

Best practice project delivery of world-class health infrastructure

Received (in revised form): 19th April, 2016



Jackie Hawkins

is the Project Director of Capital Infrastructure for Gold Coast Health with responsibility for capital delivery and building readiness. Jackie has 25 years of experience in a variety of managerial and executive roles within Queensland Health. Formal qualifications include postgraduate business qualifications and a Master's Degree in Industrial Law.

Gold Coast University Hospital, 1 Hospital Blvd, Southport QLD 4215, Australia

Tel: +61 407 624 953

E-mail: jackie.hawkins@health.qld.gov.au



Kaylene Sutherland

has held several senior positions at Gold Coast Health. Underpinned by clinical experience, Kaylene was the Senior Director of Business Transition, responsible for leading the design phase of GCUH and operational commissioning of the new facility. Lending her experience in health service development, she is currently Medical Manager for the Gold Coast 2018 Commonwealth Games.

Gold Coast University Hospital, 1 Hospital Blvd, Southport QLD 4215, Australia

Tel: +61 432 004 782

E-mail: kaylene.sutherland@health.qld.gov.au



Toni Peggrem

is the Executive Director Strategy & Planning for Gold Coast Health and was the Director of Clinical Service Planning during project delivery. Toni has over 25 years of experience in health administration and capital works. Formal qualifications include Bachelor of Physiotherapy, Bachelor and Master of Science (Education) providing a clinical, analytical and educational background to successfully develop health services for the future and lead organisational change.

Gold Coast University Hospital, 1 Hospital Boulevard, Southport QLD 4215, Australia

Tel: +61 459 819 606

E-mail: toni.peggrem@health.qld.gov.au



Mike Allsopp

was the Executive Director of Strategic Development and Executive Project Director from 2007 to 2014, with responsibility for overall programme lead. Mike has over 35 years of experience as a health service executive in various positions within Australia. Formal qualifications include B.Bus and MBA as well as a Fellow of the Australian College of Health Service Managers.

77 Berry Street, North Sydney, NSW, 2060 Pty Ltd, Australia

Tel: +61 411 880 421

E-mail: mike.allsopp@capitalinsight.com.au



Chris Snape

has more than 25 years' experience delivering business and information technology systems with particular emphasis on business change, systems integration and technical development. This has included successful completion of major high-risk programmes and projects in a range of large private and government organisations including Gold Coast University Hospital (GCUH). Formal qualifications include Bachelor of Engineering (Hons).

162 Lambert Street, Kangaroo Point, QLD 4169, Australia

Tel: +61 403 495 944

Email: chris.snape@casen.com.au

Abstract The Gold Coast, located in South East Queensland, is home to Australia's largest public health infrastructure project to date. A dedicated project team applied innovative project management skills to deliver four complex projects concurrently, within the approved budgets and contract time and to a quality standard recognised nationally and internationally. Fast tracking of project delivery effectively reduced timeframes through risk managing the concurrent delivery of health service planning, project definition plans and schematic and developed design processes, which are traditionally completed as sequential programmes of work. This paper describes best practice project delivery methodology, learnings and achievements in the delivery of world-class health infrastructure, on both brown- and greenfield sites. It also explores an ethos of teamwork and partnering that created opportunity and integrated risk management priorities, which gave comfort and confidence to the Queensland Government and all key stakeholders.

KEYWORDS: hospital construction, hospital commissioning, project governance, partnering

INTRODUCTION

The Gold Coast Hospital and Health Service (GCHHS) is an independent statutory body, governed by a local Hospital and Health Board. It is responsible for delivering public hospital and health services to an estimated residential population of 593,209 people in 2016, which is projected to have the largest growth rate of any local government area in Queensland at 27 per cent, taking our residential population to over 753,583 people by 2026.^{1,2} The region is bounded by the Logan and Albert Rivers in the north and northwest; Mount Tamborine, Canungra and Beechmont to the west; and Coolangatta in the south. In addition, the health service delivers secondary and tertiary health services to the Northern New South Wales community and the many tourists who visit the region.

The Gold Coast Health Project Team (Project Team) recently completed the largest health infrastructure programme of work in Australia.

Project Delivery required the effective, concurrent project management and delivery of AU\$2bn in health infrastructure comprising the construction of Robina Health Precinct (RHP), the expansion of Robina Hospital (RH), the construction of

Gold Coast University Hospital (GCUH) and the refurbishment of Southport Health Precinct (SHP).

RHP is a purpose-built outpatient and community healthcare facility designed to consolidate and optimise access to ambulant health services. These services were previously delivered from a diverse range of leased premises, which, in some instances, were not fit for the purpose (Figure 1).

RHP is a 5,000-square metre multistorey health facility comprising consultation rooms, gymnasium, education space and cardiac rehabilitation (Figure 2). It is located diagonally opposite RH to maximise the availability of health service clinicians.

The project budget was AU\$36m and it was delivered on a greenfield site. The project was completed in 2011 and achieved significant savings in terms of leasing costs and workforce efficiency. The RHP has car parking on site and is located 200 metres from the Robina public transport hub, which includes rail and bus services.

Robina Hospital Expansion (RHE) was delivered in two stages. The first stage delivered 154 additional beds, which resulted in a total bed stock of 364. The new building was completed in 2010.



