Australian Government

Department of Infrastructure and Transport

Infrastructure Planning and Delivery:

Best Practice Case Studies Volume 2

FEBRUARY 2012

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Australian Government

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Infrastructure Planning and Delivery:

Best Practice Case Studies Volume 2

FEBRUARY 2012

Melbourne Convention and Exhibition Centre, Victoria

Rosebery Schools, Northern Territory

Minister's Foreword

The Australian Government is committed to improving the way National Infrastructure Projects are delivered. Recognising and promoting industry best practice will help to secure best value for money for the Australian taxpayer and ensure our infrastructure meets the challenges of the future.

Nation building infrastructure such as roads and rail are some of the biggest investments a Government will make. That is why it is crucial we do the appropriate groundwork to make sure these projects serve Australia as they were intended.

To improve the standard and quality of our infrastructure investments, the Commonwealth Government acted early by creating Infrastructure Australia (IA) which has introduced a national approach to the way we plan, finance and deliver infrastructure needed to boost our national productivity.

The creation of IA was only the first step. A comprehensive program of microeconomic reform has been pursued under the auspices of the Council of Australian Governments' (COAG) Infrastructure Working Group.

Last year, in order to deepen understanding and provide practical insight into the complexities of planning and delivering large infrastructure projects, the COAG Infrastructure Working Group released Infrastructure Planning and Delivery: Best Practice Case Studies. This publication detailed the planning and delivery processes of six major projects.

Following the success of that booklet, a further eight case studies that exemplify best practice infrastructure delivery have been selected to create the second *Infrastructure Planning and Delivery: Best Practice Case Studies* booklet. This booklet builds on the work of the first and extends analysis to bring deeper understanding of the processes identified in the case studies that illustrate and highlight best practice.

I trust governments, industry and academia find the case studies informative and useful so that we may all learn and adopt best practice strategies in future infrastructure projects.

I would like to acknowledge the contributions of Infrastructure Working Group members, my Department and Parsons Brinckerhoff in producing this booklet.

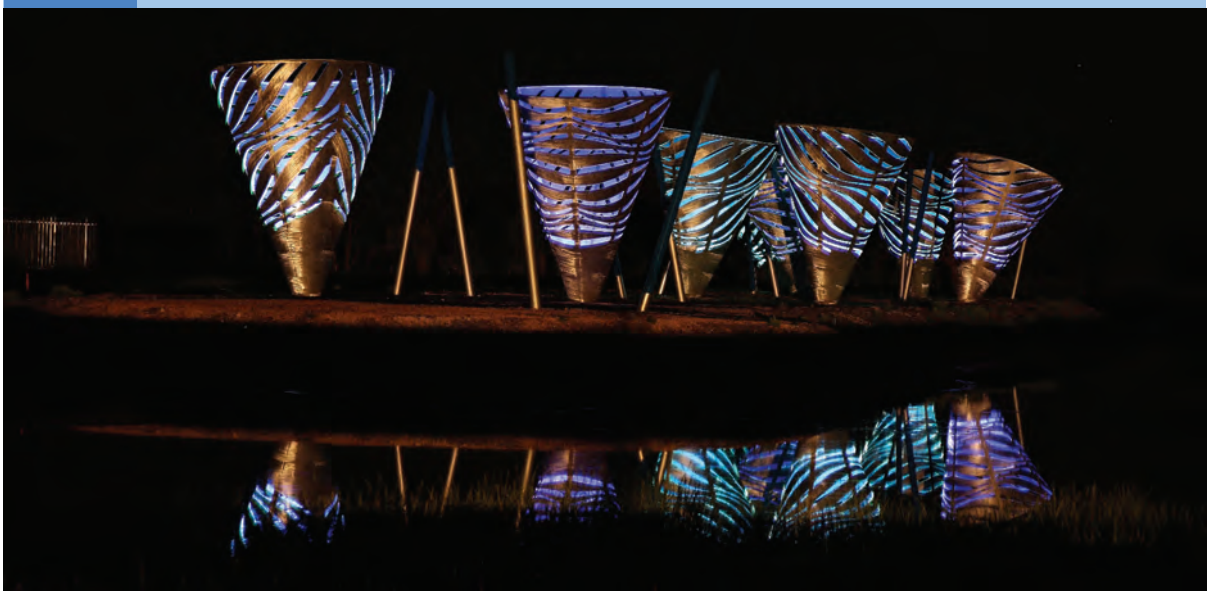
Anthony Albanese

MINISTER FOR INFRASTRUCTURE AND TRANSPORT

Contents

PART A – Highlighting best practices

1 Introduction and scope



New Perth-Bunbury Highway, Western Australia

1.1 Introduction

Effective and efficient infrastructure is vital to Australia's future prosperity and driving sustainable economic growth. Properly delivered and resourced infrastructure projects underpin the nation's economic prosperity, providing both primary and secondary benefits to Australian industry and the wider Australian public.

As the Australian economy experiences sustained growth, even during the recent worldwide economic downturn, the demand for new and enhanced infrastructure continues to fuel the infrastructure project pipeline.

The Commonwealth, working with the states and territories, is committed to the delivery of high-quality infrastructure projects and driving continuous improvement in this arena. This can be achieved through the identification of best practice processes and behaviours in planning, procurement and delivery of infrastructure projects.

While successful delivery of key infrastructure is vital to Commonwealth, state and territory governments, it should be recognised that there are risks associated with all project delivery. The potential cost of failure to deliver any of the key project components (cost, quality, safety or schedule) is an inherent risk.

While cost overruns in major infrastructure projects represent one aspect of risk, another is the downstream impact, specifically the delay in securing the benefits expected from completed infrastructure projects.

This booklet aims to provide a platform for sharing the knowledge gained through a review of best practice case studies within Australia's public sector. Knowledge sharing in this way will enhance the nation's ability to deliver high-quality infrastructure projects.

1.2 Report structure

This booklet is the second in a series and follows ***Infrastructure Planning and Delivery: Best Practice Case Studies***.[1]

This booklet is divided into two sections:

Part A

- Provides an overview and discussion of key aspects of this document, including:
  - best practice lessons drawn from the case studies;
  - emerging best practices observed in the selected case studies; and
  - relevant policies relating to infrastructure delivery.

Part B

- Provides a summary of each of the eight case studies selected for this review, detailing best practices recognised during various phases of the project life cycle.

1.3 Scope

Parsons Brinckerhoff, on behalf of the Council of Australian Governments' (COAG) Infrastructure Working Group (IWG), has reviewed the nominated case studies. The role of Parsons Brinckerhoff has not been to audit these projects, but to review and provide key examples of best practice in planning and delivery of infrastructure projects.

The case studies in this booklet have been assessed against the same criteria as the previous booklet to ensure consistency. This booklet has also included additional criteria regarding completion of the project on time and within budget.

Projects were assessed against the following key criteria:

- quality of infrastructure assessment and planning, including the extent to which projects were embedded in holistic sector strategies/plans and wider land use plans (where relevant);
- quality of business case development and the extent to which robust and objective project selection criteria influenced decisions;
- presence of overarching project governance structures and processes to oversee the project's delivery;
- extent and quality of project management and planning processes and the degree to which they influenced delivery;
- choice of funding methods, including the allocation of financial risk between parties;
- attention paid to wider risk management issues (i.e. not just financial) and how those risks were identified and managed;
- sustainability and appropriateness of the management, oversight and regulation (where relevant) of ongoing operations; and
- completion on time and within budget.

1 Department of Infrastructure and Transport, *Infrastructure Planning and Delivery: Best Practice Case Studies*, December 2010.

Table 1 (Nominated case studies) illustrates the broad cross-section of projects analysed and shows the spread of geography, sectors, value and procurement methodologies used.

It should be noted that all projects are complete and operational, with the exception of the Maitland–Whittingham Third Rail Line, which is scheduled for completion in late 2012. Stage 1 (the Minimbah Bank) commenced operation in 2010.

Table 1 Nominated case studies

Project	State/ Territory	Sector	Project value	Procurement method[2]	Opening date
Gateway Upgrade Project	QLD	Road	$2.12b	Design, construct, maintain	Mid 2011
South-west Queensland Road Reseal	QLD (Local Govt)	Road	$16.1m	Managing contractor	June 2011
Research and Education Building, Royal North Shore Hospital	NSW	Health	$98m	Managing contractor	July 2009
Maitland–Whittingham Third Rail Line	NSW (ARTC)	Rail	$476.8m	Alliance	November 2012
Rosebery Schools	NT	Education	$60m	Design and construct	January 2011
Gallipoli Underpass (South Road Upgrade Anzac Highway Underpass)	SA	Road	$118m	Early contractor involvement	December 2009
Melbourne Convention and Exhibition Centre	VIC	Buildings	$1.4b	Public private partnership	July 2009
New Perth–Bunbury Highway	WA	Road	$705m	Alliance	October 2010

The diverse nature of these projects is highlighted by the varying project capital values, procurement methods and sectors in which the projects have been delivered. Further detail on the process undertaken to examine each individual project is outlined in Section 3 (Driving best practice).

Nation-building infrastructure projects are usually complex and bring with them significant financial burdens imposed on funding bodies. Funding can be sourced from Commonwealth, state or territory governments, private industry or a combination of these. Effective planning, delivery and operation of infrastructure can cost these bodies many billions of dollars. However, the benefits to the community in regards to increased productivity, safety and amenity are often many times greater than the original cost.

2 For details on these procurement methods, see guidance in Section 3.1

Each project has been assessed as meeting at least one of Infrastructure Australia's (IA) Strategic Priorities. These priorities have been developed to meet the key aims of Infrastructure Australia.[3] **Table 2** below illustrates each project against Infrastructure Australia's Strategic Priorities.

Table 2 Infrastructure Australia's Strategic Priorities[4]

		Gateway Upgrade Project	South-west Qld Road Reseal	Research and Education Building	Maitland–Whittingham Third Rail Line	Rosebery Schools	Gallipoli Underpass	Melbourne Convention Centre	New Perth–Bunbury Highway
SP1	Expand Australia's productive capacity				✓		✓		
SP2	Increase Australia's productivity	✓	✓		✓				✓
SP3	Diversify Australia's economic capabilities							✓	
SP4	Build on Australia's global competitive advantages	✓						✓	
SP5	Develop our cities and/or regions	✓	✓			✓	✓		✓
SP6	Reduce greenhouse emissions					✓	✓	✓	
SP7	Improve social equity, and quality of life	✓		✓		✓			✓

Maitland-Whittingham Third Rail Line, New South Wales

3 Infrastructure Australia, *A Report to the Council of Australian Governments*, December 2008, p. 8.

4 Infrastructure Australia, *Better Infrastructure Decision Making*, October 2010, p. 14.

2 Best practice outcomes from the case studies

Gallipoli Underpass (South Road Upgrade Anzac Highway Underpass), South Australia

This chapter reviews best practice outcomes in two sections. The first highlights best practices considered to be well supported by Government policy; these may be seen as sound and established practices. The second section discusses emerging best practices that have demonstrated value in the project, but may sit outside existing policy guidance.

In analysing best practice, Parsons Brinckerhoff has undertaken a rigorous assessment of each individual case study. This has included:

- an initial assessment based upon a common assessment framework, completed by the project teams most responsible for the delivery of the infrastructure;
- qualitative interviews with the project teams to determine the specific practices which were key to the project's success;
- analysis of project documentation provided by project teams;
- internal assessment of the project practices and approaches;
- cross-checking of the analysis undertaken with the agencies responsible for delivery; and
- final determination of best practices for each case study.

Central to the content of this booklet is an understanding of best practice. For example, selecting a procurement route by reviewing existing policies and incorporating anecdotal advice from colleagues may be considered good practice. However, the adoption of a tailored approach based on lessons learnt and applying continuous improvement throughout the procurement may be considered as best practice. **Figure 1** (Identification of best practice) proposes a framework for identifying best practice in the context of this booklet.

Figure 1 Identification of best practice

Best practice	Project planning and delivery informed by applying lessons learnt, continuous improvement and benchmarking against other projects and industries
Good practice	Project planning and delivery informed by enhanced 'standard practice' i.e. adapted from historical data and information, qualitative and quantitative
Standard practice	Project planning and delivery informed by common industry standards, systems and information
Emerging practice	Project planning and delivery defined by an organisation or individual
Ad hoc practice	Project planning and delivery not defined

Key best practice outcomes identified by each project team are listed below. These have been extracted from the Summary of Key Conclusions in Part B.

Gateway Upgrade Project, Queensland

- A government delivery option (through a fixed price lump-sum design, construct and maintain (DCM) contract) rather than a PPP, may be a better value for money (VFM) delivery model and prove successful for a large size, high-profile complex project (on a brownfield site).
- The use of a comprehensive, robust and accountable risk management methodology (which may be updated following the business case and procurement phase and budgeted for in the delivery phase) allows the adoption of a proactive approach to the treatment of risks.
- A proactive approach to community and stakeholder engagement (including interface agreements with key stakeholders) ensures all parties are kept informed of project progress and any issues are promptly addressed.
- A fixed price lump-sum contract does not preclude a number of scope changes/enhancements that may be considered/adopted. Detailed assessments can be carried out by independent assessors to ensure VFM is achieved on a cost–benefit basis.
- Even though a project may be delivered under a hard dollar contact — by agreement of the parties, the contract can be successfully administered through a formal relationship framework, strongly endorsed by executive management and adopted through multiple levels within the project team.

