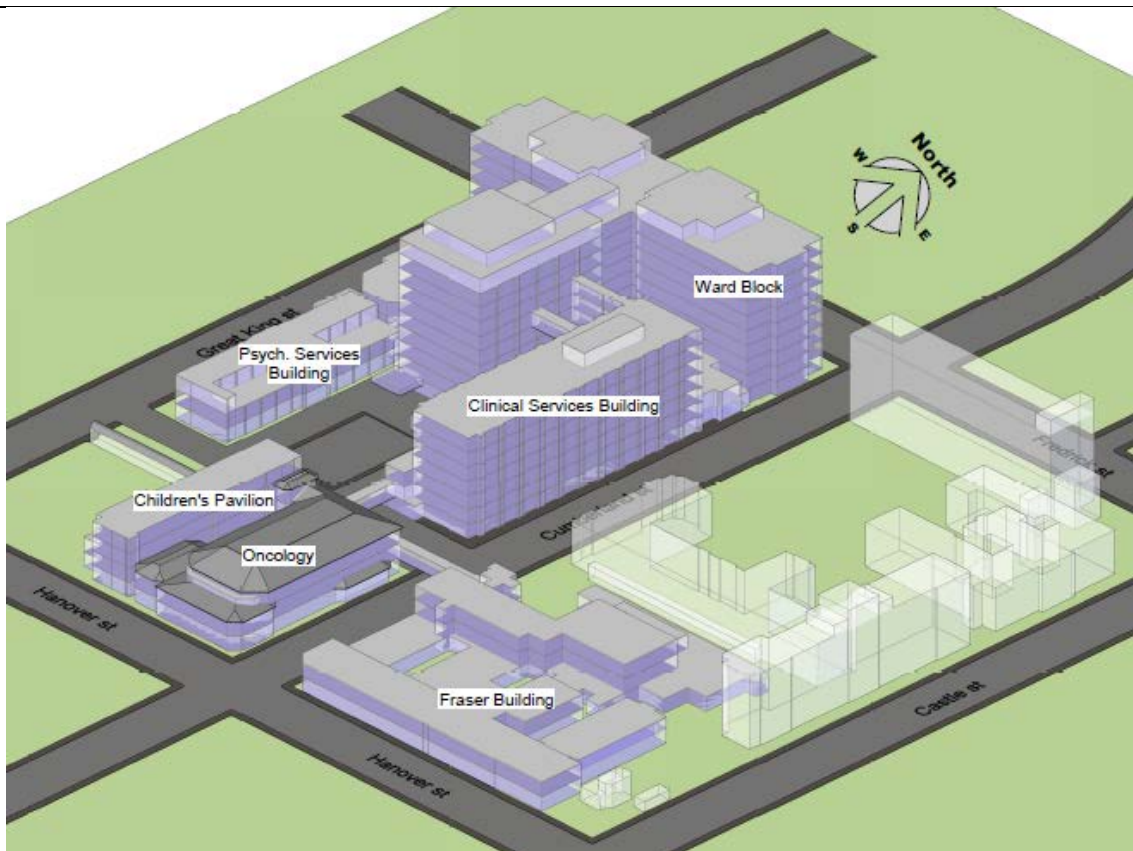


Southern Partnership Group

(commissioned by the Ministry of Health)

FINAL 29 June 2017

Indicative Business Case for Dunedin Hospital Rebuild



Front cover image: Southern DHB, *NCC Background Document 100 Dunedin Hospital Site Plan*.

This business case has been prepared by Sapere Research Group for the Ministry of Health.

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1. Executive summary

1.1 Introduction

This Indicative Business Case (IBC) seeks formal approval to proceed to the Detailed Business Case (DBC) stage for the redevelopment of Dunedin Hospital.

The document follows the Treasury's Better Business Case five stage approach. It moves through a Strategic Case, followed by an Economic, Management, Commercial and Financial Case.

The purpose of this IBC is to:

- Confirm the strategic context and fit of the proposed investment into Dunedin Hospital.
- Confirm the need to invest and the case for change.
- Identify a range of potential options.
- Recommend a preferred way forward for further development of the investment proposal, supported by a limited number of short listed options for further analysis.
- Seek the early approval of decision makers to develop a Detailed Business Case, based on a preferred way forward.

1.2 Strategic Case

The Strategic Case addresses the condition of existing hospital infrastructure in Dunedin.

The Clinical Services Block (CSB) has critically reached the end of its serviceable life. The Ward Block - although structurally solid - has significant maintenance issues and impedes the delivery of efficient and effective services. Neither building is economic to repair or refurbish.

No building on the Dunedin city campus complies with importance level four (IL4)¹ standards. This would greatly impact the day to day operation of the facility after a significant earthquake (one in 500 year event).

The Strategic Case also highlights the challenge that the Southern DHB faces with an increasing ageing population and the associated forecast unsustainable service demand. Population ageing means a rapid growth in complex patients, bed-day requirements and other resourcing unless the system is reorganised. Service delivery changes that better utilise primary and community services will flatten that demand but frail elderly patients will continue to reach the hospital in increasing numbers, with increasing complexity. Thus, it is essential that services at Dunedin Hospital are changed to provide an increased focus on generalism, increased theatre efficiency, more rapid discharge processes and improved rehabilitation approaches.

The DHB is aware that it needs to significantly change the way in which hospital, primary and community care services are organised and delivered. While facility design is critical for

¹ IL4 - Buildings that must be operational immediately after an earthquake or other disastrous event, such as emergency shelters and hospital operating theatres, triage centres and other critical post-disaster infrastructure.

enabling modern models of care, it is only one of a number of enablers. This IBC presents a case for investment in a hospital build and the benefits of that investment depend to a large extent on the changes to service delivery. While there is a clear dependency, investment in service redesign and in primary and community care in particular is outside the scope of this business case.

1.2.1 Investment objectives that support systems change

The Southern Partnership Group (SPG) and members of the Southern DHB's executive identified the following investment objectives. Section 4.6 provides a full description of the investment objectives, including the existing arrangements, business needs and proposed measures to track performance against.

- Ability to adapt - to create responsive infrastructure and capability that supports disruptive health system change after completion.
- Optimise use of total health system resources two years after completion.
- To reduce non-value added time by 80% to create a seamless patient journey two years after completion.
- To improve the patient and staff experience after completion.
- To reduce the risk of harm to 'acceptable standards' two years after completion.

Initial programme estimates are for completion/occupancy in 2027 however the timeframes for the programme and for achieving these objectives will be reviewed during the DBC process.

In addition, a set of Critical Success Factors (CSF) were agreed to guide the assessment of various options. The CSFs for an investment include:

- Meets the business needs of the DHB.
- Strategic fit.
- Delivers perceived value.
- Relative affordability.
- Achievable.

These CSF are detailed under section 5.1 in the Economic Case.

1.3 Economic Case

The Economic Case sets out the key findings of the initial options analysis. It draws conclusions about the options and recommends a preferred way forward.

The options were developed in a series of workshops shaped by information emerging about the building condition, structure and scope of services to be included within the investment. Key stakeholders attended these workshops including the SPG, DHB, Ministry of Health and Treasury officials. In addition to the Base Case, seven options were selected and worked through with a scope spanning from the Base Case through to an ambitious option of a new hospital on a new site for all Dunedin and Wakari services.

The Base Case is presented as a do minimal counterfactual to the other options explored. It involves demolition of the existing CSB and Psychiatric Services Building that are incapable of being economically renovated and refurbished along with the lecture theatres on Dunedin city campus, and construction of a new replacement CSB.

Over the course of assessing the long list of options, it has become apparent:

- The condition of existing buildings on the Dunedin city campus (excluding the Oncology Building) is significantly worse than anticipated. There is significant risk of operational failure because of building failure.
- The base case of extending the life of the existing buildings is, in this instance, no more than a “shadow” base case as operationally the buildings are failing and it makes no sense to rebuild what is there.
- The option of renovating and refurbishing the Ward Block has become significantly less plausible in an environment where services would need to be decanted floor by floor and remain operational. Further, at this stage in programming this option, the Ward Block would be not be fully refurbished until late 2031.
- The Ward Block’s structural grid and floor to floor heights would not offer the flexibility that a new building would, compromising the role out of more efficient models of care.
- Structural renovation and repair to the Ward Block would be very challenging and is estimated would cost more than a new build – it is therefore an uneconomic investment to make in an old building that would yield, relative to a new build, a sub-optimal outcome.
- The CSB does not comply with importance level four (IL4) standards and would be damaged to the point it would be unusable after a significant earthquake (one in 500 year event). These risks are recognised (occupants are termed “at low risk”), this fact poses a challenge for continuity planning.
- Likewise, the Ward Block is also not IL4 compliant and as with the CSB would be unusable after a significant earthquake, although occupants are termed “at low risk”.

1.3.1 All short list options require rebuild on a new site

Of the seven options explored, those that were shortlisted were all new builds with no renovation or refurbishment of existing buildings required. All of the short list options have at their core acute clinical services, birthing, inpatient units and clinical and non-clinical support services, and ambulatory services.

The short listed options varied on whether or not services remain on existing and or adjacent site (options B, C and D), are moved to Wakari (option E) or are relocated to other sites within Dunedin (options F and G). Variations also were based on the inclusion or exclusion of health hubs, cancer services, acute mental health inpatient services, forensic mental health services and university designated space. In short, there is a core service requirement with material additions to service and cost of build – all depending on site choice.

1.3.2 The preferred options

Based on the assessment against the Investment Objectives and the Critical Success Factors the SPG agreed at their meeting on the 2nd May to recommend that the following two options are taken through to the DBC: new hospital on a new site and new hospital on Wakari site.

New hospital on new site

- This option provides for a new fit for purpose CSB, IPU and ambulatory services on a new site. This option, depending on site size and shape, presents potentially better orientation, geometry, spatial layout and functional relationships than the adjacent site option.. The opportunity for scale and further development may exist along with green space for paediatric and rehabilitation services in particular (and mental health if included).
- A total building area of [REDACTED] derived by combining benchmarked areas across a number of health infrastructure projects and key inputs such as bed numbers converted from modified activity projections in the detailed clinical service plan part B.
- The new hospital could be commissioned in February 2027 (two years earlier than the adjacent site option).
- Estimated costs [REDACTED] Inclusions and exclusions are detailed in Appendix 3.

New hospital on Wakari site

This option provides for a new fit for purpose CSB, IPU and ambulatory services on DHB owned land:

- Its main benefits are that the DHB already owns the land and that the site is relatively large with plenty of green space.
- There will be a need to demolish some existing facilities and decant services to clear sufficient space for a new build. This will add cost, time and create service disruption.
- However, potentially its main draw-back is its distance from the CBD, university and polytechnic and there has been expressions of opposition from some in the community. There would also need to be further understanding of the travel and transport implications of moving the hospital to this site.
- A total building area of [REDACTED] [derived by combining benchmarked areas across a number of health infrastructure projects and key inputs such as bed numbers converted from modified activity projections in the detailed clinical service plan part B.
- At this stage the new hospital will be commissioned in December 2027. However, it should be noted that due to the need to demolish existing buildings and decants services this time will possibly be longer.
- Estimated costs [REDACTED] Inclusions and exclusions are detailed in Appendix 3.

Under both of these options, depending on site, the following additional services could be provided at additional cost, on and off the site:

- Health hub(s).
- Oncology services.

- Acute mental health.
- University only space that is not mutually required by Southern DHB and University related to teaching, research or needed for the hospital to be accredited as an undergraduate or post graduate medical training facility.

Given the amount of investment required, the SPG determined that the option of building a new facility for acute services and inpatient units on University owned land directly adjacent to the Ward Block (involving renovation and refurbishment of the Ward Block to allow for ambulatory services and non-clinical services, but excluded modifications to the Ward Block to remedy spalling², latent asbestos and maintenance issues) would provide a suboptimal solution with a number of disadvantages including a constrained site for future proofing, decanting and disruption to services and retrofitting an old existing building, seismic risk and ongoing maintenance issues. While it appears affordable on a build-cost basis, ultimately the renovation and refurbishment option proposed as IBC option B is actually more expensive in a simple capital context and will take four years longer to deliver than the new purpose built facility.

The DBC will need to consider and assess other procurement options including Public Private Partnership (PPP) against the traditional model of design and construct, and other options likely to be reviewed and analysed once a site has been selected. Procurement options are addressed under Section 7 of this report - the Commercial Case.

1.4 Independent governance

The Crown has implemented a joint Southern Partnership Group (SPG) inclusive of the DHB to oversee the planning, design and construction of the hospital development. The SPG reports to the Ministers of Finance and Health.

The Ministry of Health is the Project Sponsor, has a Project Manager and team overseeing and coordinating the project with secretariat support to the SPG.

The DHB is consulting on a major organisation restructuring to re-orient its management to the strategic challenges identified by it. It is anticipated this structure will be more agile and geared to realising the benefits identified in this business case largely through re-orientation of roles in the wider Southern DHB health system.

The DHB is also embarking on a clinical service change programme with dedicated executive and clinical leadership positioned to drive the change through. There are a number of initiatives planned and underway including (inter alia):

- the development of a primary and community health care strategy;
- a hospital admission reduction programme;
- Community-based wrap around solution for older people;
- A risk stratification approach to the management of patients with long-term conditions;
- Health pathways development, and
- Telehealth implementation.

² Spalling is a result of water entering brick, concrete or natural stone and forcing the surface to peel, pop out or flake off. In concrete, spalling happens because there is moisture in the concrete. Eventually, spalling can cause crumbling and destruction of a structure.

The DHB has established a Programme Management Office to oversee the interests of the SDHB in the hospital redevelopment, particularly the impact to the change management.

1.5 Affordability challenges

The DHB has been operating with deficits for many years. As a result the DHB enters the build with no reserves to apply to the funding of facilities. The DHB has committed to achieving break-even by 2019/2020. Break-even is temporary: looking out 25 years, the DHB continues to run an operating deficit. This is attributed to the combined impacts of the rebuild and other replacement on capital costs, aging and increased demand for services and staff. Even with efficiency savings, the DHB's deficit position could be as large as

The persistent deficit means the DHB will be likely to remain reliant on direct Crown funding support for day-to-day cash requirements for maintenance and future asset replacement as well as the proposed rebuild. This being the case, none of the options, including the Base Case, are affordable.

However, the alternative is a worse predicament. Without a new and/or dramatically renovated and refurbished hospital, the DHB will almost certainly fail to meet its long term service objectives and its commitment to deliver health services to the communities it serves.

1.6 IT recognised, though needs further thought

Information technology is a significant enabler of health care in a number of ways. Service projections inherently assume that changing models of care will be underpinned by advances in information technology such as patient portals and shared access to electronic data repositories including digital prescribing and medical imaging. A core component of the Ministry of Health's Digital 2020 (developed to progress the digital initiatives identified in the New Zealand Health Strategy) is the digital hospital that aims to "seamlessly unite patients, doctors, staff, assets and information throughout the hospital"³. Hospitals are becoming increasingly technology driven with imaging in theatres and computers beside the patient's bed side. Southern DHB has been at the centre of one of the major initiatives with the development of electronic pharmaceutical administration in the hospital. Any new hospital needs to have sufficient infrastructure to support digitisation and this is in the functional specification. Southern DHB is currently developing its IT strategy and this will be covered in the Detailed Business Case in much more detail.

1.7 Next steps and work deferred to the DBC stage

This IBC seeks formal approval from the Capital Investment Committee and Ministers to commence development of the Detailed Business Case (DBC), based on the preferred way forward and the short-listed options above. The DBC will then form the basis of further advice on a preferred build option and the manner in which that build will be procured and financed.

³ <http://www.health.govt.nz/our-work/ehealth/digital-health-2020/digital-hospital> (accessed 7 June 2017).

Practical next steps include:

- Reviewing the initial programme estimates.
- Seeking approval to select a site during the DBC phase.
- Re-check services modelling and re-assess demand. Facility demand forecasts are subject to change dependent on revision and validation during the DBC.
- Define a strategic and facility model of care and translate models of care into space requirements and accommodation needs. A reduction in size of 10,000m², for example, would deduct in the order of [REDACTED] from the initial estimates.
- Understand what is required to achieve faster commissioning of a new hospital.
- Address questions around hospital affordability (and deficit support). None of the build options, including the Base Case, are affordable. The hospital redevelopment project will need to be treated as a special case.
- Confirm the maintenance programme required going forward.
- Explore opportunities for the project to work with the University and Polytechnic on their future needs.
- Consider a strategy for exiting the existing site or, depending on the option selected, sites.
- The opportunities health hubs offer to change space requirements and accommodation needs.

As mentioned earlier, the decision was made to defer a market sounding until the DBC stage. In addition to the market sounding, the DBC will be unusually extensive given the need to identify a new site for the new hospital. It will need to address a range of issues starting with site selection including geo-tech assessment, transport assessment and economic assessment and master site planning of at least one and possibly two sites. Further, service projections need to be challenged to ensure the hospital is the right size for what is needed and, in particular, surgical forecasts need to be reviewed in some detail, working with the refreshed and improved data-set that the DHB is working to produce. The DHB will need to give full expression to the systems level changes proposed including developing a supporting IT strategy. After that, there will be an extensive review of project risks and then, consequently, selection of procurement process that best moderates those risks. The functional specification for the build needs to be worked through at first in a manner that is site independent and, finally, the DHB's operating costs and project financing issues need to be worked through.

1.8 Feedback incorporated into this IBC

As part of the IBC process previous drafts of this IBC were reviewed by Government officials, Southern DHB's Facility Redevelopment Executive, Southern DHB's Clinical Leadership Group and the Ministry of Health. All comments have been considered carefully and the majority of comments and suggestions have been incorporated into this IBC.

2. Introduction

2.1 Structure and purpose of this document

The Ministry of Health has commissioned this indicative business case (IBC) on behalf of the Southern Partnership Group (SPG) to provide recommendations on preferred investment option(s) for the redevelopment of Dunedin Hospital facilities. This IBC seeks approval to develop the investment options further during the next stage of the DBC.

This IBC follows the Treasury's Better Business Case (BBC) guidance and is organised around the five case model:

1. Strategic case
2. Economic case
3. Financial case
4. Commercial case
5. Management case

This IBC follows on from a Strategic Assessment prepared for the Capital Investment Committee and commissioned by the Ministry of Health on behalf of the Southern Partnership Group (SPG) in 2016. The Strategic Assessment outlines the need to invest in critical and failing infrastructure at Dunedin Hospital.

The purpose of this IBC is to:

- Confirm the strategic context and fit of the proposed investment.
- Confirm the need to invest and the case for change.
- Identify a range of potential options.
- Recommend a preferred way forward for further development of the investment proposal, supported by a limited number of short listed options for further analysis.
- Seek the early approval of decision makers to develop a Detailed Business Case, based on a preferred way forward.

2.2 Close engagement through a service planning process

This IBC has been developed through close engagement with key stakeholders, involving consultation with clinicians and management across the district; including staff at Dunedin, Invercargill, and rural hospitals; the Primary Health Organisation (PHO) and general practice; and the University of Otago, Otago Polytechnic and private hospitals.

3. Southern District Health Board: the organisation and the population it services

3.1 Southern DHB

Southern District Health Board is responsible for most publicly funded hospital services and primary health care across the Otago and Southland regions of New Zealand. The DHB was established in 2010, as a result of the merger of Southland and Otago DHBs. As with other DHBs, it has a statutory responsibility for improving, promoting, and protecting the health of the population living in the catchment area. This includes planning, funding, and providing or contracting services to meet the health needs of the population.

The DHB is the most rural of tertiary DHBs. The estimated resident population of Southern DHB in 2016/17 is 319,200.⁴ In addition, the DHB provides acute care to a number of visitors to the region.

The DHB has district level healthcare facilities including Wakari Hospital, Southland Hospital, and Lakes Hospital and provides services out of a number of community owned rural facilities (Oamaru Hospital, Gore Hospital, Clutha Health First Hospital, Maniototo Hospital).

