Site Review of the new Women's and Children's Hospital

Table of Contents

1. Executive Summary

The South Australian Government committed to build a new Women's and Children's Hospital (new WCH) co-located with the Royal Adelaide Hospital (RAH). The current Women's and Children's Hospital (WCH) situated in North Adelaide has ageing infrastructure and no adult intensive care unit (ICU). The current WCH layout also limits the ability to implement contemporary models of care and has limited options for expansion.

In 2019, following a Taskforce assessment, a site immediately to the west of the RAH was chosen for the new WCH and named the RAH West site.The key advantage of this site is the ability to deliver contempoaray clinical care while also being able to link to the RAH infrastructure. This includes a direct access to the RAH's adult ICU, the RAH helipad and other ancillary support infrastructure in the RAH. Co-location of the new WCH with the RAH on the RAH West site also allows for operating theatre linkage and enhanced emergency surgical response.

Despite the significant clinical and shared infrastructure advantages of co-location on the RAH West site, concern has been expressed that the site may be too restricted to meet future demand for the new WCH and that the site constraints may result in a significant construction cost premium over other sites.

Importantly building the new WCH on the RAH West site significantly limits, almost exstinguishes, any future expansion of the RAH, while at the same time preventing any future expansion of the new WCH on the RAH West site.

Given these concerns, the Minister for Health and Wellbeing appointed an independent Chair to lead a new WCH Review Group (RG) to undertake a rapid review into the proposed site location of the new WCH. In addition to the independent Chair, the RG membership comprised both the Chair and CEO of the Women's and Children's Health Network (WCHN), the CEO of Renewal SA, independent health infrastructure and railway experts and senior representatives from the Department of Health and Wellbeing (DHW), the Department of Infrastructure and Transport (DIT)and the Department of Treasury and Finance (DTF).

The key objective of the review undertaken by the RG was to contrast the clinical objectives and capital and operating costs of the RAH West site (Option 1(a) – current concept) against the following alternative options:

- Option 1 (b): RAH West Site plus enhanced public transport and future proofing
- Option 2 (a): Thebarton Police Barracks Site adjacent to Port Road
- Option 2 (b): Thebarton Police Barracks Site set back from Port Road
- Option 3 (a): City West site (square building orientation)
- Option 3 (b): City West site (north/south rectangular building orientation)
- Option 4: Hybrid Site (new WCH split across RAH West and the Thebarton Police Barracks site, connected by pedestrian bridge link over the rail corridor).

To progress the review in a timely manner, the RG established six working groups to progress relevant issues. The working groups were:

- Clinical Reference Group, which advised on the clinical adequacies of each option,
- Master Plan Working Group, which prepared layout concepts for each site,
- Site Issues Working Group, which investigated issues to achieve site clearance,
- Public Transport Working Group, which provided advice on service improvements,
- Rail Working Group, which investigated undergrounding of rail lines, and
- Financial Working Group, which assessed the financial merits of each option.

The options were examined by the working groups to determine if a more strategic site could be found that still achieved the clinical requirements and that facilitated expansion of both the RAH and the new WCH in the medium to longer term.

The Clinical Reference Group (CRG) was requested to provide advice to the RG on clinical benefits and issues for each of the options being considered for the new WCH. The CRG advice included the WCHN and DHW views of the extent to which the site options would deliver on clinical requirements and either meet or compromise patient treatment, along with the extent of that compromise (if any) compared to the RAH West site.

With the larger floor plates potentially available in options 2 to 4 concept layouts, the Master Plan Working Group (MPWG) explored ways to offer additional clinical connectivity, such as locating the neonatal ICU adjacent to theatres, outpatients integrated on one floor and oncology next to inpatient units. Car parking requirements and active transport needs were also considered in the transport master planning for these options, to ensure that transport access was at least equal to option 1(a). Consideration was also given to the potential future capacity for other complementary functions within the Adelaide Biomedical Precinct, such as SA Pathology and Ronald McDonald House

The Site Issues Working Group (SIWG) was tasked with advising the RG of the cost and timeframes to provide clear sites for construction of the new WCH under options 2(a), 2(b), 3(a), 3(b) and 4. The SIWG also considered the actions needed to achieve a clear site at each location, including any powers available to government on compulsory land acquisition (if needed) or other mechanisms available to secure site access. The risks to timeframes and cost were also identified under options 2 to 4.

The Public Transport Working Group (PTWG) reviewed the public transport access requirements at the alternative sites to ensure that public transport access is appropriate for a large quaternary hospital and that the provision of public transport under options 2, 3 and 4 were at least equal to that proposed for option 1(b).

The focus of the Rail Working Group (RWG) was to identify overall construction costs, operating costs, key assumptions, and constraints to underground the rail lines. The objective of this work was to determine if it was feasible to remove constraints to enable the new WCH to be built on the RAH West site, but not be limited in floor plate size by the proximity of the current rail lines to the immediate west of the site.

The Financial Working Group (FWG) was tasked with undertaking a financial analysis of the quantitative findings by the Master Plan, Site Issues, Rail and Public Transport working groups, including a comparison of the capital and operating costs associated with option 1(b) and options 2 to 4 compared to option 1(a).

In addition to the financial analysis, the RG conducted a qualitative analysis of the options using some 40 attributes were grouped into the following categories to reflect the working group structures:

- Clinical and Clinical support – The ability of an option to meet the clinical requirements in particular the key criteria to provide an optimal functional layout and a safe pathway to achieve transfers to the RAH and the ability of the option to provide for future expansion.
- Master Planning – The option's impact on building functionality, shape and form, leverage off the RAH infrastructure and capacity to expand in the future.
- Construction – The option's complexity to build, program impacts on time to complete and impact on the RAH and other parties during construction.
- Public Transport – The ability for a site to have access to public transport, support for safe cycling and walking and vehicle access.
- Site Issues – The extent of planning, heritage and other approvals and their complexity for each option.
- External Factors – The potential for a site to facilitate further developments and proximity to additional accommodation and parking for patient families and staff.

The attribute groupings were weighted based on their significance to the new WCH. The weightings in the multi-criteria analysis were Clinical 40%, Master Planning 12.5%, Construction 20%, Transport 12.5%, Site issues 10% and ExternalFactors 5%.

The South Australian Government was also concerned to ensure that the option selected would meet the health needs of the community, not only in the short to medium term, but have the capacity to meet needs in the longer term. The ability of each option to meet longer term needs was also part of the qualitative assessment process with 2 of the 40 attributes focussed on this issue.

Option 1(a) was assessed as capable to meet health needs out to 2036/37 and will likely meet the needs out to the time horizon of 2041. Using the high growth population forecasts would necessitate a further 82 treatment spaces (beds) and around a 15% increase in hospital space be needed beyond 2041. Option 1(a) with its constraints on floor plates would not be able to meet the 2041 requirement in a high growth scenario without relocating some less critical health services off site. With appropriate design, option 1 (b) and options 2 to 4 were judged as being better able to meet these longer-term needs should they eventuate.

The RG and relevant working groups were sent the matrix (or part thereof) to individually score each option against each of the attributes using scoring of 0-1 unacceptable, 2-4 poor, 5-7 fair and 8-10 good/excellent. The average score for each working group was calculated and added to the average score of RG members to deliver a final average score for each attribute for each option. The average of these scores represented the overall qualitative ranking for each option.

The qualitative analysis resulted in option 2(b) ranking with the highest score followed closely by 2(a) and then 1(b) and 3(b) on equal scores. Options 1(a) and 4 were ranked significantly lower than the other options.

The qualitative ranking was compared to the financial analysis. Compared to option 1(a) all the other options require significant capital and operating cost premiums. In essence gaining flexibility for future expansion and improved clinical adjacencies comes at a significant capital cost, ranging from $500m for option 1(b) to $1.5bn for option 4. These cost differentials are driven by a range of factors including additional design costs, costs to relocate SAPOL from the barracks site in the case of options 1(b), 2(a), 2(b) and 4 and acquisition and demolition costs for options 3(a) and 3(b).

These factors also result in longer times to commissioning of the new WCH for options 2 to 4, with commissioning times extending from late 2028 for options 1(a) and 1(b) to early 2033 in the case of option 3(a).

Option 2(b) provides the greatest level of flexibility for future growth and was rated the highest in terms of qualitative attributes, particularly the need to meet clinical adjacencies for the new WCH. Importantly it retains the RAH West site as a future expansion zone for the RAH, as included in the RAH Master Plan. With a large podium level floor plate all the hot floor services for example are located on one floor so that theatres and and other critical care services are adjacent. The cost premium of option 2(b) is largely driven by the costs to relocate SAPOL from the barracks site and cost escalation due to the time taken for this relocation. This enabling cost is not dissimilar to the $187 million enabling cost of relocation of railyard infrastructure including the Adelaide railyard to Dry Creek in 2011-12 to enable the construction of the RAH. If the relocation costs and timeframes can be reduced, then the cost premium over option1(a) can be significantly reduced. Option 2(b) is the most favoured option if a long-term planning horizon is chosen for both the new WCH and the RAH.

Option 1(b) offers capacity to expand the new WCH up to 96 beds beyond the capacity of option 1(a) which would cater for demand well beyond 2041. This could be achieved at a cost premium of $270m over option 1(a) if the extension of the Adelaide BioMed City into the SAPOL barracks site is deferred. Option 1(b) in this form is effectively a design of the 5 tower levels that accommodate the inpatient units to deliver 4 wards per floor rather than 3 wards under option 1(a). It does not, however, provide the flexibility of the large floor plate that option 2(b) provides and so is rated lower on clinical adjacencies.

Option 1(a) also has an airbridge connection to the RAH and so provides the best connection for staff and patients between the 2 hospitals. However, it does not have the floorplate size of option 2(b) and does not

provide opportunities for on-site expansion for the RAH. It is, however, the lowest cost solution.

The Rail Working Group investigated the feasibility of reconstructing the rail lines adjacent to RAH underground to free up site capacity for the RAH West site. The investigation of this proposal found that this would only provide an 80m section immediately adjacent to Port Road that could be utilised for the New WCH. The limits of rolling grade and the proximity of the Torrens River rail bridge and the Adelaide rail yards precluded a longer underground section. The costs of the extensive works required to achieve this was estimated at $500m and construction would cause considerable disruption to freight and passenger rail traffic as well as substantial traffic interruptions to Port Road. It was not considered a feasible option.

Whichever option is decided by the SA Government, the RG considers there is considerable merit in undertaking a value management assessment to optimise the functional layout of the new WCH at lowest cost of construction. This assessment should include a benchmarking exercise against other relevant hospitals recently tendered in other states.

To support the carpark design capacity, all options assume a very substantial shift in mode share to public transport. For options 1(a), 1(b), 2(a), 2(b) and 4 improved public transport services are needed to facilitate that shift. Further transport modelling is recommended during the Master Planning phase to confirm the public transport service offerings and the proposed carpark size area.