South-west Queensland Road Reseal, Queensland

- The use of a coordinated procurement strategy (with multiple smaller projects that have a similar scope of works) can deliver real savings in the costs of procurement and contractor mobilisation.
- Engagement with a large contractor through a coordinated procurement strategy provided opportunities for smaller entities (local governments) in relation to employment and the provision of goods and services to the project.
- A collaborative approach by entities with similar requirements can lead to a business case to service a joint outcome, and to best manage the logistics and resources.
- Managing risks across diverse projects can be undertaken through the involvement of each ‘element’ of the combined project, involving local stakeholders where necessary to fully capture the risks.

Research and Education Building Royal North Shore Hospital, New South Wales

- An agreement defining the arrangements should be agreed and documented where there are external participants contributing funding to a project and before any commitment to the procurement of the works. The agreement should cover the project scope, budgets and governance structures. Shared objectives should be established early.
- Consistent leadership of a project is a key for success. Projects can benefit positively where a project team/project manager can be brought to a project with experience on similar projects. Projects benefit from accessing the experience of the client agency and to ensure active and focussed participation in the involvement the project.
- The procurement method selected should be the one that bests suits the project risks; in this case, time constraints were managed with the appointment of a managing contractor to allow construction to be progressed in packages while the design was completed.
- Projects can benefit where the scope is clearly defined and articulated at the commencement of the project. Further there is accessible documentation that clearly sets out what is ‘in scope’ and what is ‘out of scope’ for the approved project. To manage any scope change there must be a robust protocol established and implemented.

Maitland–Whittingham Third Rail Line (Commonwealth/ARTC), New South Wales

- Projects that have identified strategies which have strong stakeholder and industry ownership are more likely to result in positive outcomes.
- Where a strategic outcome is important, allowing redundancy and running concurrent processes during the planning process can compress the project schedule, achieve outcomes more quickly and realise better outcomes for the wider community.
- The alliance team (which includes the client) achieves better integration of the project elements through the client's knowledge and involvement. Client involvement provides an avenue to change dynamically as circumstances require. The effectiveness of the project is increased when the roles and responsibilities of all team participants are defined, documented and communicated and the accountabilities are established and agreed to upfront. For stakeholder management those engaged with communicating with the particular group need the respect of that group. Consistent leadership of a project is a key for success.
- The alliance model may be chosen for a number of reasons and on this project it was chosen because it best mitigated risk. The procurement method for any infrastructure project should be selected based on what best suits the project and optimises its chances for success.
- For many organisations, infrastructure is a second priority to its business operations. Where the delivered project has a significant operational component, then operational requirements including safety are paramount and need to be introduced into the design from project inception and for each design review thereafter.

Rosebery Schools, Northern Territory

- Projects that have been identified from departmental strategies, informed by solid feasibility studies, risk assessed contextually for the region and have strong stakeholder engagement in their development have proven successful. Thorough planning is more likely to deliver a successful project.
- Projects benefit from a project team/project manager with experience on similar projects and when the team has worked together on previous projects. Consistent leadership of a project is a key to success.
- The governing parties (or client) should select a procurement methodology that best suits the project, the client and the team and best manages the risks identified on the project.
- Active stakeholder and community engagement in the development of a project (including the objectives and benefits to be achieved) and then ongoing consultation during project delivery, works towards ensuring stakeholder and community acceptance on delivery and in operation.

Gallipoli Underpass (South Road Upgrade, ANZAC Highway Underpass), South Australia

- The Early Contractor Involvement (ECI) process can allow all disciplines to work together in an integrated manner from early in the project to produce solutions and optimise opportunities for collaboration.
- Engaging the community and stakeholders fully during the design phase can assist in incorporating functional integration into the design development phase and ensure minimum disruption to the community during construction.
- A commitment to strong communication and information sharing ensures a project's success.

Melbourne Convention and Exhibition Centre, Victoria

- Drawing on the knowledge of a key operational stakeholder throughout the project can result in better outcomes and potentially increased useability of the delivered infrastructure.
- If the structure of the project allows for flexibility in innovation, this should be provided as a method for delivering enhanced strategic outcomes from the project and/or the delivered infrastructure.
- The commitment of public funds to a project and the potential for private public partnerships can attract private investment. Early engagement with industry to discuss this form of procurement is critical to maximising opportunity for innovation.
- An integrated project team provides additional redundancy, and in a multi-organisational project can provide opportunities for mutual support when the project structure will support it.

New Perth–Bunbury Highway, Western Australia

- Effective planning for the project years in advance provided ample opportunity for public consultation well ahead of the project requirement. This resulted in stakeholders being well-informed and engaged in the development of the project.
- A critical success factor was the inclusion of WA Limestone as an alliance partner, rather than as a traditional subcontractor. This is a departure from normal alliance methodology, but proved advantageous as it provided increased certainty regarding value of raw materials, and early engagement ensured the supply of materials to the project.
- The early contractor involvement optimised the chances of success in a constrained market and ensured providers were committed to the project from the outset.
- Individual accountability with contractual incentives and penalties resulted in the project attracting a high calibre of experienced leaders who were committed to delivering results for the duration of the project.

3 Driving best practice

Research and Education Building, Royal North Shore Hospital New South Wales

Many of the best practices observed in the case studies in this booklet are similar to the key lessons from the previous version of this booklet, which were:

- projects that develop from long-term plans and which have robust business cases are likely to be successful;
- strong project governance arrangements mean strong project delivery;
- the procurement model should be chosen on the basis of project specifics and should rigorously follow established published guidelines;
- transfer risk appropriately in order to maintain value for money; and
- careful management of local and environmental impacts assists project delivery.[5]

These are reflected in the following section of this chapter. The key differentiation from the previous version is the discussion on the emerging best practices in Section 3.2.

5 Department of Infrastructure and Transport, *Infrastructure Planning and Delivery*, December 2010, p. 7.

3.1 Fundamentals of best practice

The first element of analysing best practice is to examine those practices that are well established within the current policy and project environment. After careful analysis of the case studies, three important best practices have been identified and are discussed below:

- **'Best fit' procurement —** procurement;
- **Infrastructure that meets a community need —** strategic context, business case and external stakeholder involvement; and
- **Getting the fundamentals of project management right —** project governance and delivery.

'Best fit' procurement

Selection of the right procurement methodology is critical to achieve the best outcomes, both financially and from a holistic perspective.

Procurement is broadly defined as the 'whole process of acquiring property or services' where property may be defined as 'every type of right interest or thing that is physically capable of being owned.'[6] In terms of infrastructure projects, there are a number of recognised procurement methodologies.

It should be noted that this booklet does not attempt to discuss all types of procurement for infrastructure projects; however, for reference purposes the common forms of procurement are listed in **Table 3** below.

Early Contractor Involvement (ECI) has not been included in this table as it is an emerging procurement model and is discussed later in Section 3.2.

Table 3 Forms of procurement for infrastructure projects

Alliance contracting	the principal or government agency collaborates with one or more non-owner parties (for example, the designer and constructor) to share the risks and responsibilities in the construction phase
Construct only (lump sum or fixed price)	the principal or government agency has full responsibility for design and documentation, and may engage a design team to develop the design documentation on its behalf
Construction management	the principal or government agency engages the design team and trade contractors directly, with a construction manager appointed to manage the construction works on its behalf
Design and construct	the principal or government agency prepares a brief that outlines key and functional user requirements which is less detailed than that required for construct only
Design, construct and maintain	the contractor has the responsibility for the maintenance of the asset in addition to its responsibilities under design and construct
Direct managed	involves the principal or government agency managing the detailed delivery
Managing contractor	involves the principal or government agency appointing a contractor who engages subcontractors to deliver the works, accepting some delivery risk
Public private partnership (PPP)	a service contract between the public and private sectors, where the government pays the private sector to deliver an asset and related services over the long term

6 Department of Finance and Deregulation, *Commonwealth Procurement Guidelines*, December 2008, p. 3.

The importance of 'best-fit' procurement has been recognised as a fundamental driver for successful project delivery. A number of professional industry associations have evolved to build a body of knowledge and to establish professional standards, training and practices to promote best practice procurement.[7]

Procurement strategies also form a key 'gate' in the Gateway Review Process, which is discussed later. State governments across Australia; notably Victoria[8] and Western Australia,[9] have also provided guidance and documentation in the area of procurement.

Obtaining value for money is an important consideration in this process– however its priority will depend upon the outcomes required. The *Commonwealth Procurement Guidelines* highlight that value for money is a combination of factors (**Figure 2**).

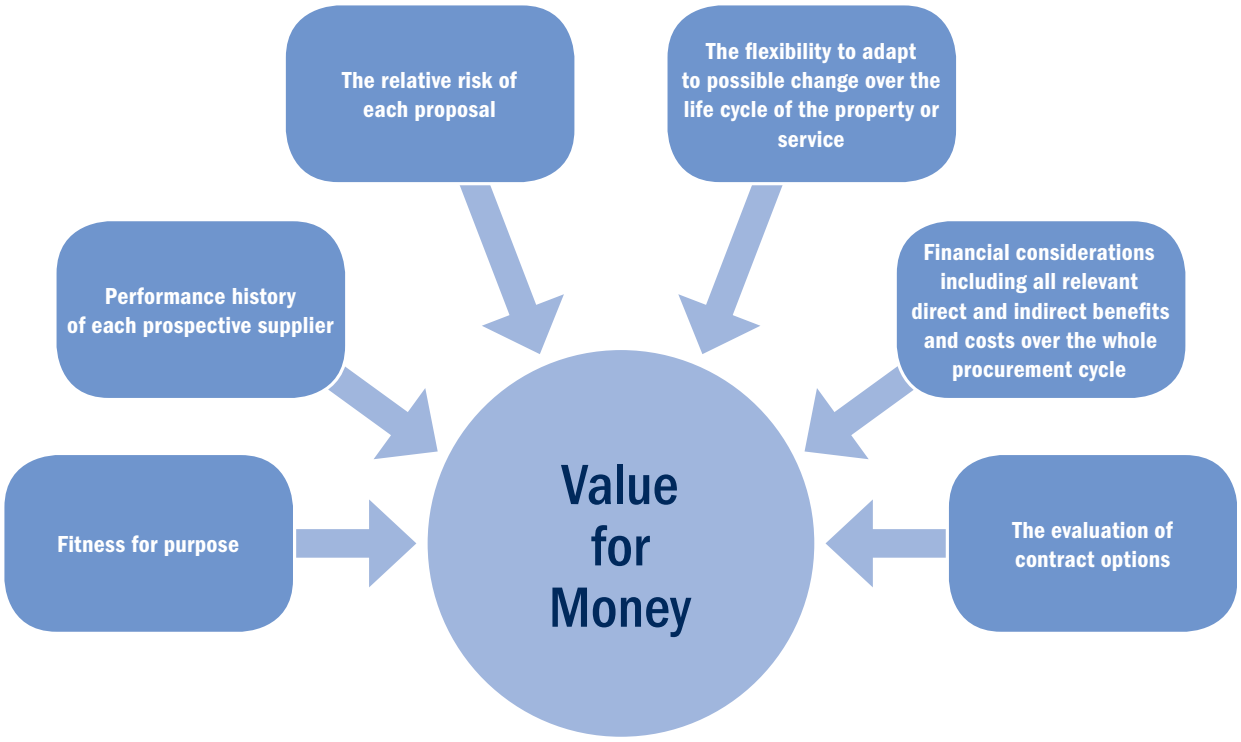


Figure 2 Definition of value for money[10]

The case studies in this booklet highlight the importance of selecting a procurement method best tailored to project requirements, demonstrating there is not a 'one-size-fits-all' methodology that will deliver success. A useful guide to some of the advantages and disadvantages of individual procurement methodologies is outlined in **Table 4**.

An example of best-fit procurement is illustrated in the South-west Queensland Road Reseal project where a number of local councils collaborated under the Queensland Department of Transport and Main Roads to combine their road reseal programs. It achieved a 20 percent saving whilst delivering real benefits to the people of the region, demonstrating the better value for money outcomes achieved through coordinated procurement strategies.

Further examples of best-fit procurement can be seen in the Maitland–Whittingham Third Rail Line project. Given the compressed nature of the schedule, a project alliance provided the best approach for assessing and managing risk throughout the project.

7 See Chartered Institute of Purchasing and Supply (CIPS) Australasia website, www.cips.org/en-au, and Australian Association of Procurement and Contracting (AAPCM) website, www.aapcm.com.au

8 Victorian Department of Treasury and Finance, *Investment Lifecycle Guidelines – Supplementary Guidance*, July 2007.

9 Western Australian Government (Centre for Excellence and Innovation in Infrastructure Delivery), *Infrastructure Procurement Options Guide*, November 2010.

10 Department of Finance and Deregulation, *Commonwealth Procurement Guidelines*, December 2008, p. 11.

The employment of a design, construct and maintain procurement methodology on the Gateway Upgrade Project ensured that the project's size, complexity and maintenance requirements were adequately covered—not only during project delivery, but throughout the initial ten years of operation of the asset.

Selection of the right procurement methodology is critical to project success and **Figure 3** highlights some important considerations for selecting the best approach. Part B (Case Studies) explores these considerations in more detail.