The DHB has approximately 4,500 staff, 2,500 of whom work at Dunedin or Wakari Hospitals. In 2015 the DHB's Board was replaced by a Commissioner and two deputy Commissioners. The Commissioner is accountable to the Minister of Health and is scheduled to hold office until 2019.⁵

3.1.1 Dunedin campuses: Dunedin Hospital and Wakari

Dunedin Hospital is the main referral hospital for the Southern DHB offering a range of clinical, clinical support and non-clinical services. It is a small tertiary hospital and works in partnership with the district level hospital in Invercargill.

The clinical services provided from Wakari include mental health, acute mental health, forensic mental health, audiology and physical rehabilitation for those aged less than 65 years.

3.1.2 Strong links with the University of Otago

Dunedin Hospital is a University teaching and clinical training hospital with strong links to the University of Otago and the Otago Polytechnic Schools of Nursing, Midwifery and Health Sciences. The University of Otago uses up to 20 percent of the Dunedin Hospital site for research and teaching activities, an arrangement agreed at the time of the construction of the existing Ward Block. The DHB also partners with the University in health research activities and has established a Health Research Office to facilitate research of by staff of both organisations. There is a number of staff jointly appointed by both the University and

⁴ Ministry of Health.

⁵ <http://www.southerndhb.govt.nz/pages/about-southern-dhb/> Retrieved on 28 May 2017.

DHB. A dislocation of these links would markedly change the character of the hospital. Dialogue with the University about the hospital redevelopment will continue and options for co-location will be explored further.

3.1.3 Services provided based on ‘Southern Future’ programme

The ‘Southern Future’ programme describes the principles by which the DHB manages itself and provides services to the community: Targets define the specific outcomes for the DHB. During 2016 the DHB held district wide listening sessions with staff, leaders, providers, patients and whanau to develop a set of values that will guide behaviours and decision-making. The DHB has set itself the following aspirational principles as the “measurement base [to] test ... performance against”.⁶

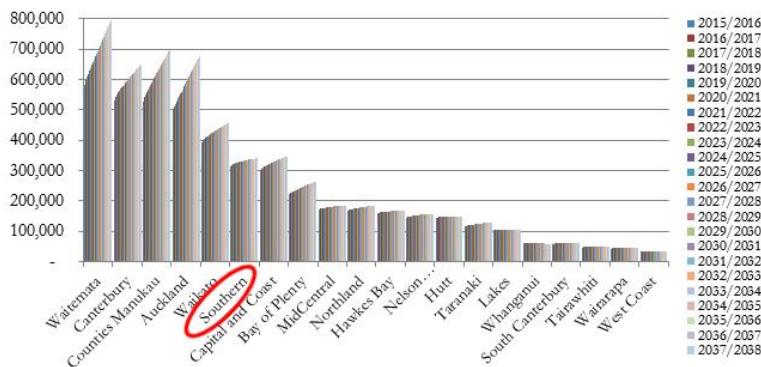
- *Visibly lead the Southern DHB Plan*
- *Patients are at the centre of everything we do*
- *Actively build capacity and capability of our people*
- *Ensure fair access to services across the whole district*
- *Ensure Māori health and well-being is integral to planning and service delivery*
- *Focus on the development of a District wide network of care*
- *Develop and enable clinical leadership*
- *A commitment to continuous quality improvement and patient safety*
- *Take a long term view of decision making*
- *Be transparent in our decision making*
- *Be visible and connected to our staff*
- *Be in the community*
- *Build one source of truth*
- *Invest to save*

3.1.4 Population projections show modest growth with considerable ageing

Figure 1 shows the projected populations of each DHB from 2015/16 to 2037/38. It reveals that most of the projected national population growth is concentrated in the large metropolitan DHBs. Most provincial DHBs are projected to have low population growth over this period. While the total population of Southern DHB is not projected to have significant population growth, sub-regions within Southern DHB are projected to have quite different population patterns – both in terms of growth or decline, and in terms of population composition.

⁶ Southern DHB “Owning our Future” (November 2015).

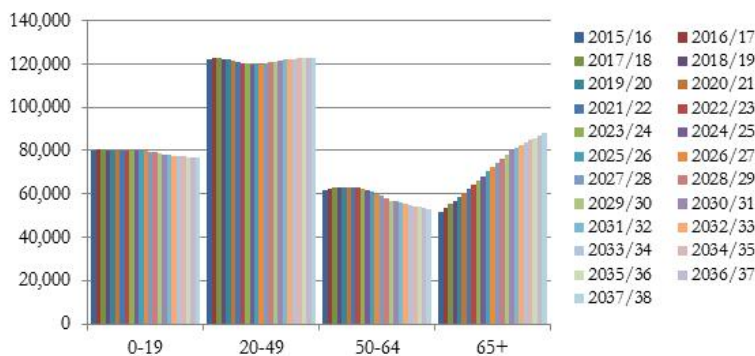
Figure 1 Projected DHB populations - 2015/16 to 2036/37



Source: Statistics New Zealand

Furthermore, the proportion of the population that is aged 65+ is projected to increase in all areas within Southern DHB, and largely to be at higher levels than elsewhere in New Zealand. Additionally, the Māori, Pacific, and Asian populations are projected to increase in Southern DHB. **Age is the most significant demographic factor the DHB will need to respond to as it is the single variable that best predicts health service need and consequently health system cost.**

Figure 2 Projected growth in Southern DHB population by age group, 2015/16 to 2036/37



Source: Statistics New Zealand

Compared to other DHBs, Southern DHB has a relatively low proportion of people who are Māori, Pacific or Asian, and a relatively high proportion of people of other ethnicity. The DHB has a lower proportion of the population that is in the two lowest deprivation quintiles (fifth lowest proportion of population in quintiles 4 or 5)

3.1.5 Dunedin Hospital service volumes are from Dunedin and the wider Otago/Southland environs

In the 2014/15 year, there were approximately 40,700 discharges at Dunedin Hospital, utilising around 106,000 bed days (a crude average of 2.6 days per discharge). The 36,800 case mix discharges generated 37,700 case weights.

In the same year, there were approximately 1,200 discharges from Wakari Hospital (mental health and physical rehabilitation), utilising around 38,500 bed days (a crude average of 31 days per discharge).

Dunedin has the usual pattern for discharges, with the emphasis within medical specialties on acute/arranged events, and the majority of surgical events being elective. Surgical events have a high average caseweight, particularly acute surgery.

As might be expected, the majority (over three quarters) of inpatient events are for people who live in the Dunedin City area, or the surrounding Otago areas of Clutha and Waitaki. Dunedin plays an important role as a high level secondary and tertiary hospital for the wider District, covering Southland and Otago, the largest DHB geographic area in New Zealand. Dunedin Hospital therefore fits within a network of rural hospitals which serve the whole population of the District, as well as the DHB operated Southland Hospital in Invercargill and Lakes Hospital in Queenstown.

In 2014/15 there were approximately 152,800 outpatient clinic attendances (first and follow up appointments, allied health contacts, nurse led clinics, etc.) and 34,000 outpatient tests or procedures at Dunedin Hospital. Compared to inpatient events, a higher proportion of outpatient attendances (86%) were for people living in Dunedin City, Clutha or Waitaki. Dunedin Hospital also provides community referred radiology on an outpatient basis.

There were 42,400 presentations to the ED or paediatric acute assessment unit in 2014/15, with 88% of patients living in Dunedin City, Clutha or Waitaki.

In the same year, there were approximately 2,100 outpatient attendances at Wakari Hospital for allied health and rehabilitation services (89% from Dunedin City, Clutha or Waitaki). A substantial amount of outpatient activity takes place in patients' homes, including district nursing and allied health assessment and education. There were approximately 56,800 of these contacts in 2014/15, with most coordinated out of Wakari Hospital.

3.2 Alignment to existing strategies

Service planning across the DHB health system and Dunedin Hospital more specifically has guided core aspects of the hospital redevelopment process. This service planning aligns with the strategic direction set by central Government and the South Island Region. The relevant strategic and planning documents include (see Figure 3 for how they fit together):

- The 2016 New Zealand Health Strategy, which has five strategic, interconnected, themes aiming towards all New Zealanders living well, staying well and getting well: *'people-powered, closer to home, value and high performance, one team, and smart system'*.⁷
- The South Island Regional Health Services Plan, which aims to keep people well and provide equitable and timely access to safe, effective, high-quality services as close to people's homes as possible.
- Southern Strategic Health Plan – Piki Te Ora, which describes how Southern DHB will develop an effective and efficient system of care.

⁷ Ministry of Health. (2016). New Zealand Health Strategy 2016. Retrieved from <http://www.health.govt.nz/publication/new-zealand-health-strategy-2016>

- Southern DHB Annual Plan and Māori Health Plan, which aim to improve patient access and population health outcomes, and achieve clinical and financial sustainability.

Figure 3 Relevant existing strategies



Source: Adapted from the Southern Strategic Health Plan

The Dunedin Hospital redevelopment aligns with these strategic directions by encouraging the roll out of more modern models of care that will improve efficiencies and effectiveness of hospital services. By changing the way in which services are organised in the hospital, and how they integrate with primary care and allied health, the DHB can realise the benefits of improved patient flow, improved quality of patient care, improved patient and staff safety, increased efficiency of service delivery and reduced costs.

4. Strategic Case

This section sets out the strategic case for the redevelopment of the Dunedin Hospital city campus. The strategic case finds that there is a compelling case for change based on the condition of existing hospital buildings. The structure and layout of the Clinical Services Block and Ward Block are hindering modern and efficient service delivery.

4.1 Dunedin campus

The Dunedin city campus includes six buildings with construction dates ranging from 1935 to 1993. The figure on the cover of this report shows the layout of the Dunedin Hospital site.

4.2 Critical clinical facilities at end of life, uneconomic to renovate and refurbish

A number of reports commissioned by the DHB set out the poor condition of the buildings. For example, reports from Rider Levett Bucknall (RLB)(2012)⁸ and Beca (2017, 2014)⁹, make clear the Clinical Services block, the Children's Pavilion Building, the Fraser Building and the Psychiatric Services Building have reached or are near the end of serviceable life and are uneconomic to repair or refurbish compared to the cost of a new facility. The majority of the buildings' services (e.g. mechanical and hydraulic systems) are at the end of their useful life.

The reports also concluded that these facilities are unsuited for clinical use. The 2017 Beca report concluded that interim capital works will likely run to several hundred million dollars of investment, most of which will be wasted in the medium to long term.

The reports did not assess the Oncology Building. The oncology building is fit for purpose albeit tight for space.

4.2.1 Existing buildings approaching end of service life

The table below outlines the construction dates of these buildings, and remaining estimated weighted average service life (as at 2012). Many have since exceeded the limit of their remaining service life.

Table 1: Overview of buildings in Dunedin city campus

Building	Year constructed	Weighted average remaining service life RLB ¹⁰ (2012)
Psych Services Building	1935	3 years

⁸ The RLB RELifing® reports (December 2012) present the figures for the asset life and weighted asset life as a proportion of the current new build costs, expressing life as a linear regression to give an expected average building life. The component elements of a building (e.g. structural elements, external fabric, internal finishes etc.) are weighted, giving an average life remaining per building.

⁹ Beca (2014) Peer Review of the 2012 Dunedin Hospital RELifing Analysis with Commentary on the Future Viability of the Clinical Services Block. 10 September 2014.

Building	Year constructed	Weighted average remaining service life RLB ¹⁰ (2012)
Fraser Building	1940	3 years
Children's Pavilion	1945	2 years
CSB (CSB)	1960s	5 years
Ward Block	1980	16 years
Oncology	1993	Not included in the report

Source: Southern DHB. (2014). *Brief for Capital Investment Committee – Dunedin Hospital Campus*

The Clinical Services Building

The Clinical Services Building (CSB) is the most critical of these buildings for clinical services and is the second largest on the campus. The CSB houses a large number of clinical services and support services including operating theatres, outpatient clinics, laboratories, central sterile services, radiology, day surgery, fracture clinic, physiotherapy, emergency department, and the mortuary.

The CSB has concrete spalling¹¹, water ingress through the roof and concrete walls, requires replacement windows, ceilings and floors and requires a general refurbishment throughout. Numerous areas and building components have been identified as containing asbestos. While we are advised that this is encapsulated (and is being managed); these areas will need careful consideration if any refurbishment works are to be undertaken. Where asbestos removal is required refurbishment costs will be increased (Beca, 2014).

Not only would it be uneconomic to repair and refurbish the CSB, it would also be “difficult (possibly impractical) and inefficient to undertake with enabling, decanting, temporary accommodation requirements likely to add significant expense.” (Beca, 2014).

In the context of Dunedin Hospital, while it has been known for several years that the CSB is unable to be renovated and refurbished, the costs of urgent works such as asbestos decontamination have been unavoidable. With the age of these buildings, repair and maintenance costs are higher and the likelihood of needing further repairs and renewals will increase rapidly now the majority of building services are beyond the end of their useful life.

The CSB, as with all buildings on the campus, are not built to importance level 4 (IL4) standards¹². This applies also to the largest facility, the Ward Block. There is virtually no seismic restraint to internal plant and service infrastructure (pipework, ceilings/lightings, switchboards) that would have the most significant impact on the day to day operation of the facility post event. In other words, if a significant earthquake affected Dunedin (one in 500 year event), the hospital would be damaged to the point it would be unusable..

The CSB is not suited to either acute clinical functions due to the storey height, or as ward space due to the building's grid and column spacing, building depth and foot print area that would render it entirely inefficient. The buildings necessitate an outdated way of organising

¹¹ Spalling is a result of water entering brick, concrete or natural stone and forcing the surface to peel, pop out or flake off. In concrete, spalling happens because there is moisture in the concrete. Eventually, spalling can cause crumbling and destruction of a structure.

¹² IL4 - Buildings that must be operational immediately after an earthquake or other disastrous event, such as emergency shelters and hospital operating theatres, triage centres and other critical post-disaster infrastructure.

staff and are highly inefficient for today's way of organising services, let alone the challenge the DHB has set for itself for a different way of meeting future patient needs.

The Ward Block

While the Ward Block is regarded as being relatively solid and is termed "low risk" for occupants, the Beca and subsequent reports (Proj-X, 2017) have highlighted a number of issues with its performance and composition, including concrete spalling, asbestos and a range of maintenance issues that that would require substantial investment to maintain its functionality and remain safe. These issues are recognised and are being managed as best as possible with the funding available. Aside from the maintenance, spalling and asbestos issues, the structural height, ceiling and floor spatial layouts render the Ward Block a poor fit for modern clinical service needs.

As with the CSB, the scope and scale of undertaking a renovation and refurbishment project for the Ward Block would be a long drawn out complex and disruptive challenge. A number of reports¹³ set out these challenges that includes (inter alia) fully replacing the central plant, replacing the fire systems, relocating stair cores to the outside of the building, expanding the lift cores to accommodate larger lifts and extending the floor areas. In addition, the building would need to be environmentally cleaned of all asbestos. The Ward Block would need to be decanted floor by floor and in service zones (there are three vertical service zones)¹⁴. In practical terms, renovation and refurbishment would involve significant disruption to services with noise, reduced access and would require significant precautions to ensure adequate clinical safety and infection control measures are in place.

The Ward Block would be nearing 50 years old at the time of renovation and refurbishment and it is considered will continue to have ongoing maintenance issues associated with its age, as well as any operational impacts post an earthquake¹⁵. Ultimately, to renovate the Ward Block would be uneconomic as reports estimate it would likely cost more than a new build¹⁶.

4.2.2 Existing facilities impede efficient models of care

It is clear that existing facilities are ill suited to more efficient, modern models of care. For instance:

- no space for a rapid assessment function;
- lack of appropriate space for acute assessment for patients presenting to ED with mental health conditions;
- lack of theatre capacity;
- wards constrained space wise and are not fit for contemporary care;
- day surgery patients being treated in main operating theatres, as opposed to in the day surgery unit;
- too few bathrooms, inadequate power points around beds, inadequate space for medical equipment, and insufficient points for medical gases;
- imaging and the emergency department not co-located;
- poor ward sight lines and a lack of privacy and dignity for patients;

¹³ Beca (2017), Warren & Mahoney (2016), Proj-X (2017).

¹⁴ Proj-X (2017) Dunedin Hospital Ward Block Re-living – report prepared for the Ministry of Health.

¹⁵ Proj-X (2017).

¹⁶ Ibid.

- day patient and outpatient zones severely deficient, and
- patients flow into the wrong points of the hospital (e.g. outpatients might be seen in wards).

The poor layout, flow, and condition of the current facilities make it difficult for the DHB to run efficiently or deliver contemporary care to patients. The inflexible and inappropriate nature of the current facilities directly leads to increased costs, reduced service capacity, reduced productivity, and poorer patient outcomes. Examples of these are as follows:

- In some cases, the need to employ additional staff as a direct result of facility layout. For example, since radiology is not co-located with ED, orderlies have to be employed to ferry patients from ED to radiology.
- In other cases, staff costs are higher than they would be in a facility with more modern layout. For example, nursing costs are higher because of a structure based on relatively small wards.
- Inflexibility creates a situation where certain processes or treatments occur in multiple locations across the facility – whereas it would be more efficient if they could be provided in one location.
- Inflexible design can also create hazards, such as those created by the column spacing in the CSB.
- The lack of ability to provide care in the appropriate location within the hospital increases costs – for example, when day surgery patients are treated in main operating theatres, as opposed to in the day surgery unit or the community.
- The lack of an appropriate space for acute assessment for patients presenting to ED with mental health conditions means that additional staff time is required to transport the person to the psychiatric services/administration building. This building is located some distance from the ED and is isolated outside of working hours.
- Lack of adequate storage areas creates clutter throughout patient circulation paths and increases risk that patients or staff could be harmed.

4.2.3 Existing facilities are creating material risks

The current situation creates material, clinical, financial, and organisational risks for Southern DHB. As noted above, the condition and layout of infrastructure (excluding the Oncology Building) does not support features of safe care, leading to an increased likelihood of adverse events for both staff and patients.

- A combination of building layout, patient flow, and building condition mean that adverse events relating to delirium, infections, and falls are more likely.
- Challenges maintaining infection control – a number of services have higher rates of infection compared to comparator facilities.
- High levels of noise and poor layout increase the likelihood of communication errors.
- Falls due to facility design – such as in shower areas or where nursing staff are not able to easily maintain line of sight on patients.

While the CSB, the Children’s Pavilion, the Fraser building, and the Psychiatric Service Building have all been judged as being effectively uneconomic to repair, the most significant risk relates to the CSB. The key risk is the potential for either the emergence or discovery of

a significant defect in the condition of the building that necessitates part or total closure of the building for the purpose of providing clinical services. This disruption would also occur following a significant earthquake. This forms a challenge for business continuity.¹⁷

- **Clinically** – this would lead to significant disruption, as patients would need to be treated either in alternative locations on the Dunedin city campus or be transported to facilities in other locations. While some services with minimal resource requirements (e.g. outpatient visits) may be able to be relocated, services that are reliant on specific fixed equipment or resources (ED, theatres, labs, imaging, mortuary) would be very difficult, if not impossible, to relocate on short notice.
- **Financially** – a number of ‘fixes’ have been made to the CSB to ensure that it is able to continue to function. However, as the condition of the building deteriorates, there is an increasing risk that the fixes will fail or new issues will not be able to be resolved without capital expenditure.
- **Organisationally** – the combined impact of infrastructure issues leading to a culture of workarounds in combination with financial pressures may be affecting organisational culture and staff morale.
- **Training accreditation** – in 2015, Dunedin Hospital lost training accreditation for ICU trainees. While facilities were cited as part of the reason, they were not the only reason. The loss of accreditation also affected internal medicine, ED, and anaesthetic trainees.