Figure 1: Robina Health Precinct
Source: Gold Coast Health



Figure 2: Robina Health Precinct gymnasium
Source: Gold Coast Health

The next stage was the refurbishment of the existing wards and services, expanded diagnostic and support services, and infrastructure expansion including the construction of a car park. This work was completed in 2012.

RH is located on a 6.6-hectare site and has a footprint of 40,000 square metres (Figure 3). RH delivers level 4/5 clinical services within the Queensland Clinical Services Capability Framework (CSCF v3.2).³

The project budget was AU\$277m and included a AU\$2.7m teaching facility operated in partnership with Bond University. Project delivery was meticulously staged to accommodate construction, refurbishment and commissioning on a brownfield site. Service continuity was a major challenge; however, the facility remained fully operational at all times.

The project was delivered on time and with a surplus that was partially utilised to add value to the original project scope via the construction of a 500-bay car park and the installation of a magnetic

imaging resonance (MRI) scanner. RH is located opposite the public transport hub, which includes rail and bus services (Figure 4).

GCUH opened in September 2013 following extensive commissioning and the planned relocation of 220 patients; and 4,500 health service staff; without incident. The facility offers new and expanded services for the Gold Coast community and is an exemplary new environment for the sustainable provision of acute health services into the future.

A specialist facility, GCUH has been built with 750 overnight beds, 189 bed alternatives, more than 70 per cent single-patient bedrooms, and is equipped with the latest technology to enable clinicians to provide the highest level of patient care and comfort. GCUH has the capacity to become the largest clinical teaching and research facility in Australia.

GCUH is a tertiary facility delivering level-6 services (CSCF v3.2) and was constructed on a 20-hectare site with a floor space of 170,000 square metres. GCUH was



Figure 3: Robina Hospital
Source: Gold Coast Health



Figure 4: Robina Hospital external linear courtyard
Source: Gold Coast Health

master planned into a Health and Knowledge Precinct including Griffith University, Gold Coast Private Hospital, Gold Coast City Council Economic Development and the

Commonwealth Games Athletes Village (Figures 5 and 6).

The delivery of GCUH resulted in the addition of five new service capabilities,



Figure 5: Gold Coast University Hospital
Source: Gold Coast Health



Figure 6: Gold Coast University Hospital atrium entrance
Source: Gold Coast Health

minimising the need for patients to travel to other facilities outside of the Gold Coast to receive medical treatment. Further, the addition of a number of extended service capabilities improved the self-sufficiency of GCHHS.

GCUH has a 2,200-bay commercial car park and a public transport hub including a light rail station and a bus station. The GCUH project budget was AU\$1.76bn and the facility was constructed on a greenfield site. Sub-projects of GCUH included the rebuilding of facilities for the Churches of Christ and Salvation Army Recovery Centre. These services required relocation from the GCUH site to enable hospital construction. The Project Team also led the interface with collocated capital infrastructure including Stage 1 of Gold Coast Light Rail and public-private partnerships with the collocated Gold Coast Private Hospital and the commercial car park.

SHP is a 7,500-square metre community health centre, fully repurposed from a university medical and dental teaching facility.

The AU\$12.5m project was delivered over 12 months and in three stages. Final completion was in September 2015; however, the building was progressively occupied as each stage was completed, creating the challenge of construction in a building delivering patient care (Figure 7).

While RHP consolidated ambulant services at the southern end of the Gold Coast, SHP consolidated ambulant community health services at the northern end of the Gold Coast and also achieved savings due to a significant reduction in lease costs and optimisation of access and workforce.

Services include a range of adult and paediatric ambulatory services, including oral health treatment and laboratory services and renal dialysis home training (Figure 8). SHP incorporates a public car park and is located on the Gold Coast Light Rail network.

SKILL DEVELOPMENT AND COMMITMENT TO BUILDING AND SUSTAINING A MORE EFFICIENT, MODERN AND SERVICE-ORIENTATED PUBLIC SECTOR

In partnership with Queensland Health's Corporate Capital Delivery Branch, GCHHS recognised the value of establishing a localised project team to deliver its four health infrastructure projects from the outset. This strategy was developed to ensure local input, consistency in health service and infrastructure planning, and post project knowledge retention.

The Project Team included project managers, nurse managers, biomedical technicians, information technology



Figure 7: Southport Health Precinct
Source: Gold Coast Health



Figure 8: Southport Health Precinct renal dialysis home training
Source: Gold Coast Health

experts and a number of support staff who collectively led health service planning, facility design, facility commissioning and relocation of a major teaching facility to a new site. In addition, the Project Team led commercial, business continuity and change leadership activity.

Project Team members completed relevant training and study within the fields of health service planning and project management over the lifecycle of the project. Further

study added to the diverse skill set of the project team members, all of which came from a variety of clinical and business backgrounds, creating a well-rounded, cohesive and effective team. Teamwork was a key feature of project delivery, resulting in the creation of a high-performing team. The ethos of a portfolio approach to project delivery created a safety net that helped manage risk and leverage innovative thinking and opportunity.

The Project Team considered lessons learned from similar projects, both nationally and internationally. This enabled streamlining and constant evaluation of project management and functional design practices, within an evidence-based framework. In addition, learnings were workshopped and documented at the completion of each project phase to ensure continuous process improvement and promotion of a learning culture within the team.