2. Introduction

In 2019 a Taskforce was established to provide advice to the former Minister for Health and Wellbeing on the scope, cost and location of a new WCH adjacent to the RAH. The Taskforce included clinicians representing the Women's and Children's Health Network (WCHN), and other Local Health Networks (LHNs); the Chief Executive Officer of WCHN; Executive Director Infrastructure Department of Health and Wellbeing (DHW); Deputy Chief Executive SA Health and representatives from Renewal SA, Department for Planning, Transport and Infrastructure, and Department of Treasury and Finance.

The key objectives of the Taskforce included identifying the state-wide models of care and services to be delivered by the new WCH, identifying the number of inpatient beds / treatment spaces required and analysing site options that would enable co-location of the new WCH with the RAH.

The five sites identified by the Taskforce were:

- Site 1 – RAH West – A triangular area of state-owned land directly west of the RAH. This had been earmarked for future expansion of the RAH and is the current location of a stormwater bio- retention basin, fire water tanks and pump station for the RAH site.
- Site 2 – Gaol Road – The site adjacent to Gaol Road and the current Thebarton Police Barracks, west of the Australian Rail Track Corporation (ARTC) rail corridor and which is bounded by Port Road to the south, and Park Land to the north. The site includes local and state heritage buildings and Aboriginal burial sites.
- Site 3 – Park 25 – Located in the parkland south of the RAH, south of Port Road, west of West Terrace and north of Glover Avenue (Henley Beach Road). The site includes a multi-sport precinct and several significant trees. This site is under the care and control of the Adelaide City Council (ACC).
- Site 4 – City West – Located within the Adelaide CBD, south of the RAH, between North Terrace / West Terrace / Hindley Street and Gray Street. The site includes local and state heritage buildings. The development of the new WCH on this site would either need to be in partnership with the property owners or a compulsory acquisition.
- Site 5 – River Torrens – A long thin site located north-east of the RAH, adjacent to the River Torrens and the Montefiore Road Bridge. This site is separated from the RAH by the Adelaide railyards.

The Taskforce developed five site criteria to evaluate each site and recommend a preferred site. The criteria were:

- Clinical – The ability of each site to meet the clinical requirements, in particular, the key criteria to

achieve clinical connectivity from the co-location of the new WCH with the RAH.

- Clinical support – The ability of each site to be connected to clinical and non-clinical support services.
- Site and building infrastructure – The ability for each site to access other support services and infrastructure. Also assessed was the ability for the government to gain care and control over each site.
- Transport – The ability for each site to provide adequate access to public and private transport.
- Planning and approvals – The requirements for each site concerning planning approvals and their complexity.

Based upon the above criteria, the Taskforce advice was that site 1 (the RAH West site) was the preferred site for the new WCH.

The key advantage of this site is the ability to deliver clinical requirements while also being able to link to the RAH and have clinical connectivity to the RAH's adult ICU, the RAH helipad and other ancillary support infrastructure in the RAH (e.g. food services, loading dock, engineering infrastructure etc).

Despite the significant clinical and shared infrastructure advantages of co-location, concern has been expressed that the RAH West site may be too restricted to meet future demand for the new WCH and that the site constraints may result in a significant construction cost premium over other sites. Building the new WCH on the RAH West site also significantly limits any future expansion of the RAH onto that site.

The Malinauskas Government is committed to building the new world-class Women's and Children's Hospital (new WCH) within the immediate proximity of the Adelaide BioMed City and to include the additional 50 beds pledged in the 2022 election.

3. Objectives of the Current Review

Noting current site selection was made back in 2019, the Minister for Health and Wellbeing has appointed an independent Chair to lead a new WCH Review Group (RG) to undertake a rapid review into the proposed site location of the new WCH. The key objective of the RG is to contrast the clinical objectives and capital and operating costs of these options against the RAH West site (base case – current concept). The terms of reference for the review are included as Appendix A.

The review assessed the benefits and costs associated with the following options for placement of the new WCH:

- Option 1: Current Concept (RAH West Site).
- Option 2: Thebarton Police Barracks Site.
- Option 3: City West Site (corner of North Terrace and West Terrace).
- Option 4: Hybrid Site (new WCH split across RAH West and the Thebarton Police Barracks site, connected by pedestrian bridge link over the rail corridor).

Despite the significant clinical and shared infrastructure advantages of option 1: current concept (RAH West Site), concern has been expressed by some that this site may be too restricted to meet future demand for the new WCH and that the site constraints may also result in a significant construction cost premium over other sites. Importantly building the new WCH on the RAH West site also significantly limits any future expansion of the RAH onto that site.

The State Government has committed to including 50 additional overnight beds at the new WCH. The new WCH project team have updated the current concept to incorporate these beds and associated support spaces within the design. This provides key parameters for the current concept for comparison with alternative sites.

Furthermore, in addition to the sites evaluated by the Taskforce, a further alternative has since been proposed, which involves a women's hospital on the RAH West site and a separate children's hospital on the Thebarton Police Barracks site. This option can be considered as a combination of the available sites and has merit in overcoming the site limitations with the RAH West site, while still retaining the critical connectivity to the RAH

adult ICU for women.

4. Review Process and Governance

The RG was chaired by Jim Hallion AM (a former Chief Executive Officer and Commissioner of the SA Government) and membership comprised of Jim Birch (Chair of the WCHN Board), Sam Sangster (an independent health infrastructure consultant), Lindsey Gough (CEO of WCHN) and senior representatives from the DHW, the Department of Infrastructure and Transport (DIT), the Department of Treasury and Finance (DTF) and Renewal SA - with specialist assistance as required.

The composition of the RG was as follows:

Membership of the new WCH Review Group	Role
Jim Hallion, Independent Appointment	Chair
Sam Sangster, Independent Appointment	Member
Brendan Hewitt, Executive Director Infrastructure DHW, new WCH Project Director	Member
Lindsey Gough, Chief Executive Officer, WCHN	Member
Jim Birch, WCHN Board Chair	Member
Simon Morony, Executive Director Across Government Services, DIT	Member
Sandy Burness, Director Account Management, DTF	Member
Chris Menz, Chief Executive Renewal SA	Member
Mark Williams, Independent Appointment, Rail/Public Transport	Invited
Matt Hunt, Director City Projects, Major Projects and Pipeline Renewal SA	Invited
Jack Reynolds, Health Facility Planner	Invited

To progress the review in a timely manner, the RG established six working groups (WGs) to progress relevant issues. The six WGs were assigned leads to coordinate activities and to report to the RG on their area of responsibility.

The WGs and their team leaders were:

- Master Plan Working Group (MPWG) – Lead Brendan Hewitt
- Site Issues Working Group (SIWG) – Lead Matthew Hunt / Sam Sangster
- Public Transport Working Group (PTWG) – Lead Simon Morony
- Rail Working Group (RWG) – Lead Jim Hallion
- Clinical Reference Group (CRG) – Lead Lindsey Gough
- Financial Working Group (FWG) – Lead Sandy Burness

5. Scope of Work

To ensure site selection for the new WCH represents best value for money and capitalises on existing opportunities, the RG was tasked with comparing the proposed RAH West site (option1) against options 2, 3 and 4 identified earlier in the report.

The RG's task was to contrast the clinical objectives and capital and operating costs of these options against the RAH West site. The options were examined to determine if a more cost-effective site could be found that still meets the clinical requirements and that facilitates expansion of both the RAH and the new WCH in the medium to longer term.

The RG examined the previous site selection evaluation undertaken by the Taskforce to determine if there are any changed circumstances since the previous site selection work was completed or matters not fully considered. The additional 50 overnight beds committed during the election and the need to ensure longer term expansion opportunities for both the new WCH and the RAH were a particular focus of the RG work. The RG also noted that public transport access to the RAH West site needed further development.

The RG commissioned the Master Planning Working Group to prepare high level master plan concept layouts and costings for the new WCH to meet current and identified future demands for options 2, 3 and 4. The concept layouts for these sites also needed to incorporate the option 1 shared facilities with the RAH, as well as consideration of additional clinical adjacencies due to expanded floor plates, which were not available under option 1, due to the physical constraints of that site.

The master plans for the Thebarton Police Barracks and City West sites under options 2, 3 and 4 also aimed to incorporate feasible high level concept layouts that located the new WCH as close as possible to the RAH to maximise connectivity to the identified critical areas of the RAH and to the Adelaide Park Lands.

With the larger floor plates potentially available in options 2, 3 and 4 concept layouts explored ways to offer additional clinical connectivity, such as locating the neonatal ICU adjacent to theatres and oncology next to inpatient units. Car parking requirements and active transport needs were also considered in the transport master planning for these options, to ensure that transport access was at least equal to option 1.

During the Master Planning process it became clear that sub-options for options 1, 2 and 3 might offer enhanced benefits and in some cases lower overall costs than the initial selected options. Accordingly, the total options selected for evaluation became:

- Option 1 (a): Current Concept (RAH West Site).
- Option 1 (b): RAH West Site plus enhanced public transport and future proofing
- Option 2 (a): Thebarton Police Barracks Site adjacent Port Road
- Option 2 (b): Thebarton Police Barracks Site set back from Port Road
- Option 3 (a): City West site (square building orientation)
- Option 3 (b): City West site (north/south rectangular building orientation)
- Option 4: Hybrid Site (new WCH split across RAH West and the Thebarton Police Barracks site, connected by pedestrian bridge link over the rail corridor).

The Site Issues Working Group (SIWG) was tasked with advising the RG of the cost and timeframes to provide clear sites for construction of the new WCH for the 2 alternative sites under options 2(a) and (b), 3(a) and (b) and 4. The SIWG also considered the actions needed to achieve a clear site at each location, including any powers available to government on compulsory land acquisition (if needed) or other mechanisms that might be utilised to secure site access. The risks to timeframes and cost were also identified under options 2 to 4.

The Public Transport Working Group (PTWG) reviewed the public transport access requirements at the alternative sites to ensure that public transport access is appropriate for a large quaternary hospital and that the provision of public transport under options 2, 3 and 4 were at least equal to that proposed for option 1(b).

The focus of the Rail Working Group (RWG) was to identify overall construction costs, operating costs, key assumptions and constraints to underground the rail lines. The objective of this work was to remove constraints to enable the new WCH to be built on the RAH West site, but not be limited in floor plate size by the proximity of the current rail lines to the immediate west of the site.

The existing rail corridor effectively removes land and air space that could be used for a potential hospital or hospital related ancillary functions. This is due to constraints requiring vertical clearance above the tracks for the overhead traction system and the need for any bridge structure over the rail lines to have a clear span across all railway tracks.

The Clinical Reference Group (CRG) was requested to provide advice to the RG on clinical benefits and issues for each of the options being considered for the new WCH. The CRG advice included the WCHN view of the extent to which the site options would deliver on clinical requirements and either meet or compromise patient treatment, along with the extent of that compromise (if any) compared to the RAH West site.

The Financial WG was tasked with undertaking a financial analysis of the quantitative findings by the Master Plan, Site Issues, Rail and Public Transport WGs, including a comparison of the capital and operating costs associated with options 2, 3 and 4 compared to option 1.

As well as providing governance across the working groups, the RG assessed the trade-offs between overall construction costs, operating costs, and clinical functionality for each option, together with advice on the future proofing capability of each option.