4.2.4 The problem definition

The following problem definition was developed by the Southern Partnership Group (SPG) during a facilitated workshop early in the process and therefore focuses on the issues of the CSB. The problem definition does not therefore encompass the issues of the Ward Block, as these were not known to the SPG at the time. Consequently the problem definition will be revisited during the Detailed Business Case (DBC) stage. It should be noted, however, that the recent reports on the condition and structure of the Ward Block will likely enhance the problem definition, rather than detract from it.

Problem definition

In developing the Strategic Assessment mentioned above, an Investment Logic Mapping process was undertaken that describes the following priority problems for service delivery out of the Dunedin Hospital city campus:

- A deteriorating environment is eroding quality of care, creating safety risks and potential harm, and causing distress to patients and staff;
- Inflexible and inappropriate care facilities restrict service capacity, cause delays, and increase outsourcing costs;

¹⁷ Southern DHB has developed business continuity plans, including a Health Emergency Plan and meets the legislative requirements for Health as set out in the Civil Defence Emergency Management Plan Order 2015. It maintains a Coordinated Incident Management System and has plans in place for adverse events. Ward and Unit plans for planned power outages across the Dunedin and Southland hospital campuses, loss of medical gasses and IT for certain areas of Dunedin Hospital have been developed. A vertical evaluation plan is in place.

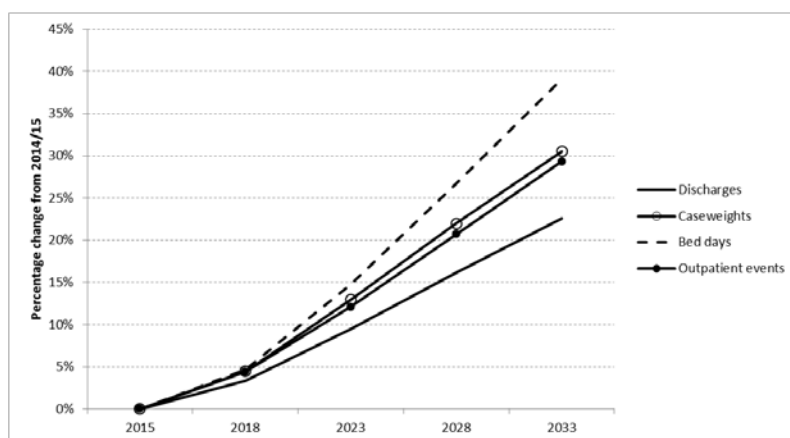
- Care facilities cannot absorb innovations, preventing efficiency gains and care improvements.

4.3 Unsustainable demand forecast under status quo scenario

The Detailed Services Plan part A provides a forecast of activity by department across the Dunedin and Wakari hospitals. The forecasts provide a picture of what future discharges, caseweights and bed days in Dunedin and Wakari would look like if services are delivered under the current model of care, at current intervention rates, as the population changes.

The graph below shows the increases as percentages from the 2014/15 baseline. The increase in discharges is substantial at over 20 percent, but is outweighed by the increases in caseweights and bed days. These reflect the current age distribution of the more complex, higher caseweight inpatient events, and their length of stay, and the impact that the ageing population will have upon the need for services if current models of care continue. The clear message is that the average complexity of a case will increase across the hospital, and that there will be substantial pressure upon bed capacity, under existing models.

Figure 4: Percentage increase in services driven by demographic change



The other important message from the aggregate forecast is that, under current models of care, outpatient events are expected to increase at a faster rate than inpatient events (in fact, at a similar rate of increase to the forecast growth in caseweights). If there is a shift in the setting of provision of some services, from inpatient to outpatient areas, then there will be redoubled pressure upon outpatient capacity. This implies a strong need to review existing outpatient care models, and to scrutinise the need for all of the existing outpatient attendances across the hospital, as well as the potential to provide some of that care in other settings, including primary care.

In terms of the projected volumes, general medicine sees the largest growth in bed days while orthopaedic surgery will be the most expensive in terms of case weights.

Dunedin Hospital currently has 350 resourced acute beds. Based on the forecasts, if the services continue to be provided as they currently are they will need 481 beds, a shortfall of

131 acute beds¹⁸. Similarly, under the forecasts with unadjusted growth, Dunedin Hospital would need to provide a minimum of 17 theatres compared to its current provision of 10 theatres and 3 procedure rooms.¹⁹ Such shortages would require the DHB to outsource core services from 2023/24 onwards.

4.3.1 Reorganising service delivery

The DHB is clear that the current environment for service delivery must change to reduce amenable hospital admissions, reduce length of stay, improve patient flows and provide care for people in the community where appropriate. Existing arrangements are not clinically or financially sustainable.

Through the process of developing the Detailed Services Plan part B, the DHB identified a number of initiatives to improve patient flow, patient outcomes, staff and patient experience and at the same time reduce hospital demand. Examples include:

- Focused ongoing investment in primary and community care to improve care coordination with hospital staff, reduce hospital demand and provide care closer to home.
- Review criteria and roles for generalists and specialists in admitting and managing patients.
- Redesign and streamline models of care so that they are centred on the patient journey prior to admission to hospital, during stay and following hospital discharge into the community.
- Enhanced discharge practice.
- Review workforce roles with a focussed effort on planning a sustainable and flexible future workforce (with a focus on allied health and all staff working to reach their maximum scope of practice).
- Invest in IT, developing a digital hospital and adopt technologies such as telehealth.
- Improve both internal (in the hospital) and external (i.e. with primary care) communication and coordination.

At the time of writing, the DHB is reorganising its change programme. While changes to hospital demand will, to a significant extent, be driven through changes in the way the workforce is organised and services delivered (including the setting), the state and layout of existing facilities clearly impedes the introduction of new, more efficient and effective patient centred models of care.

4.3.2 A modified forecast underpins facility requirements

Based on planning assumptions listed above and outlined in more detail in the Detailed Services Plan part B, a number of scenarios have been modelled to assess the impact that improvements would make on demand. The model takes, as its starting point, a basic forecast that reflects change in population size and age structure. From this starting point, a number of ‘modifiers’ are applied that assume a percentage change in volume that may be achieved over a period from a 2017/18 base. The end result is a modified service demand. Detailed Services Plan part B considers benchmarks from other hospitals or DHBs, and

¹⁸ Excluding acute mental health beds.

¹⁹ Facility demand forecasts are subject to change. They will be retested and validated during the DBC.

provides a rationale for the assumptions. These forecast reductions are relative to forecast growth, and are not absolute reductions.

Table 2 Modified service demand

Specialty	Assumption
Emergency Department (ED)	10% reduction in forecast volumes over 10 years.
General Medicine	Hold bed days flat for a period of 10 years.
Older person's health	Halve the forecast growth.
Orthopaedics	Acutes - 1% p.a. increase in discharges and 10% reduction in forecast ALOS ²⁰ over 10 years. Electives - 3% p.a. increase in discharges and 2% reduction in forecast ALOS over 5 years.
General Surgery	Acutes - 2% reduction in forecast discharges over 5 years and 10% reduction in forecast ALOS over 10 years. Electives - 3% p.a. increase in discharges.
Cardiology	5% reduction in forecast ALOS over 5 years.
Gastroenterology	5% reduction in forecast discharges over 7 years.
Neurology, Renal, Respiratory	5% reduction in forecast discharges over 7 years and 10% reduction in forecast ALOS over 10 years.
Cardiothoracic, ENT, Neurosurgery, Plastics, Urology, Vascular	5% reduction in forecast acute ALOS over 5 years.

The future facility requirements are based on these modified scenarios, the future facility requirements are forecast. Modifying the forecast in this way lessens the facility requirements.

Table 3 Modified facility requirements

Input	Existing	Unmodified demand (Base Case)	Modified demand
Beds (excluding mental health and ISIS)	350	481	427

²⁰ ALOS – average length of stay

Input	Existing	Unmodified demand (Base Case)	Modified demand
Theatres	10 theatres and 3 procedure rooms	17 spaces configurable as theatres or procedure rooms	Unmodified - remains at 17 due to projected increase in elective surgery, waiting lists and unmet demand

Source: Johnstaff

These bed and theatre forecasts will be revisited during the Detailed Business Case (DBC) and retested against an improved data set. In particular, the theatre data set needs close scrutiny and the DHB is working on improving the quality of internal data to enable that scrutiny to happen. This may in turn impact the theatre forecast presented here.

Modified forecasts reduce staff requirements slightly

The base case projections assume an increase of Dunedin Hospital staff to 3,161 staff by 2041/42. This projection assumes existing models of care and intervention rates continue. (This increase in staff is largely due to population ageing, the main determinant of service demand). In comparison, the modified staff forecast assumes an increase in Dunedin Hospital staff to 3,044. This is a small difference, of 117 staff, the majority being nurses.

4.4 Facility needs for the future are clear

Dunedin Hospital will continue to provide tertiary and secondary services to support a range of health needs for neonates, infants, children, adults and older persons. Dunedin Hospital will accommodate patients on a planned and unplanned basis requiring access to complex assessment, diagnostic and interventional technology.

Patients who can be safely treated in the community setting will be supported through a shift towards better integration of tertiary, secondary, primary and community services and increased uptake of technologies such as telehealth. This will be of particular benefit to care coordination for the older person. For patients requiring access to typical clinical services, discussions to date have endeavoured to centre around the patient journey, the relationships among the services and how, as a collective, care can be delivered in the right place at the right time by the right people.

The hospital as a facility needs to provide adequate space to support administration, teaching and research by Southern DHB staff. Strong ties with the university will be maintained.

4.4.1 The projected floor area could be the same as existing area, but differently organised

The overall gross floor area will represent a quantum area based on benchmarks comparing other health infrastructure projects in Australia and New Zealand (Christchurch ASB and Burwood). The gross floor area for these facilities was developed in accordance with the

minimum areas requirements provided within the Australasian Health Facility Guidelines (AHFG)²¹.

For this early stage of spatial planning for Dunedin Hospital the gross departmental floor area of most functional planning units (services / departments and units) varies to existing with some being larger and others smaller. The current fragmentation of services across multiple buildings provides an opportunity for tighter spatial planning, more purposeful accommodation arrangements and better adjacencies to reduce wasted travel time. A rebuild will provide an opportunity to plan more shared areas between units and reduce duplication of space, equipment and building services.

The overall area is estimated to be similar to the existing area, despite introducing new services such as MAPU and allowing for increased circulation routes throughout the buildings. It is envisaged that inside the departments the spaces may appear larger to the user, not only because many rooms are currently undersized (e.g. theatres), but also because there is an opportunity to introduce new approaches to storage, workspace design, staff stations and staff amenities.. Evidence based design principles will mean there is more natural light; external views and the inclusion of nature through planning and organising interiors to create a positive experience for patients and staff.

As detailed planning progresses and the high-level area schedule morphs into a detailed schedule of accommodation, the departmental areas may increase marginally in response to a greater understanding of the performance specifications of the spaces to be occupied.

4.5 Benefits that will be realised

This Strategic Case has highlighted that future service demand will be both clinically and financially unsustainable using the current set of facilities. A well designed, fit for purpose hospital is one of many enablers required to deliver more modern models of care and improve the effectiveness and efficiency of services across the local health care system.

There are therefore benefits that can be directly attributed to an investment in a new hospital development in Dunedin, such as theatre productivity improvements, while other benefits such as reduced admissions will largely depend on wider system improvements and investment in primary and community care. There is a complex interplay of hospital based clinical services, particularly services for the frail elderly, and the organisation and management of community and primary care. For example, shorter length of stay may arise in part because of improved discharge processes, but also because better theatre design and flow results in patients spending less time waiting in beds for surgery.

Table 4 summarises the benefits to be gained from a new hospital. Many of benefits outlined therein are dependent on system improvements being made. However, it needs to be noted that considering changes to primary and community care is not in scope for this Indicative Business Case.

²¹ The AHFG briefing documents are not prescriptive and ask planners to apply the guidelines within the context of a project and the occupants of the facility. The latest revisions make reference to local jurisdictional requirements and models of care which may provide the same space but planned differently across projects.

Table 4 Benefits of the investment

Main benefit	Who benefits	Direct/Indirect	Possible measures
More sustainable health outcomes	<ul style="list-style-type: none"> • Patients and whānau • DHB staff • Wider community 	Both direct and indirect	<ul style="list-style-type: none"> • Reduced net occupied bed days • Increased ratio of telehealth events to outpatient attendances • Reduced staff roster costs to outcomes • Reduced average length of stay
Higher quality patient care	<ul style="list-style-type: none"> • Patients and whānau • DHB staff 	Both direct and indirect	<ul style="list-style-type: none"> • Reduced transit delays between hospital services • Improved patient experience • Lower hospital acquired infection rates
Improved patient and staff safety	<ul style="list-style-type: none"> • Patients and whānau • DHB staff 	Direct	<ul style="list-style-type: none"> • Reduced falls • Reduced health and safety incidents • Reduced medication errors

4.6 Agreed investment objectives and business needs

The investment objectives and business needs were identified in a Case for Change workshop held on 3 November 2016. The investment objectives were endorsed subsequently by the SPG and DHB.

The five investment objectives identified are as follows, all by 2027:

1. Ability to adapt - to create responsive infrastructure and capability that supports disruptive health system change;
2. Optimise use of total health system resources;
3. To reduce non-value added time by 80 percent to create a seamless patient journey;
4. To improve the patient and staff experience, and
5. To reduce the risk of harm to 'acceptable standards'.

Taken together, these investments present a series of important challenges with goals of greatly enhanced efficiency as well as substantial improvements for staff and patients.

Note: the 'achieved by' date of 2027 was selected by the SPG and DHB prior to the options analysis set out in the Economic Case and the programming of the short list options that shows completion/occupancy dates of 2027 and after. While the DHB is currently working on initiatives to achieve these objectives, it will need to reassess the timeframes for achieving these objectives during the DBC process.

Table 5 Investment objective 1

Investment Objective One	Ability to adapt - to create responsive infrastructure and capability that supports disruptive health system change <u>by 2027</u>
Existing Arrangements	<ul style="list-style-type: none"> There are a number of factors that hinder the rollout of more modern models of care required to improve efficiencies and the effectiveness of hospital services. These include the design, configuration and condition of the existing infrastructure. Further, due to the current state of the buildings the hospital system has limited resilience to major events.
Business Needs	<ul style="list-style-type: none"> Need to design hospital infrastructure that can flex to accommodate future changes in technology, service models and capacity. Hospitals need to be patient centric in design (human design) and resilient to future changes and events including pandemic outbreaks in disease and catastrophic disasters.
Possible Measure	<ul style="list-style-type: none"> Ability to flex to upper and lower forecast limits

Table 6 Investment objective 2

Investment Objective Two	Optimise use of total health system resources <u>by 2027</u>
Existing Arrangements	<ul style="list-style-type: none"> For a number of reasons patient flows through the hospital are largely inefficient, with inconsistent high variability processes and pathways, interrupted care, repetitive and duplicated effort, all resulting in delays to providing timely access to quality health services. Services are not always provided in a timely manner leading to increased length of stay. There are recognised workforce capacity constraints, e.g. across many allied health specialities. and There is inadequate investment in innovative models and tools to optimise use of resources, and insufficient uptake of tools where these have been introduced (e.g. HealthPathways).
Business Needs	<ul style="list-style-type: none"> Encourage and reward staff innovation and flexibility as a mindset. Introduce lean methodology into service design and extend where this has been implemented (e.g. Productive Series) to increase efficiencies over time. Implementation/extension of HealthPathways and other similar tools. Workforce planning - looking for roster efficiencies, extending workforce to work under full scopes and possible labour substitution (e.g. Physician Assistants).

	<ul style="list-style-type: none"> • Enable an aspirational zero cancellation target for procedures. • Co-ordination of surgical lists and theatre capacity, with ICU and bed capacity. • Live within our means.
Possible Measure	<ul style="list-style-type: none"> • Acute bed days, ED admissions, ALOS, readmissions • Conversion to surgery rate from elective referrals • Increased patient experience • Proportion of patients that return to previous circumstances • Residential care rates for over 75 year olds • Revenue exceeds expenses (no deficit) • No deferred maintenance

Table 7 Investment objective 3

Investment Objective Three	To reduce non-value added time by 80% to create a seamless patient journey <u>by 2027</u>
Existing Arrangements	<ul style="list-style-type: none"> • Poor flows, constrained by current layouts • Interrupted care • Unnecessary and repeated testing • Need for staff work-arounds • Split-site hospitals • Referrals in from rural providers poorly coordinated leading to inefficiencies
Business Needs	<ul style="list-style-type: none"> • 24/7, 365 days a year services where appropriate • Lean productivity concepts used as a model to reduce process delays and handovers • The right person gets right services at right time and the right place • Efficient flow from admission to discharge
Possible Metrics	<ul style="list-style-type: none"> • Reduced cancellation rates for operations • Reduced outpatient non-attendance rates (DNAs) • Reduced avoidable delays • Reduced waiting times

Table 8 Investment objective 4

Investment Objective Four	To improve the patient and staff experience <u>by 2027</u>
Existing Arrangements	<ul style="list-style-type: none"> • Poor staff morale and engagement. • Poor working environments. • Lack of privacy for patients. • Cancellations, delays and unnecessary testing. • Unnecessary steps/ interrupted patient flows.
Business Needs	<ul style="list-style-type: none"> • Enhanced community confidence in the DHB. • A hospital consistently scoring either at, or above, the national average on patient experience surveys. • Enhanced patient, family and staff satisfaction.
Possible metrics	<ul style="list-style-type: none"> • Patient experience surveys • Staff engagement surveys • Cancelled/postponed operations and outpatient appointments • Wordle comments

Table 9 Investment objective 5

Investment Objective Five	To reduce the risk of harm to ‘acceptable standards’ <u>by 2027</u>
Existing Arrangements	<ul style="list-style-type: none"> • Delays and interruptions in timely care. • Workarounds with the potential for additional risk of harm. • Physical facilities and building services that are neither fit for purpose nor compliant.
Business Needs	<ul style="list-style-type: none"> • Enable the elimination of ‘never’ events of harm (events that have the potential to cause serious harm, which is wholly preventable e.g. wrong site surgery). • Zero falls (with harm).
Possible Metrics	<ul style="list-style-type: none"> • Hospital acquired infection rates • Falls rates • Staff harm rates • Adverse events (HQSC) • Medication reconciliation (HQSC) • Hand hygiene (HQSC) • Surgical safety checklist (HQSC)

4.7 Risks

The build project involves many risks, principally around the programme and planning stage. A risk summary is included at Appendix 4.

Construction risk needs to be looked at closely in the DBC stage. (For example, by using a risk workshop identifying categories of risk, likely magnitude, high/low/midpoint impacts and whether risks correlate. Some risk distributions might be possible to simulate).

4.8 Constraints and dependencies

The business case is subject to the following constraints and dependencies. Dependencies will be carefully monitored during the project.

Table 10 Constraints and dependencies (project specific and general)

Item	Notes
Project specific constraints	Notes and management strategies
Funding for capital investment and ongoing to meet the capital costs	To be further explored in collaboration with Treasury and Ministry of Health officials.