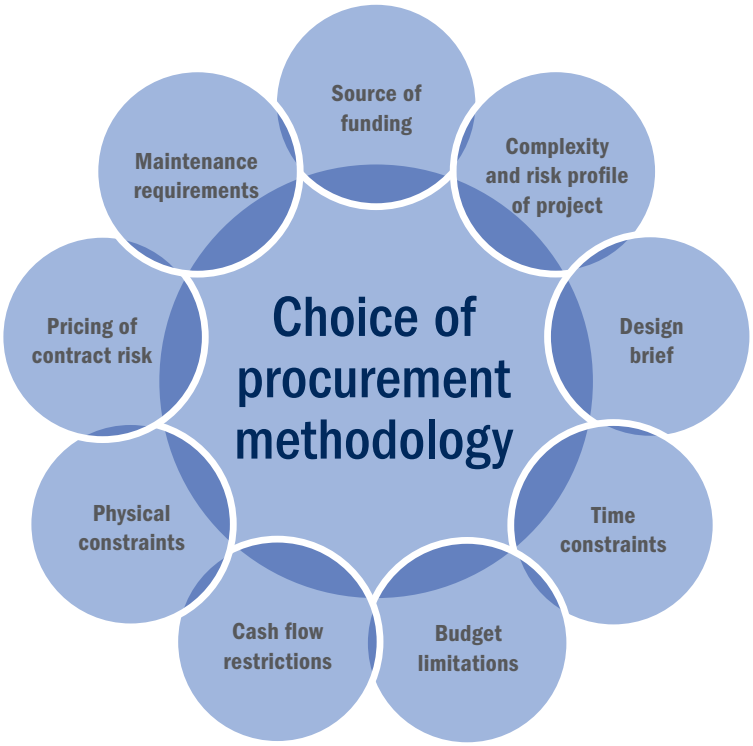


Figure 3 Considerations in selecting a procurement methodology[11]

11 New South Wales Government, *Procurement System for Construction: Procurement Practice Guide*, 'Procurement Method Selection', July 2008, p. 9-13.

Table 4 provides some discussion on the specific advantages and disadvantages of common forms of procurement. It should be noted that these advantages and disadvantages are not exhaustive and primarily consider issues highlighted in this booklet.

Table 4 Advantages and disadvantages of procurement models[12]

Procurement delivery models	Primary advantages	Primary disadvantages
Alliance contracting	• All parties have shared responsibilities, including risk • Provides flexibility to modify the design and allows ongoing changes to be incorporated during construction • Provides incentives to complete the project on time and on budget • Integrated team eliminates any potential adversarial culture	• Requires a genuine commitment to collaboration • Cost to establish and maintain the team can be high
Construct only	• Highest level of client control and certainty regarding scope • Contract value is known prior to commencement	• No single point of responsibility for the project • Client retains the risk in relation to the design, coordination of construction and fitness for purpose
Construction management	• The client can retain a high degree of control over the works while administration and coordination is conducted by the contractor • Management risk borne by the contractor	• No single point of responsibility for the project • Can be administratively complicated
Design and construct	• Potential to achieve schedule efficiencies • Contractor can drive cost and other efficiencies in the design • Single point of accountability for design and construction	• Cost may escalate due to the contractor bearing design risks • No focus on life-cycle costs, client retains whole-of-life asset risk
Design, construct and maintain	• Single point of accountability • Similar advantages to design and construct, with integration of maintenance for a fixed term • Transfer of life-cycle cost and risk	• Cost may escalate due to the contractor bearing design and maintenance risks • Success relies on well-articulated functional and service specifications
Direct managed	• Potential for shorter lead times to start or undertake work • Suitable for undertaking work of a sensitive nature • Allows full client control of all aspects of the project	• Increased demand on client resources • Client carries all risks
Managing contractor	• Potential for shorter design and construction program • Allows client control of the design development • Allows the contractor to advise on buildability issues	• May not be tendered to the open market (may be negotiated) • Client and contractor share the risk of time and cost through to the end of design development
Public private partnership	• Integration of design, construction, finance, operations, maintenance and refurbishment responsibilities • Greater transfer of risk to private sector at each phase • Opportunity for the development of innovative solutions	• Success relies on well-articulated, functional and service specifications

12 Western Australian Government (Centre for Excellence and Innovation in Infrastructure Delivery), *Infrastructure Procurement Options Guide*, November 2010, p. 29–49.

Infrastructure that meets a community need

Guidance on infrastructure planning and delivery has been published by Infrastructure Australia in its *Better Infrastructure Decision Making Guidelines*,[13] and is updated on a regular basis. The publication outlines Australia's key decision-making processes for national infrastructure.

The publication is informed by Infrastructure Australia's Reform and Investment Framework (**Figure 4**). Additional detail on this framework, including detailed descriptions of each stage, is provided at Appendix 1.

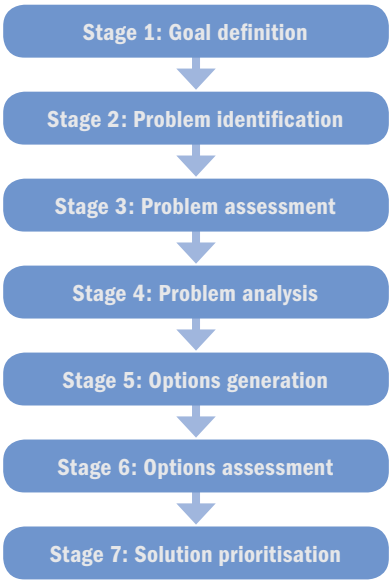


Figure 4 Infrastructure Australia's Reform and Investment Framework[14]

The Reform and Investment Framework encourages the development and assessment of project options in response to an identified need. When administered in the project feasibility and initial planning phase, it can be used to justify solutions presented in the business case, and to ensure that the delivered infrastructure asset meets current and future public requirements.

The Framework can also be used to identify priority areas within the community that will benefit most from provision of new infrastructure. For instance, a new educational facility will provide more community benefit if it is constructed in an area characterised by lower literacy rates rather than if it has provided to a community with high literacy rates.

The case studies considered in this booklet are all relevant to the 'big picture' within which they sit. As a case in point, the Rosebery Schools project was justified as a direct result of an identified need for improved educational facilities to support community development and growth in the Palmerston area in the Northern Territory. The focus on delivering benefits for the local population helped to foster community interest and support for the project.

The New Perth–Bunbury Highway project demonstrates a similar link to the strategic context where long-term strategies have been considered in urban planning initiatives. Communication of the project need to the community fostered support and reduced the likelihood of objections. The Maitland–Whittingham Third Rail Line project further demonstrates the benefit of involving external stakeholders. Engagement with the community within the vicinity of the rail alignment and appropriate consideration of the environmental impacts of the project resulted in successful application of pioneering practices in environmental offsets.

13 Infrastructure Australia, *Better infrastructure Decision Making Guidelines*, October 2010.

14 ibid, p. 12.

Melbourne Convention and Exhibition Centre, Victoria

Where decisions have been guided using a structured and systematic platform that is integrated in a holistic strategy, a project effectively markets itself to the community. Where the wider strategic benefits of an infrastructure project can be demonstrated to the community, 'not in my backyard' sentiments may be avoided.

Many project stakeholders are well positioned to understand the community impacts and benefits associated with an infrastructure project. Experience has shown that project teams that have consulted with stakeholders—particularly from the early planning stage are more likely to deliver optimal outcomes.

For example, consultation with local stakeholders in the case of the Rosebery Schools project allowed the project team to highlight the benefits to the community and foster increased support for the development. In a smaller community, high level support was critical to the project's success.

The benefits achieved through stakeholder engagement initiatives can be successfully monitored throughout the project. Metrics can be developed to determine the level of success and can be useful in projecting the level of use of the infrastructure asset when completed.

The Queensland Gateway Upgrade Project for example, tracked the success of stakeholder engagement throughout the project using extensive metrics. This was validated at the conclusion of the project when 175,000 people walked over the new duplicated Gateway Bridge; a useful guide to the success of the communications strategy and the high level of community interest in the project delivered.

Getting the fundamentals of project management right

It is a popular mantra that there is 'no such thing as a silly question', and questioning the basic rationale behind any project can often result in real benefits to projects. Fostering an environment within a project team that allows team members to speak freely and propose 'outside the box' solutions can lead to better results. This is important in the context of project culture as well as the structured processes required for larger infrastructure projects.

For example, in the Melbourne Convention and Exhibition Centre project, the original scope was extended by two initiatives to yield additional benefits during the life of the project. The first of these increased the environmental credentials of the building to be the world's first six-star Green Star convention centre (a measurement of the reduced environmental impact or 'green' credentials of the building). The second facilitated the development of an adjacent commercial hub to provide greater commercial opportunities within the vicinity of the convention centre. While these initiatives were both outside the scope of the original business case, they both delivered real benefits.

Project success can also depend on the experience and expertise that resides within a project team in the form of intellectual capital. Intellectual capital, in this context, can be defined as the collective ability of the project team to address all of the challenges likely to be encountered during the construction and operational life of the infrastructure asset. Experience shows that projects characterised by greater intellectual capital are capable of proactively addressing risk and providing thought leadership. Where a gap in knowledge is identified, successful project teams seek the information required and involve key stakeholders in the project team to maximise project benefits.

The Research and Education Building, Royal North Shore Hospital project in Sydney directly involved a key operational stakeholder (the Area Health Service) in the project team as a full-time team member, rather than adhering to the traditional practice of consulting the operational stakeholder as a third party. Implementing this strategy facilitated the implantation of operational knowledge and expertise into the project development and construction phases, resulting in significant stakeholder and community buy-in to the project that subsequently increased the delivered asset's operational effectiveness.

The Gallipoli Underpass project in South Australia exemplifies the benefits that can be achieved through synergies within the project team created through complementary skill sets. The project manager, design manager and construction manager (from the Department of Transport, Energy and Infrastructure, Thiess, Leed Engineering, and Parsons Brinckerhoff) each brought different skill sets which combined to deliver real benefits to the project.

In the Queensland Gateway Upgrade Project, the involvement of key staff from the Department of Transport and Main Roads and Queensland Motorways Limited during the procurement phase, ensured that valuable knowledge was retained within the project team, reducing the need to bring members 'up to speed'. This retention of project knowledge was seen as important in the subsequent delivery of the project.

Funded by the State Government, the South-west Queensland Road Reseal project effectively increased intellectual capital through involving local councils as members of the project team. This assisted the project team in the identification and management of key risks which may have potentially impacted the project cost and schedule.

New Perth-Bunbury Highway, Western Australia

Gateway Review Process

Gateway Review Processes are used to strengthen the oversight and governance of major projects and assist agencies to deliver agreed projects in accordance with the stated objectives.

The Gateway Review Process involves short, intensive reviews at 'gates' in the project life cycle. These are undertaken by peer reviewers who have had no involvement with the project and are therefore impartial.

These reviews may focus on:

- assessing the project against specified objectives at a particular stage in the project's life cycle;
- providing early identification of areas that may require corrective action; and
- providing validation that a project is ready to progress successfully to the next stage.[15]

Table 5 Stages of the Gateway Review Process[16]

Critical stage or gate	Type of review
Gate 0	Business need
Gate 1	Business case
Gate 2	Procurement strategy
Gate 3	Investment decision
Gate 4	Readiness for service
Gate 5	Benefits realisation

While some case studies in this booklet have applied the Gateway Review Process, not all have been required to do so as a matter of policy. **Table 6** details which projects have applied the Gateway Review Process or similar state based review processes.

15 Department of Finance and Deregulation, *Gateway Review Process — A Handbook for Conducting Gateway Reviews*, August 2006, p. 11.

16 ibid.

Table 6 Application of the Gateway Review Process across each case study

Project	Gateway Review		Comment
	Yes	No	
Gateway Upgrade Project (Qld)	✓		
South-west Queensland Road Reseal (Qld – Local Govt)		✓	Project was not nominated for a Gateway Review Process, based on the risk profile.
Research and Education Building, Royal North Shore Hospital (NSW)	✓		
Maitland–Whittingham Third Rail Line (NSW – ARTC)	✓		The project was modelled on internal ARTC project management processes, consistent with the Gateway Review Process.
Rosebery Schools (NT)		✓	A Project Control Group reviewed milestones through the project life cycle.
Gallipoli Underpass (SA)		✓	SA Government had not adopted Gateway Review Process at the time of the project. SA Government review processes were used.
Melbourne Exhibition and Convention Centre (VIC)	✓		
New Perth–Bunbury Highway, Mandurah Entrance Road (WA)		✓	WA Government had not adopted Gateway Review Process at the time of the project. WA Government processes were used.

3.2 Emerging best practice

Analysis of the case studies has identified three practices and behaviours that are considered to be 'emerging' best practice in the infrastructure project environment. In some of the case studies, it has been noted that 'outside the box' processes and behaviours have been used to deliver optimised results.

This section will discuss these key lessons:

- **Involve the contractor early in the project** – procurement;
- **Engage the 'operator' in the project team** – project governance; and
- **Make individuals, not just teams, accountable** – project delivery.

Involve the contractor early in the project

ECI is often a combination of collaborative contracting with a more traditional design and construct model. While this methodology may take a number of forms, in its most common form it involves the contractor working closely with the client through the initial stages of the project. This may require the contractor to compete for the early engagement role. The contractor works with the client to develop the design and cost models (a risk-adjusted price) in parallel. Involving the contractor in this process can enable both the client and the contractor to appropriately allocate risk and reduce costs.

Following the determination of the risk-adjusted price, the client has the prerogative to either accept this price as proposed by the contractor, or to approach the market as a public tender under which the design will be delivered.

The Gallipoli Underpass project was delivered under an ECI, while the Research and Education building and the New Perth-Bunbury Highway incorporated aspects of ECI within their selected procurement model.

The Gallipoli Underpass project used ECI to reduce costs and mitigate key project risks. In addition, early involvement of the contractor in the design phase ensured constructability. These factors were important to the South Australian Government.

In the Research and Education Building project, ECI facilitated release of work packages in advance of the design being finalised, allowing the schedule to be accelerated. Furthermore, this methodology enabled completion of the project prior to the commencement of a wider redevelopment.

The New Perth–Bunbury Highway, apart from being a large and complex project, had the additional pressure of competing with the mining sector for resources – ECI ensured resources were 'locked in.'

In each case, the project team followed a close variant of the process described above, where the contractor was involved through a competitive process early in the project and assisted in the development of the design and budget.