The Project Team was also responsible for the commercial aspects of project delivery including procurement, site acquisition and consequent capital delivery, tender and delivery of retail precincts and purpose-built educational partnership zones, tender and delivery of the first outsourced facilities management contract in Queensland, and oversight of commercial car parks and leasing. All commercial activity was conducted in accordance with Government Purchasing and Procurement policy, Asset Management Frameworks and Quality Assurance Frameworks. The project engaged with expert and independent Quantity Surveyors and Probity Advisors to ensure appropriate commercial and contractual compliance and utilised governance structures including Project Control Groups and Steering Committees.

STAKEHOLDER ENGAGEMENT

Internal and external public relations, communication and engagement played a pivotal role in the success of the GCHHS projects.

Consumer representatives were embedded to act for the local community on key project committees and reference groups. This engagement strategy ensured the GCHHS projects were better informed by the local community and that the community could contribute to decision-making. From project initiation, the Project Team maintained an extremely strong relationship with the Gold Coast community,

remaining transparent in its communications through community awareness via events, online presence and strong media coverage via local and national media outlets.

Tangible examples of the feedback that was incorporated into established evidence-based design principles to create a balanced environment for users and visitors include the following:

- Clear signage both inside and outside our facilities;
- Minimising travel distances between departments and wards;
- Maximising the therapeutic benefits of outdoor parkland settings;
- Promoting safe and vibrant public spaces with gardens, courtyards, walkways, bike paths and art work;
- Providing easy access for people who are mobility impaired or wheelchair bound;
- Connectivity with the surrounding precinct by creating accessible and shared amenities.

The Project Team identified six important stakeholder groups as critical target audiences. These included community, employees, government, emergency services, key partners and media. Communication and engagement activities were tailored over time to ensure that considered and timely information was provided to all important stakeholders through a variety of mediums (Figure 9). Each level of the public participation spectrum was utilised across the project lifecycle enabling two-way communication and a high level of engagement across all internal and external stakeholders groups.

Engagement with other government departments with project dependencies was also a major element of the engagement plan. The project Steering Committee membership included senior representatives from Premier and Cabinet, Queensland Treasury, State Planning and Development, and Housing and Public Works.

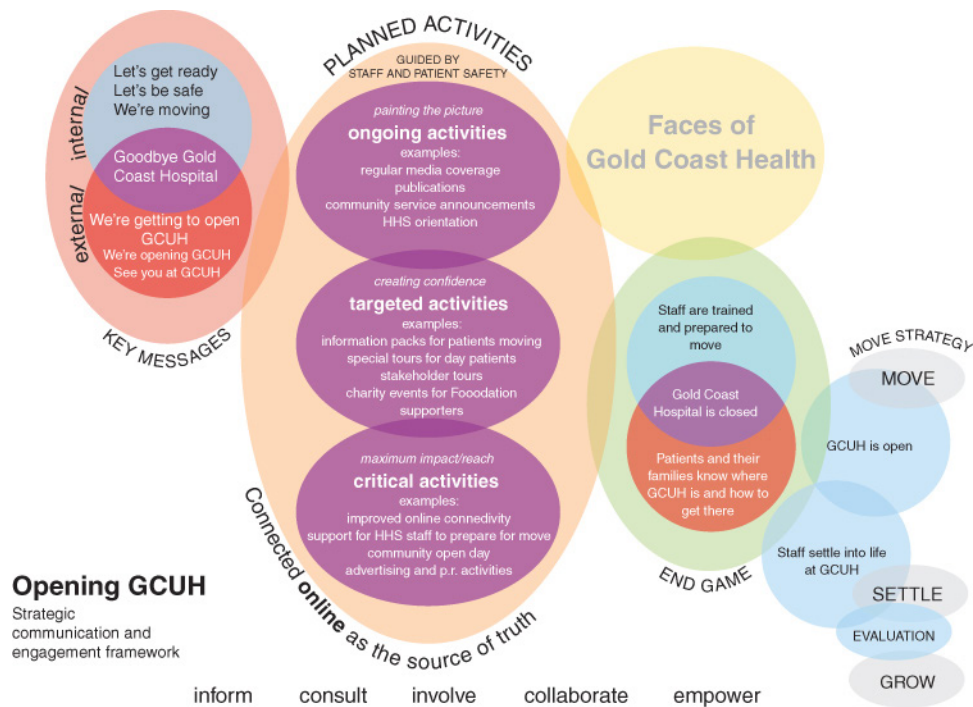


Figure 9: Opening GCUH – strategic communication and engagement
Source: Gold Coast Health

GOVERNANCE

The Project Team established portfolios and governance structures to complement each stage of the project lifecycle. This methodology enabled effective management of scope creep via the implementation of a robust change management process. By setting clear expectations for all stakeholders, the Project Team created confidence in the projects as well as in their ability to deliver.

‘Good governance is about the processes for making and implementing decisions. It is not about making “correct” decisions, but about the best possible process for making those decisions.’ Effective governance structures need to be accountable, transparent, lawful, responsive, equitable, effective, efficient and participatory.⁴

Integrated risk and programme management, coupled with clear decision-making points and protocols, is essential for good project governance. These principles

underpinned decision-making across all four projects delivered by the Project Team.