Item	Notes
Project-specific dependencies	Notes and management strategies
Availability of a suitable site for the Dunedin hospital redevelopment	The Dunedin hospital redevelopment will affect the strategic, facility and service models of care delivered by the Southern DHB. The site selection process will require that strategic, facility and service models are considered.
Investment in information technology to enable implementation of a digital hospital, and innovations to support modern health care delivery (e.g. patient portals, telehealth).	This project is dependent on the IT strategy being developed by Southern DHB and this will be covered in more detail in the DBC. IT is a key enabler of benefits from the Dunedin Hospital redevelopment.
Need to reframe patient and providers' expectations relating to location, arrangement and distribution of services in new models of care	A wider change management/engagement programme will be required to articulate new models of care
Availability of construction expertise at critical points of the redevelopment	The Ministry of Health will explore national and international expertise
General dependencies	Notes and management strategies
Staff capacity may be constrained to drive both transformational change and keep business as usual operating	The DHB has recently released a change proposal to streamline staff in line with future strategic priorities
Funding and workforce availability to support new models of care	Ongoing investment required into primary and community care Workforce modelling and planning required
Workforce and/or training issues required to deliver new/enhanced strategic models of care	Time-lag associated with training and redesign of future workforces will need to be planned for and resourced
Primary and community care's capacity, and appetite, to operate a revised model of care in line with the Southern DHB's transformational change programme.	Capacity, finance, sites and ways of working between primary and secondary care will require realignment and likely redesign of services.
Continue delivering full clinical services during delivery of transformational change programmes	Including, but not limited to, construction activity associated with the Dunedin Hospital redevelopment

5. The Economic Case – exploring the preferred way forward

The purpose of the economic case is to identify the investment options that optimise value for money. This is achieved through:

- identifying Critical Success Factors (CSF);
- generating a wide range of options;
- an initial options assessment to identify a limited number of short-listed options that would potentially meet the investment objectives and critical success factors;
- closer assessment of the options, and
- identifying a preferred way forward based on the short-listed options.

The initial part of this Economic Case deals with the generation of options (with a short description of the Base Case) before providing a closer assessment of the options.

5.1 Critical success factors

The following CSFs were identified and agreed by stakeholders through a series of meetings and workshops. Note, these factors have been reassessed as part of the process and, in particular, the cap on affordability has been removed and replaced with ‘relative affordability’, with the intention of focussing on options that are ‘most affordable’.

Table 11 Critical Success Factors

Critical success factor	Description
Meets the business needs of the DHB	<ul style="list-style-type: none"> • Meets agreed investment objectives and related business needs and service requirements. • IL4 services are provided from IL4 compliant facilities. • Enables continuity of services during the investment period. • Ability to meet future demand for services
Strategic fit	<ul style="list-style-type: none"> • Is aligned with the strategic directions of the Government, the Ministry of Health and the DHB – i.e. care is provided closer to the home and services are organised based on modern, integrated models of care. • Is aligned with regional planning and/or takes into account regional uncertainties. • Is able to meet government priorities. • Enables the delivery of safe high quality care. • Provides positive staff and patient experience.

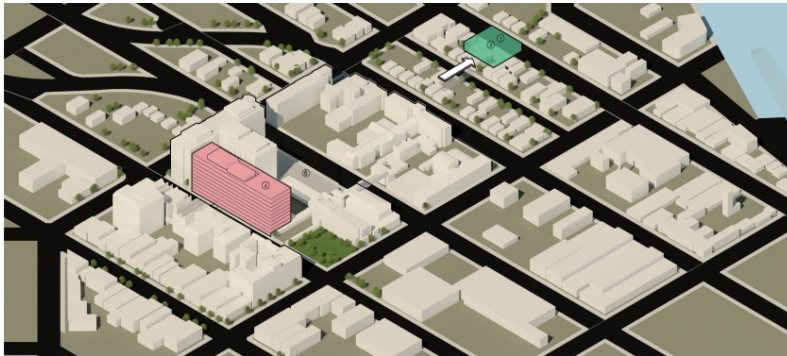
Critical success factor	Description
Perceived value	<ul style="list-style-type: none"> • Delivery of care to patients and value for money is optimised– e.g. if the facility allows improved health outcome against indicators such as length of stay, reduced ED admissions and repeat admissions, improved patient experience that wouldn't be achieved without the investment, then the investment should be considered as value for money.
Relative affordability	<ul style="list-style-type: none"> • The DHB has access to capital to meet the build costs and can continue to fund the capital costs. • Does not displace other DHB priorities, such as IT and capital investment. Further investment will be required for the DHB to operate modern models of care (e.g. digital hospital, telehealth).
Achievability	<ul style="list-style-type: none"> • Enables continuity of service during the investment period. • Can be done in the proposed time frame with the current resources and support. • Within the programme's control and influence. • Able to engage with the community through the process. • Land acquisition and consenting is achieved within the required timeframe.

5.2 The Base Case as a 'do minimal' counterfactual

The Base Case is typically where investors would look to work the existing infrastructure to prolong its life where feasible, with targeted additional investment. In most investment cases, the Base Case is the alternative counterfactual - the 'status quo' or 'do nothing' option. While the Base Case is presented in this business case as the counterfactual, because conditions at Dunedin's CSB are so critical, it represents a 'do minimum' approach rather than a 'do nothing' approach. Where possible, the Base Case is designed to minimise capital expenditure and utilise existing infrastructure and/or locations.

In this IBC the Base Case involves a scenario in which the Dunedin city campus is kept at a point at which it is just serviceable. This requires demolition of the Psychiatric Services Building and a CSB that is incapable of being renovated and refurbished along with the lecture theatres on the Dunedin city campus. The Base Case sees the construction of a new replacement CSB by 2025. A new Energy Centre will also be built and commissioned by 2025.

Figure 5 Indicative hospital layout in Base Case



All other buildings remain in operation, creating a challenging high cost, high maintenance working environment. The Ward Block building in particular will begin to fail and will become unserviceable due to being uneconomic to “re-life” – a term for substantial renovation (Beca, 2017). Demolished accommodation within the Psychiatric Services Building and University of Otago lecture theatre will be re-provided and integrated into the new CSB. There will be no change to Wakari site configuration.

5.2.1 Limited changes to hospital services

The replacement CSB will provide an opportunity to improve patient and staff flow. For example, there will be improvement to departmental layouts and room configurations with minimum area sizing aligned to the Australasian Health Facility Guidelines. In the base case, however, there is no increase in the quantity of key inputs such as operating theatres and imaging systems.

The Detailed Services Plan part B illustrates the pressures that future growth will have on the Dunedin city campus, staff, and the wider health system. For the Base Case there will be a limited number of service changes in response to these pressures, for instance:

- Acute Care
 - Interventional Suite - will remain with ten operating theatres and one procedure room. No change to the post-anaesthesia care unit, day surgery or obstetrics. The Base Case will combine the Theatre Sterile Services Unit and Central Sterile Services Unit.
 - Critical care – the Emergency Department (ED) and imaging will be provided in the new CSB. ED will include emergency psychological services.
 - Medical and surgical inpatients would remain in Ward Block.
- Ambulatory Care
 - The Fracture Clinic will be provided in the new ED. Specialist Ears, Nose and Throat (ENT), eyes and speech therapy clinics re-provided in the new CSB.
- Clinical support services
 - Laboratory re-provided. No change to the mortuary location.
- Rehabilitation and Older Persons
 - Allied health gym re-provided.

- Mental health (as currently provided in the Psychiatric Building)
 - Emergency Psychiatric Service reprovided as an integral part of the Emergency Department
 - Mental Health Older Persons Service day hospital re-provided
 - Psychiatric day unit re-provided
- Administration and supporting services
 - Corporate offices and medical records storage re-provided
- Academic, research and skills development requires replacement of University of Otago lecture theatres
- Ward Block remains as uneconomic to renovate and refurbish and unsuitable for clinical use.

5.2.2 Practical barriers to implementing the Base Case

There are a number of practical barriers that would make the Base Case very challenging to implement and meet the Critical Success Factors:

- The site is constrained making the build process more complex.
- The new CSB will offer benefits but material efficiency flows will not be realised and outsourcing services for future demand will likely be necessary.
- Clinical units will continue to work in isolation and functional relationships between services will be ineffective - important aspects of flow and relationships will not be addressed and access would be hampered.
- The link between the new CSB and Ward Block will be compromised with differing floor to floor heights and no level travel between two buildings.
- Issues with the Ward Block remain (spalling, latent asbestos and a range of maintenance issues) that would require substantial investment to maintain functional and safe.
- The Ward Block remains a poor fit for modern clinical service needs.
- Critically, this option is unable to meet forecast service volumes over the next 25 years and therefore will not meet the service objectives.

5.2.3 Summary – not an option to carry through to the short list

The Base Case appears affordable in the short term (in the sense that Crown capital investment is relatively small, compared to the other options). It reuses existing infrastructure, which also appears attractive at first. Over time, however, the buildings will fail and further investment (in the hundreds of millions) will be needed. Ten years out, the Base Case requires greater capital investment and has in aggregate greater deficits.

This option is unlikely to realise any benefits of new models of care. This option is impractical to implement given the constrained site and the compromised link between the replacement CSB and the Ward Block.

5.3 Canvassing a wide range of options

Although the process for arriving at a short list presents in this paper as linear, this is not the case. In particular, there has been a continuous flow of information around the state of the hospital buildings and in particular the work needed to renovate and refurbish the Ward Block. Through this process the range of options and the assessment of those options has become progressively clearer.

On 14 December 2016 a workshop was held with Southern DHB and consultants (Sapere Research Group, Jacobs and Johnstaff) to develop a long list of investment options. The long list began with a description of the services to be provided under each investment option. The workshop also covered the location of services in terms of single site, split site, existing sites and new sites. The SPG confirmed a list of seven options: A through to G. All of these options support modern models of care and the hospital's revised role across the DHB's health system, with a primary focus on providing services to the frail elderly.

5.3.1 Some comments about developing the options:

- There are challenges to how the DHB operates over two main hospital sites in Dunedin and Invercargill. Unfortunately, the distances are too great for there to be an acute/elective service split across these sites, as found in some other areas of NZ.
- Dunedin Hospital operates in downtown Dunedin, as well as at Wakari. There are a number of opportunities to re-look at how these two sites are organised. A substantial part of aged care services are based at Wakari and it is expected gerontology services will be integrated much more closely with front line services in Dunedin's main hospital to enable early interdisciplinary team based assessment and planning for the coordinated discharge of patients back to home and continuing care in their community.
- Moving acute hospital services into the existing Wakari facility is not a realistic option and has been discarded. Wakari Hospital is a large, inflexible facility which would be very costly to change to meet modern clinical standards. Most clinical buildings of similar type around NZ are being decommissioned or used only for non-patient activity such as administration. There is an open question as to how services can be simplified and integrated in one place, and there will need to be particular consideration of the rehabilitation model in relation to providing more rigorous active rehabilitation programmes within Dunedin Hospital and the pathway for transitioning to rehabilitation provided within the community.
- Running across the top of the debate is the possibility of establishing/leasing community health hubs to deliver acute care and continuing care coordination closer to home (e.g. supporting community based rehabilitation and care of the elderly). A health hub could also provide part of a solution for a decanting strategy needed for some of the options. The Clinical Leadership Group is enthusiastic of the care changes that might be accomplished and, also of the community based triaging options. However, there needs to be sufficient scale to make these hubs work efficiently and effectively.
- Primary and community care services and IT are not in scope and parking will need to be allowed for but construction of a car park is out of scope and will need to be financed elsewhere.
- Finally, at this stage the University's needs are less developed. As such, no University-specific space has been included in the costings and will be an add-on. The academic,

education and research user group identified the benefits of shared inter-professional learning and research hubs, greater emphasis on education and research occurring within the clinical areas, all supported by a culture of peer supported learning, enquiry and problem solving. Dialogue with the university will continue and options for co-location explored further.

Table 12 Scope of services

Minimum scope	Maximum scope	Out of scope
<ul style="list-style-type: none"> All services currently provided in the existing CSB 	<ul style="list-style-type: none"> All services currently provided on the Dunedin city campus and all services currently provided on the Wakari site 	<ul style="list-style-type: none"> Primary and community care services Any mental health service beyond emergency psychiatric service provided as part of the Emergency Department.²² Information technology (aside from backbone within buildings) Public car parking University-only spaces for research and education

5.4 Long list options

There are seven options on the long-list canvassed in this IBC, alongside the base case. These options are described (in this section) before discussing the short list (in the next section).

Option A – new acute clinical services building and refurbished Ward Block

This option introduces a new CSB to the Base Case. The Ward Block is refurbished for ambulatory, inpatient and university accommodation. The CSB will be constructed on university owned land adjacent to the existing site. Existing University accommodation (Hayward College and Cumberland College) will need to be demolished and provided for elsewhere. The Fraser Building will also need to be demolished and a hub built to decanter services to. A new Energy Centre will be provided. Under this option the new CSB will be commissioned mid-2026 with completion of the Ward Block refurbishment late 2031²³.

²² In these early planning stages of the redevelopment it has been assumed that all services currently provided in the Psychiatric Services Building will be re-provided. Older Person Mental Health and Older Person Health is assumed to have a presence for community based day programmes within a community setting. Similar spaces will be available to both services.

²³ Dunedin Hospital Redevelopment Master Programme Version 01b.

Figure 6 Indicative hospital layout in Option A



Option B – new CSB and inpatient accommodation, re-using the Ward Block for outpatients

Option B includes a new CSB and Inpatient Units (IPU) to deliver inpatient accommodation for Dunedin city campus services. The majority of ambulatory services and non-clinical services will be provided in the existing refurbished Ward Block with some non-clinical services distributed across both buildings. As with Option A, the CSB and IPU will be constructed on existing University owned land adjacent to the hospital's existing site. Existing university accommodation (Hayward College and Cumberland College) will need to be demolished and provided for elsewhere. The Fraser Building will also need to be demolished and a Hub built to deconter services to. A new Energy Centre will be provided. Under this option the new CSB will be commissioned early-2029 with completion of the Ward Block refurbishment mid-2031²⁴.

Figure 7 Indicative hospital layout in Option B



²⁴ Dunedin Hospital Redevelopment Master Programme Version 01b.

Option C – new core services on an adjacent site

Option C provides for a new CSB and IPU that integrates and consolidates services spread across several buildings into a logical arrangement of functional planning zones. The new build enables for enhanced models of care for many services. As with Options A and B, the building will be constructed on University owned land adjacent to the existing site. Existing university accommodation (Hayward College and Cumberland College) will need to be demolished and provided for elsewhere. The Fraser Building will also need to be demolished and a Hub built to decanter services to. A new Energy Centre will be provided. Under this option the new hospital will be commissioned mid-2030.²⁵

Figure 8 Indicative hospital layout in Option C



Option D – rebuild on adjacent site and community health hubs

Option D is effectively the same as Option C, with the exception of health hubs providing ambulatory services in the community.

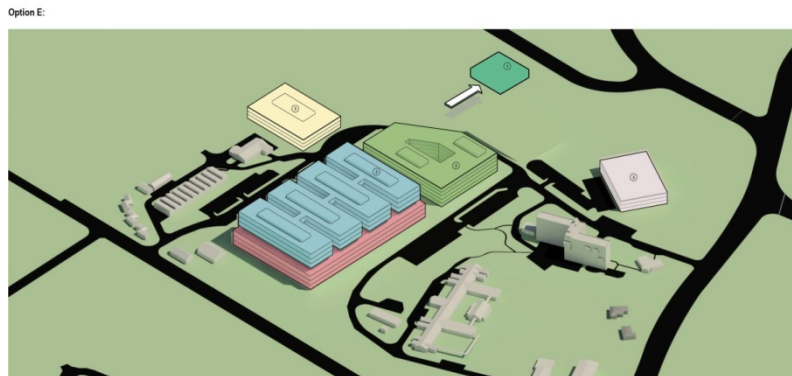
Option E – new build on Wakari site

Option E includes a new build on Wakari site to accommodate all existing Dunedin City campus services. This includes all clinical and non-clinical services and the Oncology Centre. Some replacement of mental health services and decanting of services into a new facility will likely be needed to facilitate clearing for the new hospital site. There is the potential space to relocate some university services on site (and this remains open to future discussion with the University). At this stage the new hospital is programmed to be commissioned in December 2027. However, it should be noted that due to the need to demolish existing buildings and decant services the timeframe will likely possibly be longer.²⁶

²⁵ Dunedin Hospital Redevelopment Master Programme Version 01b.

²⁶ Dunedin Hospital Redevelopment Master Programme Version 01b.

Figure 9 Indicative hospital layout in Option E



Option F – full rebuild including new mental health facilities

Option F includes a new build replacing all Dunedin city campus services (clinical and non-clinical) including the Oncology Centre, on a new site. This option does not include all Wakari services, but does allow for acute adult mental health services. Under this option, the new hospital will be commissioned early 2027²⁷.

Figure 10 Indicative hospital layout in Option F



Option G – a full rebuild of everything including forensic mental health facilities

Option G includes a build on a new site to replace all Dunedin city campus and Wakari clinical (e.g. Oncology Centre, forensic mental health services) and non-clinical services. This is a new hospital build for Dunedin City and effectively closes down the Wakari site. Under this option the new hospital will be commissioned late 2027²⁸.

²⁷ Dunedin Hospital Redevelopment Master Programme Version 01b.

²⁸ Dunedin Hospital Redevelopment Master Programme Version 01b.

Figure 11 Indicative hospital layout in Option G



5.5 Assessment of long list

The SPG met on the 28 March 2017 to work through and shorten the set of options based on the analysis presented above.

During this process Base Case and Option A were ruled out as feasible options primarily because substantially renovating the Ward Block for clinical use would be a complex, disruptive and time consuming process. Refurbishing the Ward Block would not result in a modern, flexible, fit for purpose health facility at the conclusion that is compliant with IL4 standards.

It also became apparent that Option G is the least affordable and most exceeds the requirements as set out in the problem definition and strategic assessment for this business case with likely limited marginal capital gain. However, this option is achievable in the longer terms on a suitable site and with appropriate master planning (avoiding a repeat of the current situation).

It also became apparent that the remaining options were all those that required a new build on a new site (C – F) with no refurbishment of existing buildings required. Each of these options has at their core acute clinical services, IPU, non-patient services and ambulatory services (each of which is required). However options C – F varied on whether or not services remain on existing adjacent site (option C and D), are moved to Wakari (option E), and on the scope of additional services to be included (variables include health hubs, oncology services, acute adult mental health inpatient and university only research and teaching).

The SPG directed the following options be further reviewed:

Option B (on adjacent site)

To include: a new CSB and IPU for Dunedin city campus services refurbished Ward Block for ambulatory services and non-clinical services, [REDACTED] on the site to accommodate Southern DHB internal parking requirements and public drop off parks - no allowance for general staff, afternoon staff or general public parking (as this is out of scope and will need to be financed elsewhere). There would be a new Energy Centre, space for shared university and DHB learning and research and the CSB and IPU would be constructed on University owned land adjacent to the hospital's existing site. As a consequence, existing University accommodation (Hayward College and Cumberland College) would need to be demolished and provided for elsewhere. The Fraser Building would also need to be demolished and services provided for elsewhere.

- A total building area of [REDACTED] of refurbished space).derived by combining benchmarked areas across a number of health infrastructure projects and key inputs such as bed numbers converted from modified activity projections in the detailed clinical service plan part B.
- The new Clinical Services Building will be commissioned in early 2029.
- It will take until 2031 to refurbish the ambulatory part and back of house functions of the Ward Block and relocate services.
- This option excludes any modifications to the Ward Block to remedy spalling, latent asbestos and maintenance issues.
- Estimated cost - [REDACTED] Inclusions and exclusions are detailed in Appendix 3.

Further options to be considered as inclusions to Option B with additional costs include:

- A new health hub to decant services from the Fraser Building with a focus on community mental health and older persons health within community context
 - Refurbishment of the Ward Block for University only accommodation that could potentially be included and leased back to the DHBdavin
- Changes to the Ward Block building envelope.
- General public parking

New hospital on new site

To include: A new fit for purpose CSB, IPU and ambulatory services on a new site. The key difference between the option set out above and this option is that the former requires a retrofit of an existing building and the latter, depending on site size and shape, presents potentially better orientation, geometry, spatial layout and functional relationships. The opportunity for scale and further development may exist along with green space for paediatric and rehabilitation services in particular (and acute mental health if included).