Any additional external benefits or disadvantages from each site (e.g. access to public transport, access to Park Lands, urban redevelopment facilitation etc.) were also identified. This included the potential for each option to cater for the longer-term expansion of the new WCH and the RAH beyond the current service planning horizon of 2036/37. The review did not revisit the functional layout of the proposed new WCH, other than to increase clinical adjacencies when alternate site concept layouts allowed this to occur.

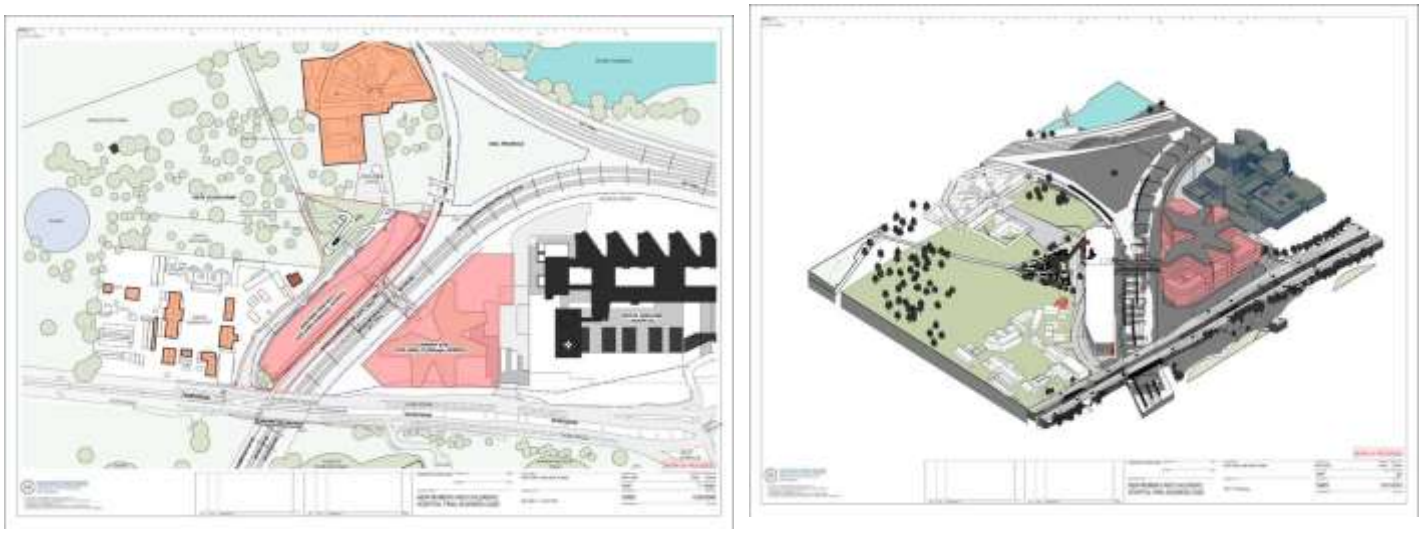
The RG also did not consider other sites for locating the new WCH, as the objective of the review was to locate the new WCH within the Adelaide BioMed City and to maintain a level of clinical connectivity to the RAH.

Consideration of provisions for SA Pathology and Ronald McDonald House were indicative only, as these facilities are out of scope of this review and will require separate reviews.

6. Option 1 (a) Current Concept (RAH West Site)

The current concept locates the new WCH on a triangle site immediately west of the RAH and has a standalone car park provided across the rail lines in the Park Lands. The key advantage of this option is the physical connection to the RAH across three levels supporting access for logistics, public and clinical services. It also enables shared infrastructure with the RAH, thus reducing overall running costs for the new WCH.

Figure 6.1: Option 1 (a) Site layout



This site provides for a building with a podium floor plate of up to 14,500sqm. The podium will be 7 levels and a tower of 5 levels with 3 wards per floor.

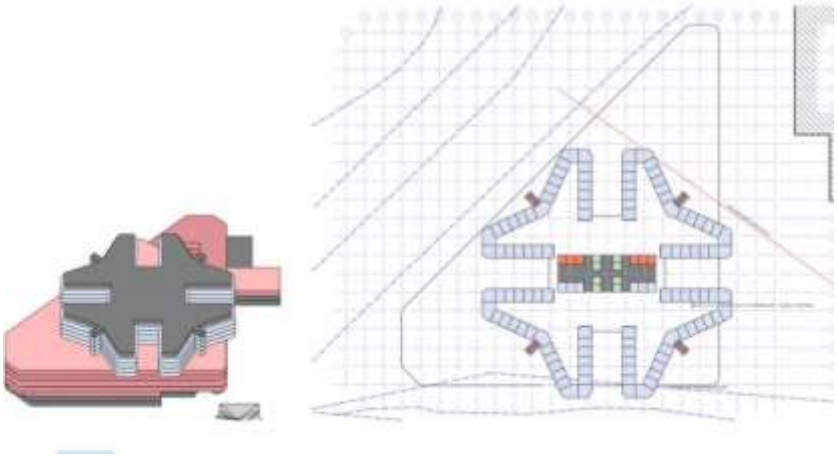
Option 1(a) provides physical clinical connection to the RAH via an airbridge which provides for direct access to the RAH's adult ICU, the RAH helipad and other ancillary support infrastructure in the RAH. The proximity of the two hospitals under this option also facilitates the sharing of food services, loading dock and engineering infrastructure.

While accommodating the current demands for health services the constrained triangular footprint of the site limits capacity for growth of both the new WCH and the RAH. Also, the constrained podium tower splits acute services across several levels, for example the NICU is located on a separate floor level to the theatre suites.

7. Option 1 (b) RAH West Site plus enhanced public transport and future proofing

Option 1(b) uses the same site boundary as option 1(a). However, this option increases the tower design floor plate to accommodate four (4) wards per floor. The significance of this change is that this allows for an additional floor for future expansion, with an additional four (4) wards available should future demand require it. In the short to medium term this extra floor space would be utilised by WCH support staff who in option 1(a) need to be accommodated elsewhere in the precinct

Figure 7.1: Option 1 (b) layout



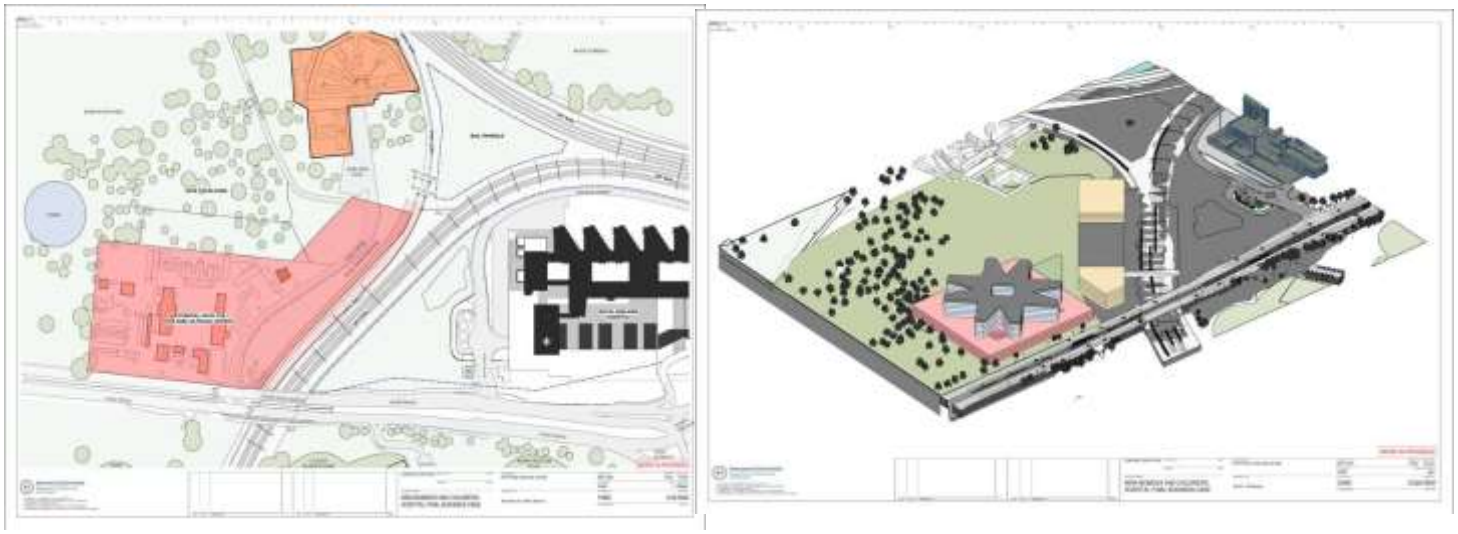
This option also addresses concerns raised in the Review about car parking and limited public transport services under option 1 (a). An additional tram stop on Port Road near George Street is provided and all tram services extended to the Entertainment Centre. As the O-Bahn and Hills bus services currently terminate at North Terrace, they are extended past the new WCH under option 1 (b). This option also involves provision of a third City Connector service to link other city bus services to the new WCH.

The Review Group consider these additional bus and tram services are needed to provide public transport access to a level expected of a quaternary hospital.

8. Option 2 (a) Thebarton Police Barracks Site – Adjacent Port Road

Option 2(a) involves the development of SAPOL barracks site adjacent to Port Road with a combination of integrated and standalone parking adjacent to Gaol Road.

Figure 8.1: Option 2 (a) Site Layout



This site provides for a building with a podium floor plate of 18-20,000sqm. The podium will be 4 levels and a tower of 6 levels with 4 wards per floor.

The connection to RAH is provided by road and new pedestrian access bridge across the rail lines. The emergency transfer between RAH and the new WCH would be by ambulance. This option provides a large flexible square footprint, providing for 23hr, PICU, NICU, Periop, DOSA and Birthing all being located on one floor level.

The enhanced public transport services outlined in option 1(b) are also included in this option, but with the bus and tram stops moved to Goal Road.

This option requires the Port Road Bridge to provide two right turn lanes off Port Road and a tram stop at Gaol Road. In order to achieve this a rebuilding of the Port Road Bridge is required at a cost estimated at $150 million and closure of 9 months.

9. Option 2 (b) Thebarton Police Barracks Site set back from Port Road

Under option 2(b) the development of SAPOL barracks site is similar to option 2(a) but with the new WCH setback from Port Road, partially on Park Lands. The site layout is shown in Figure 9.1.

Figure 9.1: Option 2 (b) Site Layout

This site provides for a building with a podium floor plate of 18-20,000sqm. The podium may be 4 levels and possibly a tower of 5-6 levels.

This option has all the same benefits as 2(a) regarding clinical flexibility and future expansion. Connection to RAH is provided by road and new pedestrian access bridge across the rail lines. Emergency transfer between RAH and the new WCH is by ambulance. Carparking provided by a separate building east of Goal Road as per option 1(a) and (b).