HEALTH SERVICE PLANNING

‘Health service planning aims to improve health service delivery and/or system performance to better meet the health need of a population. It comprises the process of aligning the delivery of existing health services to meet the changing patterns of need and use of services. This aims to make the most effective use of available and future health resources (funding, staff and infrastructure). Health service planning is future orientated and usually adopts a medium-long term (10–15 years) perspective supporting healthcare providers to respond to:

- health improvement for targeted populations
- increasing or changing demand for health services

- improved health service delivery models
- emerging trends in health service delivery
- new policy initiatives and directions.⁷⁵

All health services were evaluated prior to service commencement, from both health service and state-wide perspectives, to ensure that their services were safe and appropriate utilising objective national accreditation standards⁶ and the CSCE.

Principles underpinning health service planning across GCHHS include integrated care across disciplines and facilities, a patient-centred and systemic approach, high quality and safe care, improved access, flexibility and a culture of learning and innovation. Given the level of GCHHS expansion, it was essential that health service plans had the flexibility to adapt to new technologies and models of care in addition to conflicting user requirements and competing priorities, time constraints and levels of engagement.

PARTNERING

Partnering was a key feature of Gold Coast Health infrastructure project delivery. Partnerships between the Project Team, consultants, builders and important stakeholders were established early. Partnership charters were collaboratively developed to ensure a shared vision and shared risks and benefits. Our Managing Contractors: Boulderstone (Robina); Lend Lease (GCUH); and design and construct builder Quadric (SHP) embraced the partnership model, which facilitated a collaborative environment and vision, as opposed to the adversarial relationships often experienced.

The major partner of the Project Team was GCHHS. This partnership was essential to transitioning from a project environment to health service operations. It was very evident that some clinicians found it difficult to see a design on paper and translate that into three dimensions; and an operational reality. The Project Team

used as many mechanisms as possible to help bridge that gap, including visiting other sites and looking at specific detail, the development of 3D models and fly throughs, and constructing mock rooms to optimise feedback and understanding prior to major construction. By applying our learnings across the four projects, we quickly discovered that clinician engagement was variable. We decided to accept that reality and fully engage with those who were interested and able to participate. We did not slow down our processes for those who were less willing. We set clinically realistic deadlines and stuck to them. Managing around changes in organisational leadership was also a significant challenge in that we experienced executive-level turnover several times throughout our projects' lifecycle. The Project Team strategically engaged with middle management, which was quite stable. This stabilised the platform from planning to post-move transition.

Effective partnering with local, state and federal government as well as other non-government agencies enabled the fast track and concurrent construction programmes to be achieved from a government perspective, without incurring client-initiated delay costs within the Managing, and Design and Construct, Contracts. Changes in government were experienced at all levels throughout the projects' lifecycle, which resulted in challenges to commitment and funding. It was incumbent on the Project Team to very quickly communicate the benefits to the community and instil a level of confidence through on-point engagement and communication. The Project Team established and funded a position within the Gold Coast City Council (local government) to effectively facilitate the processing of development applications, consultation and collaboration. This initiative was highly successful in terms of managing bureaucracy and establishing a single point of knowledge and facilitation.

Collaboration with other Gold Coast-based projects also ensured the best outcome for Gold Coast. Senior project team members attended regular meetings with important projects that interface with the GCHHS, including the Gold Coast Health and Knowledge Precinct, Gold Coast Rapid Transit, the Gold Coast Commonwealth Games 2018, and education partners Griffith University, Bond University and TAFE Queensland. By working closely with these projects and partners, the Project Team was able to actively contribute and influence surrounding infrastructure for the benefit of health patrons.

Now managing closure of the GCUH Project, the GCUH Project Team has established relationships across Queensland and Australia with other health infrastructure projects to provide practical advice, mentorship and applied expertise in hospital design, construction, commissioning and relocations. Through sharing lessons learned, the Project Team supports a national culture of excellence in hospital infrastructure projects and sets a standard to increase the reputation of Gold Coast Health, the Department of Health and the Queensland Public Sector through effective and sustainable project leadership.

ICT DELIVERY (GCUH FOCUS)

The delivery of Information and Communications Technology (ICT) for a facility such as GCUH was one of the most challenging endeavours that could be undertaken by an organisation. The significant complexity was based on the need to incorporate thousands of existing operational systems that were typically evolutionary (unplanned) and at different stages of their technology lifecycle (the very old to the new), with new biomedical, building and service-related systems introduced with the new facility.

As with any new major hospital planning, budgeting and construction started a number

of years before the ICT were required, and many of the ICT assumptions were based on what was known at that stage. There were assumptions that specific new ICT systems and technologies would be implemented and certain technologies adopted. A number of these were either not delivered or partially delivered, or there were unforeseen changes in the planned technologies.

All of the technology changes were applied while reducing the business change impact of new systems, so as not to overwhelm the workforce. The concept of 'Like for Like' was adopted. This concept ensured that replacement or new systems where implemented, would be closely configured to the system being replaced, or had the simplest form of practical configuration. Future proofing was ensured by implementing capability to grow these configurations and expand the use post facility occupancy.