- A total building area of [REDACTED]
- The new hospital will be commissioned in February 2027 (although if built on the adjacent site the date would be May 2030)
- Estimated costs - [REDACTED] Inclusions and exclusions are detailed in Appendix 3.
-

If the space allows, the following services could be provided in addition and at additional cost on the site:

- Health hub(s).
- Oncology services.
- Acute adult mental health inpatient.
- University only space that could be leased back to the university.

At this stage the site is unknown, and will need to be acquired and resource consent obtained. Depending on the availability and selection of an alternative site there may or may not be a physical dislocation from the central business district, university and polytechnic.

New hospital on Wakari site

This option provides for a new fit for purpose CSB, IPU and ambulatory services on DHB owned land. Its main benefits are that the DHB already owns the land and that the site is relatively large with plenty of green space. There may be a need to demolish some existing facilities and decant services to clear sufficient space for a new build. This could add cost, time and create service disruption at Wakari. However, potentially its main draw-back is its distance from the CBD, university and polytechnic and that it would likely encounter community opposition. There would also need to be further understanding of the travel and transport implications of moving the hospital to this site.

- A total building area of [REDACTED] derived by combining benchmarked areas across a number of health infrastructure projects and key inputs such as bed numbers converted from modified activity projections in the detailed clinical service plan part B
- The new hospital will be commissioned in December 2027 (potentially longer to allow for demolition and decanting)
- Estimated costs [REDACTED] Inclusions and exclusions are detailed in Appendix 3
-

As with both options above, this option could include (at additional expense):

- Health hubs located in the community or the existing city campus site²⁹.
- Oncology services.
- University only space that could be leased back to the University.
- Space requirements and accommodation needs will be reviewed again during the Detailed Business Case. A reduction in size of [REDACTED] from the initial estimates.

5.6 Real and escalated redevelopment costs

The real and escalated cost of each of the shortlisted build options is summarised below. The escalated figures allow for the timing of the build/transfer, whereas the real figures show an estimate of the cost if the hospital was built today.

Further details on the inclusions and exclusions are provided in Appendix 3.

²⁹ Alternatively, health hubs might instead be provided as leased space.

Table 13 Estimated cost of Dunedin Hospital redevelopment*

\$ Millions	Real cost of build	Escalation	Escalated cost of build
Base Case	■	■	■
Option B (Adjacent site)	■	■	■
New Hospital on new site	■	■	■
New Hospital on Wakari site (initial estimate only)	■	■	■

* Early indicative figures. Range could be plus or minus 10 percent.

Source: RLB, Sapere Research Group

The figures for the Base Case, Option B and new hospital on new site have been sourced from RLB quantity surveyors. An indicative cost of a new hospital on the Wakari site has been estimated by RLB using the new hospital on new site option, with a deduction to reflect the cost of the land and additional escalation of ten months.

The cost of build figures do not encompass every item on the DHB’s 25 year plan for capital expenditure at the hospital. They only account for new build / redevelopment costs (not, for example, for the costs required to maintain or alter other buildings on campus). These costs are discussed in the context of whole of life costs and benefits, set out below.

5.7 Whole of life costs and benefits

The whole of life calculations capture the entire spend on Dunedin and Wakari hospital facilities, including expenditure on replacing or renewing existing buildings. Crucially, Option B and the Base Case both include significant costs in relation to keeping the Fraser Building and Ward Block operational beyond 2021/22, and these costs are avoided in the New Build options. This replacement will likely require ongoing reliance on deficit support, or at least, capital funding decisions that are beyond the scope of this IBC.

Table 14 below shows the 25 year sums of building replacement or major repair expenditure expected by the DHB alongside the redevelopment cost figures included above in Table 13. No allowance for replacement of non-building assets (like furniture or fittings) has been included in these figures. The first column is the total cost of the build, as estimated by the quantity surveyor. The second column is the value transferred to the DHB following the build. These values vary because the values transferred exclude the value of some components (for example student accommodation from option B), since this value represents a transfer from the Crown to another party. There is also an adjustment for the value of furniture, fixtures and fittings in Option B.

This table illustrates that in the Base Case and Option B, the future capital requirements for buildings are larger than for the amounts funded as part of this IBC. This table also indicates that when these replacement expenditures are accounted for, the money saved on replacement in new build option would entirely offset the higher build cost it entails. There is no allowance for what might happen to the buildings beyond this 25 year time horizon, although it is certain that replacement of many of the buildings will be required.

Table 14 Sum of capital expenditure for Dunedin Hospital 2017/18 – 2041/42

(\$ Millions)	Total cost of re-build (incl. escalation, contingency)	Rebuild capital value transferred to SDHB	Future capital requirements (25 year sum of capital needed for replacement or major repair of DHB hospital buildings, not covered by IBC)
Base Case	████████	████████	████████
Option B (adjacent site)	████████	████████	████████
New build new site	████████	████████	████████
New build Wakari site	████████	████████	Not modelled by DHB

Source: Southern DHB, Sapere Research Group

The table below summarises the whole of life impacts (in present values) of the short listed options. The whole of life costs are the present values of the build costs set out in the first column of the table above.

The whole of life benefits include: improved hospital efficiency, net of additional rates, utility and maintenance expenditure and projected savings on building replacement (with building replacement being derived from the figures underpinning the sums represented in the rightmost column above). Each benefit is stated as relative to the Base Case.

There are no terminal values for building replacement or repair beyond 2041/42 in the present value calculation. We note that these are material, and will lead to Option B having even lower net value. It will not change the ranking between build options.

The public sector discount rate (cost of capital) is 6.0 percent.

Financing charges (depreciation, capital charge) are excluded as these are accounted for in the cost of capital. There are no impacts included here that are not readily monetised, including improvements to health services for the Southern population, improvements for staff or improvements to safety or risk.

Real build values and escalation amounts are included at Table 13 page 42.

Table 15 Whole of life (PV) costs and benefits of hospital redevelopment

\$ Millions	Base Case	Option B (adjacent site)	New build new site	New build Wakari site
Whole of life costs (pv)	████	████	████	████
Whole of life benefits (pv)	█	█	█	█
Net value	████	████	████	████

Source: Sapere Research Group

5.8 Assessment against Investment Objectives and Critical Success Factors

The revised short list of these three options has been assessed against the Investment Objectives and CSF.

Table 16 –Short list assessment against the investment objectives

Investment Objectives	Option B (Adjacent site)	New hospital on Wakari site	New hospital on new city site
<p><u>Investment objective one</u> To create a responsive infrastructure that supports disruptive health system change</p>	<p>Advantages</p> <ul style="list-style-type: none"> A new new acute CSB and IPU enabling more modern productive and patient centred models of care. <p>Disadvantages</p> <ul style="list-style-type: none"> The Ward Block is still constrained with low ceiling height. Still a split site with services at Wakari. Tight site may limit future options for development, may not be ‘elderly friendly’ and will provide logistical issues Service disruption due to decanting <p>Risks/uncertainties</p> <ul style="list-style-type: none"> Constraints of building modern hospital on relatively tight city site Constraints on future flexibility 	<p>Advantages</p> <ul style="list-style-type: none"> A new new acute CSB, IPU and ambulatory services enabling more modern productive and patient centred models of care. Co-location of mental and physical health services Site has options to scale up Can work with the land to make it fit for purpose <p>Disadvantages</p> <ul style="list-style-type: none"> Maybe some disruption to mental health services through the decant process and may increase both time and cost Dislocation from oncology services provided on current site. Dislocation from university and polytechnic <p>Risks/uncertainties</p> <ul style="list-style-type: none"> Helicopter service might be an issue in the area 	<p>Advantages</p> <ul style="list-style-type: none"> All existing Dunedin city campus (excluding oncology services) provided on the same sight in a modern fit for purpose hospital. Services not disrupted as a result of decanting Potentially, site has options to scale up <p>Disadvantages</p> <ul style="list-style-type: none"> Services still provided across two sites – Dunedin and Wakari Dislocation from oncology services, depending on specific location. <p>Risks/uncertainties</p> <ul style="list-style-type: none"> Need to acquire site / site specific Could increase distance between Wakari and Dunedin city campus Could increase distance between hospital and university and polytechnic

Investment Objectives	Option B (Adjacent site)	New hospital on Wakari site	New hospital on new city site
<p>Investment objective two Optimise use of total health system resources</p>	<p>Advantages</p> <ul style="list-style-type: none"> • Modern new acute CSB and IPU design enabling improved patient flows, increased productivity, reduced length of stay and more efficient delivery of care • Refurbishment option for the Ward Block is adequate for office space and certain procedures • Could locate some Wakari services in the Ward Block <p>Disadvantages</p> <ul style="list-style-type: none"> • Still need to replace old plant – more expensive over the 25 year horizon • Need to demolish university accommodation and provide alternative • Need to build a hub to decant services from Fraser Building • Constrained site will make it more complex to build • With refurbishing Ward Block, investing in old building that is not IL4 compliant • Likely as or more expensive than a new build 	<p>Advantages</p> <ul style="list-style-type: none"> • Modern hospital design enabling improved patient flows, increased productivity, reduced length of stay and more efficient delivery of care • Don't have to retrofit an existing structure • Potential to bring other businesses on site • Can potentially sell Dunedin city campus site <p>Disadvantages</p> <ul style="list-style-type: none"> • Significant site works needed. • Some decanting likely required. 	<p>Advantages</p> <ul style="list-style-type: none"> • Modern hospital design enabling improved patient flows, increased productivity, reduced length of stay and more efficient delivery of care • Don't have to retrofit an existing structure • No decanting costs • Can potentially sell Dunedin city campus site <p>Disadvantages</p> <ul style="list-style-type: none"> • Unknown site works and consenting requirements, until site selected <p>Risks/uncertainties</p> <ul style="list-style-type: none"> • Potential staff travel time, until site selected

Investment Objectives	Option B (Adjacent site)	New hospital on Wakari site	New hospital on new city site
<p>Investment objective three To reduce non-value added time by 80% to create a seamless patient journey</p>	<p>Advantages</p> <ul style="list-style-type: none"> • Modern design allowing the widespread introduction of Lean productivity concepts and efficient flow from admission to discharge • Fit for purpose design will reduce delays and duplication of staff effort, although ambulatory services are still provided in the old Ward Block <p>Disadvantages</p> <ul style="list-style-type: none"> • Ambulatory services are still provided in the old Ward Block across the state highway • Services still provided at Wakari and there may be some unnecessary duplication, repetition and travel • Service decanting <p>Risks</p> <ul style="list-style-type: none"> • Is the site large enough for a modern hospital? Ability to scale? 	<p>Advantages</p> <ul style="list-style-type: none"> • Modern design allowing the widespread introduction of Lean productivity concepts and efficient flow from admission to discharge • Fit for purpose design will reduce delays and duplication of staff effort • Most existing clinical and non-clinical Dunedin and Wakari services provided on one site <p>Disadvantages</p> <ul style="list-style-type: none"> • Inefficiencies/loss of productivity due to staff being split between Wakari site, Oncology Centre, university and polytechnic 	<p>Advantages</p> <ul style="list-style-type: none"> • Modern design allowing the widespread introduction of Lean productivity concepts and efficient flow from admission to discharge • Fit for purpose design will reduce delays and duplication of staff effort • Services not disrupted as a result of decanting <p>Risk</p> <ul style="list-style-type: none"> • Travel may be an issue for staff depending on proximity to Wakari, Oncology Centre, the university and polytechnic

Investment Objectives	Option B (Adjacent site)	New hospital on Wakari site	New hospital on new city site
<p>Investment objective four To improve patient and staff experience</p>	<p>Advantages</p> <ul style="list-style-type: none"> • Modern new acute CSB and IPU design enabling improved patient flows, reduced waiting time and length of stay • Improved working environment • Improved spatial layout and aesthetics • Refurbished Ward Block for non-clinical and suitable ambulatory services • Close proximity to the university and polytechnic <p>Disadvantages</p> <ul style="list-style-type: none"> • Services are still provided across the Dunedin and Wakari sites • The state highway bisects the refurbished Ward Block (ambulatory) and Oncology Centre • No green space • DHB does not own land 	<p>Advantages</p> <ul style="list-style-type: none"> • Single site modern build reducing staff travel time • Improved patient flows, reduced waiting time and length of stay • Improved working environment • Available green spaces • Ease of car access (two access points) and parking <p>Disadvantages</p> <ul style="list-style-type: none"> • Inefficiencies/loss of productivity due to staff being split between Wakari site, Oncology Centre, university and polytechnic • May entail additional travel time for patients and staff • Ease of public transport access <p>Risks/uncertainties</p> <ul style="list-style-type: none"> • Community and political opposition • Potential impact on central business district 	<p>Advantages</p> <ul style="list-style-type: none"> • Improved patient flows, reduced waiting time and length of stay • Improved working environment • Improved spatial layout and aesthetics • Potential for available green spaces <p>Disadvantages</p> <ul style="list-style-type: none"> • Inefficiencies/loss of productivity due to staff being split between new build, Wakari site, university and polytechnic • May entail additional travel time for patients and staff • Staff remain up at Wakari versus those in a new hospital – could harm staff morale • DHB does not own land <p>Risks/uncertainties</p> <ul style="list-style-type: none"> • Could increase distance from Wakari site, Oncology Centre, CBD, university and polytechnic • Community and political opposition • Potential impact on central business district

Investment Objectives	Option B (Adjacent site)	New hospital on Wakari site	New hospital on new city site
<p>Investment objective five To reduce the risk of harm to ‘acceptable standards’</p>	<p>Advantages</p> <ul style="list-style-type: none"> Fit for purpose design will improve staff experience and reduce delays, duplication of staff effort, interruptions and ‘work arounds’ that potentially lead to risks of harm (although ambulatory services are still provided in the Ward Block) <p>Disadvantages</p> <ul style="list-style-type: none"> The state highway bisects the refurbished Ward Block (ambulatory) and Oncology Centre 	<p>Advantages</p> <ul style="list-style-type: none"> Fit for purpose design will improve staff experience and reduce delays, duplication of staff effort, interruptions and ‘work arounds’ that potentially lead to risks of harm 	<p>Advantages</p> <ul style="list-style-type: none"> Fit for purpose design will improve staff experience and reduce delays, duplication of staff effort, interruptions and ‘work arounds’ that potentially lead to risks of harm

Table 17 Critical success factors

Critical success factor	Description	Option B	New hospital on Wakari site	New hospital on new site
Meets the business needs of the DHB	<ul style="list-style-type: none"> Meets agreed investment objectives and related business needs and service requirements IL4 services are provided from IL4 compliant facilities Enables continuity of services during the investment period Ability to meet future demand for services 	<ul style="list-style-type: none"> Partial 	<ul style="list-style-type: none"> Yes³⁰ 	<ul style="list-style-type: none"> Yes (depending on site)
Strategic fit	<ul style="list-style-type: none"> Is aligned with the strategic directions of the Government, the Ministry of Health and the DHB – i.e. care is provided closer to the home and services are organised based on modern, integrated models of care. Is aligned with regional planning and/or takes into account regional uncertainties. Is able to meet government priorities. Enables the delivery of safe high quality care. Provides positive staff and patient experience. 	<ul style="list-style-type: none"> Partial 	<ul style="list-style-type: none"> Yes 	<ul style="list-style-type: none"> Yes (depending on site)
Perceived value	<ul style="list-style-type: none"> Delivery of care to patients and value for money is optimised– e.g. if the facility allows improved health outcome against indicators such as length of stay, reduced ED admissions and repeat admissions, improved patient experience that wouldn't be achieved without the investment, then the investment should be considered as value for money. 	<ul style="list-style-type: none"> Partial 	<ul style="list-style-type: none"> Yes 	<ul style="list-style-type: none"> Yes (depending on site)
Relative affordability	<ul style="list-style-type: none"> The DHB has access to capital to meet the build costs and can continue to fund the capital costs Does not displace other DHB priorities, such as IT and capital investment 	<ul style="list-style-type: none"> Most affordable build costs, but least affordable when ongoing replacement of existing assets is factored in 	<ul style="list-style-type: none"> Second most affordable build costs, but savings on replacement capital 	<ul style="list-style-type: none"> Least affordable build costs, but savings on replacement capital

Critical success factor	Description	Option B	New hospital on Wakari site	New hospital on new site
Achievability	<ul style="list-style-type: none"> • Enables continuity of service during the investment period. • Can be done in the proposed time frame with the current resources and support. • Within the programme's control and influence. • Able to engage with the community through the process. • Land acquisition and consenting is achieved within the required timeframe. 	<ul style="list-style-type: none"> • Partial 	<ul style="list-style-type: none"> • Yes ³¹ 	<ul style="list-style-type: none"> • Yes (depending on site)

³⁰ Although, with some disruption of services to Wakari, including time and cost.

³¹ *Although this option may not meet stakeholder expectation for co-location near city centre, university and polytechnic.

5.9 Preferred option is a new build, site yet to be determined

The SPG agreed on 2 May to recommend two options to be taken through to the DBC: New hospital on a new site and new hospital on Wakari site. This recommendation was based on the assessment against the Investment Objectives, the Critical Success Factors, expected construction costs and likely ongoing required asset replacement costs.

Given the amount of investment required, the SPG felt option B would provide a suboptimal solution with a number of disadvantages (e.g. decanting and service disruption, retrofitting an existing building, constrained site, non-IL4 compliant) and constrained by the State Highway network. It would also take longer to complete than the above two options for a new hospital.

6. Management Case

6.1 Governance

As outlined elsewhere in this document, the Dunedin Hospital redevelopment project has two distinct but interdependent streams of activity, each of which has independent governance and management arrangements. The planning, business case development and construction of the hospital building(s) is governed by the SPG, and the wider DHB clinical services change programme is governed by the DHB.

Both projects/programmes rely on each other to achieve the investment objectives of this business case and realise the benefits set out in this report. Ultimately therefore, the Ministry will need to maintain close oversight of the DHB's change programme to ensure the investment's benefits are realised, and will do this through its usual performance monitoring functions and through the governance arrangements outlined in this section of the IBC.

6.1.1 Assurance and governance by the Southern Partnership Group

Ministers have appointed the SPG to provide independent assurance and governance of the redevelopment of Dunedin Hospital. The SPG will oversee the planning, business case development, contracting and construction phases of the redevelopment. This group meets monthly and the term lasts until the completion of the redevelopment or earlier at the direction of the Ministers of Health and Finance.

The following five members have been appointed to the SPG:

- Andrew Blair (Chair).
- Dr Margaret Wilsher.
- Richard Thomson.
- Dr Tony Lanigan.
- Mr Andrew Connolly.

Ex-officio members include the Southern DHB CEO, and Senior Responsible Owner from the Ministry of Health. The Southern DHB Commissioner and an observer from Treasury are attendees. The SPG Chair or delegate is the governance spokesperson for the project.

The SPG is accountable to the Ministers of Health and Finance to provide direction and monitoring for the successful delivery of the redevelopment project. SPG has authority to make recommendations within the agreed scope or budget.

6.1.2 The role of the Ministry of Health

The Ministry of Health is the Project Sponsor and provides project management. The Ministry is accountable and responsible for the delivery of projects governed by SPG. It has a Project Manager who manages all employment and procurement arrangements to support the SPG.

6.1.3 DHB change programme governed by the DHB

The DHB has established a Facilities Redevelopment Executive (FRE) group to provide governance and oversight of its role in the redevelopment of Dunedin hospital. The FRE's terms of reference outline the functions of the group and involve (inter alia) providing guidance and structure to DHB staff engagement, monitoring overall progress of the DHB's projects relating to the redevelopment, providing feedback on draft documents and overseeing inputs into the business case development and other key phases of the redevelopment.

The FRE meets monthly and is accountable to the DHB Commissioner.

The FRE is supported by a Programme Management Office with staff dedicated to the hospital redevelopment.