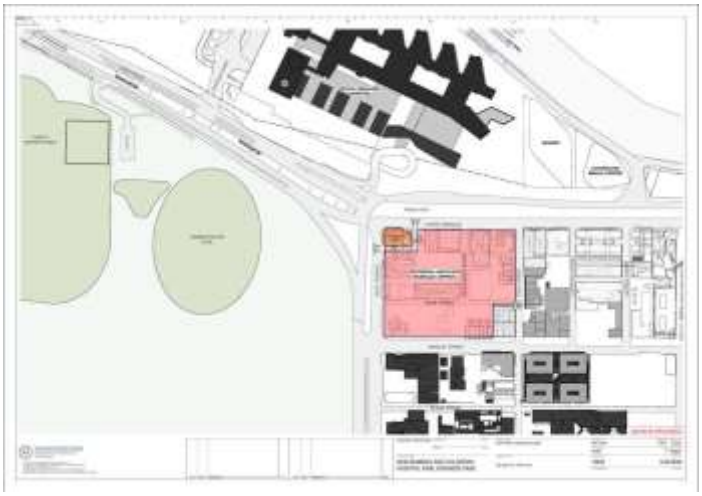
The key difference between this option and option 2(a) is the introduction of a second entry to the new WCH west of Goal Road which removes the need to completely replace the Port Road Bridge. However, bridge deck strengthening will be required to accommodate one right turn lane into the new WCH from the east and new northern and southern pedestrian bridges are required.

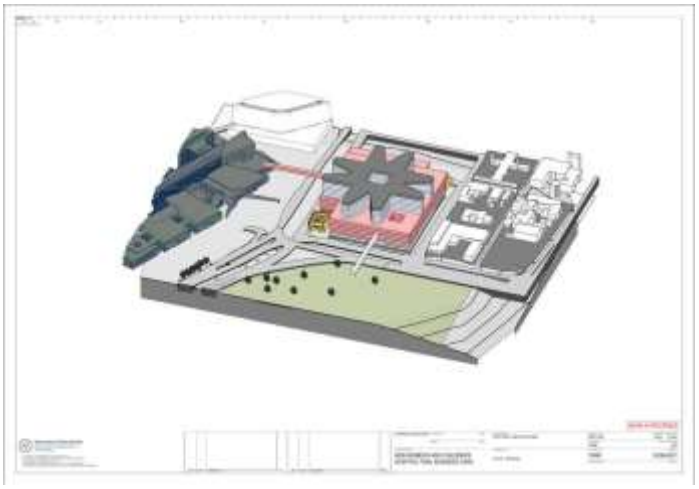
The enhanced public transport services outlined in option 1(b) are also included in this option, but with the bus and tram stop moved to Gaol Road.

10. Option 3 (a) City West Site (Square Building Orientation)

This option requires the development of the site between North Terrace and West Terrace, and Hindley and Gray Streets situated across from the RAH, with parking integrated with the hospital.

Figure 10.1: Option 3 (a) Site Layout





This site provides for a building with a podium floor plate of 18,000sqm. The podium may be 5 levels and a tower of 6 levels.

While the square footprint of the site limits flexibility to a degree, the option allows for 23hr, PICU, NICU, Periop, DOSA and Birthing to be located on one floor level. The concept also provides four wards per level, with an airbridge provided across North Terrace to the RAH. Shell floor levels could be added for later expansion.

Given the high standard of public transport services already surrounding this site no changes to bus or tram services are envisaged. However, recognising the very high cost to acquire Adelaide Day Surgery and CMAX buildings and the disruption this would incur to these health services a variation on this option was developed as outlined below.

11. Option 3 (b) City West Site (North / South Rectangular Building Orientation)

This option involves the development of the site between North and West Terraces, Philip and New Market Streets. It is situated across from the RAH, with parking under the hospital similar to option 3(a).

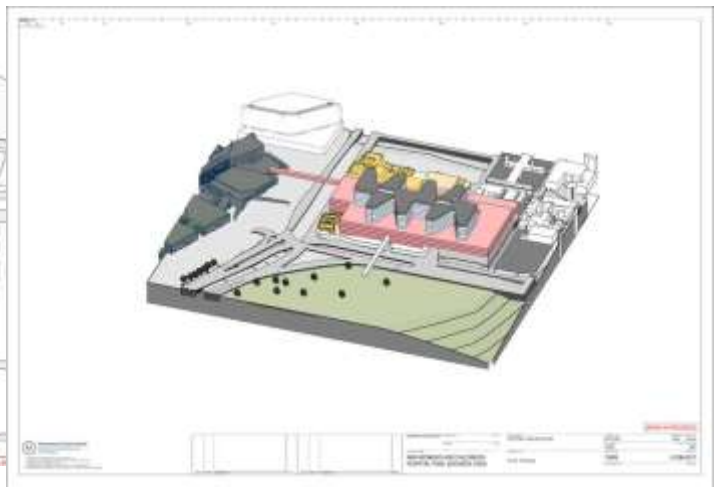


Figure 11.1: Option 3 (b) Site Layout

This site provides for a building with a podium floor plate of 18-20,000sqm. The podium will be 5 levels and a tower. This option also provides four wards per level, with an airbridge provided across North Terrace to the RAH and connection to West Terrace Park Lands via a bridge over West Terrace. Shell floor levels could be added for later expansion.

Given the high standard of public transport services already surrounding this site no changes to bus of tram services are envisaged.

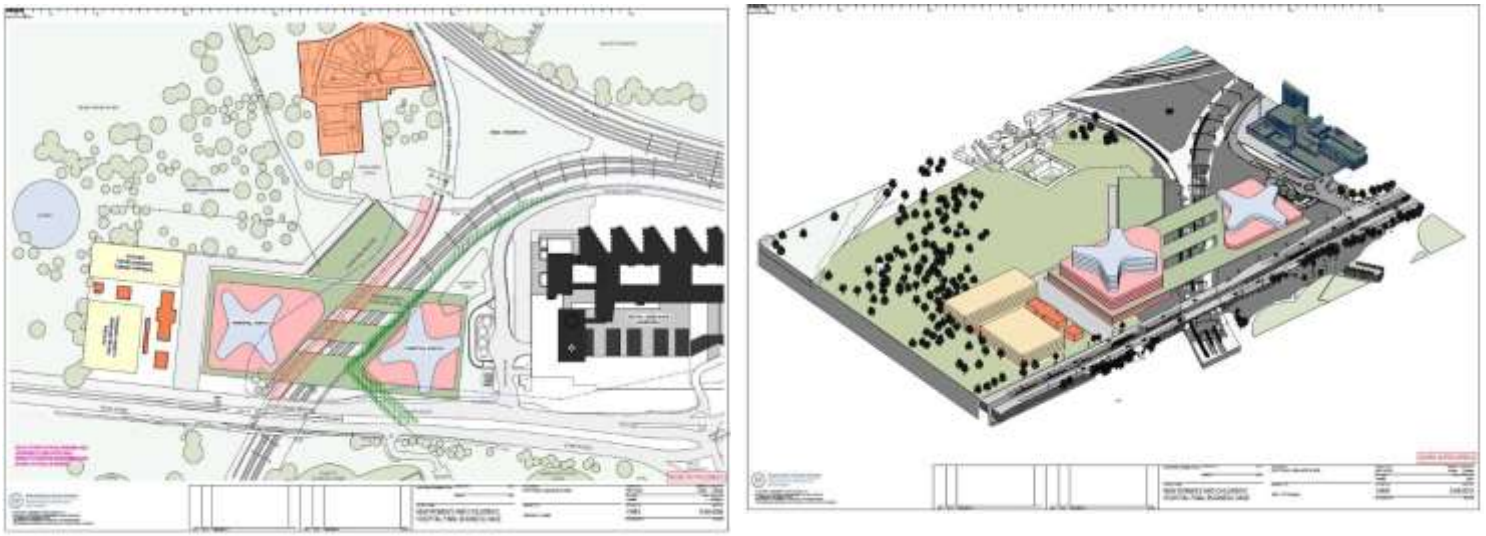
While this option is similar to option 3(a) it avoids the disruption and costly acquisition of Adelaide Day Surgery and CMAX. The north/south orientation of the building also provides improved layout and flexibility over option 3(a). However, this option builds over Hindley Street which would then be closed to through traffic. Hindley Street would become the entrance to the new WCH.

Agreement with the City of Adelaide Council would be needed, and traffic modelling undertaken.

12. Option 4 Hybrid Site (new WCH split across RAH West and the Thebarton Police Barracks site, connected by pedestrian bridge link over the rail corridor).

Option 4 is best described as a hybrid proposal, with a children's hospital situated on the SAPOL barracks site and the new women's hospital on the triangular site directly adjacent to the RAH, with parking under the children's hospital.

Figure 12.1: Option 4 Site Layout



Under this option, the split hospital will require duplication of some clinical and non-clinical services. This duplication may be reduced if a clinical functional split is developed rather than the proposed split of the hospital into separate women's and children's hospitals. Physical connection to the RAH would be provided via a new airbridge for the eastern building.

Building over rail lines to provide a conditioned connection at levels 3 and above between the two buildings requires further investigation and is likely to only be achieved at high cost. Significant engineering works would be needed in the rail corridor to avoid building collapse in the event of a freight train derailment.

Given these issues this option was evaluated on the basis of a pedestrian bridge connection between the two buildings.

13. Clinical Reference Group Findings

The Clinical Reference Group (CRG) comprised the Chair of the WCHN, CEO and Clinical Directors and support staff. The members agreed that the critical question to be answered on site selection from a clinical perspective is how important is geographical accessibility compared to other factors e.g. adjacencies and functionalities. Prior to scoring the Clinical Reference Group considered the criticality of the weighting in relation to the women's access between new WCH and RAH. This was a high priority for the original new WCH Taskforce. As the design process has evolved it has become clear that the existing location (option 1(a)) has limitations in relation to the floor plate being able to accommodate appropriate clinical adjacencies desired by WCHN clinicians. This requirement differed from the original new WCH Taskforce assessed potential locations for new WCH. The CRG took into consideration both competing priorities in their assessment.

13.1 Option 1(a) – RAH West

The group consider the location for option 1(a) to be constrained due to size, shape and boundaries of the land area. The group also considers that the floorplate does not allow for optimal functional and operational layout. The other main drawbacks of this option are that there is currently no available expansion space for either new WCH or the RAH.

The main benefit of this option is the close proximity to the RAH and the 30 – 40 meter link bridge which will facilitate a safe and time critical emergency pathway to provide response for critically unstable patients (women and children) and any subsequent transfers between new WCH and RAH. Option 1(a) does not facilitate the accommodation of the 160 staff currently planned to be housed in the Australian Bragg Centre unless this is facilitated by building onto the planned car park. This option will be supported by access to the helipad located at the RAH.

13.2 Option 1(b) – RAH West

The group consider option 1(b) to be an improved option to 1(a). The additional space on the police barracks over the railway line provides for an improved functional and operational layout. This concept layout for this option accommodates four wards per floor versus three wards per floor in option 1(a). Option 1(b) also still has close proximity to RAH to facilitate the safe and time critical emergency pathway for critically unstable patients (women and children). This option does allow for accommodating the 160 staff currently planned to be housed in the Australian Bragg Centre and potential future expansion space for new WCH.