The main definition used to manage scope and risk for ICT delivery at GCUH was based on the statement that 'ICT must provide systems to ensure that the Hospital can operate and provide safe health care services, and the ICT provided does not introduce a risk beyond what currently exists'.⁷

The question of identification and delivery of ICT scope for GCUH was complex as there were many parties involved with competing priorities and agendas. Sufficient ownership, accountability, oversight and governance were established to ensure delivery. Overall ownership and delivery for ICT at GCUH was through the GCUH Technology Project, a sub-project of the overarching infrastructure project in support of the GCHHS. This was key to ensuring that gaps that may have existed in delivery between the State, Health Service and Managing Contractor were appropriately identified and addressed.

A flexible delivery framework was implemented, providing the required controls and management of information

for delivery that addressed the required quality, risk, timeliness, teamwork and collaboration, consistency, business value and communication. The framework was responsively supported through staffing of the project, partnering with organisations with ownership and defining clear accountabilities across the differing parties. Oversight was not about decision-making. Oversight was about facilitation of the agreed scope and activities, assisting in setting direction and monitoring performance of the team within the delivery framework.

In delivering this large and complex programme of activities, there were a number of essential principles, developed to support safety and success, adopted by ICT. These were as follows:

- Only do what is required.
- Keep the delivery for staff as simple as possible to lessen the business change impact.
- Utilise sound change and communication strategy at all levels.
- When relevant, start communicating with staff about the technology and the changes in their work practices, have them engaged and use their forums. Remove all jargon and ensure that messaging is simple and clear.

A 'drop in' centre was established at the old hospital, which provided a demo area with the technologies to be introduced at GCUH. A large number of hospital staff visited, providing them important training and, in turn, valuable feedback to the project.

The final budget for ICT at GCUH was three times greater than what was initially identified in the design and planning stages of project delivery. The increase was largely driven by the significant technology advances from the original budget and associated plan, the volume of audit and rectification activities on legacy systems and inflation. In terms of context, the iPad did not exist when technology for GCUH was first considered.

BUILDING COMMISSIONING AND FACILITY READINESS

'Building commissioning refers to completion for occupation by the contractor from a physical facility viewpoint. Typically, activities include the successful running of all plant and equipment.'⁸

Contemporary thinking and the majority of Australian Government policies and guidelines refer to a verification process that requires testing of compliance against various engineering specifications, documents and interfaces; and compliance with relevant Building and Development Codes.^{9–11}

The Project Team ran a concurrent and hybrid process to complement the consultant's Building Commissioning programme. Every test conducted by third parties, including contractors, consultants and the Queensland Fire Service (QFS), was witnessed by Project Team staff. In addition, the Project Team developed and implemented a Facility Readiness programme that tested critical building elements on a 100 per cent basis. The definition of critical was intrinsically linked to safety. The Project Team conducted room-by-room functional testing of every component, including power outlets, drug safes, every nurse call and emergency call point, access and security, patient hoists and plumbing and water quality. Where relevant, testing was completed on both mains and emergency power. This process, while labour intensive, identified almost 6,000 defects not identified through the contractual/consultant verification process, which is sample and percentage based. The result was well worth the investment in that it significantly improved function, safety and the confidence of staff and patients. These defects would have become evident over time; however, identification of pre-facility occupancy enabled early rectification and facility readiness.

The Facility Readiness Team also led the procurement, installation, integration and training for 29 major pieces of medical

equipment including computed tomography (CT) scanners, MRIs, linear accelerators, robotic pharmacies and angiography systems; and the commissioning of more than 5,000 additional medical devices including ventilators, patient monitoring systems and anaesthetic machines.

In preparation for building handovers and operational commissioning, this team also developed an 'Interim Operational Management Plan' documenting and delivering essential services including access, security, safety, cleaning and amenities and building services such as the tender, appointment and mobilisation of the Facilities Management provider.

In preparation for facility occupancy, the Project Team also led and coordinated commercial opportunities including retail, cafes and recreational facilities within the facilities.

OPERATIONAL COMMISSIONING AND FACILITY RELOCATION

As the Project Team delivered and commissioned smaller facilities first (RHE and RHP), the opportunity was presented to leverage and learn from those experiences and apply that knowledge to the Operational Commissioning of GCUH, which was extremely complex, and required the relocation of a tertiary facility to a new greenfield site. Significant learnings were also applied from the Birmingham University Hospital experience, where the level of detail, complexity and workload during Operational Commissioning was recognised and documented.¹² Operational Commissioning of GCUH involved over 200 individual departments across a 170,000-square metre footprint.