6.2 Programme management by the DHB

The Southern DHB will adopt a programme management approach to manage the transformational change programme. 'Programme management' means organising, directing and implementing projects. The DHB's approach will consist of three critical elements:

- Corporate strategy – the realignment of roles and responsibilities at the Southern DHB required to best position the organisation to deliver transformational change through creating greater opportunities for clarity, efficiency and accountability.
- Delivery of models of care changes – to maximise efficiencies of new strategic models of care for patients in the District.
- Business as Usual continuity – to ensure that Southern DHB continues to seamlessly operate its services during the construction phase of the redevelopment.

Note: The Southern DHB is, at the time of writing, embarking on a proposal for change that will realign its operating structure. The purpose of this proposed change is to better position the organisation for its future path through providing greater focus on strategically important areas and creating greater opportunities for clarity, efficiency and accountability. All future actions outlined below as part of the change programme are, as such, subject to refinement in line with the proposed changes to the wider delivery and operational model of the organisation.

6.2.1 Roles and functions in programme management

The main roles, with their associated responsibilities, within the project management approach to deliver the wider transformational change outlined in this business case include:

- The FRE and Executive Leadership Team (ELT) will provide governance and oversight of the Southern DHB role in the Dunedin Hospital Redevelopment project and the wider transformational change programmes and will escalate unresolved issues to the Commissioner Team as appropriate.
- The Chief Executive, who will operate as the Senior Responsible Owner for the transformational change programme being delivered, with responsibility for realisation of clinical and efficiency benefits being delegated to members of the ELT.
- Affected stakeholders, clinicians and patients- the named individuals and groups who will be interested/involved in – or affected by – the change. The Southern DHB's Community Health Council will support change projects and programmes by providing one channel for gathering patient input.

- Clinical Leadership Group (CLG). The CLG will provide the clinical oversight and service inputs and make recommendations to the FRE and Commissioner Team on clinical and service needs of the Southern DHB, which will help enable the transformation to enhanced patient-focussed healthcare delivery in the Southern district.
- ‘Clinical Change Leaders’ –clinical staff, embedded in the business, who will help realise the benefits of the planned transformational changes. The exact number of clinical change leaders to be deployed will change over the course of the programme.
- The Project Management Office (PMO), which is responsible for facilitating planning, monitoring Southern DHB’s preparation for the Dunedin hospital redevelopment and transformational change programmes. This will include projects related to workforce change, procurement, IT and informatics, financial analysis and clinical project management as required.
- User Groups – to inform projects and programmes with bottom-up, ground level input and feedback to the design and planning work.

6.2.2 Stakeholder communication

A communications plan for the Dunedin Hospital Redevelopment Project has been developed by the Ministry of Health in conjunction with Southern DHB and approved by the Southern Partnership Group. It will be refreshed periodically. Southern DHB also has a responsibility for planning, overseeing and implementing communications with key internal and external stakeholders on its transformational change projects that link to the Dunedin hospital redevelopment. All activity will be guided by a stakeholder engagement plan, with at least 1.0FTE Communications Advisor resource dedicated to the programme(s).

6.2.3 Project assurance

The PMO will conduct regular internal, critical reviews of milestones, resource plans, risks and issues throughout the programme on behalf of the ELT and FRE. Southern DHB will also participate in external assurance regimes, such as Gateway Reviews, as directed by Treasury and Ministry of Health officials.

At the time of writing, the Southern DHB had participated in Gate 0 and Gate 1 reviews by the Gateway team for the Dunedin hospital redevelopment.

6.2.4 Clinical leadership

Effective clinical leadership is essential to drive the clinical service changes required across the DHB. As noted above, the DHB is using a CLG to provide clinical and service advice for the hospital redevelopment. Membership is broad and includes key clinical leaders across the DHB including primary care, representatives across the provider arm and one nominee from the University of Otago’s Division of Health Sciences.

To date the CLG have made recommendations to the FRE on several clinical changes including care of the frail elderly, ambulatory care, acute assessment units and a model of medical generalism. The group is currently discussing telehealth, digital hospitals and research and evaluation in relation to the redevelopment (amongst other things).

6.3 Clinical services change programme

The FRE are in the process of arranging their internal capacity and potentially procuring external services to assist in the development and implementation of a district wide service

programme including for primary and community health care. The change programme (included at Appendix 5) is focussed on redesigning future models of care at three distinct levels:

1. Strategic Model of Care
2. Facility Models of Care (development not underway until DBC stage reached)
3. Service Models of Care

7. Financial case

The Dunedin Hospital rebuild will involve Crown capital expenditure in real terms of [REDACTED]. [REDACTED] Once the rebuild is included the total capital spend for the DHB on all its hospitals, including Dunedin, will be between [REDACTED] over the next 25 years.

This chapter outlines the effects of this capital expenditure on SDHB's finances and assesses the affordability of the rebuild.

The most apparently affordable option, the Base Case, is provided as a counterfactual for comparison purposes. It is broadly described in the Economic Case as an unworkable option. It has not progressed on to the short list.

7.1 Modelling approach

7.1.1 Financial projections from DHB financial model

The financial projections reproduced in this Financial Case have been sourced from Southern DHB's Dunedin Hospital Redevelopment model. The model is designed to support quantification of the financial implications of the different options identified. The model has defined in financial terms the forty one Health Services identified in the Strategic Services Plan. The base year for the cost allocation is FY2014/15, but the forecast years 2016/17 to 2019/20 align with the DHB's 2016/17 Annual Plan.

The health services allocations have been defined through an extensive financial analysis in order to attribute the revenue and expenditure and identify the cost drivers.³² It is important to note that the development of the model has been beleaguered by the complexities associated with health data, the availability and quality of both financial and non-financial data and the absence of a costing system.³³

The model is designed to provide indicative financial forecasts for the next 25 years for each Health Service and the Southern DHB based on:

- indicative long term (25 year) capital intentions (including all capital works required for building infrastructure and replacement of all assets including IT);
- forecast demand³⁴ for Health Services for the period;
- identified drivers³⁵;
- incremental changes³⁶, and

³² Detailed modelling notes on the methods used are available from the DHB.

³³ There is no report that tracks the expenditure of the Southern DHB by PUC code.

³⁴ These measures included Inpatient Events, Inpatient Caseweight Discharges, Inpatient Bed Days and Outpatient Volumes.

³⁵ These drivers are linked to changes in forecast demand for Health Services.

³⁶ These changes can be either a change in the number of FTE or a change in revenue or expenditure in either financial terms or percentage terms.

- inflationary pressure³⁷.

The model distinguishes between the forecasts for the Funder and the Provider and also includes a separate forecast for Dunedin as a subset of the Provider Forecast.

7.1.2 Core assumptions in the modelling

The modelling takes a whole-of-DHB view to provide an overall assessment of affordability. The model uses as an input a 25 year forecast of all capital expenditure expected to be made by the DHB, including:

1. The Dunedin Hospital Redevelopment capital expenditure, which is based on estimates provided by RLB (as summarised in section 5.6 and 5.7 and Appendix 3) and amended to reflect the amounts transferred to the DHB balance sheet. (The values transferred exclude the value of student accommodation from option B for example, as this value represents a transfer from the Crown to another party. There is also an adjustment for the value of furniture, fixtures and fittings in Option B.³⁸)
2. An assessment for infrastructure replacement not covered by the Dunedin Hospital Redevelopment, which is based on the RLB 2012 assessment and updated following the findings from the 2016 BECA Building Assessment report. It is assumed that all infrastructure capital expenditure on items of infrastructure that will be demolished will cease two years prior to the demolition with the exception of the Ward Block which ceases four years prior to demolition.
3. Non-infrastructure related capital expenditure (including IT and clinical equipment), which is based on accounting replacement.

There are a range of assumptions that apply to all options irrespective of the capital investment and changes to models of care and intervention rates. The most pertinent of these assumptions are provided in Appendix 2.

7.1.3 Efficiency gains and cost savings are factored in

The Dunedin Hospital redevelopment will realise efficiency gains and cost savings, as a result of accommodating the roll out of more modern models of care. In addition to the new hospital facilities, this will require investment in reviewing and strengthening urgent care, targeting reductions in acute demand (POAC), ambulance diversion to other clinic locations, medicine therapy assessment (MTA), *HealthPathways* implementation, discharge support to reduce readmissions and professional education around advance primary care. This will represent an estimated cost of [REDACTED] per year for the DHB until 2019/20. These costs are incorporated into the efficiency gains.

By changing the way in which services are organised in the hospital, and how they integrate with primary care and allied health, the DHB can realise the benefits of improved patient flow, improved quality of patient care, improved patient and staff safety, increased efficiency of service delivery and reduced costs.

In its modelling Southern DHB has developed a number of scenarios for each of the build options which assume some efficiency gains. It is assumed that there is a 0.5% ongoing

³⁷ Inflationary pressure in the model include CPI and Wage Inflation.

³⁸ Crown funding for furniture and fittings (as part of deficit support or otherwise) may still be required. The adjustment was to avoid a double count with amounts already included in the DHB's 25 year capital plan.

efficiency dividend, and an additional 1.0% to 2.0% efficiency factor that builds up over a three year period following the build.

The additional 1.0 to 2.0% is new hospital-specific; that is, it is assumed that without the new facilities these gains would not occur. In practice, this yields (for the new hospital new build option) savings of around [REDACTED] over the three years following the build and [REDACTED] over the three years following the build.

7.1.4 No provisioning

The proposed rebuild is a replacement project. That is, it involves replacing an existing asset (the hospital) at the end of its working life with a similar asset. Typically a DHB would be expected to have provisioned for replacement capital infrastructure to some degree. This expectation is greatest for DHBs with relatively new major assets, but all DHBs are expected to use depreciation on major assets to provision for the eventual replacement of those assets. In the case of Dunedin Hospital, the DHB's contribution from depreciation provisions/free cashflows over and above baseline is nil.

7.1.5 Few alternatives

The DHB has insufficient reserves and investments, or assets it can sell, to finance the build or part of the build.³⁹ In the case of the new hospital, new site option, the land underpinning the existing Dunedin Hospital could be sold, with a resulting gain from sale in the order of [REDACTED]

The DHB's debt ratio⁴⁰ is [REDACTED] based on Total Assets and Total Liabilities as outlined in the Annual Plan for year 16/17.⁴¹ The Office of the Auditor General notes debt ratios above 70 percent are "outside a reasonable range".⁴²

7.1.6 Crown equity injection to finance the rebuild

An equity injection from the Crown is sought to finance the proposed rebuild. This injection is necessary because the DHB does not have a sufficiently strong balance sheet to finance the proposed rebuild through reserves or private or Crown debt.

Dunedin Hospital represents a special case. The DHB has no alternative – continuing with the status quo until the DHB has provisioned sufficiently for the rebuild is not feasible due to a combination of the large size of the capital outlay, the deteriorating state of the hospital and the limits on deficit support which exclude cash injections to cover depreciation. As outlined in the Strategic Case, many buildings on the Dunedin city campus are at (or beyond) the end of serviceable life. These buildings are critical to patient care and are uneconomic to renovate and refurbish – including one building that provides a large number of core clinical services. The buildings are deteriorating and related issues emerge frequently. The current

³⁹ Consistent with this view, the DHB is currently receiving equity injections from the Crown for capital in relation to urgent interim works and equity injections for deficit management.

⁴⁰ Debt Ratio is a financial ratio that indicates the percentage of an entity's assets that are provided via debt. It is the ratio of total debt (the sum of current liabilities and long-term liabilities) and total assets (the sum of current assets, fixed assets).

⁴¹ Ratio calculated using 16/17 figures from 16/17 Annual Plan.

⁴² Office of Auditor General *Results of the Health Sector Audits 2016* <<http://www.oag.govt.nz/2016/health-audits/part3.htm>>

situation places Southern DHB in a position of considerable clinical, financial, and organisational risk.

Injection characteristics

The financial modelling underpinning the financial case incorporates the following assumptions about the Crown equity finance arrangements:

- All build options will be completely financed from Crown Equity, with a transfer of the hospital assets from the Crown to the DHB when the build is complete. The impact is an equity injection equal to the value of the new hospital asset⁴³; there is no cash outlay from the DHB to the Crown.
- The Southern Partnership model continues through the build period with the Ministry of Health managing the contracts.
- The Crown is assumed to provide deficit support for replacing existing assets in addition to financing the hospital rebuild.

7.1.7 The build cost will likely require a budget bid

The build will be managed as a Crown project.

The proposed build cost is beyond the latitude of the Health Capital Expenditure Budget, or HCE. The Dunedin redevelopment will be the subject of a budget bid in 2018 and will not come from the Health Capital Expenditure budget.

7.1.8 This IBC assumes conventional procurement

The working assumption is that the Ministry of Health will contract for the construction of the facility, with separate arrangements made for maintenance. This is known as 'conventional procurement'. In this situation, the facility is owned by the DHB and the operating or service contracts can be re-tendered periodically or self-managed.

Public Private Partnership (PPP) arrangements, under which the DHB would contract for a combination of construction and aspects of maintenance and/or replacement, are to be considered in the Detailed Business Case. No allowances for PPP arrangements have been incorporated into this Indicative Business Case.

7.2 Summary of financial results

7.2.1 Base Case (used as a counterfactual)

- Applies Detailed Services Plan for the Dunedin Hospital Campus: Part A.
- Assumes that the CSB replacement will deliver some but no specific efficiency factor has been factored into the forecasts.

The Net Deficit for this option is depicted as the red line in the charts shown in this Financial Case. This shows the deficit will increase to ██████ in FY2025/26 following the completion of the New Clinical Services Building in FY2024/25 and will increase further to ██████ in FY2033/34 resulting from the high level of capital expenditure required to

⁴³ There may be some expenditure that will be incurred by the Crown that are essential for the hospital project but will not be transferred to the DHB. This includes, for example, expenditure on student housing facilities required to facilitate Option B.

remediate the existing dilapidated infrastructure. The deficit will then decrease to [REDACTED] in FY2041/42 once the level of capital expenditure diminishes.

7.2.2 Hospital on adjacent site with refurbished ward block (“Option B”)

- Applies Detailed Services Plan for the Dunedin Hospital Campus: Part B.
- It has been assumed that in addition to the ongoing annual efficiency dividend 0.5% sought that an additional 0.5% – 1.0% efficiency over a 3 year period post the build can be realised.
- Investment in Primary and Community Health and Allied Health will be completed within the current period covered by the FY2016/17 Annual Plan, which provides a forecast up until FY2019/20.
- Unlike the Base Case the current working assumption is that the facilities under these options will provide a hospital which is fit for purpose and able to meet the demands of the Southern Catchment.

The Net Deficit for this option is depicted as the dark blue line in the charts shown in this Financial Case. This shows the deficit will increase to [REDACTED] in FY2029/30 following the completion of the new acute clinical services building and energy centre in FY2028/29 and will increase further to [REDACTED] in FY2031/32 resulting from the residual capital expenditure required to remediate the existing dilapidated infrastructure. As the level of capital expenditure begins to decrease from FY2031/32 there will be a reduction in the deficit, with a further reduction in the level of capital expenditure from FY2037/38 resulting in a further reduction in the deficit, which will decrease to [REDACTED] by FY2041/42.

7.2.3 Option new build on new site

- Applies Detailed Services Plan for the Dunedin Hospital Campus: Part B.
- Build completed in FY2026/27 but excludes the options of including Health Hubs, a new Cancer Centre and a new Mental Health facility.
- Includes a sale of the land upon which the existing Dunedin Campus sits following the completion of the new hospital in FY2031/32.
- It has been assumed that in addition to the ongoing annual efficiency dividends sought that an additional 1.0 – 2.0% efficiency over a 3 year period post the build can be realised, in addition to the ongoing 0.5 efficiency dividend.

The Net Deficit for this option is depicted as the dark green line in this Financial Case. This shows the deficit will increase to [REDACTED] in FY2027/28 following the completion of the new Hospital in FY2026/27. The deficit will decrease as the capital expenditure required to remediate the existing dilapidated infrastructure diminishes before returning to surplus from FY2040/41. There is a one off temporary improvement in the deficit in FY2031/32 relating to the sale of the Dunedin Campus.

7.2.4 Option new build on Wakari site

- Not modelled by Southern DHB (awaiting detailed investigation) so no detailed financial analysis is provided (only initial estimates of build cost and transfer value).
- Includes a sale of the land upon which the existing Dunedin Campus sits following the completion of the new hospital and demolition of the existing buildings in FY2031/32.

7.3 Affordability Challenges

7.3.1 A DHB under sustained financial pressure

Southern DHB is entering the hospital redevelopment facing sustained financial pressure. We summarise the situation as follows:

- In 2016/17 the DHB will receive \$823 million in core government funding.⁴⁴ Approximately half of this amount is to purchase traditional hospital and mental health services, and the remaining half to purchase community-based health services, including primary care.⁴⁵
- The DHB has been running a deficit for many years (in 2015/16 the deficit was \$33.5 million).⁴⁶ This financial pressure has meant the DHB over the years reduced its capacity to fully understand costs and cost drivers, develop and implement actions to reduce costs/productivity/quality/patient and staff experience, and monitor and modify the impact of any changes. This reduced capacity represents a false economy – the costs involved of developing this capacity and capability are likely to be less than the value (both financial and non-financial) of improving processes, and reducing inefficiencies.
- The DHB's failure to deliver on its financial budgets (since rectified) placed it under both public and government scrutiny. Further, due to the Government's lack of confidence in the DHB managing its finances, the Minister dismissed the Board in June 2015 and replaced it with a Commissioner. The Ministry of Health has maintained a presence in facilitating decision making around capital planning and investment.
- In other tertiary hospitals, the cost of providing highly complex specialised services is paid in part by patients visiting from out of region. However, Southern DHB mainly services only its own population as a relatively small number of patients from South Canterbury DHB come to Dunedin for tertiary care.
- There is a complex interplay with commissioning decisions for national programmes. While funding for new programmes is typically provided to DHBs for the first few years, this funding is often then shifted into baseline funding. This means the DHB needs to continue to provide the service, but through PBFF funding. This creates more challenges for DHBs with modest population growth, as expectations that they continue to provide these services limit their ability to invest in others.
- The Commissioners and CEO are committed to closing out the operating deficit. The DHB is focussing on process efficiencies and cost controls to both increase quality of service and reduce waste, in order to manage the deficit down to a break-even position. It is anticipated that this will be achieved in the 2019/20 financial year.

Table 18 below shows financial performance over the past five financial years.

⁴⁴ The Treasury. (2016) Vote Health. Retrieved from <http://www.treasury.govt.nz/budget/2016/estimates/v6/est16-v6-health.pdf>

⁴⁵ Southern District Health Board. (2016). Health Strategy and Planning. Retrieved from <http://www.southerndhb.govt.nz/index.php?page=305>

⁴⁶ Southern DHB. (2016). Our Planning and Accountability Documents. Retrieved from http://www.southerndhb.govt.nz/files/18641_20161208144621-1481161581.pdf

Table 18: Southern DHB financial performance 2011/12 - 2015/16

Year	Total income (\$000)		Total expenses (\$000)		Surplus/(Deficit) (\$000)	
	Actual	Budget	Actual	Budget	Actual	Budget
2011/12	836,612	828,419	849,800	838,910	(13,237)	(10,491)
2012/13	849,705	849,208	861,339	860,186	(11,889)	(10,978)
2013/14	873,897	862,131	891,719	871,170	(17,822)	(9,039)
2014/15	883,905	879,525	911,085	894,324	(27,180)	(14,800)
2015/16	903,676	897,053	937,219	933,008	(33,543)	(35,955)

Source: Southern DHB Annual Reports. (2012 - 2016).

7.3.2 Deficits continue over 25 year forecast

As explained above, Southern DHB has been running a deficit for many years. While it is undertaking a range of cost saving initiatives to address the fiscal deficit in the short term, it faces a number of challenges over the longer term including increasing demand for services as the population ages, low population growth and the expense of running two major hospitals in the district. Looking out 25 years, the DHB continues to run an operating deficit. This is attributed to the impacts of aging and increased demand for services and staff. Even with efficiency savings, the DHB's deficit position could be as large as [REDACTED] million by 2027/28 under the new build scenario (with the DHB's costs of interest, depreciation and capital charge rising to [REDACTED]).