13.3 Option 2(a) – SAPOL

The CRG consider option 2(a) to provide an improved functional and operational layout to options 1(a) and 1(b). This is due to the larger floor plate and ability to better manage the required clinical adjacencies as well as the ability to locate all of the 160 staff currently planned to be housed in the Australian Bragg Centre. This option allows for future expansion space and in addition vacates the option 1(a) site to accommodate future expansion space for the RAH. This option, however, does not provide as optimal a pathway for critically unstable patients (women). These patients would need to be transferred by ambulance to the RAH and there would be a distance for RAH staff to travel to new WCH should assistance be required and vice versa. However, a pedestrian bridge will be built over the railway line linking to facilitate staff transfer between sites. This option does, however, provide better helicopter access as the site would be provided with its own helipad. It is noted that option 2(a) triggers a significant upgrade to the Port Road Bridge although it does work within the confines of the SAPOL land title. This option (along with 2(b)) has the most optimal access to parklands and Aboriginal and other culturally sensitive and family friendly environments.

13.4 Option 2(b) – SAPOL

This option is similar to option 2 (a) and provides an improved functional and operational layout to options 1(a) and 1(b). This is due to the larger floor plate and ability to better manage the required clinical adjacencies as well as the ability to locate all of the 160 staff currently planned to be housed in the Australian Bragg Centre.

The CRG consider this option to be an improvement on option 2(a) as the rectangular layout makes it easier to drive natural light into the building. The CRG also preferred this option over option 2(a) due to the fact that ambulance entrance and exit will be separate to the rest of the traffic (option 2(a) does not have separate ambulance entrance and exits).

It is noted that this option does not trigger an upgrade to the Port Road Bridge as it pushes more to the northwest and uses land in addition to the SAPOL land title which is encapsulated by a SAPOL lease with Adelaide City Council. This option (along with 2(a)) has the most optimal access to parklands and Aboriginal and other culturally sensitive and family friendly environments.

13.5 Options 3(a) and 3(b) – City West

The CRG consider these options to be able to provide a reasonably good functional and operational layout. However overall the CRG considers that these options do not provide for optimal ambulance access due to the location of the land area and the traffic volume that uses that area. This location, situated adjacent to two major arterial roads, with very heavy traffic volumes would create significant issues in terms of ambulance access. In addition although the option 1(a) location would be vacated and provide for future expansion for RAH, there is no nominated expansion space for new WCH.

There is poor access to Aboriginal and culturally sensitive and family friendly environments and very poor access of new WCH to the parklands and oval across West Terrace. However, a pedestrian footbridge would be built to allow families to walk from new WCH to the Park Lands and oval across West Terrace. The CRG considers the location without the footbridge to be very sub optimal for families, children and adolescents. Even with the footbridge in place, the location is still seen to be sub-optimal. The identified outdoor area currently almost exclusively consists of concrete space and does not have easy access to parklands which has been identified as a key criterion by consumers.

These options were considered to provide a very poor solution to a safe and time critical emergency pathway to provide response for a critically unstable patients (women) and subsequent transfers between new WCH and RAH. There would be a distance for RAH staff to travel to provide assistance (and vice versa) and would require ambulance transfer for patients to RAH which would be challenging due to the location. The distance from option 3(a) and 3(b) to RAH ED is in a conditioned space via an airbridge over North Terrace. However, once inside the RAH the journey across and down floors to get to the emergency department is long and convoluted. This option does, however, provide better helicopter access as the site would be provided with its own helipad.

13.6 Option 4 – Hybrid RAH West and SAPOL

The CRG considered that option 4 does not provide the ability to have optimal functional and operational layout. The floor plate available adjacent to the RAH is no more than 8000sqm (in option 1(a) and 1(b) the floor plate is 14000 – 15000sqm). This does not allow for a functional split of services and will likely need duplication of services e.g. theatres which will inflate operational costs significantly.

The CRG consider that this does not maximise access for ambulances, as if women's and children' sservices were to be split across two buildings then access to the Women's Assessment Service would be separate to the Paediatric Emergency Department. The group also do not consider that this option optimal for future expansion for RAH and new WCH.

It is also considered that if this hybrid option is to utilise the RAH helipad then this would be sub optimal for the services in the building across the railway line. The CRG consider that if the proposal would be to split the Women's and Children's services across the two buildings that this would be a less optimal solution than option 1(a). Should the Women's and Babies services remain on the RAH West site, then this will facilitate a safe and time critical emergency pathway to provide response for critically unstable patients (women) and any subsequent transfers between new WCH and RAH.

In summary the CRG identified two options with extremely close weighted scorings. Those options are option

1(b) and option 2(b). These options scored highest for different reasons and the reference group indicated that for option 1(b) further work would be required to identify those services to be located across the railway line as part of the construction for new WCH.

14. Site Issues Working Group Findings

The Site Issues Working Group (SIWG) assessed the timelines, costs and risks associated with obtaining care and control of each of the seven site options for the new WCH in a form, and on terms, that will facilitate the required development.

In doing so, the SIWG explored mechanisms available to acquire care and control of each site, achievability or otherwise of each proposed site layout within current planning code and pathways to obtaining planning and other relevant approvals for the development. The impacts of each option on current site occupants, city functions and the community were also assessed.

In addition, the SIWG has made a qualitative assessment of external factors impacting each site with regard to the potential to precipitate further development and investment, including opportunities for commercial partnerships with private landowners or developers. SIWG also assessed the proximity to parking, hotels, services, amenities and functions considered desirable for staff, patients and families visiting the hospital.

14.1 Options 1(a) and 1(b)

For Options 1(a) and 1(b), the main body of the hospital is proposed to be located on land to the immediate west of the Royal Adelaide Hospital (RAH West site). This land is already owned by the Minister for Health. However, an agreement will be required with Central Adelaide Local Health Network and its Private Partner under the RAH PPP contract (Celsus) to construct on the PPP site, build connection points with the Royal Adelaide Hospital and create clinical and operational links.

Options 1(a) and 1(b) propose that a multi-deck car park will be located on Park Lands under the care and control of Adelaide City Council. No agreement has been struck with the Council about the construction of the car park in this location, however, discussions are underway to secure Council support for this proposal. A solution may see the loss of open Park Land offset by a land swap involving an area of the Park Lands adjacent Adelaide Gaol under the care and control of the Minister for Environment and Water. This land would need to be upgraded by the State, at its cost.

The location, form and layout of structures proposed under Options 1(a) and 1(b) are considered to be broadly aligned with the current planning code following code amendments implemented in 2021.

The RAH west site is a registered site under the Aboriginal Heritage Act and as such requires approvals under sections 21 and 23 of that Act. Section 21 and Section 23 approvals were granted by the Premier in January 2022.

Options 1(a) and 1(b) are considered to provide limited opportunity to drive further development and investment or opportunities for commercial partnerships due to the constrained nature of the RAH West site, noting that Option 1 (b) scores higher in this area based on the potential for further development on the SAPOL barracks site in the future.

These options are somewhat separated from both the CBD and inner western suburbs with limited access to commercial car parking options, hotels, retail and patient centred services within a walkable distance.

14.2 Options 2(a), 2(b) and 4

Options 2(a), 2(b) and 4 propose to locate the new WCH on the SAPOL Barracks site to the west of Gaol Road, and substantial built form on Park Lands under the care and control of Adelaide City Council. This will require an intra-government transfer of care and control of the SAPOL site to the Minister for Health.

These options each require the relocation of SAPOL functions from the Barracks to a new custom-built facility in a suitable city fringe location to support key police functions. This relocation will need to occur prior to the

commencement of works on site to build the hospital, and potential alternative sites have not yet been investigated.

Advice supplied to the SIWG originating from SAPOL is that relocation will take approximately 36 months. This includes time to identify and acquire a new site in a suitable location, design and deliver new facilities and relocate SAPOL functions and services.

Assuming that the process to relocate SAPOL commences immediately, in parallel with the process to obtain all planning and other approvals to build the new WCH on Park Lands, demolition works could commence on the SAPOL site by mid-2025. However, the SIWG recommends that the State establishes a clear pathway to obtaining development and demolition approvals for new WCH before committing to the relocation of SAPOL, including acquiring an alternative site.

Having secured vacant possession of the site, these options require:

- The removal of up to 10 significant State Heritage Places and their curtilage from the State Heritage register to allow for their subsequent demolition or alteration.
- Further amendments to the planning code to allow construction of buildings taller than the current limit of 2 storeys on the SAPOL site and, in the case of Option 2B, the expansion of the Riverbank Zone and Health sub-zone.
- Approval to construct significant road and public transport layover infrastructure on Park Lands under the care and control of Council or State Government to cater for the increased level of vehicle traffic.
- Approval of a change in use of areas of the Adelaide Park Lands.

The SIWG consider that above issues represent a significant challenge and obtaining required approvals may be difficult under current legislation and may require the introduction of a special Act of Parliament.

Mechanisms have been identified by URPS to make amendments to relevant legislation and regulations in order to create a pathway for approvals that may be easier to navigate and remove some of the risks that a proposal is rejected. This could include amending legislation to allow the proposal to be assessed as a Crown Development.

The SIWG also consider these site options to have the poorest connection to the CBD, and limited connection to the inner western suburbs. As such, there is very little access to commercial car parking options, hotels, retail and patient centred services within a walkable distance.

14.3 Options 3(a) and 3(b)

Options 3(a) and 3(b) require the acquisition of freehold land in the northwest corner of the city owned by private landholders. Acquisition may be by commercial agreement or through compulsory acquisition powers to acquire land for an incorporated hospital granted to the Minister for Health and Wellbeing under the Health Care Act (2008) and implemented in accordance with the Land Acquisition Act (1969).

If required, a compulsory acquisition process would be undertaken by DIT on behalf of the Minister for Health. DIT has estimated that the process should take between 9 to 20 months from the date that Ministerial approval is granted, depending on the extent to which the process is subjected to objections and legal challenges. Other factors that may delay vacant possession of the land include the potential need to relocate businesses or tenants.

Option 3(a) includes two significant commercial buildings, currently occupied by allied health industry tenants including CMAX clinical trials. Acquisition of these sites would require substantially higher levels of compensation than the surrounding sites and would likely trigger significant objections, legal disputes and the requirement to relocate tenants to purpose-built facilities before vacant possession of the buildings can be achieved.

As such, compensation would be required to acquire all privately owned properties within the Option 3(a) site area (approx. 17,000m2). Vacant possession of the site is anticipated to take 30 -36 months.

Further, the acquisition and subsequent demolition of these buildings, one of which (CMAX) has recently been redeveloped at considerable expense, would be considered to be counter-productive to the requirements of

the broader health precinct and send negative messages to private developers considering investments in the precinct.

Option 3(b) comprises sites that are largely vacant or otherwise contain little by way of valuable improvements to the land or businesses that would be hard to relocate, with the notable exception of the McDonalds restaurant on the corner of West Terrace and Hindley Street. As such, whilst the relevant legislation allows for objections or legal challenges on a limited range of grounds, compulsory acquisition of the land in Option 3B will be relatively inexpensive, with a low probability of significant delays to taking vacant possession. The SIWG understands that the owners of the most substantial land parcels that make up Option 3 (b) are actively seeking to divest or develop their sites, and as such are considered to be unlikely to challenge the acquisitions. As with all such acquisitions, there may be negotiations regarding the prices endorsed by the Valuer General compared with private sector price expectations.