The use of the ECI methodology to improve project delivery is currently gaining credibility in the marketplace. This is particularly true when design development requires constructability considerations and insights from contractors including material selection and design options to achieve a budget.

While the ECI procurement route will be acceptable to some projects, it will not be appropriate for all. It is important to note that ECI will not eliminate all risks. Client representation may be required at a more senior level in the early stages of the project. There may also be a requirement to engage independent cost estimators or verifiers to ensure that the contractor does not inflate the risk-adjusted price on the project at an additional cost.[17]

17 Western Australian Government (Centre for Excellence and Innovation in Infrastructure Delivery), *Infrastructure Procurement Options Guide*, November 2010, p. 43.

Figure 5 highlights circumstances in which ECI may be advantageous.

Figure 5 Situations in which ECI may be advantageous

Engage the 'operator' in the project team

To achieve value for money, the asset life cycle is a key procurement consideration. Infrastructure projects progress through several stages prior to final delivery and operation. While a value for money decision focuses on the ability to secure value for the public sector, it must also consider the operation of the delivered infrastructure—in order to drive cost efficiency during the asset's life cycle and to optimise outcomes for the community.

In the Melbourne Convention Exhibition Centre project, the existing operator of the Melbourne Convention and Exhibition Trust (MCET) was involved as a key project team member rather than as a stakeholder. This was an important element of the project as it truly brought the operator 'along for the ride' throughout the project and ensured that no decisions were made without the involvement of the MCET. From the operator's perspective, this increased the long-term viability and useability of the convention centre, taking into consideration all elements of the project, from design through to delivery.

Make individuals, not just teams, accountable

The delivery of key infrastructure is of great interest to the community benefiting from the project. The importance of 'getting it right' becomes clear when we consider the budgets of larger projects. Cost overruns, schedule slippages or failure of quality control can cost millions of dollars in project costs or lost opportunity, or at worst can affect the safety of people using the infrastructure.

On larger infrastructure projects, accountability has been shown to be of key importance within the project team. This is shown in the New Perth–Bunbury Highway project, where WA Main Roads formed the view that greater individual accountability tended to attract higher-calibre project team members. Allocating responsibility for the performance in key areas such as project and design management to individuals, rather than the whole project team, drove these key team members to focus the team on the outcomes required.

New Perth-Bunbury Highway, Western Australia

The importance of responsibilities within the project team is also clear in the Maitland–Whittingham Third Rail Line project, where an alliance approach was used for the delivery of the infrastructure. When the client was embedded within the project alliance, there was potential for responsibilities to become blurred. This was resolved by the clear delineation of responsibilities, which were documented and communicated to all alliance members. This allowed all members of the alliance to work side by side in a more collaborative manner.

Gateway Upgrade Project, Queensland

4 Conclusions

South-west Queensland Road Reseal

Fundamentals of good project delivery are apparent throughout all the infrastructure case studies examined in this booklet, particularly those supported by extant policy. The key lessons of the previous booklet are also evident in the case studies selected for this booklet. This demonstrates that the hallmarks of successful projects are generally consistent. This is notable in the procurement practices observed; while the core practices are consistent, this booklet has sought to examine procurement from a new perspective.

While these practices are likely to remain central features of any successfully delivered project, emerging practices that may be considered 'outside the box' can aid project delivery and optimise results.

These practices can emerge as a response to external pressure on one particular element of a project, or from extensive experience in similar projects over a period of time. The net result is that the delivery of infrastructure projects can and will continue to evolve.

To ensure that projects benefit from the most recent and relevant knowledge and experience in the field, it remains important that members of the infrastructure community across the nation remain conversant with current best practice as it evolves.

PART B – Case Studies

Maitland-Whittingham Third Rail Line, New South Wales

This section provides a detailed summary of each of the eight nominated case studies and covers the five key elements listed below:

Strategic Requirement	Quality of infrastructure assessment and planning, including the extent to which projects were embedded in holistic sector strategies/plans and wider land use plans (where relevant).
Business Case	Quality of business case development and the extent to which robust and objective project selection criteria influenced decisions. Choice of funding methods, including the allocation of financial risk between parties.
Policy, Procurement and Governance	Presence of overarching project governance structures and processes to oversee the project's delivery.
Planning	Attention paid to wider risk management issues and how those risks were identified and managed. Sustainability and appropriateness of the management, oversight and regulation (where relevant) of ongoing operations
Delivery	Extent and quality of project management and planning processes and the degree to which they influenced delivery. Completion on time and within budget.

The case study summaries aim to identify and highlight best practice processes and behaviours with respect to the above five elements. Analysis of these processes and behaviours led to the development of the key best practice lessons.

Gateway Upgrade Project, Queensland

Project description

The Gateway Upgrade Project (GUP) included the duplication of Brisbane's landmark Gateway Bridge, refurbishment of the existing Gateway Bridge and construction/upgrade of 24 km of motorway between the Pacific Motorway (in the south) and Nudgee Road (in the north). The project included a new 7 km deviation on the northern side of the Brisbane River which provided a much-needed second access to the Brisbane Airport. The project included (as a contract extension) the upgrade of an additional 4.3 km section of the motorway upgrade between Mt Gravatt–Capalaba Road and the Pacific Motorway.

Project cost	$2.12 billion (2011)
Funded by	Queensland Government Queensland Motorways Limited (toll revenue)
Project commencement (contract awarded)	September 2006
Project completion (including contract extension)	Mid 2011
Consistent with Infrastructure Australia's Strategic Priorities	SP2 – Increase Australia's productivity SP4 – Build on Australia's global competitive advantages SP5 – Develop our cities and/or regions SP7 – Improve social equity and quality of life
Method of procurement	Government delivery option (GDO) through a design, construct and maintain (DCM) contract
Operator/principal	Queensland Motorways Limited (QML) (operator)
Contractor	Leighton–Abigroup Joint Venture (LAJV) (design, construction and maintenance contractor)

5.1 Project overview

The $2.12 billion Gateway Upgrade Project (GUP) was the largest road and bridge infrastructure project delivered under a design, construct and maintain (DCM) contract in Australia and the first of its kind for Queensland. The project involved the duplication of Brisbane's landmark Gateway Bridge (renamed the Sir Leo Hielscher Bridge — South), refurbishment of the existing Gateway Bridge (renamed the Sir Leo Hielscher Bridge — North) and construction/upgrade of 24 km of motorway corridor between the Pacific Motorway (in the south) and Nudgee Road (in the north). It included construction of a new 7 km deviation on the northern side of the Brisbane River which provided a much-needed second access route to Brisbane Airport, as well as the installation and roll out of free-flow tolling and intelligent transport system (ITS) technologies throughout the project corridor.

The upgraded corridor provides a critical connection to key state and national transport networks in the heartland of Queensland's economy and the 'Australia TradeCoast'.[18] Owing to its location, the project is of tremendous importance. The rapid growth of Brisbane Airport, TradeCoast development, the Port of Brisbane and the surrounding industrial precinct will be supported by this vital transport infrastructure.

The Gateway Motorway duplication was integrated with infrastructure development for Australia TradeCoast. The development followed recognition of the immense potential for four of the region's key contributors to economic growth to drive the ongoing development of the region in a collaborative way.

The original Gateway Bridge (opened in 1986) was the only river crossing east of Brisbane CBD — the need for the GUP and provision of a second river crossing was justified by the population and rapid industry growth in and around the Port of Brisbane, the airport and regional south-east Queensland. Construction commenced in March 2007 and was completed by July 2011 (including project extension).

The GUP comprised:

- construction of a second (six-lane) Gateway Bridge (renamed the Sir Leo Hielscher Bridge — South) including a pedestrian walkway and cycleway;
- refurbishment of the original Gateway Bridge (renamed the Sir Leo Hielscher Bridge — North);
- construction of a new 7 km six-lane motorway north of the Sir Leo Hielscher bridges to Nudgee plus a new airport interchange;
- upgrading (to six/eight lanes) of 16 km of motorway south of the bridges between Lytton Road and Pacific Motorway (including the project extension); and
- installation and roll out of free-flow tolling and intelligent transport system (ITS) technologies throughout the project corridor.

18 *Australia TradeCoast Limited* is an independent economic development agency in Brisbane, comprising Queensland Government, Brisbane City Council, Brisbane Airport Corporation and Port of Brisbane Pty Ltd.

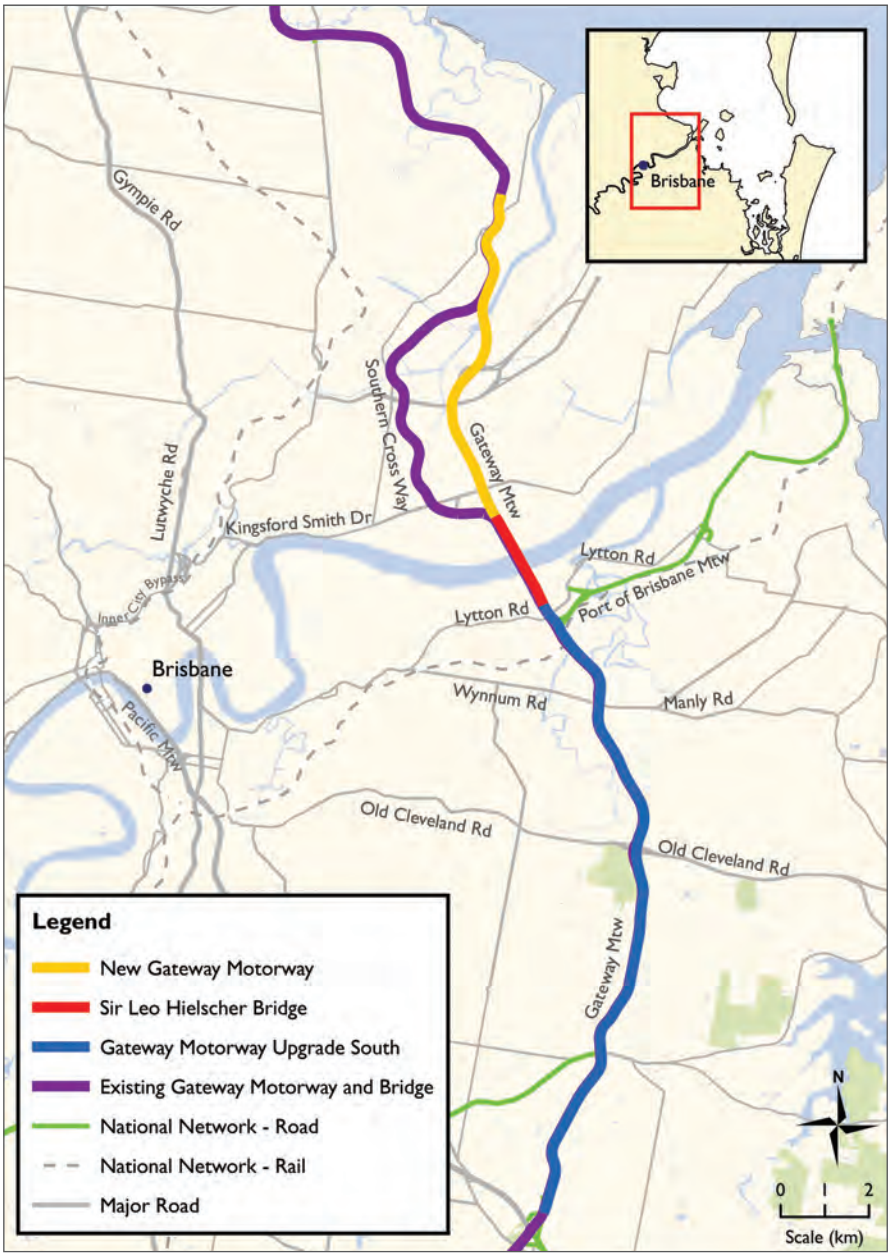


Figure 6 Gateway Upgrade Project, showing existing and new sections

5.2 Business case

The need for the GUP flowed directly from the success of the original Gateway Motorway (opened in 1986) to support and influence development in and around the Port of Brisbane, the airport and regional south-east Queensland.

The original Gateway Bridge serviced the growing industrial areas in the eastern section of the city, Brisbane Airport, and the port facilities at Fisherman Island and also formed part of the city bypass for traffic destined for the Pacific and Bruce highways. The Gateway Motorway was progressively opened and then duplicated in the late 1980s and early 1990s. Significantly, the bridge and motorway were not designed for the current traffic volumes and new developments such as Australia TradeCoast. At the end of 1986 the daily vehicle count for the corridor totalled 17,000 vehicles; by the end of 2007 this had increased to 100,000 vehicles.

The strategic project objectives identified in the business case centred around providing an increased capacity urban bypass of Brisbane and the consequent strategic benefits (improved safety and traffic flow) to motorists, industry, freight movement, tourism and general growth of related areas, in particular the Australia TradeCoast precinct.

The purpose of the business case development stage was to justify the need for the GUP by establishing clear objectives, identifying and investigating project delivery options most likely to provide the best value for money outcome, and seeking commitments regarding project funding (including possible tolling strategies).

The main objective of the GUP was to improve productivity by increasing the capacity and efficiency of a major national transport and freight route linking significant business and industry precincts across Brisbane and Australia TradeCoast. Initial planning investigations for the business case accurately predicted that duplication of the Gateway Bridge would markedly reduce congestion and corridor travel times by up to 15 minutes which, in addition to supporting trade and industry, would gain substantial community support – crucial to the success of this project.

Project highlight

The GUP was the first road infrastructure project assessed against the Queensland Government Public–Private Partnership value for money (PPP/VFM) Framework. As a candidate for this new framework, the Queensland Government recognised the need for detailed analysis of the potential procurement method to ensure value for money.