The deficit trends are shown in the chart at Figure 12 below. The projection shown in the chart begins at year 2020/21. The assumption is that the DHB has achieved savings sufficient to return it to a net positive income position in the previous year, 2019/20 (this is consistent with the 2016/17 Annual Plan for Southern DHB).

SDHB's modelling shows that even with the assumed ongoing efficiency savings each year, the DHB only returns to a surplus by 2042.⁴⁷ That means the hospital build can only be characterised as 'unaffordable' for 16 years. That is, the hospital build costs cannot be funded within the DHB's funding envelope without incurring further deficits.

However, the alternative is a worse predicament. Without a new and/or dramatically refurbished hospital, the DHB will almost certainly fail to meet its long term service objectives and its commitment to deliver health services to the communities it serves.

The persistent deficit means the DHB will be likely to remain reliant on direct Crown funding support for day-to-day cash requirements as well as the proposed rebuild. This being the case, none of the options, including the Base Case, are affordable.

⁴⁷ There is an assumed ongoing savings of 0.5% in DHB personnel and operating for all years with a further efficiency of 0.5% - 1.0% for Option B and 1.0% -2.0% for Option Core applying to personnel and operating in Dunedin for the 3 years post the final completion/commissioning of the new hospital.

[REDACTED]

[REDACTED]

[REDACTED]

7.4 Forecast IDCC expenditure for the DHB

Ongoing capital impacts from the build include interest, depreciation and capital charge (or, IDCC). The projections show an IDCC cost for the DHB of between [REDACTED] million per year for the new build options. This can be compared with the lower cost for the base case, which rise to [REDACTED] million in 2014/42. The DHB's current IDCC bill is around [REDACTED] million.



7.5 Graphical summaries of financial performance

The set of charts below summarises the DHB's financial performance under each of the options. The improvements to financial performance are largely due to the assumptions made about efficiency gains. (For avoidance of doubt, option 'core' is the new hospital on new site option).

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[Redacted]

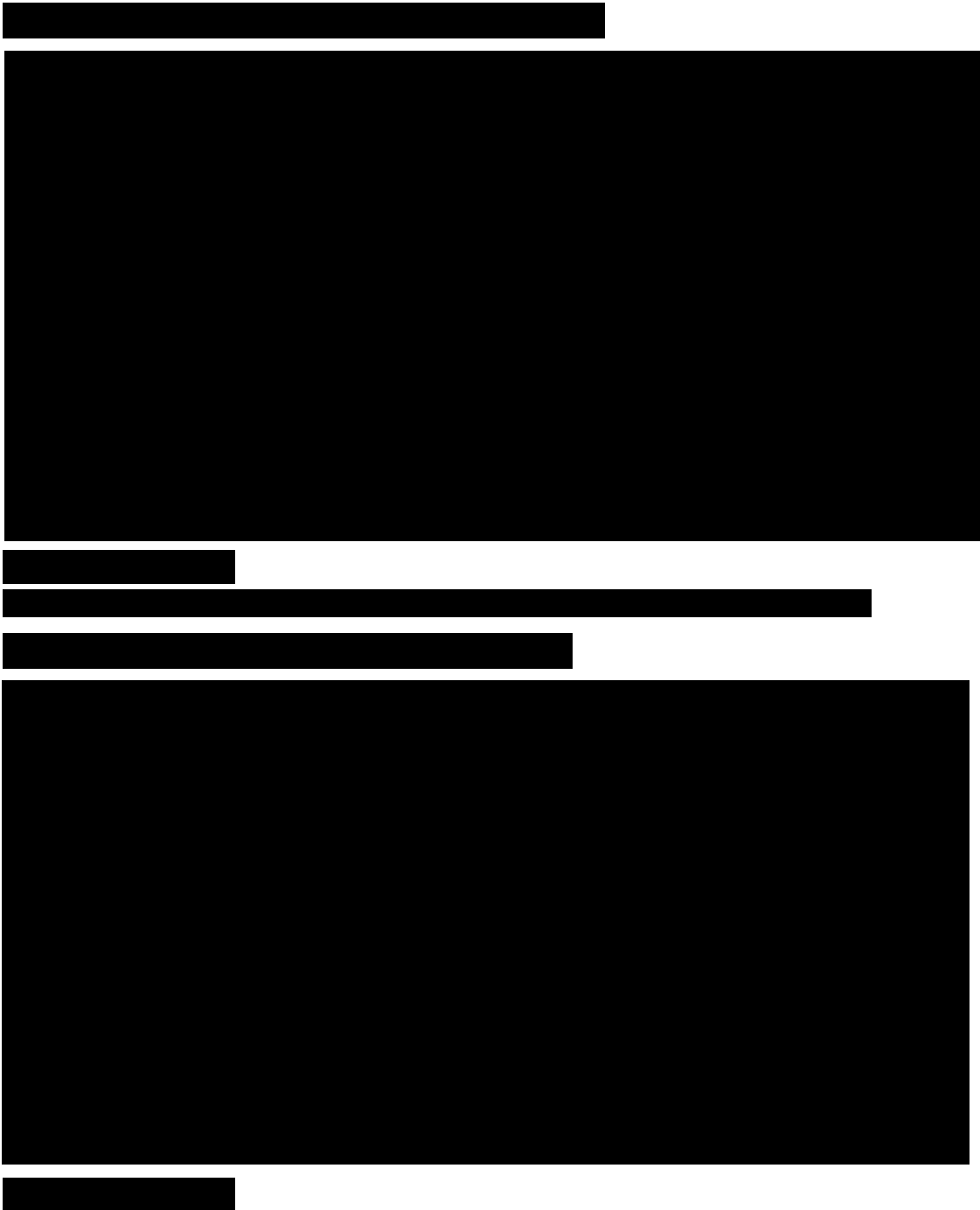
[Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]



7.6 Projected financial statements

Projected financial statements for the Base Case and other options have been prepared to support this IBC, but are not reproduced here for reasons of brevity. Consistent with the analysis above, the picture shows a worsening financial position in the first few years of the 25 year time horizon but a return towards surplus in later years of the forecast.

7.7 Whole of life benefits analysis

Whole of life benefits versus whole of life costs are summarised in Table 15 on page 43. This table shows that none of the hospital rebuild options on the short list, or the Base Case, provide an NPV positive position (which is a requirement typically sought in capital budgeting decisions). That section also describes how a new build will reduce the replacement capital expenditure requirements on the DHB. An explanation of the operational benefits is provided below.

The operational benefits from the redevelopment will include:

- Efficiency gains, which include savings to hospital operating costs and staff costs, and small reductions in outsourcing expenditure (any gains are net of the operating cost of achieving the new models of care)
- Additional / (reduced) maintenance cost relating to new build

7.7.1 Efficiency gains from new models of care

The most significant of these impacts is the efficiency gains from having a new hospital and, with it the new models of care it accommodates. The efficiency gains that are new hospital related provide the DHB with savings of around [REDACTED] over the three years following the build and [REDACTED] on hospital operating expenditure over the three years following the build.

7.7.2 Maintenance costs for a new hospital

A traditional assumption is that new hospitals are cheaper to maintain and operate than old ones. This does not necessarily play out in practice. The experience at Middlemore Hospital has been that new buildings have cost substantially more than old buildings to maintain.⁴⁸ The reasons are:

- Maintenance staff need to “learn” how the building operates and the new systems installed in it, and what is normal/abnormal. This requires time and cost to do this in the first few years. New process/schedules need to be set up.
- New buildings inevitably have more sophisticated services and systems in them (e.g. a move from non-air conditioned building to an air conditioned buildings, extra security, perimeter lighting etc.). This increases both the maintenance costs and the energy costs.
- The maintenance regime specified by suppliers is extremely thorough and needs to be followed to meet warranties. Sub- contractors can also try to insist that they do the maintenance (at high cost) in order to keep the warranty “live”.
- New buildings have a higher standard of finish, but robustness is invariably not designed into the building. It requires more maintenance to keep this standard high. With a high initial standard, the staff naturally want to keep that standard.
- Modern items are normally less robust than old items in old buildings. New items are easier to break and hence cost more to maintain.

⁴⁸ Email from Buildings and Facilities Manager at Counties Manukau DHB.

- New buildings are never perfect, either in design or in construction. They require minor alterations, modifications, adjustments for the first couple of years. This will end up as a maintenance cost.

As a result of the combination of these factors, the costs to maintain a new building for the first 2 or 3 years can be 20% to 50% higher than the old buildings they replaced on a \$/m² basis. After 3 or 4 years there may be a reduction as maintenance practices establish (and the DHB's forecast assumes that after the first three years there will be a reduction in the maintenance bill of one percent per year). Overall, however, it is possible the cost to maintain a new building might be greater than an old building.

There will also be minor impacts on rates and utilities bills, as the size and location of the facilities changes. If the improvements proved to add 20 percent to the maintenance bill, then the sum of the additional maintenance, rates and utilities expenditure would amount to about [REDACTED] dollars per year (real) in the new hospital new site option versus in the base case an additional bill of [REDACTED] per year (real) for the years 2021/22 to 2024/25 and [REDACTED] per year from 2024/25 onward.

The maintenance and operating cost impacts will be teased out further in the Detailed Business Case.

[REDACTED]

[REDACTED]

8. Commercial Case

The Commercial Case plans for the procurement arrangements needed to implement the preferred solution, prior to issuing requests for proposals. The IBC Commercial Case considerations are not intended to be as detailed as the Strategic or Economic Cases, and include only a high level qualitative analysis of the identified procurement approaches that seem appropriate for this project. Because it is too early to proceed to market sensing, we have based this chapter on input from Rider Levett Bucknall, Proj-X, Johnstaff and the Treasury, as well as our own research.

8.1 No recommendation at present

There appear to be a range of viable options from a traditional build programme through to a Public Private Partnership (PPP). Common to both is the need for a credible project director, architectural practice and construction company who have demonstrated experience and success in designing and delivering complex, large scale health infrastructure projects.

It is inappropriate to provide a recommendation until the Dunedin project has been defined in term of its location, size, and critical factors such as finances, timing and the like.

The build is large and complex and there are a number of specific project risks needing to be taken account of including the size of the build. Rider Levett Bucknall reports particularly high prices on projects for certain trades in the North Island currently due to lack of resources. These trades currently include “Fire sprinkler/protection works” Mechanical Services work” “Plumbing & Hydraulics work, and Precast Concrete works. Also, due to lead times on certain materials supplies Rider Levett Bucknall is currently engaging in early procurement for supplies of precast concrete and structural steelwork. Major projects are also having steelwork fabricated overseas in order that construction programmes can be maintained. Construction programmes and procurement methodologies must take account of these market conditions.

8.2 Project assumptions and procurement considerations

Our assumption for the project is that procurement will include the physical infrastructure of the hospital and maintenance services.

Table 19 Project assumptions

Item	Assumption
Scope definition	The scope of provision is for provision and possibly maintenance of new infrastructure. Clinical, nursing or other services are excluded.
Location	Wakari has been identified as a potential location due to its current land ownership by the SDHB. Other possibilities within the city centre and around Dunedin are being explored. Early indications predict costs in excess of \$1 billion (Section 1.3.2).
Operational responsibility assumptions	There will be no private sector involvement with the delivery of clinical services. Car parking will be a consideration in site location and is integral to any hospital development and may or may not be included in the final contract scope. Parking has been beyond the scope of this IBC and will need to be considered separately. Health hubs are assumed to be considered separately (and leased).
Asset management/ facilities management assumptions	The procurer is open to full commercial responsibility for management of assets and facilities
Programme timing (main hospital build)	<p>Tender issued: 2021 – 2023 (depending on option and earlier if possible)</p> <p>Construction starts: 2022 – 2026 (depending on option)</p> <p>Handover of asset to provider: 2027 – 2029 (depending on option) – does not include refurbishment of Ward Block)</p> <p>Number of years facilities management: TBC</p> <p>There is high sensitivity to build time given the current poor state of current facilities. Earlier tendering and construction should be sought wherever possible.</p> <p>NB The programme for the main hospital build is delayed by a lack of decanting space. For most options replacement accommodation first needs to be designed, consented and built. With demolition and site preparation work this adds 3 – 4 years to the overall programme. The programme will be reviewed as part of the DBC.</p>

Item	Assumption
Procurement experience	There is considerable international experience in hospital construction of this magnitude and it will be important to leverage the expertise gained to date from those experiences where appropriate. It is likely the project director and the construction contractor will need to be sourced internationally. A number of PPP projects have been signed to date in New Zealand. At over a billion dollars, this would be one of the largest, and potentially most complex, project completed to date.
Market size and appetite	There is not expected to be any financing constraint.

8.3 Factors for consideration in the detailed business case

Rider Levett Bucknall identifies the following factors for consideration:

- Time minimisation
- Financial control
- Quality control
- Effective performance
- Financial risk acceptance
- The nature of the project
- Location of the project
- The national economic situation and stability of the building market
- Magnitude of finance costs
- Desired date for commencement and/or completion.

There are two main forms of contracts:

- Non-integrated which divorces design (by client) and construction. The various forms can be:
 - Fully documented lump sum competitive tender with/without Schedule of Quantities.
 - Provisionally documented lump sum competitive tender with/without Schedule of Quantities.
 - Provisional documented lump sum contracts with competitive tenders on P&G and margins with subsequent negotiation of a lump sum price based on full documentation prior to work commencing
- Integrated contracts involving the overlapping of design and construction to reduce the overall time allowing the Contractor the opportunity to be involved in the design process and commence construction prior to completion of the design. The various forms can be
 - Single negotiated contracts

- Competitively based deferred let contracts
- Cost Plus contracts
- Guaranteed maximum price contract
- Construction management contract
- Design and Build Contract
- E.C.I (Early Contractor Involvement)
- PPP contracts allow the client to develop a brief and competitively bid in the market for consortia to design, construct, finance, and maintain the buildings for a set lease period and may include provision of clinical services.

8.4 Objectives guiding procurement options and selection process

In addition to the analysis outlined in this chapter, the objectives described below will be used to guide the overall procurement options development and selection process – both here and through the DBC, where they will inform the evaluation criteria used to quantitatively evaluate the shortlist of procurement options.

- Outcomes – the procurement strategy is conducive to achieving investment objectives outlined in the Strategic Case.
- Cost certainty – the procurement strategy provides certainty over cost to completion, cost over the life of the facilities and infrastructure, and support of whole of life considerations.
- Fit for purpose – the procurement strategy ensures that the assets delivered by the project are fit for purpose.
- Timing – the procurement strategy is able to deliver the project within the Ministry’s timing requirements (and earlier if possible).
- Optimal risk transfer –the procurement strategy allocates risks to the party best placed to manage them.
- Accountability – the procurement strategy provide an optimal level of accountability of service providers and contractors (single point and multiple point accountability).
- Innovation and incentive – the procurement strategy incentivise the introduction of best practice and innovation in delivering the desired outcomes.
- Market competition – the procurement strategy maximize the competitive bid process within capacity and constraints of the market and early engagement of key subcontractor resources.

8.5 Preliminary comment on procurement options

This section summarises our current assessment of procurement options. .

The concerns of stakeholders received by us emphasise a range of concerns:

- The ability to deliver on a design sufficiently flexible to meet current and future needs
- The ability to engender sufficient competition

- The ability to lay-off risk to contractors and their ability to carry that risk
- Whether the institutional process is sufficiently robust to withstand tendencies to value engineer processes in a sub-optimal manner.

More importantly, with this range of stakeholder concerns, will be the issue of whether or not there is sufficient capacity to operate a contract by the contractee.

Alliance and early contractor involvement

Both an alliance more generally and Early Contractor Involvement are clever mechanisms for resolving technical issues in particular. However, detail design of a hospital is a repeatable process and has been such for many years. Architectural standards are in place and sit in the software programmes of all health architects. If there is complexity to resolve on this project then that complexity may relate more to construction and workforce availability than design.

8.6 Public private partnerships

This section addresses public private partnerships (PPPs) as these are likely as an option, as this is a new build (which is unusual in a New Zealand health setting). PPPs can generally be defined in terms of the extent of risk that the procuring consortia is prepared to accept during design and construction and pre and post occupancy. We look at two types of variations below.

PPP- Design and build, finance maintain (DBFM)

Under a DBFM model the contracted party will accept responsibility for the building and its services, and exclude clinical operations – i.e. will design, build, finance and maintain a hospital, but will not actually deliver the clinical services. The advantage of this approach is to allocate a number of significant risks to parties that have the experience to handle them better. Furthermore, whole-of-life considerations are taken into account such that the maintenance costs are taken into account at the design and build phases, thus achieving a lower cost outcome. As Johnstaff notes:

“Furthermore, whole of building life costs are considered during the design stages, which often results in a more robust quality building which maintains its performance throughout the term of the deed. It is imperative that experienced and proven expertise is engaged to design and construct the facility and opt-in clauses for the procurer to take over responsibility in the event of the proponent failing to meet their legal obligations.”

There is a strong requirement for sufficient expertise to design the scope effectively and for suitable step-in clauses for the procurer to take over in the event of non-delivery.

PPP – Design, build, finance, maintain, operate (DBFMO)

This option would, in the case of a hospital, also add in the clinical services to the PPP delivery requirements. A DBFM would, if managed effectively, achieve the whole-of-life focus and competitive outcome sought. A DBFMO looks more difficult and it is likely there would be resistance to any change given Dunedin Hospital is a referral hospital with tertiary level services. A staged development of procurement expertise from, say, rehabilitation and hotel services (such as in a proposed, but not implemented, rehabilitation hub in Auckland’s eastern suburbs), to a secondary care hospital, and to full service offering might be more achievable. Also, there are alternative ways of contracting for clinical services such as an innovative outsourcing contract for urology services in Canterbury.

8.6.1 Further considerations of a DBFM PPP option

As per the New Zealand Treasury guidance, the IBC must include an initial qualitative assessment of PPP procurement against a range of specific criteria including:⁴⁹

- nature of the required asset;
- outcome specification;
- durability of service specification;
- project complexity;
- project scale;
- project timelines, and
- competitive tensions.

Additional consideration is required when PPP procurement is to be included as a short list option. This normally includes:

- market sounding; and
- endorsement by joint Ministers (being the Minister of Finance and the Minister of Health)

These additional considerations have not formally been undertaken in this IBC, as the Ministry of Health has deferred engaging directly with the market until joint Ministers have had the opportunity to consider the options set out in the Economic Case. Nonetheless, a brief assessment of the anticipated market interest and appetite has been included and is set out below.

Table 20 Assessment against specific criteria

Criteria	Assessment
Nature of the required asset	The project has a clearly defined and specific intended purpose. The lease would sit on the Crown's balance sheet and the emphasis will be on whole of life costs.
Outcome specification	The completed project is intended to provide both clinical services and non-clinical services. While it would be inappropriate for a private sector partner to manage the delivery of clinical services, there are a range of non-clinical services that can be well specified and delivered by a third party under a contractual relationship. There is scope for the PPP contract to include incentives to deliver stronger performance, resulting in greater efficiency and higher quality service outcomes.

⁴⁹ NZ Treasury (2015, p. 17-18).