Compensation required to acquire all privately owned properties within the Option 3(b) site area (approx. 22,000m2). Vacant possession of the site is anticipated to take 12 to 18 months.

Both options 3(a) and 3(b) are considered to be broadly in line with the existing planning code as it applies to the Capital City Zone. This zoning, combined with a location further from the flight path to Adelaide Airport places fewer restrictions on land uses, and will also allow additional height of buildings, increasing design flexibility for the hospital, and the potential to incorporate additional built form for future expansion or complementary development of facilities for SA Pathology, Ronald McDonald House, medi-hotels, retail or consulting rooms.

Both options propose to retain the only State Heritage Place within the site areas (the Newmarket Hotel) however consideration will need to be given to construction of the new WCH adjacent a State Heritage Place.

Option 3(a) includes the requirement to acquire and demolish up to six Local Heritage Places on Gray Street and Hindley Street. This would need to be addressed under the Heritage Places Act. Option 3(b) avoids the need to demolish at least five and potentially all six of these Local Heritage Places.

Both options include a proposal to construct pedestrian bridges from the WCH over North Terrace to the Royal Adelaide Hospital and over West Terrace to provide improved access to the Park Lands. These linkages would require approvals from the City of Adelaide and may require approvals under the Park Lands Act and Heritage Protection Act.

Both options also require the closure or alteration of Council roads within the area. Of note, option 3(b) includes the closure to through traffic of the western end of Hindley Street, however this is considered by the SIWG to be viewed favourably by planning and Council.

Options 3(a) and 3(b) are located within Adelaide's Central Business District, and directly across North Terrace from Adelaide Biomed City. This proximity, combined with the availability of adjacent development sites in the Capital City Zone provides the most opportunity for future development and investment from the private sector, including commercial partnerships. This location is also considered the most advantageous for easy access to parking, hotels, retail, services and other amenities within easy walking distance, as well as the ease with which the private sector can respond to meet the demand for additional amenity or services into the future.

Whilst all site options assessed as part of this process will position the WCH within close proximity to the Royal Adelaide Hospital, providing clinical connectivity for emergency, the SIWG consider the City West sites (Options 3(a) and 3(b)) provide significantly better connectivity with the broader biomedical, research and university precinct. Of the options assessed, only options 3(a) and 3(b) are located within 500 metres of all buildings and institutions within Adelaide Biomed City, as well as the entirety of the UniSA City West campus. The SIWG also consider that these options significantly enhance the attractiveness of the north- west quadrant of the Adelaide CBD for further private investment from allied health and complementary industry.

15. Master Plan Working Group Findings

The Master Plan Working Group (MPWG) provided feasible layouts and constructability advice for all options including plan views and elevations to demonstrate that each site could to varying degrees meet the clinical requirements. In addition, the MPWG undertook a costing exercise to determine the capital cost differences between the options on a comparison basis to option 1(a). Table 15.1 shows the results of that analysis.

Table 15.1 Capital cost comparisons

Option	1(b)	2(a)	2(b)	3(a)	3(b)	4
Capital cost increase over 1(a)	$500m	$900m	$700m	$1,300m	$1,000m	$1,500m

The cost increases are driven by increased design costs (all options), site acquisition and clearance costs (options 2 to 4), increased building size (all options) and building escalation costs associated with later construction starts (all options) and longer times to commissioning (options 2 to 4). There are very substantial cost premiums for building additional capacity (all options) and for changing to a new site.

16. Public Transport Working Group Findings

16.1 Option 1(a)

Minimal public transport improvement are included within the baseline concept Site 1(a). Two new bus stops are proposed to be constructed on the northern and southern sides of Port Road, immediately west of the Port Road and George Street intersection.

16.2 Option 1(b) and Option 4

Options 1 (b) and 4 receive the same bus and tram infrastructure and achieve significantly improved public transport services and infrastructure over option 1(a). Total proposed frequency to site from all services on weekdays is approximately every 2-3 minutes during the day. The design of the new WCH would enable future expansion of bus and tram stops, however these would not be in the initial project scope.

16.3 Options 2(a) and 2(b)

Services and infrastructure is as per site option 1(b) (inclusive of the new Gaol Road bus layover and turnaround) except Tram and bus stops on Port Road are moved to just west of Goal Road. This will require a rebuild of the Port Road bridge to accommodate two right turn lanes off Port Road and the tram stop. It should be noted that the Port Road tram stop is not the key factor determining the Port Road bridge rebuild; if the Port Road tram stop was removed, the bridge would still need upgrading for site option 2(a) due to the site configuration.

16.4 Options 3(a) and (b)

No changes to public transport services or infrastructure are proposed for site option 3(a) given its proximity to a range of existing services. Under option 3(a) road layouts will need to be significantly altered to accommodate the new WCH, with Hindley Street becoming one way.

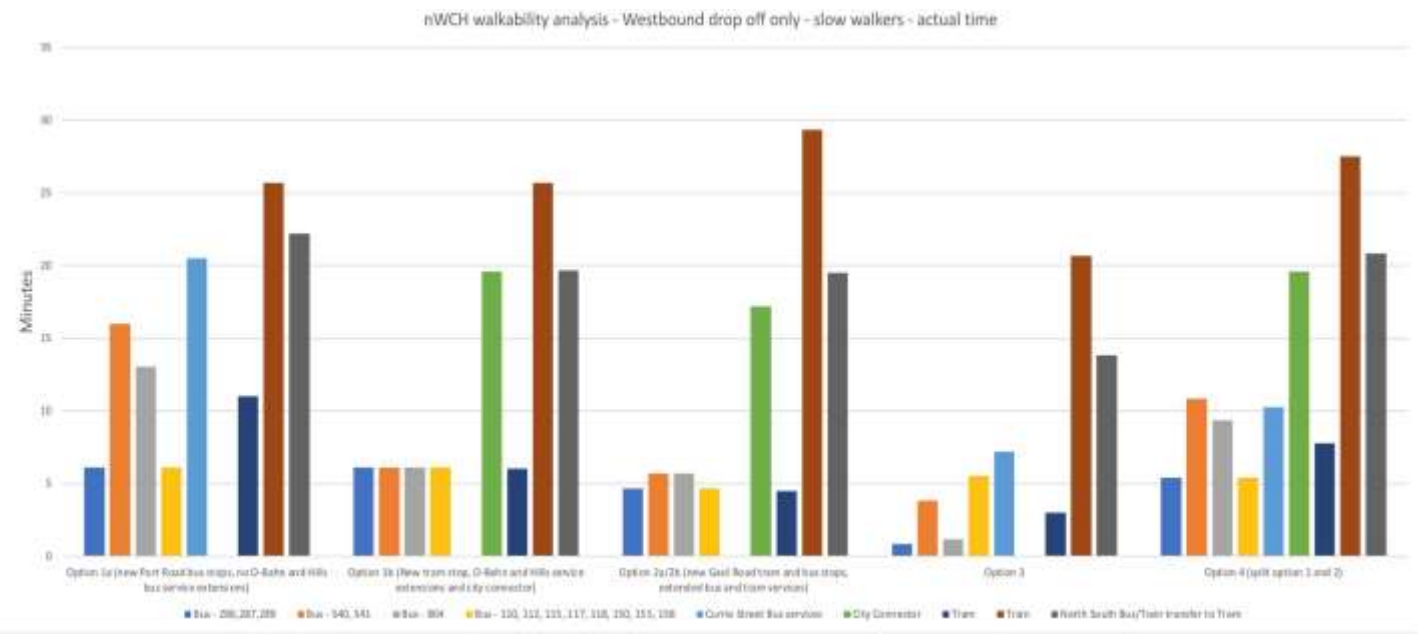
PTWG notes that the proposed master plan for option 3(b) will require the closure of Hindley Street as a through road to meet the needs of the new WCH.

16.5 Walkability Analysis

The walkability analysis considers the components of a journey e.g. walk time, wait time, additional time on public transport, and calculates the perceived time for a journey.

The time for a slow walker to reach the front entrance at each of the site options is depicted in Figure 16.1. Time is inclusive of road crossings at signalised intersections.

Figure 16.1 Walkability Analysis



Walk times from train services are assessed as 25 minutes or more due to the distance from the Adelaide railway station. Most visitors, patients and staff using train services would interchange to tram services at the Adelaide railway station, which is one of the factors in recommending the extension of tram services under options 1(b), 2(a), 2(b) and 4. The Rail Working Group has investigated the provision of a rail station opposite the RAH West site to improve services for both the new WCH and the RAH (refer section 17.For bus and tram services, walk times are considerably enhanced for all options compared to option 1(a).

16.6 Public Transport Costings

The provision of additional public transport services under options 1(b), 2(a), 2(b) and 4 require additional capital costs to purchase new vehicles, infrastructure costs for tram and bus stops and increased operating costs to extend services. It is estimated that an additional Tram stop and bus interchange would cost approximately $26 million with a further $15 million required for expansion of the tram and bus fleet. It is estimated that the expansion of services could cost approximately $4 million to operate.

17. Rail Working Group Findings

The Rail Working Group (RWG) was convened to assess a number of options in order that the new WCH could be built on the RAH West site, but not be limited in floor plate size by the restrictions imposed by the proximity of the current rail lines to the immediate west of the site, north of Port Road and to the south of the rail triangle.

The RWG examined the feasibility of undergrounding the ARTC and metropolitan passenger lines in the vicinity of the RAH. Using the maximum allowable grades, it is only possible to provide a section some 80m in length that could be utilised by the new WCH.The work needed to achieve this is extensive including the complete replacement of the Port Road bridge and construction would be expected to take over 3 years to complete. The estimated cost of undergrounding the rail lines is $500m. Very significant disruption to Port Road, interstate freight services and metropolitan rail services could be expected over the construction period. It is not considered a feasible option.

The RWG also considered the option of constructing a railway station servicing either the Belair lines or the Seaford lines, but with the passenger and freight lines remaining at grade. Significant works would be needed to achieve the appropriate rail alignment and cost of works is estimated at $160m with a 2.5-year construction timeframe. The high cost of this station is due to the extensive realignment works that would be needed to accommodate a station platform.The RWG also consider a proposal to allow a podium to be constructed over

the existing train lines. To allow appropriate clearance over the ARTC freight line and the metropolitan passage line the podium would match into level 3 of options 1(a), 1(b) and 4 of the new WCH.

Concepts have been prepared for a podium length of 80 metres and 160 metres. The difference in length is that any structure 80 metres or longer over the rail line is classified as a tunnel and requires forced ventilation and life preservation equipment which adds to the cost.The supporting wall structures would also need to be designed for impact loading from a train derailment. An 80m podium would cost around $185 m while a 160m podium would cost around $250m.

18. Capacity for Future Expansion

The endorsed scope of the new WCH will incorporate a total of 550 treatment spaces, this number is inclusive of the 50 additional paediatric and adolescent inpatient beds committed by the South Australian Government in the 2022 South Australian Election. The 550 treatment spaces are to be delivered as shown in Table 18.1.