Following assessment against the PPP/VFM Framework the Queensland Government selected a GDO as the preferred delivery model where the state takes responsibility for ownership, finance, operation, toll collection and revenue risk. Under the GDO the project would be delivered (through a DCM contract) and operated by QML (QML is a Queensland government toll operator for the existing Gateway Bridge) in partnership with the state government under a new 30 year road franchise agreement (**Figure 7**). The project would be funded using state loans repayable by QML through toll revenue over a 30 year franchise period ('public funded PPP'). The alternative procurement method considered in the business case was a traditional PPP which was rejected as the GDO was considered better value for money given the known traffic and revenue on a 'brownfield' site and lower (current) cost of state borrowing. The GDO also provided the opportunity for earlier procurement, economies of scale for QML, and integrated road network management.

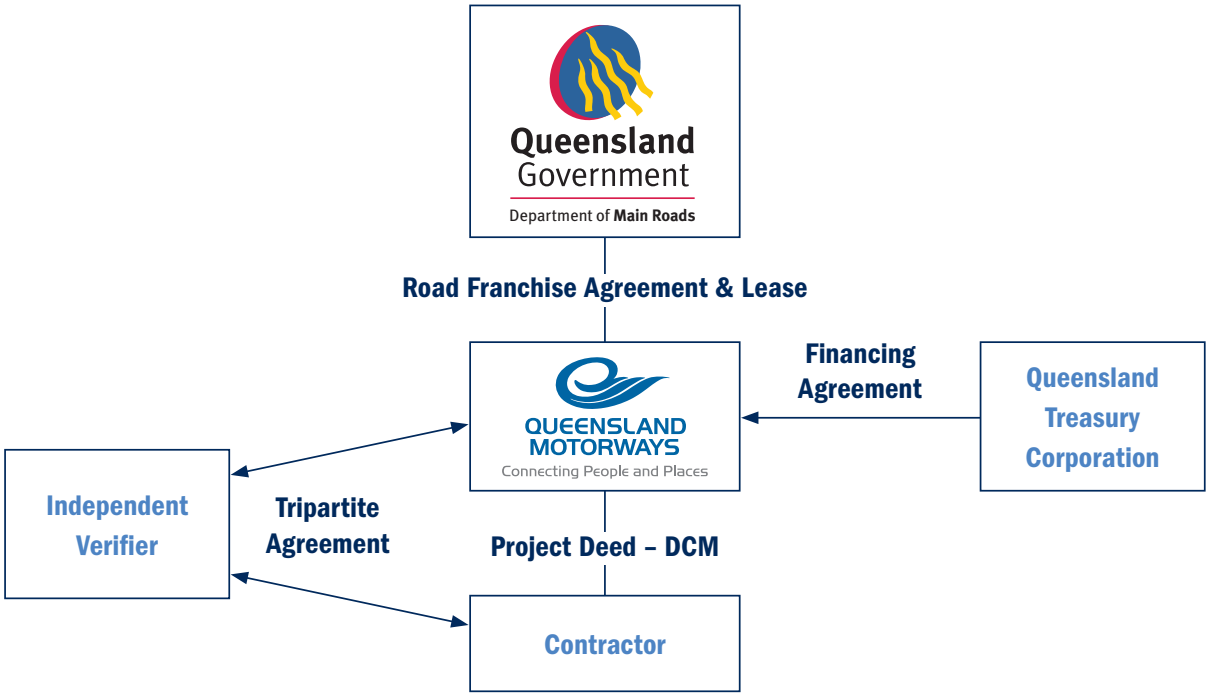


Figure 7 Delivery model for Gateway Upgrade Project [19]

The business case recognised that innovative construction techniques and effective time and budget management would be crucial to the delivery of the GUP. This was reflected through the Queensland Governments choice of a fixed price lump-sum DCM contract, where the private sector has responsibility for the design, construction and maintenance of the new motorway while the government owns and operates the asset. Additional benefits for the project under the DCM contract included significant opportunity for innovation and whole of life outcomes and earlier start sequencing.

The contract delivery method selected and comprehensive contract documentation ensured minimal risk was retained by the principal. Stringent handover conditions were required of the DCM contractor to ensure the specified residual life of the infrastructure was provided at the end of the ten year maintenance period. The delivery model included an independent verifier deed (design and construction verification with selected proof engineering).

The business case included a quantified appraisal of the project's economic, environmental and social costs as well as a rigorous risk assessment. Traffic and tolling scenarios and potential project delivery methods were investigated as part of the economic analysis.

The project budget was established as part of the business case using first principles estimating (as applicable for large/high-risk activities), benchmarking and rigorous assessment.

The environmental and social impact studies were also incorporated and formed part of the analysis. Comparison of the projected project benefits against original predictions is currently being undertaken and will be included in a benefits realisation report. This report will review levels of service, travel time savings, accident benefits and social and environmental benefits.

19 Queensland Motorways, *The Gateway Upgrade Project Delivery Phase: Challenges and Solutions (presentation)*.

The business case also included:

- a risk register – this was established during the business case and developed further during the procurement and delivery phases;
- an environmental impact statement – addressing environmental, cultural heritage, native title and land issues;
- economic analysis included modelling various traffic and tolling scenarios;
- project delivery methods; and
- options analysis – other routes (with particular reference to environmental impacts).

It is important to note that while this project predates Infrastructure Australia's Reform and Investment Framework, the Queensland Government ensured that the project was consistent with, and aligned with strategic infrastructure priorities. These priorities were identified in the Roads Implementation Program, the South East Queensland Integrated Regional Transport Plan and the South East Queensland Regional Framework for Growth Management. The frameworks ensured that the project supported regional and economic development and was consistent with priorities identified in the Regional Transport Plan and road network enhancements. The main project priority was later reinforced during the development of the Queensland Government's 2005 South East Queensland Regional Plan and the first South East Queensland Infrastructure Plan and Program, developed in 2006.

The business case phase included extensive community and stakeholder consultation and the development of an environmental impact statement (addressing environmental, cultural heritage, native title and land issues). Stakeholders included road users, adjacent land owners, businesses, the Queensland and Commonwealth Governments, lobby groups, and local councils.

Evidence received to date has illustrated that the GDO delivery model through a DCM contract has proven successful for the project and is appropriate for GUP's large size, high profile and complex nature.

5.3 Procurement, governance and policy

The GUP demanded a rigorous procurement process which would secure value for money, promote innovative design and construction methods and facilitate a risk-adjusted approach to costs and non-price features. At the start of the procurement phase of the project, QML and the Queensland Government assembled a team of legal, engineering and technical advisers from the public and private sectors to assist in selecting the best proponent to deliver the project.

Throughout the procurement phase (and the business case development phase), the project team maintained strict probity procedures to ensure the integrity of the procurement process was maintained. As public funds were being used for the GUP, QML was committed to ensuring the procurement process was conducted under the Government's probity and accountability policy, namely that it was ethical, honest and fair to all participants.

In early 2005, QML commenced the procurement and tender process for a DCM contractor and issued a registration of interest for the project that resulted in several national and international companies registering their interest with three invited to submit a formal bid. The tender analysis stage involved extensive quantitative and qualitative assessment in relation to value for money using an adjusted comparative price that gave QML and the Queensland Government a high degree of confidence.

Community needs were a major focus during the procurement process, with the project team adopting a proactive and coordinated approach to encouraging public feedback through briefings with special interest groups and one-on-one meetings. Reference groups were formed, workshops were held and stakeholder interface agreements were established where required. Local newspaper advertisements, public displays, website updates and a 'project hotline' were amongst the methods used for community engagement.

A key activity towards achieving meaningful community and stakeholder engagement was the formation of agency reference groups. The groups comprised representatives from various peak organisations, government departments and major businesses in the project corridor and provided invaluable specialist regulatory, technical and social knowledge.

Following the comprehensive evaluation process, individual team reports were consolidated and provided to the selection committee (QML/State) for consideration and assessment. After thorough analysis and assessment, the selection committee submitted the evaluation report to the QML Board and the Queensland Government. Prior to the contract award the budget was reset to accommodate the 'agreed' tender price. The final budget included a detailed risk assessment (including QML and government retained risk) which was subsequently endorsed by QML and approved by the Queensland Government.

In September 2006, QML engaged LAJV under a project deed for the design and construction of the GUP and maintenance of the asset for a ten year period.

As part of the learning process, feedback was sought from unsuccessful tenderers following industry engagement. Positive responses confirmed satisfaction with the procurement process.

The responsibilities, based on the GDO model, for the project were:

QML on behalf of Queensland Government

- ownership, finance, operation, demand/traffic
- significant opportunity for innovation and whole of life outcomes
- economies of scale through existing State involvement in the Gateway Bridge, Port of Brisbane and Logan Motorways
- integrated network management
- earlier start sequencing.

Leighton–Abigroup Joint Venture

- design, construction, maintenance
- strict handover conditions required of the DCM contractor to ensure the residual life of the infrastructure.

Project highlights

- Transitioning key staff from the business case phase through the procurement phase to the delivery phase maximised project performance and ensured minimal loss of corporate knowledge on the project.
- Selecting GDO as the preferred delivery model (rather than a PPP) because it provided best value for money.
- Involving the community and stakeholders throughout the various phases of the project allowed for timely input and facilitated strong project acceptance and support.

In 2007 the QML and Queensland Government GUP team won the Engineering Excellence Award for 'Perfecting the Procurement Phase'.

5.4 Planning and Delivery

Strong project governance was one of the keys to project success. This was achieved through clear accountabilities: strict adherence to QML and government policies and procedures; application of project management methodology (including emphasis on risk management); risk-based monitoring; use of independent verifier, targeted meetings and detailed review and reporting to QML Board, and the franchisor (Queensland Government) under the Road Franchise Agreement. The project deed also included provision for a dispute resolution board.

The project plan was developed by QML in accordance with project management body of knowledge principles. It incorporated the risk management sub-plan that monitored and managed progress against identified potential risks and opportunities. In accordance with the project deed, LAJV as the DCM contractor produced individual management plans for design, construction, environmental, safety, community engagement, industrial relations and maintenance. These plans were reviewed by QML and the independent verifier.

QML's legal and technical advisers provided initial training and expert advice as required in the complexities of administering the procurement and project delivery contract (unique to Queensland) to ensure that procedures were closely and correctly followed. In addition, several team members involved in the procurement phase transitioned to new roles created during the delivery phase allowing the retention of procurement corporate knowledge. All project staff including designers were co-located on site to optimise collaboration and interaction.

As a part of QML's management structure a member of the QML senior management team was appointed general manager to encourage linkages within the project operating structure. The general manager had also been the project director of the business case and procurement phases.

A project operating system was also developed, to document the administration processes used by QML. To facilitate interaction in relation to quality management, integrated software systems were shared by LAJV. QML's site administration team provided full electronic control of all contract and project management documents.

A fundamental platform for the success of the project was the embracement and successful application of a formal and facilitated relationship framework which delivered win-win outcomes and best for project decisions. This relationship framework, including bimonthly 'health' checks was strongly promoted and supported by executive management and fostered very strong relationships that were recognised by an experienced independent facilitator as some of the best ever on a 'hard dollar' contract.

The risk register, which had been updated from the business case and procurement phases, was monitored and continuously updated during the design and construction phase. The reviewing and updating involved input from senior QML design and construction staff and a risk consultant. Each month the risk register was reviewed for currency of risk and every second month the residual risk exposure was re-assessed/quantified. As risks were identified and treated the resulting cost was drawn down from the risk budget after the approval of the QML/Queensland Government risk panel and QML Board. The evolution of the register and the trends can be tracked within the project document system. The risk status was reported to the QML Board and Queensland Government on a quarterly basis, and risk reviews related to the above were carried out regularly to AS/NZS 4360:2004 Risk Management – this was a key element of the projects risk management plan.

Value engineering and value management were applied during the course of the project, both during the tender period and later during design and construction. These included:

- considering a number of alignment options to take the motorway over or under the existing elevated Airtrain structure;
- accepting offers to bring forward several significant scope enhancements;
- carrying out continuous value for money checks against all variations during the project, including one scope enhancement of $200 million;
- accepting QML proposal to de-scope (savings) contain aspects of the project (to allow for possible future upgrades); and
- using match-casting for the main bridge approach spans which saved $3 million and approximately three months.

During the project, several design variation orders were issued — some of which resulted in cost and time savings, while others were aimed at enhancing the final product. All of these were managed through detailed risk evaluation and value for money assessment of costs and benefits.

QML submitted to the State the most significant scope change — to extend the original 20 km project by 4.3 km, which would increase the motorway capacity on this adjoining section from four to six lanes consistent with the original GUP. Following an invited offer from LAJV and a comprehensive value for money assessment, the State approved the project extension and an increase to the project budget of $240 million. The entire extension process from concept design, offer and assessment through to project extension approval (including environmental and stakeholder) was all achieved in four months.

Effective community stakeholder engagement formed an important part of the project and involved extensive consultation and information sharing with road user groups, adjacent land owners, businesses, lobby groups, and local councils. A State communication strategy and project communication plan was implemented using specialist communications teams working for the principal and contractor and coordinated with the State to provide an integrated delivery through all media outlets. Proactive consultation through evolving stakeholder groups (agency reference groups, special interest groups and community liaison groups) was promoted during all phases of the GUP.

The success of stakeholder engagement was evaluated using feedback via a variety of channels and metrics including a dedicated project website and telephone hotline. Targets and metrics were defined for each channel, for example, number of complaints to project 'hotlines' and the time taken to resolve complaints. Strong community support for the project was illustrated during the public open day which saw 175,000 members of the Brisbane community walk over the bridge.