Criteria	Assessment
Durability of service specification	There will be demand for hospital services delivered through the project – but there is some uncertainty in how the delivery models will need to be reconfigured in response to changing demand and technology advancements over the PPP contract. There would be significant risks (albeit different) for both the Crown and a private sector partner if many services were delivered by a third party.
Project complexity	There is considerable complexity inherent in this project, as well as essential service aspects. By creating the right incentives within a PPP contract, it would be possible to transfer responsibility to a private sector partner with expertise, and the incentives, to construct this project to the specifications of Southern DHB with enough scope to introduce an innovative solution (to reduce the overall cost of the project).
Project scale	The estimated value of the project (>\$1 billion) would make this the highest value of any PPP procurement undertaken in New Zealand. It is very unlikely market interest will be inhibited by the transaction costs associated with PPP procurement.
Project timelines	There do not appear to be any conflicts of timing with other PPP projects. What is more, the timing of the project will occur once the Canterbury rebuild and much of the construction work related to the Kaikoura earthquakes has been completed. The project timelines should not be impacted by supply resource constraints (and therefore incur a premium cost to acquire the needed labour to complete the build).
Competitive tensions	The project is likely to attract interest from both domestic and international suppliers. The opportunity this project presents as the first large-scale new hospital build in New Zealand in over a decade. It is likely to be attractive to international construction contractors also – particularly those from Australia and Europe where a number of major hospital projects have been undertaken in the last 10 years. There is no identified conflict of timing with other known PPP projects in New Zealand and it may, in fact, work in the Ministry’s favour for this procurement to follow the current Waikeria Prison PPP procurement which is expected to achieve Financial Close in April 2018. The market is likely to be able to respond positively to the location of the project within Dunedin (as a relatively major urban centre).

8.6.2 Anticipated market appetite for a PPP

As outlined in Table 20 the potential size of the project is likely to prove particularly attractive to all sectors of the market. Financiers (both equity and debt) will consider this a strong proposition given the size of investment for the work required to invest in a PPP project. We do not anticipate availability of capital to be an issue but there may be less interest in a Dunedin location versus, for instance, an Auckland location, where the PPP team may move on to other opportunities.

In-depth engagement with potential market participants (including construction contractors, AM/FM providers, financiers and arrangers) is planned to be undertaken early in the DBC phase to confirm these views. It is proposed that the DBC stage include two rounds of market engagement (as compared with one in a typical DBC) to ensure that the proposed procurement approach is robustly tested with the market which will result in an informed and highly competitive procurement process.

8.6.3 Health PPPs internationally

PPPs have been used internationally as a procurement model for significant sized investments in the health sector for more than two decades. The United Kingdom first developed the concept in 1991 and has since undertaken more than 130 healthcare PPP projects, equivalent to approximately £12 billion of capital value.⁵⁰ Internationally, there is appetite for PPPs as they are seen by large investment funds as a good source of annuity income. Thus they are valued differently from other assets and internal hurdle rates for some investors may be as low as 7 percent. Early research indicates the presence of two or three active investors who may be attracted to a PPP venture. The DBC will investigate the commercial possibilities in more detail.

8.6.4 Local experience of PPPs

Local experience of PPPs is limited to schools and prisons. The conceptual, contracting and conceptual issues have been well worked through. Without a doubt, a PPP requires a very clear functional specification and a negotiation rather than a tender. Local experience with a hospital PPP is nil but, on the other hand, there have been no full-scale hospital rebuilds of this sort before, that we are aware of.

8.6.5 Project risks of a DBFM

The major risks relevant to the procurement approach (that may either influence the decision on a procurement option or provide opportunities for risk transfer/management) that we have identified to date are as follows:

Risk: The significant cost and complexity of the project may prove challenging to the construction market to deliver in a cost efficient and timely manner.

Assessment: There are several risks inherit in this project due to its cost and complexity including: design fault risk; cost and schedule overruns; project completion/project availability risk; and economic-financial risks(e.g. inflation rate risk, interest rate risk and exchange rate risk). PPP procurement may help to transfer these risks to a private sector partner. On the other hand, the PPP will need to manage other risks such as refinancing risks and interest may be reduced if there is a long build time. Importantly, a PPP will need to be assessed as to whether it increases the workforce pool available for the project.

⁵⁰ <https://www.gov.uk/government/publications/public-private-partnerships/public-private-partnerships>

Risk: Unanticipated asset maintenance costs.

Assessment: A PPP-contract can better transfer this risk to a private sector partner by incentivising higher quality in the initial build, compared to traditional procurement where there is an incentive to offer the lowest bid-price at the expense of quality. The incentive under a design and build contract expires with its warranties.

Risk: Demand risk for hospital services and uncertain scope of services to be delivered over asset life.

Assessment: Despite the delivery of clinical services being out of scope for any private sector involvement, the uncertainty around the changing models of care in the health sector over the next 10-20 years means any PPP contract will need to deal with such uncertainty. We understand the NZ form of PPP means the risk is appropriately carried by the purchaser and not by the contractor thus avoiding issues of lock in and stagnation caused by earlier forms of PPP contract. The ability to change over time will feature in any functional specification of the facility and will mean easy access to ceiling and floor space and ability to take different loadings. Essentially, this future facility needs a long life and loose fit build.

Risk: No interest from PPP investors or construction companies.

Assessment: As outlined in Table 20 this appears unlikely.

Appendix 1 Reference documents

- Sapere Research Group (2016) Southern District Health Board Strategic Services Plan
- Sapere Research Group (2016) Capital Investment Committee (Commissioned by the Southern Partnership Group), Detailed Services Plan part A
- Sapere Research Group (2016) Capital Investment Committee (Commissioned by the Southern Partnership Group), Detailed Services Plan part B
- CMM Architects, Jacobs, Johnstaff (2017) Dunedin Hospital Redevelopment Model of Care Summaries
- Rider, Levett Bucknall (2012) RELifing® reports (Dunedin Hospital), December 2012.
- Beca (2014) Peer Review of the 2012 Dunedin Hospital RELifing Analysis with Commentary on the Future Viability of the Clinical Services Block. 10 September 2014.
- Proj-X (2017) Dunedin Hospital – Ward Block Re-Lifing
- Beca – 21st February 2017 - SDHB Building Condition Report – Dunedin Campus
- Warren & Mahoney – 6th September 2016 - SDHB Feasibility Study – Utilisation of Beds in Dunedin Hospital Ward Block

Appendix 2 Assumptions in financial modelling

Core assumptions:

- **Ministry of Health Funding:** The Population Based Funding Formula will deliver small increases based on population demographic change. These increases are based on the medium investment track provided by the Treasury for testing the affordability of Long Term Investment Plans. This is approximately 3.0% per annum
- **Capital Charge:** the rate has reduced to 6% from FY2017/18 and it is assumed that any increase in Capital Charge will be fiscally neutral under the Capital Charge Rules, which will provide additional funding equal to the increase in Capital Charge.
- **Income Tax:** District Health Boards will remain exempt from Income Tax under CW38 of the Income Tax Act 007 and that GST rate remains at 15% under the Goods and Services Tax Act 1987.
- **Crown transfers:** The cost of new Dunedin hospital infrastructure in all of the options is funded by the Crown, via a transfer of the hospital assets within three months of project completion. Capital values to be transferred are per quantity surveyor (QS) costings by Rider Levett Bucknall commissioned by the Ministry of Health. With regard to the QS costings:
 - Build risk contingencies and escalations are built in.
 - GST is excluded. GST does not get capitalised it would merely result in an input credit, which given its size will result in a GST refund.
 - The difference between the RLB cost estimate and the figures in the model are the Type 2 Fixtures, Furnishings and Equipment, the Student Housing in **Option B** and an adjustment for land in the **new hospital new site option** as this was a net value. There are also adjustments for contingencies, rounding and escalation.
- **Infrastructure related capital expenditure:** This is based on the RLB 2012 assessment for infrastructure not covered by the Dunedin Hospital Redevelopment, which has been updated following the findings from the 2016 BECA Building Assessment report. The Dunedin Hospital Redevelopment capital expenditure is based on estimates provided by RLB. It is assumed that all infrastructure capital expenditure on items of infrastructure that will be demolished will cease two years prior to the demolition with the exception of the Ward Block which ceases four years prior to demolition.
- **Non-infrastructure related capital expenditure:** This is based on accounting replacement.
- **Deficit Support (Capital Injections):** Cash requirements for new assets will be funded via deficit support. Such support will be provided to the extent that cash is required to cover operating expenditure deficits and capital expenditure. It will not be provided to cover depreciation deficits as this is a non-cash expense.
- **Savings Plan:** The current plan to return the Southern DHB to breakeven by FY2019/20 will be implemented.

- **Inflation:** The cost pressures from CPI and Wage Inflation are based on the December 2016 Half Year Economic Fiscal Update, which forecasts inflation until FY2020/21. As the inflation forecast for FY2020/21 approximates the CPI and Wage Inflation over the last 15 years this has been applied to the forecast to FY2041/42 and is consistent with the rates used in Background Paper for the 2016 Stated on the Long Term Fiscal Position: Demographic, Economic and Fiscal Assumptions and Model Methods in the 2016 Long Term Fiscal Model⁵¹
- **Future Demand:** Service volumes are based on demographic profiles over 25 years. The Base Case is underpinned by the forecasts in Detailed Services Plan A and the shortlisted options are underpinned by the forecasts in Detailed Services Plan B.⁵² The effects of epidemiology have been excluded from the Sapere forecast in both Part A and Part B.
- **Staff projections:** FTE estimates are based on demographic profiles. The staff forecast reflects the effect of inpatient discharges and outpatient volumes on staffing requirements, and the service changes noted in the main body of the IBC document. Changes in workforce demographics, skill mix or the availability of a workforce to fill these roles have not been factored in to the forecast.
 - **Specialist Medical Officers and Resident Medical Officers:** The workforce work interchangeably between an inpatient and outpatient setting. It was agreed that this workforce would increase in line with increases in bed days, with the exception of outpatient only services which increase in line with outpatient volumes.
 - **Nursing and Allied Health:** The workforce tends to work in either an inpatient, outpatient or corporate setting. It was agreed that the increase in this workforce would increase in line with bed days for those working in an inpatient setting and in line with outpatient volumes for those working in an outpatient setting and would be held flat for those working in a corporate setting.
 - **Clinical Administration:** This workforce which provides support to clinical staff will also increase in line with bed days.
 - **Management and Non Clinical Administration:** This workforce is held at current levels.
- **Ceteris Paribus:** It is assumed that current Government Policy parameters and constraints do not change (e.g. there are no assumptions around increases in elective surgery or changes to superannuation or Kiwisaver requirements).

⁵¹ This report assumes that CPI will be 2% from 2021, which is based on the mid-point from the Reserve Bank Policy Targets Agreement to keep inflation between 1% and 3% over the medium term and Wage Inflation will be 3.53% from 2023.

⁵² Sapere Research Group, 2016.

Appendix 3 Build dates and values

Source: Woods Harris programme version 1b, May 2017, with Rider Levett Bucknall providing estimates

Base Case

Completion date	Activity	Escalated build cost (note exclusions)	Value to be transferred to DHB following build
17 Nov 2021	Handover of building to replace psych building and lecture theatres		
29 March 2022	Demolish existing psych building and lecture theatres	██████████	██████████
25 Feb 2025	Handover New CSB	██████████	██████████ ██████████ ██████████
27 Jan 2026	Demolish existing CSB		
	TOTAL escalated value	██████████	██████████

(This is an early estimate. Actual could be +/- 10%)

Build cost includes: Site preparation and site infrastructure to new build, external works, central plantroom building (energy centre), decanting allowance, group 2 FF&E, IT backbone allowance, design fees and consents, contingency and escalation

Build cost excludes: Any other new build or upgrade to other buildings on campus (as per Beca report 21/2/17), site wide infrastructure upgrades (aside from those relating to new build), IT hardware and IT software except as part of building envelope or infrastructure upgrade, contaminated ground, development levies, internal project management expenditure. Assumes traditional, competitive bid process.

Commentary on timing: This option requires replacement accommodation to be designed, consented and built as well as demolition and site preparation work being undertaken prior to the build. This adds 3 – 4 years to the programme, hence the timeline set out above. Actual construction of the new hospital and energy centre is assumed to take four years, with a further six months commissioning work.

Option B (build onto adjacent site)

Completion date	Activity	Escalated build cost (note exclusions)	Value to be transferred to DHB following build
29 March 2022	New Health Hub	██████████	██████████
18 July 2022	Replacement student accommodation	██████████	██████████
1 March 2023	Demolish existing accommodation		
March 2024	Design and construction of underground carparks, loading docks and non-clinical support prior to main build commencing	██████████	██████████
21 Jan 2029	New building (replacing Clinical Services Block, Inpatient Units currently located in the Ward Block and a new Energy centre)	██████████	██████████
9 Oct 2029	Demolish existing CSB		
8 April 2031	Refurbish ambulatory part of Ward block and back of house functions	██████████	██████████
	TOTAL escalated value	██████████	██████████

(This is an early estimate. Actual could be +/- 10%)

Build cost includes: Site preparation and site infrastructure upgrades, central plantroom building, decanting allowance, helipad, group 2 FF&E, IT backbone allowance, design fees and consents, contingency and escalation

Build cost excludes: internal project management expenditure, Health hub, any upgrade or repair to the Ward Block aside from refurbishment to ambulatory part and back of house functions, land costs for university, conversion costs relating to XTG for university, IT hardware and IT software except as part of building envelope or infrastructure upgrade, contaminated ground, development levies, ongoing replacement capex. Assumes traditional, competitive bid process.

Commentary on timing: This option requires replacement accommodation to be designed, consented and built as well as demolition and site preparation work being undertaken prior to the build. This adds 3 – 4 years to the programme, hence the timeline set out above. Actual construction of the new hospital and energy centre is assumed to take four years, with a further six months commissioning work. Options to reduce the programme will be explored in the DBC.

New hospital new site

Completion date	Activity	Escalated build cost (note exclusions)	Value to be transferred to DHB following build
29 March 2022	New Health Hub	[REDACTED]	[REDACTED]
11 Feb 2027	New Hospital and new Energy centre	[REDACTED]	[REDACTED]
14 July 2028	Demolish existing city campus		
	TOTAL escalated value	[REDACTED]	[REDACTED]

(This is an early estimate. Actual could be +/- 10%, even without site-specific variations. The cost of this option is site-specific).

Variation: This estimate of costs with a reduction of [REDACTED] This equates to a total reduction [REDACTED] The GFA deducted is not based on Health/Spatial planning advice and is arbitrary in order to demonstrate the impact that an area reduction of 10,000m2 could have on the overall costs.

Build cost includes: Site preparation and site infrastructure upgrades, decanting allowance, IT backbone allowance, design fees and consents, contingency and escalation

Excludes: internal project management expenditure, Health hub, Cancer centre, colocation of acute mental health, public car parking beyond minimum [REDACTED] allowance, group 2 FF&E, IT hardware and IT software except as part of building envelope or infrastructure upgrade, ongoing replacement capex, contaminated ground, development levies. Assumes traditional, competitive bid process.

Commentary on timing: This option assumes design, consenting, demolition and site preparation work being undertaken from 2019 to 2022. Actual construction of the new hospital and energy centre is assumed to take four years, with a further six months commissioning work. Options to reduce the programme will be explored in the DBC.

New hospital on Wakari site

Completion date	Activity	Escalated build cost (note exclusions)	Value to be transferred to DHB following build
29 March 2022	New Health Hub	██████████	██████████
17 December 2027	New Hospital and new Energy centre	██████████ ██████████ ██████████ ██████████ ██████████	██████████ ██████████ ██████████ ██████████ ██████████
May 2028	Demolish existing city campus		
	TOTAL escalated value	██████████	██████████

(This is an early estimate. Actual could be +/- 10%)

Build cost includes: Site preparation and site infrastructure upgrades, decanting allowance, IT backbone allowance, design fees and consents, contingency and escalation

Excludes: internal project management expenditure, Health hub, Cancer centre, colocation of acute mental health, public car parking beyond minimum ██████████ allowance, group 2 FF&E, IT hardware and IT software except as part of building envelope or infrastructure upgrade, contaminated ground, development levies, ongoing replacement capex. Assumes traditional, competitive bid process.

Variations: As with the new build option above, a reduction in GFA of ██████████ would equate to a reduction in cost of ██████████. Again as above, the GFA deducted is indicative.

Commentary on timing: This option requires replacement accommodation to be designed, consented and built as well as demolition and site preparation work being undertaken prior to the build. This adds 3 – 4 years to the programme, hence the timeline set out above. Actual construction of the new hospital and energy centre is assumed to take four years, with a further six months commissioning work. Options to reduce the programme will be explored in the DBC.

Appendix 4 Risks of the investment

[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

Appendix 5 Clinical change programme

A Strategic Model of Care

The FRE have confirmed support for the following areas to be considered in the development of a Strategic Model of Care.

Area for consideration	What success would look like
<p>Primary Care</p> <ul style="list-style-type: none"> • General practice consolidation • Development of Integrated Family Health Centres/Healthcare Home. • Risk stratification will be commonplace including access to flexible packages of care. • Specialist support provided into general practice. 	<ul style="list-style-type: none"> • General practice will be diversified, offering a range of services in one place. • General practice will be proactively managing patients most at risk of disease progression. • Health pathways will reduce unwarranted variation in care.
<p>Community Services</p> <ul style="list-style-type: none"> • Community services will be focussed on hospital, aged-residential care, mental health bed admission avoidance, rehabilitation and minor procedures. • Consideration given to utilising the Senior Medical Officer workforce in the community with in-reach to inpatient settings. • Major area for workforce development – allied health and nursing roles. • Role for rural hospitals determined as the centre of care clusters with additional acute and medical services. • NGO input strengthened particularly in regard to mental health and Māori health services. 	<ul style="list-style-type: none"> • Multidisciplinary teams based in the community would all work together to keep people healthy. • Rural hospitals would become the hub of health care for their communities. • Services in the community are easy to navigate for patients and whanau.
<p>Ambulatory Care</p> <ul style="list-style-type: none"> • Determination of which services could be ambulatory-based but co-located with hospital services (high risk, low volume). • Determination of which services could be located in community hubs (potentially large general practice) in Dunedin or provided further afield utilising telemedicine. 	<ul style="list-style-type: none"> • People will only travel to Dunedin Hospital when they need. • Telehealth will become commonplace for specialist consults to people living rurally.

Area for consideration	What success would look like
<p>Maternity Services</p> <ul style="list-style-type: none"> Primary birthing is an option across our district. 	<ul style="list-style-type: none"> Women can choose to birth as close to home as possible. Birthing units are both clinically and financially sustainable.
<p>Secondary/Tertiary Services</p> <ul style="list-style-type: none"> Determination of local service provision versus regional and national coordination of highly specialist services. Which services are required for the Central Lakes population given the rapidly changing population demographic. 	<ul style="list-style-type: none"> Levels of service are clear including services to be provided regionally and nationally. The community participates in the decision making process and therefore understands how and why services are configured.

Source: Southern DHB

Specifically, to progress change the following actions are underway:

- Alliance South, which is the partnership body across Southern DHB and Well South Primary Health Network is developing:
 - A Hospital Admission Reduction Programme that aims to reduce both the number of presentations to the ED and the number of acute hospital admissions through provision of primary and community based options for care.
 - A Community-Based Wrap Around solution for older people that promotes ageing in place through pro-active management of frailty in the community.
 - A risk stratification approach to the management of patients with long-term conditions including supported self-management.
- The development of a Primary and Community Strategy and Action Plan that will provide a clear model of how primary and community health services will be configured in 2030.
- Health Pathways development – this programme is being revitalised and will be used to reduce unwarranted variation in care and integrate care between primary and secondary services.
- Telehealth implementation – telehealth equipment is now installed in all rural hospitals and some general practices, and there will be further utilisation of this technology for both planned appointments and in the provision of specialist support into general practice and rural areas.

Service Models of Care

The DHB manages service-specific changes using service plans, which incorporate both production planning and meeting operational requirements alongside determining initiatives to increase efficiency and improve quality of services.

An existing productivity work programme accompanies the implementation of new service models. This programme is supported by the DHB’s *Skills for Change* initiative. The work is organised under five work streams: reducing patient harm, reducing staff harm, improving patient flow, reducing care variation, and better supporting complex patients.