Fundamental to the successful commencement of services at GCUH was a Service Readiness Programme, which contained overarching detail of the Operational Commissioning tasks including the following:

- Departmental Readiness Project — 'Preparing the existing facility to move'. This project involved preparing the setting up of each department by departmental employees, the pre-fill of consumables and pharmaceuticals, final clinical cleans and the distribution of access cards and keys.
- Training strategy that involved work unit inductions, technology training and training in the use of equipment and systems. Given the complexity of delivering multiple concurrent projects and the sheer size of GCUH, the Project Team built a 'Learning On-Line' training platform. It enabled the development and delivery of content and managed the logistical nightmare of booking and tracking attendance at both mandatory and department-specific training. The online content also provided flexibility in terms of allowing staff to complete training in downtime, and the learning online was a great legacy to leave for the health service and remains in use as a multidisciplinary tool for training and education. The hybrid model of face-to-face and online learning training tools, seminars, workshops and mock trials provided motivation and excitement and ensured that all employees had a full understanding of responsibilities and tasks. A mandatory training compliance rate of 87 per cent was achieved prior to the new facility opening.
- Accommodation planning detailing the work location of every employee, intrinsically linked to the ICT programme delivery in terms of phones, logins, security and access.
- Simulation and mock trial exercises in main departments; and of priority systems. These included patient flow exercises, kitchen, central sterilising, live testing of major medical equipment, the helipad and all emergency responses. As noted by Reno and Grazman,¹³ clinical operations commissioning simulations assist in providing in-depth testing of

how processes will work and where inherent risks to safety and quality may lie. Scenario modelling increases the chances that important risks can be mitigated prior to service commencement so as to better prepare the staff and hospital for safe occupancy.

‘The Move’ planning from the old Gold Coast Hospital to GCUH was underpinned by the following overarching principles, generated collaboratively between The Project Team and GCHHS staff:

- Maintain a high degree of safety for patients, staff and community.
- Ensure required services are provided, or maintained, at each facility as required throughout the move.
- Manage risk and have appropriate mitigation strategies in place.
- Minimise disruption to service delivery.
- Ensure staff are well prepared, trained and orientated with regard to the new facility.
- Limit duplication and dual running of service across two sites.
- Ensure there is effective communication and awareness for all involved to minimise the potential for confusion.
- Manage the move workforce through a structured, staged and coordinated approach.

The philosophy that encompassed the Operational Commissioning and relocation of services was ‘MOVE – SETTLE – GROW’, placing patient and staff safety central to all planning.

This planning involved a complex and detailed suite of integrated plans that were tested utilising the ‘Emergo Train System’, developed by the University of Linköping, Sweden, to simulate the move from an emergency/disaster framework and evaluate the incident command system in place.¹⁴

- Clinical Services Ramp Down/ Ramp Up Plan described how clinical

services would ramp down prior to the patient move, to achieve a maximum number of 320 patients to transfer to GCUH over the two-day move. The plan also described how the clinical services would then ramp up in order to meet the clinical demand. It was acknowledged by the GCHHS that activity targets, waiting lists and other key performance indicators (KPIs) would be affected by the ramp down of activity and this impact was managed by the GCHHS team. The ramp down programme reduced the number of inpatients requiring physical relocation between facilities, while ensuring adequate essential hospital services were maintained for residents of the GCHHS throughout the transition period.

- Support Services Order of March described the order that support services would move to GCUH over a period of two weeks, culminating in the two-day Patient Relocation.
- Patient Relocation Plan described how inpatients would move to GCUH over two days, the principles to support a safe move and the clinical considerations required.
- Goods Relocation Management Plan (furniture, fixtures and equipment; FFE) described how equipment would be transferred to GCUH, to ensure that clinical services were able to operate effectively at both sites during the move period; this was linked to the Support Services Order of March.
- Move Workforce Plan described the workforce required during the move period, the roles and responsibilities staff would undertake, and how the workforce would be acquired and trained to safely undertake the move.
- Situation Management & Command Centre was the governance structure for the move, describing how situations/ issues would be managed (Figure 10).

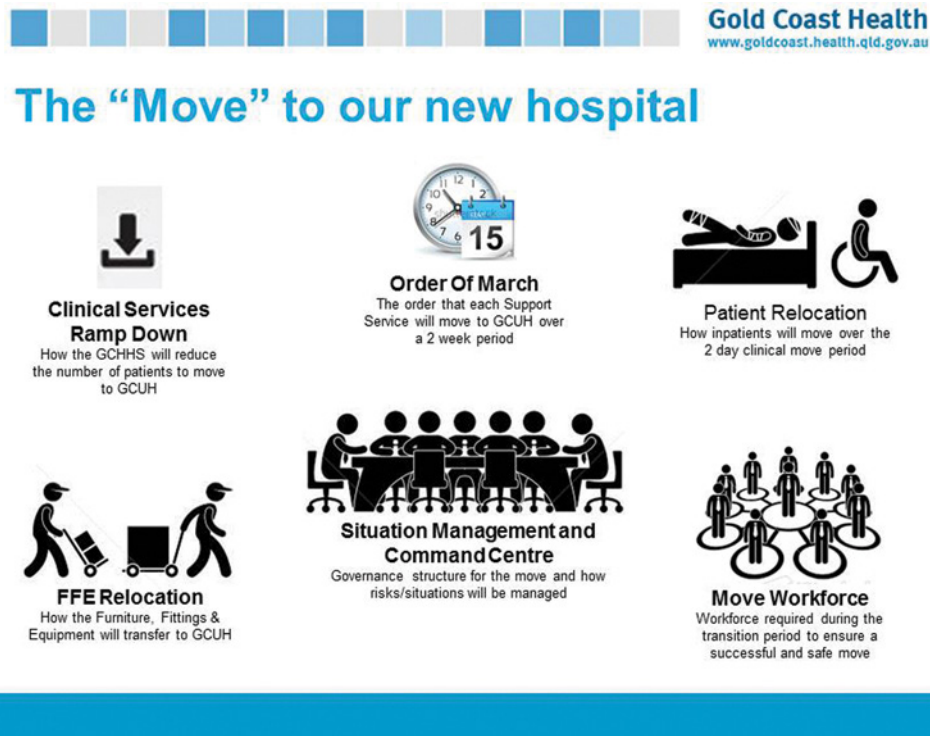


Figure 10: The Move integrated planning structure
Source: Gold Coast Health

All strategies and plans were reviewed by the Operational Commissioning Reference Group. The purpose of this group was to provide expert clinical recommendations regarding the Operational Commissioning of the GCUH. The Group was tasked with consideration and evaluation of operational commissioning activities as they developed to determine if the process and impacts were correct, acceptable and safe.