Table 18.1: Treatment Spaces at New WCH

Paediatric and Adolescent Services	Treatment Space Numbers
Medical Overnight Inpatient Beds	134 beds
Medical Day Bed Equivalents	40 bed equivalents
Paediatric ED and EECU	55 treatment bays
Surgical Overnight and 23hr Inpatient Beds	64 beds
Paediatric Theatres	10 OT's
Recovery Bays	20 stage-1 bays
2022 Election Commitment	50 beds
Sub Total	**373 Treatment Spaces**
Womens and Neonatal	
Inpatient Beds	76 beds
Neonatal Cots	70 Cots
Birthing Suites	18
Obtetric / Gynae. Theatres	4
Recovery Bays	9 stage-1 bays
Sub Total	**177 Treatment Spaces**

As documented in the new WCH Business Case, and through supporting Clinical Services Planning activity, new WCH treatment space requirements have been modelled using SA Health's Endorsed AIM (Acute Inpatient Modelling) Tool and equivalent AIM Emergency Department Tool, which projects future activity to 2031.

The AIM Tool maps historic 5-year changes in net activity levels, and assesses this activity as relative utilisation rates against demographic cohorts as per ABS 2016 Census Data. The AIM tool projects forward the relative growth or decline in the utilisation of specific health services and maps this utilisation to projected population changes utilising the SA Government's endorsed Medium-Series Population Projections. Various additional health planning scenarios are built into the projections to support overall system planning and SA Health policy.

The 550 total treatment spaces proposed for the new WCH exceeds 2031 AIM Projections, meaning that while future growth beyond 2031 has not been modelled, capacity for this growth is integrated into the infrastructure delivery.

The SA Government is focussed upon ensuring the site selected for the new WCH can support growth well beyond the 2036/37 planning horizon. However, there are significant challenges to projecting long term community health needs and service requirements at a long term timeframe (2041 and beyond). For example, health service provision will be significantly impacted by changes in models of care and use of technology and population trends are difficult to forecast over longer timeframes.

Accepting these challenges it is possible to provide a guide to the capacity of the new WCH to incorporate future health service growth. Population projections (in appropriate age cohorts) have been utilised to 2041 using the High-Series population data to stress test expansion requirements, and utilises whole of South Australia

population projections, reflective of WCHN's role as the provider of quaternary and specialist paediatric services for the whole of South Australia.

Based on current planning the new WCH's 373 paediatric and adolescent treatment spaces and 177 women's and neonatal treatment spaces will, based on South Australia's 2031 Medium-Series population, deliver a ratio of:

- 96 paediatric and adolescent treatment spaces per 100,000 South Australian's aged 0 – 17.
- 8 women's and neonatal treatment spaces per 1000 South Australian live births.

To maintain these provision ratios in a 2041 future state, where South Australia's population has grown in line with High-Series population projections, the following treatment spaces would be required:

- 442 Paediatric and Adolescent Treatment Spaces (69 net gain)
- 190 Women's and Neonatal Treatment Spaces (13 net gain)
- **632 Total Treatment Spaces (82 net gain)**

A future 2041 increase of 82 treatment spaces beyond the 550 treatment spaces in the current design would represent a 15% increase in provision of care at the hospital. An expansion at this level would be anticipated to have equivalent pro-rata impacts on clinical support, non-clinical support, public, outpatient and administration functions at the hospital. Based on this pro-rata increase a total future expansion capacity of 15% of total floor area represents a conservative and defensible future expansion capacity to meet the potential requirements of a 2041 investment in the site that would be designed to meet clinical needs beyond 2041.

This represents a requirement for a future expansion zone to accommodate 16,450sqm of gross building area. This could be delivered through a number of investment strategies, including;

- Horizontal expansion onto adjacent available land.
- Vertical expansion which would be anticipated to require partial demolition and structural upgrade of the base building.
- Relocation of specific new WCH functions to satellite sites or to an adjacent health precinct.
- Innovative investment strategies such as repurposing multi-level car parking into hospital area. These strategies would require some preplanning of the car park design, particularly increased slab to slab clearances.

Options 1(b), 2(a), 2(b), 3(a), 3(b) and 4 would all have the inherent capacity to varying degrees to meet projected demands beyond 2041. Option 1(a) would require relocation of specific new WCH functions to either adjacent sites (if available) or sites remote from the precinct after 2041 if the high growth population forecasts are realised. Accordingly, future proofing of the new WCH became two of the criteria for assessing the options.

It is important to stress that this analysis represents an upper bound of likely future demand. It would require the high growth population projections to be realised and assumes that telehealth initiatives and other technological advances do not decrease hospital demand.

19. Site Selection Criteria

The Review Group (RG) was requested to compare the proposed RAH West site (option 1) for the new Women's and Children's Hospital (WCH) against the six alternative options outlined above.

To determine which of these options provides the best location for the new WCH the RG adopted a qualitative assessment process to rate each site on the non-financial attributes. This assessment was then combined with a financial assessment.

The existing costing model from the new WCH Full Business Case was utilised to undertake the financial assessment. A present value analysis of the capital and operating costs of the six options compared to option 1 was completed to assess the relative financial merits of each option.

20. Previous Taskforce Criteria

The new WCH Taskforce developed an evaluation methodology underpinned by a set of criteria for site selection. The site selection methodology comprised five site criteria, namely clinical, clinical support, site and building infrastructure, transport and planning and approvals.

Each site was graded for each criterion as follows:

- Green – A site meets the requirements of the criterion.
- Amber – A site potentially meets the criteria requirements subject to further work or adjustments.
- Red – A site does not meet the requirements.

Building on the work completed by GHD Woodhead, the Taskforce engaged cost modelling experts, Rider Levett Bucknall (RLB), to develop capital cost estimates for the construction of the new WCH for 3 shortlisted sites. The development of the cost models addressed the specific features of each site, such as topography, the extent of civil works required, potential car parking capacity and construction access etc.

The Taskforce weighted 18 key assessment criteria over five criteria groupings, based on their significance for the new WCH. The five criteria groupings and weightings Clinical 30%, Clinical Support 15%, Site and Building Infrastructure 15%, Transport 15% and Planning and Approvals 25%.

21. Qualitative Assessment by the Review Group

The Taskforce matrix appears well constructed and provided an analysis of the key attributes of each site which were considered most significant at the time.

Therefore, the RG utilised a similar methodology to the Taskforce for the qualitative analysis of the options, but updated the matrix to consider the future expansion requirements of RAH and new WCH, a requirement to accommodated all critical care services on one floor of approximately 20,000m2, knowledge of the impact on RAH services following development of an initial project concept and a revised assessment of the total area required for the new WCH. .

The Clinical Reference Group reviewed the set of attributes for the clinical and clinical support criteria, while the Master Plan Working Group reviewed the attributes for master planning and construction and the Public Transport Working Group reviewed the attributes for public transport. The Site Issues Working Group reviewed the attributes for planning and approvals and added a new set of attributes to reflect the external impacts of the options.

As a result of the reviews the Taskforce matrix was updated to include a set of ten clinical attributes, eight master planning attributes, 8 construction attributes, 3 transport attributes, 8 site issues and 4 external factors. In all 40 attributes were assessed for each site to provide a comprehensive assessment of the qualitative aspects of each option. This compared to 18 attributes used by the previous Taskforce.

The 40 attributes were grouped into the following categories to reflect the working group structures:

- Clinical and Clinical support – The ability of an option to meet the clinical requirements in particular the key criteria to provide an optimal functional layout and a safe pathway to achieve clinical connectivity with the RAH and the ability of the option to provide for future expansion.
- Master Planning – The option's impact on building functionality, shape and form, leverage off the RAH infrastructure and capacity to expand in the future.
- Construction – The option's complexity to build, program impacts on time to complete and impact on the RAH and other parties during construction.
- Public Transport – The ability for a site to have access to public transport, support for safe cycling and

walking and vehicle access.

- Site Issues – The extent of planning, heritage and other approvals and their complexity for each option.
- External Factors – The potential for a site to facilitate further developments and proximity to additional accommodation and parking for patient families and staff.

The attribute groupings were weighted on the basis of their significance to the new WCH. The weightings were Clinical 40%, Master Planning 12.5%, Construction 20%, Transport 12.5%, Site issues 10% and External Factors 5%.

The RG and relevant WGs were sent the matrix (or part thereof for the WG's) to individually score each site against each of the attributes using the same scoring as the Taskforce, namely 0-1 unacceptable, 2- 4 poor, 5-7 fair and 8-10 good/excellent.

The average score for each working group was calculated and added to the average score of RG members to deliver a final average score for each attribute for each option. The average of these scores represented the overall qualitative ranking for each option.

The matrix results are shown in Table 21.1 below.

		1a	1b	2a	2b	3a	3b	4
	Weight (%)	Weighted Score	Weighted Score	Weighted Score	Weighted Score	Weighted Score	Weighted Score	Weighted Score
Clinical and Clinical Support	40.0%	24.69%	28.45%	27.19%	29.12%	22.07%	22.13%	24.24%
Master Planning	12.5%	6.46%	7.81%	8.38%	8.77%	6.66%	6.93%	7.29%
Construction	20.0%	9.61%	9.61%	13.79%	15.64%	13.27%	13.35%	8.98%
Transport	12.5%	5.98%	8.15%	8.43%	8.59%	9.46%	9.57%	8.21%
Site Factors	10.0%	8.00%	6.69%	4.98%	4.34%	5.84%	6.69%	5.36%
External Factors	5.0%	2.07%	2.70%	2.08%	2.51%	4.07%	4.25%	2.45%
Total	100%	57%	63%	65%	69%	61%	63%	57%

Financial Working Group Findings

Cost modelling experts, RLB, developed capital cost estimates for the construction of the new WCH for the seven options. Based upon these estimates and operating cost differentials between the options prepared by SA Health, the Financial Working Group prepared the financial analysis of each option. Each of the sites present a range of constraints and opportunities, however the core cost of constructing the main hospital works varies by 17% or some $250 million across all options. The variances in the core hospital construction costs are driven principally by the area required for the nWCH under each option. The area changes are a result of duplication of functions currently provided in 1(a). The capital cost differentials between option 1(a) and the other options are set out in table 22.1.

Table 22.1: Capital cost differences to Option 1(a)

1A RAH West	1B RAH West	2A Barracks	2B Barracks	3A City West	3B City West	4 Hybrid
	+$500m	+$900m	+$700m	+$1,300m	+$1,000m	+$1,500m
Late 2028	Late 2029	Mid 2031	Mid 2031	Early 2033	Late 2031	Late 2030

The key drivers in the variances in overall or total project delivery costs vary by option but include:

- The time and costs to acquire alternate sites, such as the SAPOL and 1 North Terrace sites. That is the cost of funding alternative sites for SA Police and the compulsory acquisition costs for 1 North Terrace.
- External works including internal and external traffic movements, in particular the interfaces with major atrial roads in the CBD.
- Escalation costs arising from longer programs due to delays in acquiring the site, such as SAPOL And 1 North Terrace, and in turn the commencement of construction.

The potential site options look at constructing the new WCH on different sites, with different completion dates and with a range of differing site access, site ownership and other constraints. In short, other than site 1a, all other sites require time and/or cost premiums before construction can commence and in turn when the new WCH will be completed.

