUSION

Table 11: Summary of Assessments

Principle/Measure	A Expand on existing TCH and Calvary Campus	B Consolidation on TCH Campus	C Build a new north side hospital on a greenfield site	D Networked and specialised hospital system - new acute hospital	E Networked and specialised hospital system - new sub-acute hospital
Patient Centred	✓	✓	✓✓	✓✓✓	✓✓✓
Intra-disciplinary and Collaborative	✓✓✓	✓✓	✓	✓✓✓✓	✓✓✓✓
Accessible	✓✓	✓	✓✓✓	✓✓✓✓	✓✓✓✓
Safe and High Quality	✓✓	✓	✓✓✓	✓✓✓✓	✓✓✓✓
Cost	✓✓	✓	✓✓✓	✓✓✓✓	✓✓

An assessment of the five options against the planning principles demonstrates the benefits of creating a full networked and specialised public hospital system in the ACT.

Other benefits of Options C, D and E that are not reflected in the analysis is the partial or full avoidance of interruption and/or relocation of services when buildings are refurbished. Patient safety can also be compromised from higher risk of infection due to contaminants such as dust. There would be no interruption to existing service during construction on a greenfield site.

Option A has the disadvantage of continuing to co-locate acute and sub-acute services on the same site. This is not optimal from a model of care or efficiency perspective.

A comparison of construction cost estimates indicates Option D has the lowest cost. As indicated previously, the actual cost of each option needs to reflect the bed numbers, bed configuration and ancillary clinical services. In addition to this, the phasing of construction needs to maximise service capacity at any one time. In achieving this, there may be additional costs incurred due to temporary capacity generation, decanting and escalation.

Assumptions and methodology for estimating time spent travelling and distance travelled.

The data used for the analysis included the distance and estimated time to travel to the Calvary Hospital, the Canberra Hospital and a new north side hospital from all suburbs within Canberra¹⁴.

The distance taken is based on the fastest route according to estimated travel time. The estimated travel time is based on the speed limits and length of the roads for the route taken. The model does not take into account estimated wait time in traffic. However, it was assumed that on most alternative routes at most times of the day, to a location of a similar distance, the average wait time would be similar.

The data was used to compare travel times to both Calvary Hospital and the Canberra Hospital from every suburb, with the closer of the two assessed as the current preferred hospital to travel to for individuals in each suburb.

The data was compared to the travel time and distance for the two proposed hospitals from every suburb. The model then minimises travel time and distance between all hospitals and individual suburbs, identifying the shortest, fastest route.

The difference in distance and travel time between the closest hospital (under the proposed options) and the current preferred hospital was then calculated to provide the potential benefit in time saved and reduced distance travelled.

If the best option remained the current preferred hospital, no benefit would be received and the result is zero to reflect no reduction in travel time or distance travelled. If one of the proposed hospitals yielded a benefit, it was expressed in both fewer kilometres travelled and minutes saved travelling. This calculation generated an exhaustive list of those suburbs that would experience changed travel distances and times under each of the five options.

The next step was to calculate the average number of separations per person, per year. This was based on total projected separations in 2021-22 divided by forecast population for that year. This method was used to capture future expected changes in utilisation rates and service delivery methods reflected in ACT Health's demand modelling.

Per person separations was then multiplied by the people located in suburbs where travel distance and times changed under the options. For some suburbs, no change was registered under any option. This step in the process generated a nominal number of separations per suburb, per year that would benefit from changed travel arrangements – these separations are termed 'affected separations'.

For some options the total number of affected separations, when summed for all suburbs, far exceeded the number of separations that could reasonably be expected to be provided by the additional beds. And the numbers did not account for usage by residents from New South Wales. Thus a constraint was required to 'cap' affected separations in line with the quantity of services to be provided to ACT residents.

¹⁴ As a preferred site for the north side hospital is yet to be finalised, savings may be subject to further change.

Appendix A

A constraint was determined by calculating total separations provided per bed, per year, multiplied by the proportion of total hospital services consumed by ACT residents as a share of total services provided¹⁵. Again figures for 2021-22 were used to ensure consistency. The constraint indicated that in some instances, only 70 per cent of the potential travel impacts could realistically be realised. This constraint was thus used to scale down the number of affected separations per suburb uniformly. For example, if the constraint was imposed at 28,000 separations and the number of affected separations was calculated to be 40,000 each suburb's affected separations were scaled down at a rate of 70 per cent.

Total affected separations for each suburb was then multiplied by the suburb's identified benefits in travel distance and time (where benefits were greater than zero) to provide a unit measure of the savings accruing to each suburb under the proposed options.

Individual suburb totals were summed to provide an aggregate measure of the anticipated savings, which was then multiplied by a factor to recognise the average number of trips made to a hospital pre-admission (for example, for scans or examinations), and during admission (for example, a family member or friend making two return trips to an individual's home).

The calculation provides the total benefit provided to the community under each option. This then had a monetary value attached to reflect either the cost savings according to distance travelled or hours saved.

Results

The following table presents the travel savings (or costs) provided by each option compared to the base case scenario - Option A. This is a marginal differential analysis because all options, with the exception of B, have additional north side beds, hence all will generate overall time savings. However, when related back to Option A, those savings can be positive or negative.

Option D generates additional positive savings primarily for residents located north-east of Belconnen and the Inner North.

Option B exhibits travel costs due to the requirement for a greater number of north side residents having to travel to the Canberra Hospital's Garran premises.

Option	B	C	D	E
Hours	10,862	2,200	-14,833	2,740
Costs	\$162,925	\$33,002	-\$222,488	\$41,099

¹⁵ The current proportion of services consumed by NSW residents (25 per cent) is assumed to be constant over the forward years.