Project highlights

- The project team adopted a comprehensive and accountable risk management methodology to proactively and successfully manage risk on the project.
- Strong project governance was one of the keys to success in the delivery of the project.

5.5 Outcomes

Construction on the (original 20 km) project commenced in March 2007 and was completed by November 2010, seven months ahead of schedule and within budget. The project extension to upgrade an adjoining 4.3 km section commenced in April 2010. These works were completed in July 2011 (in line with the completion date of the original GUP) and within budget.

The GUP was delivered progressively in six separate portions to provide benefits to motorists sooner. The GUP has delivered a safer, smarter and more reliable motorway and travel time improvements for over 100,000 motorists who use the motorway and Sir Leo Hielscher bridges every day.

An additional outcome has been the development of adjacent industrial areas and links with the Port of Brisbane and Brisbane Airport which are complemented by the project.

The benefits stemming from completion of the GUP are primarily economic with faster regional transit times and reduced congestion offering improved efficiency and growth opportunities for business, agriculture and tourism industries in the rapidly developing Australia TradeCoast. Other key economic benefits include support of the State and National highway system and improved freight efficiency in the Australia TradeCoast area. These significantly contribute to gross regional product.

Excellent outcomes were also realised in the area of occupational health and safety. LAJV created a very strong safety culture supported by management and a dedicated OHS team, and succeeded on three occasions passing one million person hours without lost time injury, on a project that saw in excess of 10,000 site inductions.

In March 2011, the GUP was awarded the Project of the Year Award at Infrastructure Partnerships Australia's National Infrastructure Awards. The prestigious award recognised the GUP 'for its iconic status, its engineering brilliance and sheer scale'.

5.6 Summary of key conclusions

Following a review of the GUP the following key conclusions regarding best practice can be identified:

- A government delivery option (through a fixed price lump-sum design, construct and maintain (DCM) contract) rather than a PPP, may be a better value for money delivery model and prove successful for a large size, high-profile complex project (on a brownfield site).
- The use of a comprehensive, robust and accountable risk management methodology (which may be updated following the business case and procurement phase and budgeted for in the delivery phase) allows the adoption of a proactive approach to the treatment of risks.
- A proactive approach to community and stakeholder engagement (including interface agreements with key stakeholders) ensures all parties are kept informed of project progress and any issues are promptly addressed.
- A fixed price lump-sum contract does not preclude a number of scope changes/enhancements that may be considered/adopted. Detailed assessments can be carried out by independent assessors to ensure value for money is achieved on a cost–benefit basis.
- Even though a project may be delivered under a hard dollar contact, by agreement of the parties the contract can be successfully administered through a formal relationship framework — strongly endorsed by executive management and adopted through multiple levels within the project team.

South-west Queensland Road Reseal

Project description

To reseal roads in remote south-west Queensland as an initiative under the Joint Purchasing and Resource Sharing Framework of Roads Alliance between the Queensland Department of Transport & Main Roads and local governments. The project resealed the following roads for state and local networks:

2009–10 – 493 km (393 km state, 100 km local)

2010–11 – 471 km (356 km state, 115 km local)

Project cost	2009–10 contract around $9 million 2010–11 contract around $7.1 million (Department of Transport and Main Roads (DTMR) component only)
Funded by	Queensland Government
Project commencement	March 2009
Project completion	June 2011
Consistent with Infrastructure Australia's Strategic Priorities	SP2 – Increase Australia's productivity SP5 – Develop our cities and/or regions
Method of procurement	Managing contractor (open tender)
Contractor	Boral Resources

6.1 Project overview

The South-west Queensland Road Reseal project involved resealing around 1,000 km of roads throughout 2009 and 2010 in remote south-west Queensland. The project was delivered through collaboration between the Queensland Department of Transport and Main Roads (DTMR) and four local councils, with an objective to secure operational efficiencies and cost savings on their annual road maintenance programs.

The overall objectives of the project were to:

- deliver planned maintenance activities on extensive sections of roads in the region;
- secure cost savings from 'economies of scale' procurement; and
- improve safety performance from the utilisation of specialised aggregate spreaders.

Fundamental to understanding this joint procurement strategy is an understanding of Queensland's south-west region. The region comprises 18 percent (320,000 km^2) of Queensland's total land area[20] and supports 0.6 percent of Queensland's population.[21] There are six local government areas (LGAs): Murweh, Paroo, Balonne, Bulloo, Quilpie and Maranoa. The region encompasses 3,948 km of the state-controlled road network and 418 km in the national road network.[22] These roads support major regional freight routes which are vital to many state industries including tourism, sport, education, manufacturing, cattle, agriculture, mining and construction.

Resealing is an integral part of state and Commonwealth road preventative maintenance programs and should be done before the road starts showing signs of stripping or loss of bitumen and stones and becomes potholed and cracked. A reseal prolongs the life of road pavement by reducing the potentially damaging effects caused by ingress of water and is more cost efficient than patching or reconstruction of a failed road. Rural roads are typically sealed with a bituminous spray seal and layer(s) of aggregate (stone).

In remote areas transport networks are fundamental to regional economic development and road pavement maintenance and servicing is crucial to ensure road safety and travel efficiency standards are maintained. Maintenance work on the road network is challenged by 'mobilisation' costs for contractors to travel to remote and very remote areas to undertake infrastructure projects.

This project consisted of annual reseal programs and contracts procured separately in financial years 2010 and 2011. These contracts were open tenders and Boral Resources secured (competitively) the contracts successively in years 2009 and 2010.

20 Queensland Government, Department of Main Roads, *Queensland Transport and Roads Investment Program*: South West Region.

21 ibid.

22 ibid.

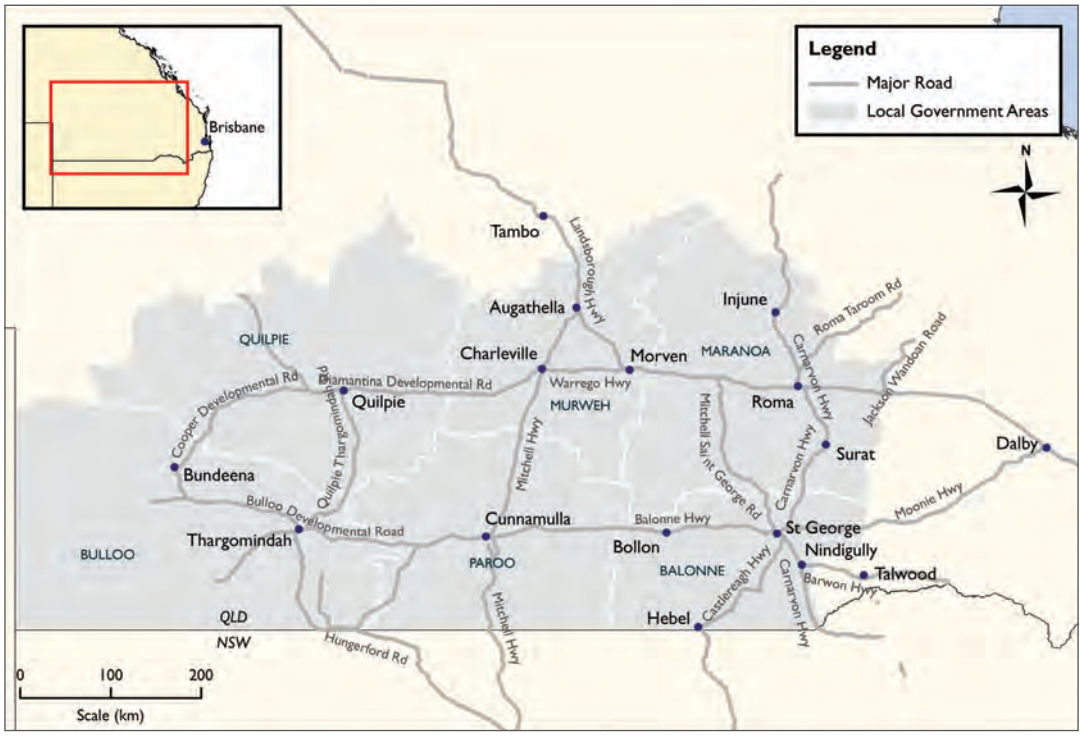


Figure 8 South-west Queensland Local Government Areas (LGAs) and the roads included in the reseal project

6.2 Business case

DTMR and the Local Government Association of Queensland (LGAQ), working with the Local Government Areas (LGAs) of south-west Queensland identified an opportunity to deliver their routine maintenance programs as a collaborative to secure cost savings, operational efficiency and improved safety. DTMR used element management plans as the guiding principle for developing this resurfacing program. The plans describe the processes for developing the program of future state-wide investment needs for the 'surfacing treatments' element, within the context of the state-wide plan. The plan includes twenty year performance targets for this element and five year milestones based on funding levels for each network. These are mapped to each of the Roads Connecting Queensland (RCQ) outcome areas – in this case, effectiveness and efficiency.

DTMR administers the road maintenance program for state-funded roads in Queensland. As both state and local governments in Queensland have a responsibility for road resurfacing, a coordinated approach to procurement was expected to deliver cost savings in procurement and provide the opportunity to carry out additional works. It was agreed that savings would be re-invested into additional works and the use of safer resealing equipment. The four local governments involved were Murweh, Paroo, Balonne and Bulloo.

Project highlight

DTMR had a requirement to undertake pavement resurfacing programs in the south-west Queensland area in 2009, and discussions with LGAQ and the LGAs highlighted that there may be benefits to conducting a joint procurement activity led by DTMR. This regional proposal was progressed with four of the six LGAs, with a decision reached to trial the joint procurement initiative in 2009.

The DTMR-led South-west Queensland Road Reseal project was funded by Commonwealth, state and local governments. During the planning stage, the DTMR regional office discussed the joint purchasing initiative with the LGAs, through Roads Regional Group (RRG) Alliance meetings, as well as with LGA engineers at Technical RRG meetings. Routine maintenance contract meetings were also used as a forum for more detailed discussions regarding scope and programming issues.

6.3 Procurement, governance and policy

The procurement and governance of this project was unconventional, with a number of agencies committing to undertake similar works under one contract. Under this 'Managing Contractor' form of procurement, risks were minimal for the works contractor. However, as the lead agency, DTMR was primarily responsible for the management of procurement risks on the project.

DMTR conducted a risk 'partnering' workshop on commencement of the project involving government representatives and the contractor. Potential risks were identified, with the parties agreeing on an approach for issue resolution. The risk management approach covered resolution from the site works upward, with the provision to escalate through the DTMR regional director or Queensland manager level if required.

As the lead agency, DTMR coordinated project procurement, deciding that the project would be delivered under a minor works contract (a standard Queensland Government document). A single public tender was issued to achieve two key outcomes for local governments. These were to reduce:

- the substantial cost of establishing contractors in remote areas; and
- administrative costs of LGAs, by not undertaking individual procurement processes.

Project highlight

The coordinated procurement strategy delivered savings of 20 percent on the total budget allocated to the project by the four LGAs. This allowed additional reseal works to occur.

LGAs provided reseal schedules and scope definition for works required in their respective areas and were included in the tender documentation. This allowed the LGAs to monitor the progress and quality of contractor work during delivery. To facilitate staging and efficiency of the reseal works and to avoid conflicting timelines, the overall schedule was managed (following the procurement stage) by DTMR in conjunction with LGAs.

This collaborative approach was embedded in the overall planning process and was developed through the partnering workshop to identify and remove the hurdles and to help achieve economies of scale and resource optimisation. This increased schedule efficiency across the project, and delivered benefits to the contractor, encouraging them to tender for subsequent contracts.

LGAs were required to submit their own sealing schedules, which were in the same format as those used for the DTMR works and required the LGAs to complete quantity estimates for their network and identify stockpile sites. These schedules were then combined with the DTMR schedules, so that tenders could be called for a larger package.

DTMR then approached the market through open tender in January 2009 and January 2010. Boral Resources (Boral) was successful on both occasions by submitting competitive tenders. Once the contract and schedule was agreed between DMTR and Boral, these documents were provided to the LGAs to allow ongoing management.

The LGAs benefited through the ability to add extra work to their reseal programs due to the cost savings realised through a coordinated procurement strategy, which essentially resulted in additional scope for the contractor. Through the effective staging of the works between the four LGAs, including both local and DTMR funded roads, the contractor was able to reduce potential stand-down time by working on LGA funded roads during regional wet seasons.

6.4 Planning and delivery

Planning for this project necessitated clear role definition for both DTMR as the decision-making body, and the local councils who participated as 'clients'.

Responsibilities	
DTMR	**LGAs**
• Procurement for reseal project	• Locally-funded road reseals
• Overall contract management	• Local schedule management
• Overall schedule management	
• State road schedule management	
• State-funded road reseals	

Coordination of the preparatory work was critical to ensure no delays to Boral's resealing works. Liaison between the DTMR and LGAs was conducted to ensure schedules did not conflict throughout the project.

Regular communication and open dialogue between DTMR, LGAs and Boral contributed to the success of the project. Inspectors were based on the reseal work sites and held regular meetings with key stakeholders and the community to ensure fast escalation and resolution of project-related issues.

Based on the success of the 2009 South-west Queensland Road Reseal project for all stakeholders, it was agreed to continue it in 2010. In 2010 the LGAs, revised the scope to include bitumen cartage, heating, spraying and spreading works; LGAs were to provide only materials and labour for their works.

There were other tangible benefits to procuring one contractor under the managing contractor model. It allowed LGAs to be involved in the joint purchasing agreement, whereby they could offer additional services to the spraying contractors by arrangement to increase employment opportunities for their staff. The road resealing activity also allowed ongoing freight and commuter activity with enhanced safety benefits from the use of higher-quality equipment on the project.