Site 1(b) has an additional $500 million in cost over site 1(a). This is due to three key factors: 1) An additional 9,266m2 for an additional floor and plant impacts to provide additional future clinical capacity;
2) Escalation and team resource costs associated with a likely additional 12 months to the program to resolve the project concept; 3) the estimated cost to acquire land and relocate SAPOL to enable that site for future expansion.

Site option 2a, 2b, 3a and 3b all require further additional area of 6,220m2 when compared to option 1a and 1b due to duplications of functions presently intended to be shared with Royal Adelaide Hospital such as the heliport, loading dock, sterilisation and catering functions. Option 4 will require further area of 6,070m2 due to duplication of functions such as operating theatres in the split women's and children's model.

Sites 2(a) and 2(b) require the acquisition of the SAPOL site and number of planning approvals before construction can commence. Identifying and financing an alternative SAPOL site incurs both a cost and time premium to utilise that site. While this also applies to site 1(b), the acquisition of the SAPOL site is not key to the critical path for construction of the new WCH in 1(b).

Site option 2(a) situated the new WCH close to Port Road, which requires significant works and cost to the Port Road Bridge, as well as significant disruption to one of Adelaide traffic routes during construction.

Site 2(b) is slightly lower in cost than site 2(a), largely due reduced impact on Port Road and the Port Road Bridge, however the exact impact is subject further detailed planning.

Differences in operating costs are limited to those costs that are a function of the absolute size of the built form of the hospital for each option, and the loss of opportunity to share certain functions between RAH and WCH if the connection is broken, such as in options 2, 3 and 4. For that reason, whilst not significant in the context of differences in capital costs, the expected operating costs of options where the linkage to the RAH is broken will be inherently higher.

As each of the sites commence operations in different Financial Years (FY) it is not accurate to compare the operating costs for 1(a), with a commencement in late 2028, with 3(a), which has a commencement in early 2033. It was therefore decided to compare the site options in FY2034 when all of the sites would be fully operational for a full 12-month period.

The result of the operational analysis is the operational cost comparison for FY 2034 as shown in table 22.2.

Table 22.2: Operational Cost Differences to Option 1(a)

1a	1b	2a	2b	3a	3b	4
$ 560.5m	$ 562.1m	$ 562.8m	$ 562.8m	$ 562.8m	$ 562.8m	$ 566m
$0	$1.6m	$2.3m	$2.3m	$2.3m	$2.3m	$5.5m

22. Review Group Findings

22.1 Option 1(a)

Situated on the RAH West site, the main benefit of this option is the close proximity to the RAH and the airbridge link, which provide response for critically unstable patients and any subsequent transfers between new WCH and RAH. Option 1(a) also allows for the sharing of infrastructure with the RAH, reducing capital and operating costs.

Option 1(a) is, however, constrained due to size, shape and boundaries of the land area and the Clinical Reference Group considered that the floorplate did not allow for the most optimal functional and operational layout. Option 1(a) also does not provide expansion space for either new WCH or the RAH.

22.2 Option 1(b)

Option 1(b) varies the tower design of option 1(a) to provide 4 wards per floor (instead of 3) which allows for significant expansion of the new WCH to cater for demand beyond 2041.

22.3 Options 2(a) and 2(b)

Under these options the entire new WCH is located on the SAPOL barracks site. It offers a combination of good clinical attributes with improved functional and operational layout compared to options 1(a) and 1(b). This is due to the larger floor plate on the podium floors providing the ability to better manage the required clinical adjacencies.

These options require the complete clearance of heritage listed buildings and rezoning to remove height restrictions. Obtaining heritage clearance approvals and planning approvals are likely to be challenging.

The site layout requires the the construction of pedestrian and cycle paths on either side of the Port Road bridge.

Option 2 (b) also utilises the SAPOL barracks site but positions the new WCH building further away from Port Road with the main traffic entrance further west of the Port Road bridge. This avoids complete replacement of the bridge (but deck strengthening, and a new pedestrian bridge is required).

Option 2(b) was the most preferred option by the Clinical Reference Group and was the most highly rated compared to all the other options on the qualitative assessment. It offers a combination of good clinical attributes with improved functional and operational layout compared to options 1(a) and 1(b). This option has the same benefits and challenges as option 2(a), but the rectangular layout of 2(b) makes it easier to drive natural light into the building. Also, under option 2(b) the ambulance entrance and exit will be separate to the rest of the traffic, allowing faster ambulance movements.

Importantly the Options 2a and 2b retain the RAH West site as an expansion zone for the RAH, as envisaged

in the RAH master Plan. Options 2a and 2b also provide better opportunities for the new WCH to expand in the furture, if required.

22.4 Options 3(a) and 3(b)

Options 3(a) and 3(b) are both located on the northwest corner of the CBD. Both options require the acquisition of freehold land owned by private landholders. Acquisition may be by commercial agreement or through compulsory acquisition. In the case of Option 3(a) the acquisition of Adelaide Day Surgery and CMAX buildings would be expensive and a significant loss of private health and medical research capability from the Adelaide Biomedical Precinct. Option 3(b) would require the closure of Hindley Street.

22.5 Option 4

Option 4 involves the new WCH split across RAH West and the Thebarton Police Barracks site, connected by pedestrian bridge link over the rail corridor

Separation into two buildings does not provide the ability to have optimal functional and operational layout. The floor plate available adjacent to the RAH is no more than 8000sqm (in contrast to 14,500 to 18/20,000sqm available for other options). This option does not allow for a functional split of services and will likely need duplication of services including theatres, which will increase operational costs significantly.

This option also does not maximise access for ambulances, as women's and children's services would be split across two buildings. Access to the Women's Assessment Service would be separate to the Paediatric Emergency Department. This option is also less than optimal for future expansion for RAH and new WCH as there will only be a small amount of space available on the RAH West location for any RAH expansion.

22.6 Rail Undergrounding

The Review Group was requested to examine the feasibility of reconstruct the rail lines adjacent to RAH underground to free up site capacity for the RAH West site. The investigation of this proposal found that this would only provide an 80m section immediately adjacent to Port Road that could be utilised for the New WCH. The limits of ruling grade and the proximity of the Torrens River rail bridge and the Adelaide rail yards precluded a longer underground section. The costs of the extensive works required to achieve this was estimated at $500m and construction would cause considerable disruption to freight and passenger rail traffic as well as substantial traffic interruptions to Port Road. It was not considered a feasible option.

22.7 Option Comparisons

The Review Group determined that Option 1(a) meets clinical requirements and likely demand requirements at least until 2041. After that date it may be necessary to decant some functions off site if high population growth forecasts are realised. Options 1(b), 2(a), 2(b), 3(a) and 3(b) all offered improvements in qualitative attributes compared to option 1(a), particularly greater flexibility for future expansion. Options 2(a), 2(b), 3(a) and 3(b), with larger floor plates, offered improved clinical adjacencies.

Options 2(a), 2(b), 3(a) and 3(b) maintain the capacity for the RAH to expand onto the RAH West site, while options 1(a) and 1(b) preclude this expansion, but offer the best connection between the two hospitals.

Compared to option 1(a), however, all the other options require significant capital cost premiums. In essence gaining flexibility for future expansion and improved clinical adjacencies comes at a significant capital cost, ranging from $500m for option 1(b) to $1.5bn for option 4. These cost differentials are driven by a range of factors including the costs to relocate SAPOL from the barracks site in the case of options 1(b), 2(a), 2(b) and 4, to acquisition and demolition costs for options 3(a) and 3(b).

Options 1(b) and 2 to 4 also required significant design work above option 1(a) and cost escalation due to delays in construction and commissioning are a significant component of the cost differentials. These factors also result in longer times to commissioning of the new WCH for options 2 to 4, with commissioning times extending from late 2028 for options 1(a) and 1(b) to early 2033 in the case of option 3(a).

For option 1(b) the capital premium of $500m could reduced by delaying acquisition of the SAPOL barracks site until further expansion is required beyond the capacity that is built into 1(b) by its 4 wards per floor design. Option 1(b) offers capacity to expand the new WCH by up to 96 beds beyond the capacity of option 1(a) which would cater for demand well beyond 2041. It does not, however, provide the flexibility of the large floorplate that option 2(b) provides and so is rated lower on clinical adjacencies. If connection to the RAH is the key driver in the decision process, then this option provides a strong connection via an airbridge and has flexibility for growth of the new WCH. However, it does not provide the same level of flexibility for growth of the RAH as it occupies the RAH West site.

Option 2(b) provides the greatest level of flexibility for future growth and was rated the highest in terms of qualitative attributes, particularly the need to meet clinical adjacencies. With a large podium level floor plate all the hot floor services for example are located on one floor so that theatres and ICUs are adjacent. The cost premium of option 2(b) is largely driven by the costs to relocate SAPOL from the barracks site and cost escalation and program extension due to the time taken for this relocation. If the relocation costs and timeframes can be reduced, then the cost premium over option1(a) can be significantly reduced. Option 2(b) is the most favoured option if a long-term planning horizon is chosen for both the new WCH and the RAH.

Option 1(a) meets the clinical requirements of the new WCH and will cater for expected growth of the new WCH until at least 2041. Only under high growth population forecasting does option 1(a) require additional treatment space capacity beyond 2041. Like option 1(b), option 1(a) has an airbridge connection to the RAH and so provides the best connection for staff and patients between the 2 hospitals. However, it does not have the floorplate size of option 2(b) and does not provide opportunities for on-site expansion for the RAH. It is, however, the lowest cost solution.

In summary the optimal hospital layout is provided by option 2(b), which also provides the best future demand flexibility for both the new WCH and the RAH. Option 1(b) provides sufficient flexibility for the new WCH to meet potential longer-term demand (but not the RAH), while option1(a) meets the likely identified needs of the new WCH out to at least 2041, unless high population growth forecasts are realised.

23. Summary of Findings

1. The Review Group found that option 2(b) provides the best combination of clinical adjacencies and future capacity expansion, but at a substantial cost premium over option 1(a). Option 2(b) was the most preferred option by the Clinical Reference Group. This is the recommended option if future expansion flexibility of both the RAH and the new WCH is a high government priority.
2. The Review Group found that option 1(b), with the deferral of acquisition of the SAPOL barracks site, provides sufficient expansion capacity beyond 2041, at the lowest cost premium over option 1(a).
3. If the SA Government is prepared to accept that some services may need to be decanted off site after 2041, if the high population growth scenario is realised, then option 1(a) is the lowest cost site option.
4. Whichever option is selected a substantial lift in bus and tram public transport infrastructure and services is required to ensure that service demand can be met, with transport modelling recommended to verify the service offerings. This modelling should also provide assurance regarding the capacity of the proposed carpark.
5. Undergrounding of the freight and passenger rail lines next to the RAH West site were found to be not feasible.
6. The Review Group consider that for whichever option is selected a value management assessment is undertaken to optimise the functional layout of the new WCH at the lowest cost of construction. This assessment should include benchmarking the new WCH against recently tendered similar hospital.

Government of South Australia

SA Health