The volume of patients able to be moved during the two-day patient move was dictated by several important considerations:

- The capabilities of the Queensland Ambulance Service (QAS), their staff availability and the number and type of vehicles they had access to over the two days;
- The impact of other major community events on the day of move;
- Acuity of the patients being relocated;

- Acceptance and readiness of the timing of the move by GCHHS.

In September 2013, the largest, successful and safe planned relocation of 219 patients took place across two days; in partnership with local QAS, Queensland Police and Queensland Fire and Rescue Services; without incident. This was despite the fact that a police officer was shot on the Gold Coast on the morning of day one of the move (Figure 11).

EVALUATION AND BENEFITS REALISATION

Benefits and achievements have been progressively measured against both quantitative and qualitative data, including original business cases and endorsed audit methodologies. The Project Team has utilised best practice evaluation methods to ensure success in terms of outcomes and as



Figure 11: Clown doctors assisting with patients on 'Move Day'
Source: Gold Coast Health

a deliberate risk management priority in giving comfort to the government and other major stakeholders in terms of governance.

The expected benefits of managing government building projects well are as follows:

- Project objectives will be achieved.
- Greater accountability and control as reflected in time, cost and quality outcomes.
- Better communication and management of stakeholders.
- All participants will have a clear understanding of their roles and responsibilities.
- Resources will be used more effectively.
- Improved practices can be reinforced through the establishment of best practice standards for the delivery of future projects.¹⁵

Evidence-based design principles and initiatives were utilised in hospital and team design from both national and international sources. Evidence of the quality of outcome is demonstrated in the completed projects achieving a high standard of service delivery and being commended in a number of industry awards.

At the outset of the projects, over 200 'user groups' were progressively established to enable both clinical and non-clinical staff

to be educated and involved in the design of their new workplace. Their operational expertise aided the design and overall quality of the health facilities from a practical, user-experience perspective. Staff were educated and involved in the design to support their newly developed models of service delivery. This strategy supported the development of staged clinical transition strategies post occupancy.

An eight-step quality process was embedded into project management of GCUH. This included 'early room reviews' in the second and third years of construction. 'User groups' were consulted to ensure the quality of finished rooms within the new facility. This process also aided in the efficiency of their completion by the Managing Contractor once approval was granted by the users.

The GCUH project was also subject to six-monthly independent audits for the duration of the project. This audit programme was implemented in accordance with Clause 4.3 of the 'Instrument of Delegation' from the Coordinator General to the Director General of Department of Health Queensland (DoH) for the delivery of GCUH:

- DoH must obtain a report from an independent auditor verifying compliance with approved procedures at least every

six months during the delivery of the facilities works, and at the completion of the facilities works.

- In the event that the auditor reports non-compliance, DoH must provide an action plan to bring the delivery of works back into compliance with the approved procedures.

The GCUH project was also subject to the Gateway Review Process¹⁶ coordinated in conjunction with Projects Queensland, Queensland Treasury and Trade. The Gateway Process consists of a series of short, intensive reviews (called 'gates') at six main decision points in the project lifecycle. Reviews were undertaken on behalf of the Project Owner by a trained, independent review team to help ensure that the investment is well spent, meets strategic objectives, achieves value-for-money outcomes and benefits are realised. A number of senior project staff completed the gateway review training to ensure that the process is embedded in decision making.

The final gate 'Benefits Realisation' was completed in February 2015. The conclusion was documented as follows:¹⁷

'The review team finds that the Gold Coast University Hospital (GCUH) project has been highly successful. This reflects well on the project team, the GCHHS and the contractors that worked on the project.'

'The result is a facility of world class standard that staff are happy to work in and that has substantially improved the standard of health care on the Gold Coast. It has moved from a community hospital to a higher level tertiary hospital with strong links to neighbouring universities.'

'This experience is being shared with other hospitals through consultancy advice and support.'

An overarching evaluation strategy for the post-occupancy evaluation of the

GCUH project was designed and endorsed in January 2014. The strategy includes auditing and review mechanisms, including implementation of the Building Performance Evaluation (BPE)¹⁸ methodology in place of a traditional post-occupancy review. The BPE enabled the Project Team to review how the facility was performing in the context of health service delivery, providing a solid basis for measuring the benefits and effectiveness of the Project. BPE was completed in three phases. Phase 1 was the quantitative and qualitative measure of the project deliverables detailed in the Business Case; Phase 2 was a functional and design review of important service areas, conducted by an independent architectural firm with significant experience in delivering health projects; and Phase 3 was the workshopping and action plan development against all recommendations/issues identified in the first two phases to ensure that benefits continued to be recognised and issues were responded to.