Safety was viewed as a critical element of the project. The region had experienced accidents due to overspread cover aggregate under previous arrangements, with three accidents in one location near Taroom in one instance. The provision of better and safer equipment during the project was an important aspect of the delivery of the works.
A key advantage of using a larger contractor to deliver the works was the significant safety benefits gained from the utilisation of automated stone spreaders, instead of cockerel operators working behind reversible trucks. The variability in application rates of cover aggregates when utilising cockerel operators potentially creates overspreading, which increases the risk to road users due to the presence of loose stones. Throughout the project, there were no reports of loose screenings or broken windscreens, which are often a minor burden on similar projects. The contractor also employed pilot vehicles to guide vehicles through the works.

Project highlight

A key advantage of using a larger contractor to deliver the works was the significant safety benefits gained from the utilisation of automated stone spreaders, instead of cockerel operators working behind reversible trucks.

6.5 Outcomes

The South-west Queensland Road Reseal was delivered in 2009 and again in 2010 as part of the Queensland Government's annual road maintenance program. The result of this approach was continuous improvement, with lessons learnt being incorporated in the second year.

The highlight of the project was the twenty percent cost saving. This was re-invested into additional road reseal works on local and state-funded roads in south-west Queensland, delivering additional value to the community. The project was delivered on time and under budget.

6.6 Summary of key conclusions

The key best practices identified in this project are:

- The use of a coordinated procurement strategy (with multiple smaller projects that have a similar scope of works) can deliver real savings in the costs of procurement and contractor mobilisation.
- Engagement with a larger contractor through a coordinated procurement strategy provided opportunities for smaller entities (local governments) in relation to employment and provision of goods and services to the project.
- A collaborative approach by entities with similar requirements can lead to a business case to service a joint outcome and to best manage the logistics and resources.
- Managing risks across diverse projects can be undertaken through the involvement of each 'element' of the combined project, involving local stakeholders where necessary to fully capture the risks.

Research and Education Building, Royal North Shore Hospital, New South Wales

Project description

The Research and Education Building construction forms part of the redevelopment of the Royal North Shore Hospital (RNSH) in Sydney, NSW.

The stand-alone building caters for the existing 300 researchers engaged by the University of Sydney in health and life sciences and accommodated on the hospital campus. The building was planned in three stages and designed and built to cater for 500 researchers.

Project cost	$98 million
Funded by	New South Wales Government and contribution from University of Sydney
Project commencement	January 2007
Project completion	Building completion: Stages 1 & 2 September 2008 Stage 3 Mid-2009 (after PPP contract signed)
Consistent with Infrastructure Australia's Strategic Priorities	SP7 – Improve social equity, and quality of life
Method of procurement	Managing contractor
Contractor	Bovis Lend Lease

7.1 Project overview

The Kolling Building for Research and Education at Royal North Shore Hospital (RNSH) in Sydney, NSW was officially opened in November 2008.

The Research and Education Building construction was part of the redevelopment of the RNSH to be completed in 2014 for NSW Health. The stand-alone building provides co-located accommodation for the existing 300 researchers previously accommodated in disparate buildings on the hospital campus within the footprint designated for the RNSH redevelopment. The building has its own architectural identity and discrete presence on site, but will have good connection with the new Acute Hospital building.

The master plan for the redevelopment of the site was approved by NSW Health in 2006, with subsequent Treasury and NSW Government approval of a public private partnership (PPP) procurement model for the RNSH redevelopment.

The NSW Government's approval of the RNSH redevelopment included funding of $68 million for Stage 1 of the Research and Education Building. Subsequent to this approval, the University of Sydney became a co-funder contributing $30 million to gain additional research facilities.

NSW Health and the University of Sydney had a shared objective of supporting the provision of a world-class research and education facility, but their individual objectives, under this principal objective differed. NSW Health had the key objectives of delivery the facility within budget design and timing requirements. The University of Sydney's key objective was that the facility would support advancement of health research and education through recruitment of scholars and scientists of national and international standing.

The wider RNSH redevelopment projects and the Research and Education Building as a component of this, meets one of Infrastructure Australia Strategic Priorities: to improve social equity and quality of life through providing both medical services to the Sydney community and advancing medical research.

7.2 Business case

The Research and Education Building project did not have a separate business case – instead it was a key component of the overall RNSH redevelopment business case and master plan that was approved by NSW Health in 2006. The RNSH redevelopment, with a budget last estimated at over $1.1 billion (2011 NSW Budget), has as its centrepiece a new Acute Hospital building.

The project was developed to resolve a key issue in the RNSH redevelopment – the removal of research buildings around the RNSH campus to facilitate the redevelopment. Project necessity was driven by the need to relocate existing research and education facilities within the hospital campus and free the central space on the campus for the RNSH redevelopment and expansion.

The nominated solution, being one building, was selected for the ability to co-locate researchers in one location, potentially generating opportunities for collaboration and enhanced outcomes. The relocation of research staff to a new centrally located Research and Education Building was essential to the broader redevelopment program, with a requirement to occur prior to any other redevelopment activity commencing.

Prior to this project and limited by infrastructure capacity, the demand from interstate and international researchers to undertake work and research at RNSH could not be met. Capacity for researchers was capped at 300 prior to this project. A second objective of the project was to increase the capacity of the hospital to accommodate researchers, advance research capability and contribute to the wider community through enhanced research outcomes.

The University of Sydney's commitment to the project was a significant benefit. The University contributed an additional $30 million to gain 200 research places in the RNSH precinct. This collaboration was beneficial for both parties, with the hospital gaining a greater number of medical researchers and enhanced research capacity and capability, and the university benefiting from placement in close proximity to a major metropolitan hospital.

The business case for the RNSH redevelopment was subject to a gateway review process, mandated by the NSW Government. The Reform and Investment Framework was not followed specifically for the project as it was a component of the greater RNSH development.

7.3 Procurement, governance and policy

Time was of the essence throughout this project, as the schedule had already been established for the award of the PPP contract for the redevelopment of the RNSH to meet the government's commitment for the schedule of the overall redevelopment. Owing to the time constraint there was insufficient time to proceed with the design and then subsequently proceed to construction. With these parameters a managing contractor was selected as the procurement method. This form of contract could respond to the schedule parameters for the project and allowed the procurement to commence without the full scope being finalised.

Project highlight

A managing contractor approach was selected, supplemented with an early contractor involvement component comprising of multiple packages released to allow for the design to be progressed while construction proceeded. This form of contract could respond to the time constraint and scope definition.

The managing contractor procurement method for the building was supplemented by ECI, with progressive letting of subcontractor packages and the final contract price being a guaranteed maximum sum. The involvement of the contractor early in the process was designed to protect both NSW Health and the University from key project risks and schedule delays, and to ensure the design and construction could respond to the anticipated late approval of funding for additional floor space.

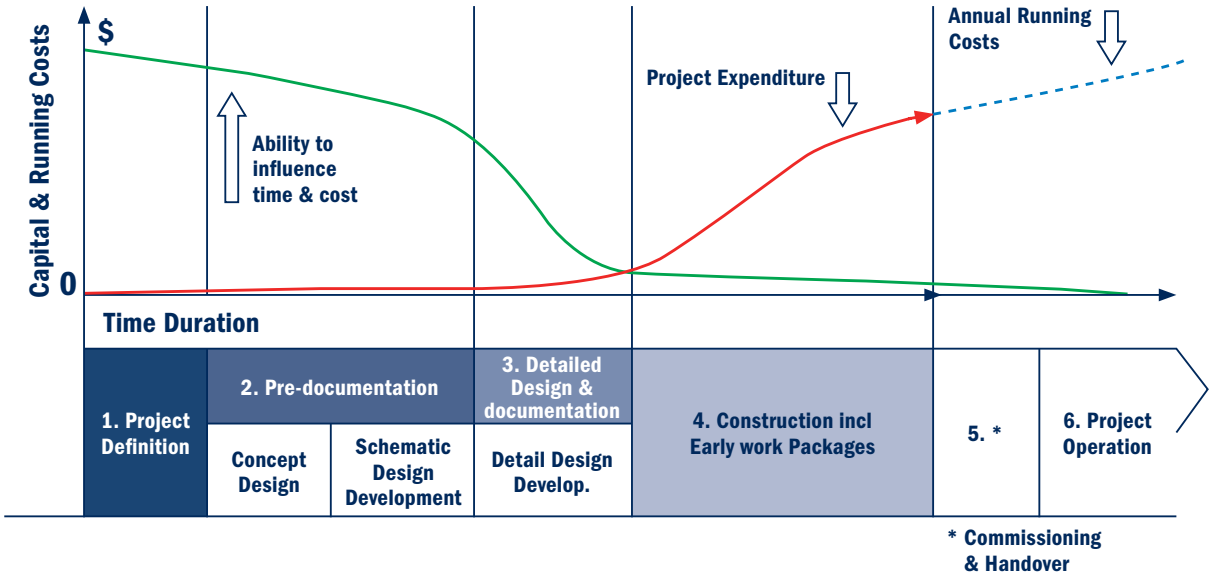


Figure 9 Ability to influence cost during a project's life cycle[23]

Through ECI, the building contractor (Bovis Lend Lease) carried out the design progressively, incorporating appropriate consideration for construction build safety and the letting of preliminary work packages. These activities were undertaken prior to Bovis Lend Lease finalising a contract price. This allowed the project to commence immediately on completion of the price negotiations and prior to completion of full design.

Without this approach to contracting, the project timeline would have been extended by some 12 months which would have delayed the commencement of the PPP project for the main RNSH redevelopment.

23 Burns Bridge Sweett, *Design Management Plan*, undated, p. 2.

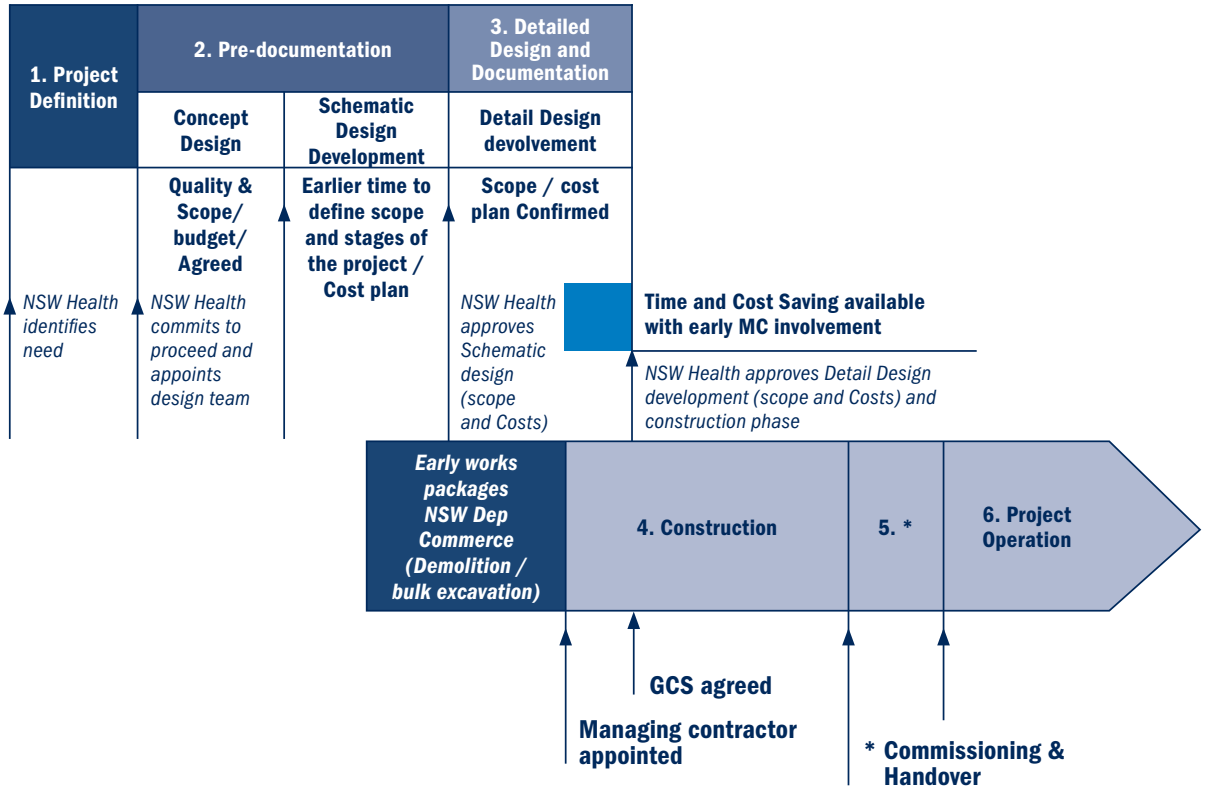


Figure 10 Concurrent design and construction work packages process[24]

The use of a managing contractor procurement method and the approach to ECI and subcontractor packaging was seen as the best practice approach to delivering the project within its time and budget parameters. This was because the approach allowed design and construction to proceed concurrently within a contractual framework and accordingly key risks to the project were known and managed by all parties.

A steering committee comprising executives of NSW Health and the Area Health Service were responsible for the operation of the RNSH during the project as well as associated communications and change management functions. The project was coordinated by a project control group with the charter to resolve matters that arose — the University of Sydney was a key member of the project control group. The stakeholders and committees for the project were the same for the entire RNSH redevelopment and were common to health projects across NSW.

As a key stakeholder, the University of Sydney assigned its own project manager, technical consultant and quantity surveyor. These appointments to the project team served to represent the interest of the University, particularly during the design meetings.

The project's risk management plan identified risks and how they would be mitigated and managed, and was maintained as an active document throughout the project. The key risks identified were: delivery within the allocated budget; managing the efforts of additional funding and scope; and completing the building on time. Both the budget and schedule were closely monitored by the project director and reported to the project control group and the steering committee. Any risk issues from the design meetings were escalated to the project control group for resolution.