CONCLUSION

The main learnings acquired from the delivery of capital health infrastructure on the Gold Coast include the following:

- The criticality of an effective Steering Committee and Governance Processes.
- Integrated risk and programme management, linked to programmed decision points is essential.
- Robust change management processes are necessary to manage scope creep, expectation and transition.
- Project delivery must consider and understand the competing priorities of the client, and facilitate an environment of inclusion to ensure a balance between participation and clinical workload.
- The power and value of good stakeholder engagement and constructive partnerships should not be underestimated.

- Technology will change, requiring constant rethinking and revision of your ICT strategy and budget.
- Maximise the opportunity to provide today's health workforce with improved teaching and research opportunities.
- A robust programme of mock scenario testing is essential to ensure safety and effective service transition.
- A robust programme (100 per cent) of facility readiness testing of critical and safety systems is essential and a very good investment.
- Concurrent programmes of work facilitate innovation, future thinking and the opportunity to apply contemporary lessons learned.

More recently, the Project Team has established a Strategic Project Management Office (SPMO), assisting similar projects and optimising lessons learned. Team members are currently advising a number of notable health projects within Australia, including the new Royal Adelaide Hospital and Sunshine Coast University Hospital. The superior delivery of Gold Coast Health Infrastructure Projects has been recognised by health peers both nationally and internationally. Project team members are regularly invited to present at conferences, participate in workshops and reviews and provide guided tours of our facilities to health and business leaders from around the world. GCHHS infrastructure projects have won multiple awards; and the establishment of the consultant SPMO is a tangible outcome of this recognition, and a mechanism that can be used to unleash the potential of the team to lead health service and infrastructure planning and project delivery in Australia.

References

1. QLD Government Statistician's Office (2014) 'Projected population, by local government area, Queensland, 2011 to 2036 (medium Series)', available at: <http://www.qgsso.qld.gov.au/subjects/demography/population-projections/tables/proj-pop-lga-qld/index.php>
2. Gold Coast Health (2015) 'Population profile report', available at: www.healthyc.com.au/MedicareLocal/media/Site-Pages-Content/Plans%20Reports%20%26%20Resources/Gold-Coast-Population-Profile-2015.PDF (accessed 4th January, 2017)
3. Queensland Clinical Services Capability Framework (v3.2) (December 2014), available at: www.health.qld.gov.au/publications
4. Department of Health Queensland (2012) 'Guide to health service planning version 2', available at: www.health.qld.gov.au/publications
5. Victoria Department of Planning and Community Development (2012) 'What is good governance - Good governance guide', available at: www.goodgovernance.org.au/about...governance/what-is-good-governance (accessed 4th January, 2017)
6. The Australian Council on Healthcare 'EquiP5' (May 2013), available at: www.achs.org.au
7. GCUH ICT Delivery Strategy and Program at GCUH Consultancy available at: <http://gchweb.sth.health.qld.gov.au/contact-us.html>
8. Moon, K. (2007) 'Total building commissioning of healthcare facilities' *The Australian Hospital Engineer*, Vol. 22, available at: www.ihea.org.au/files/IHEA_Summer_2007_Kevin_Moon.pdf
9. Department of Health Victoria (October 2015) 'Capital Projects and Service Planning - Health Service Performance', available at: www.vic.gov.au
10. Department of Housing and Public Works Queensland (2015) 'Capital Works Management Framework (CWMF)', available at: www.hpw.qld.gov.au
11. Building Code of Australia - Master Builders (2012), available at: <https://www.masterbuilders.asn.au/laws-codes-and-regulations/building-act/building-code-of-australia> (accessed 4th January, 2017)
12. Jackson, M. (2009) 'Operational commissioning - University Hospitals Birmingham NHS', available at www.uhb.nhs.uk (accessed 11th January, 2017)
13. Reno, K. and Grazman, D., (2014) 'Operations commissioning: Putting new healthcare buildings to the test', *Healthcare Design Magazine*, available at www.healthcaremagazine.com
14. Emergo Systems Train (1990), available at: www.emergotrain.com
15. Department of Housing and Public Works Queensland (October 2012) "Strategic Assessment Management Framework (SAMF)" Guideline "Management of Government Building Projects", available at: www.hpw.qld.gov.au
16. Queensland Treasury (March 2013) 'Gateway review process', available at: www.treasury.qld.gov.au
17. GCUH Project Gateway Review (2015) 'Benefits Realisation available at: <http://gchweb.sth.health.qld.gov.au/contact-us.html>'
18. Department of Health Queensland (2012) 'Guide-line for building performance evaluations', available at: www.health.qld.gov.au/qhpolicy/docs/gdl/qh-gdl-334-1

Online videos of interest

- **GCUH community day** <https://www.youtube.com/watch?v=tW0AhKdYZi8>
- **GCUH official opening** <https://www.youtube.com/watch?v=mZI6GfY2DAg>
- Gold Coast University Hospital
- <https://www.youtube.com/watch?v=fs5WEUJx9ec>
- Robina Hospital Opening
- www.youtube.com/watch?v=1RMBdDm10yA