24 Burns Bridge Sweett, *Design Management Plan*, undated, p. 2.

7.4 Planning and delivery

The project was approved as part of the overall RNSH redevelopment and came under the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act), the statutory framework for planning and assessment in NSW.

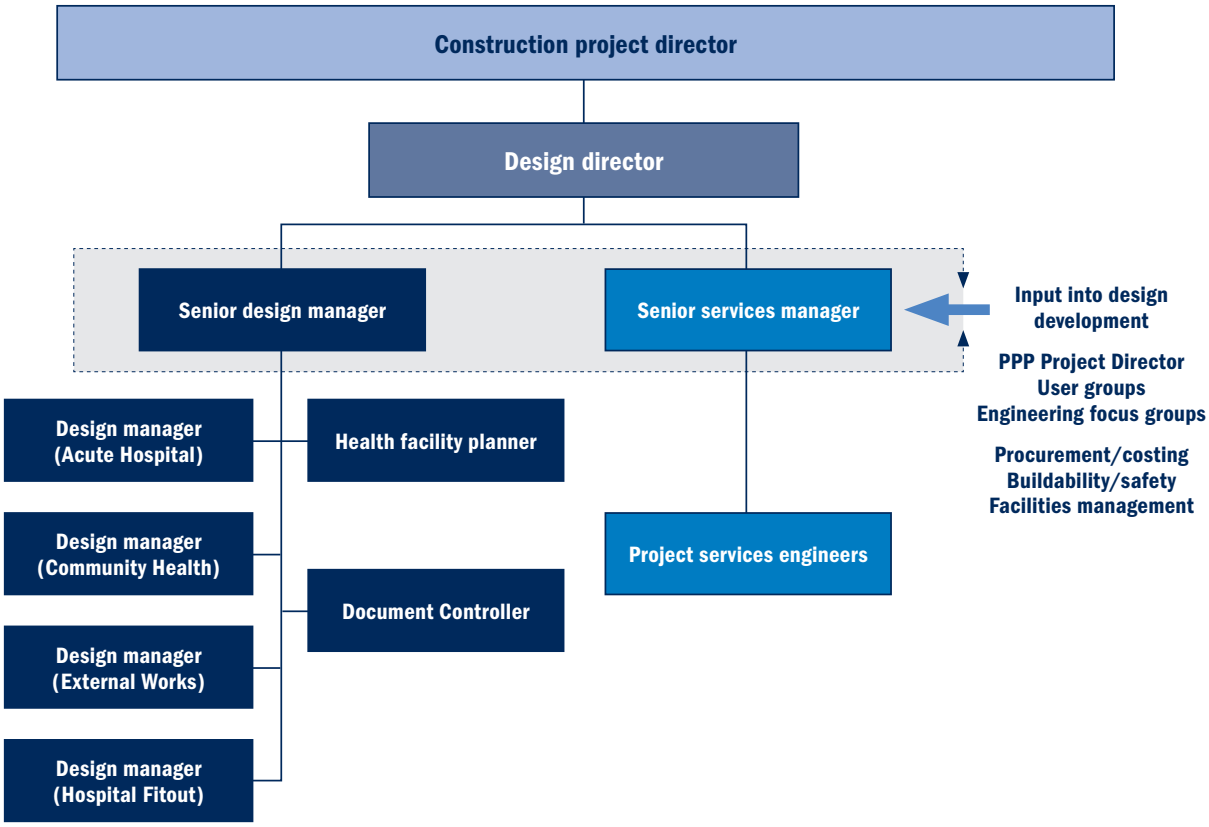


Figure 11 Organisational structure for planning and delivery of the RNSH Research and Education Building[25]

To ensure there were no delays to the commencement of the project, NSW Health remained fully responsible for timing. Under the capital works agreement, both NSW Health and the University of Sydney were responsible for managing costs and, as two funding entities, were required to achieve a consensus on the resolution of issues for the release of funds. The project relied upon the good working relationships between the two teams and the collegiate approach taken, particularly in the design meetings, for its successful completion. This was underpinned by strong executive leadership in the user group meetings.

Contractually, the building contractor had one principal — NSW Health. To allow contract payments, the University of Sydney's requirements had to be met to enable them to release funds to NSW Health. This required reaching a consensus on the resolution of issues within the project team, which was challenging due to the different project objectives and internal reporting arrangements within the respective organisations. Views also differed between the two parties regarding design, however agreement was achieved with the aid of the University of Sydney's team of consultants and advisers who participated in the project.

25 InfraShore, *Royal North Shore Hospital and Community Health Services PPP Project – PART B: Design and Construction Proposal*

Project highlights

Scope changes were a challenge to the project, particularly as University of Sydney's involvement once delivery had commenced required a number of scope changes. Scope change requests were managed with a rigorous and formalised process:

- requested scope changes with no impact to the contracted scope could be jointly agreed by the combined technical team;
- requested scope changes that constituted a variation were a cost to the requesting party; and
- requested changes that impacted costs for the other party required mutual agreement.

A project management office was established on site at the Royal North Shore Hospital campus. Establishment of this office was crucial in terms of having the project team co-located and enabled them to fully focus on the project and interact in the management, development and planning of the project, specifically the PPP.

The Area Health Service was integral to project communications. A comprehensive stakeholder and communication plan was developed for the RNSH redevelopment. One key initiative was to use the experience of the Area Health Service team in liaising with the media and community to develop and implement the communication plan. This strategy was a departure from the more usual practice of engaging a stakeholder and communication consultant and was successful because those experienced in communications (with understanding of the historical issues and contexts related to the project) and experience working with the local media, had carriage of the communications strategy and its implementation. The project director provided information to the communication team to allow it to respond to enquiries. This approach was viewed as a very positive initiative and potentially applicable to future health projects.

This was the first project where designated Area Health Service staff had been allocated to, and funded by a project, as well as and integrated into a project management office. Previous liaison between the procurement team and the Area Health Service was via the existing health service organisational structure, which was resource limited and had a focus on broader operational issues rather than on a single project.

Project highlights

- Project communications were performed by the Area Health Service team — a team that was experienced in liaising with local media, the community and government. This was a departure from using an external communication consultant.
- Area Health Service staff input was allocated to the project and funded by the project. This allowed the positions to remain focused on the project and not be distracted by their normal roles.

The project was considered a success by all stakeholders and this was largely attributed to the collaborative working relationships developed at all levels, open communication and the experience of the personnel involved. A project close-out workshop was conducted after completion, with stakeholders and users given the opportunity to examine the overall process and lessons learnt which could be taken forward to improve the overall communication and management of future projects.

The managing contractor was responsible for safety under the Occupational Health and Safety (OH&S) legislation which was a key agenda item for all meetings, (all meeting papers included a safety report). Furthermore, the design architects had a 'duty of care' provision in their brief that related in part to the safety of their design. To this end, the Area Health Service's risk assessment team conducted an OH&S review of the design and facility prior to occupation. A good safety record was achieved during the construction of the project.

The safety of those using the existing operating hospital while the construction work was being undertaken was of paramount importance; specifically the interfaces between people and vehicle movements. This was managed on a day by day basis through the managing contractor liaising with the project control group. This protocol was considered successful.

7.5 Outcomes

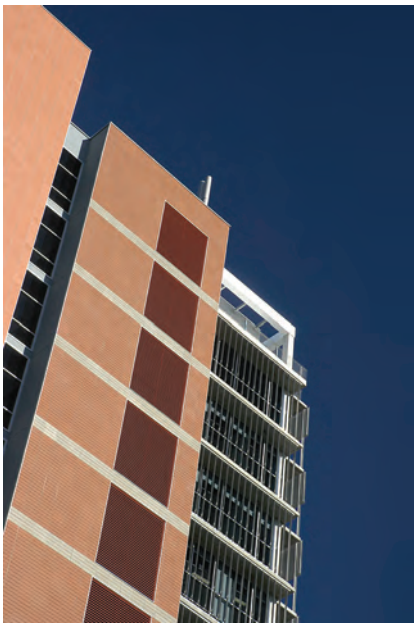
The Kolling Building for Research and Education at RNSH was officially opened in November 2008.

The Research and Education Building was achieved within the required budget, but crucially within the allocated schedule — allowing the redevelopment works to commence at RNSH. Overall, the objectives for the facility were achieved through a collegiate approach taken by all parties, particularly in the design meetings.

The Research and Education Building is located close to the newly redeveloped hospital to allow ease of access for clinicians and researchers. The education centre on the lower levels provides teaching and training for medical, nursing students and allied health students, and ongoing professional development for RNSH staff. A combination of lecture theatres, tutorial rooms and seminar and conference rooms are located on the ground level. The first floor includes tutorial rooms, a library, a clinical training area, a computer skills and learning lab, staff and student amenities area and an administrative zone. The research facilities occupy the upper levels and provide a combination of laboratory and administrative space for range of research projects, with a capacity to share high-cost laboratory equipment and common support services.[26]

The project delivered a new, high-quality research and education facility capable of accommodating up to 500 researchers. This increase in accommodation capacity is a real benefit to both the key stakeholders, the RNSH and the University of Sydney who will potentially benefit from the future opportunities for collaboration in the field of medical research and education.

At the close-out workshop the project was considered a success by all stakeholders and this was largely attributed to the collaborative working relationships developed at all levels, open communication and the experience of the personnel involved in the project.



26 Northern Sydney Central Coast, NSW Health website http://www.nscchealth.nsw.gov.au/rnsredevelopment/projectinformation/003876076.shtml

7.6 Summary of key conclusions

Following a review of the Research and Education Building at RNSH the following key conclusions regarding best practice can be identified:

- An agreement defining the arrangements should be agreed and documented where there are external participants contributing funding to a project and before any commitment to the procurement of the works. The agreement should cover the project scope, budgets and governance structures. Shared objectives should be established early.
- Consistent leadership of a project is a key for success. Projects can benefit positively where a project team/project manager can be brought to a project with experience on similar projects. Projects benefit from accessing the experience of the client agency and to ensure active and focussed participation in the involvement the project.
- The procurement method selected should be the one that bests suits the project risks; in this case, time constraints were managed with the appointment of a managing contractor to allow construction to be progressed in packages while the design was completed.
- Projects can benefit where the scope is clearly defined and articulated at the commencement of the project. Further there is accessible documentation that clearly sets out what is 'in scope' and what is 'out of scope' for the approved project. To manage any scope change there must be a robust protocol established and implemented.

Maitland-Whittingham Third Rail Line, New South Wales

Project description

The Maitland–Whittingham Third Rail Line project involves the construction of a 42.8 km third track from Maitland to Whittingham (both stages 1 and 2 of the project). The major elements included three rail under bridges, grade separations of level crossings, overbridges, signalling works and property acquisitions.

Project cost	$476.8 million (June 2011)[27] Stage 1 – $114 million Stage 2 – $362.8 million
Funded by	Australian Rail Track Corporation (ARTC) and the Commonwealth Government
Project commencement	March 2009
Project completion	November 2012 (forecast)
Consistent with Infrastructure Australia's Strategic Priorities	SP1 – Expand Australia's productive capacity SP2 – Increase Australia's productivity
Method of procurement	Alliance
Contractor	Hunter 8 Alliance (for delivery of track works): ARTC John Holland GHD ARTC Ansaldo STS Network Control System Alliance (AASNCA – for signal works) ARTC Ansaldo

27 Project value – an additional $580 million investment by the Commonwealth Government in ARTC will facilitate the implementation of the project – Department of Prime Minister and Cabinet, *Nation Building: Rail, Road, Education and Research and Business*, December 2008, p. 110.

8.1 Project overview

The Australian Rail Track Corporation (the ARTC) is upgrading the rail network between Maitland and Whittingham to improve rail transport reliability between the Hunter Valley coal mines and the Port of Newcastle. The objective is to create rail capacity ahead of industry demands.

The ARTC formed the Hunter 8 Alliance with John Holland and GHD to design and construct the Maitland–Whittingham Third Rail Line project. The project was divided into two construction stages.

Stage 1: Minimbah Bank has now been completed. This project stage involved laying a third track (10.8 km) between Minimbah and Whittingham, as well as constructing two new overbridges at the Golden Highway and the Range Road level crossings. It also included the construction of a new retaining wall adjacent to the New England Highway.

Stage 2: Maitland to Minimbah involves the design and construction of a third track (approximately 22 km) and reconstruction (8 km) of track between Maitland and Minimbah and associated infrastructure. Construction is now underway and is expected to be complete in 2012.

The key objective was to increase the output of coal through Port of Newcastle by removing a significant bottleneck in the Hunter Valley rail line. It was to ensure that rail line capacity would not limit the export capacity downstream at Newcastle. This serves to meet two Infrastructure Australia's Strategic Priorities: to expand Australia's productive capacity and to increase Australia's productivity.

The project is part of the Australian Government's Nation Building package.[28] The objectives in the business case were to:

- improve rail reliability;
- ensure more efficient movement of coal to the Port of Newcastle by improving the grade of the track on Minimbah Bank;
- increase the ability of the rail network to carry additional capacity so rail corridor capacity in the Hunter Valley stays ahead of port capacity;
- enhance security of existing coal jobs;
- reduce the operational conflicts experienced in the Minimbah area, due to the gradient of the rail line; and
- create a safer alternative for pedestrians and road users.

The project will also bring benefits to the local and broader community by generating more than 650 full-time jobs during construction, create opportunities for local and regional goods and service providers, and provide greater security for existing coal industry jobs.

28 Department of Prime Minister and Cabinet, *Nation Building*, December 2008, p. 7.

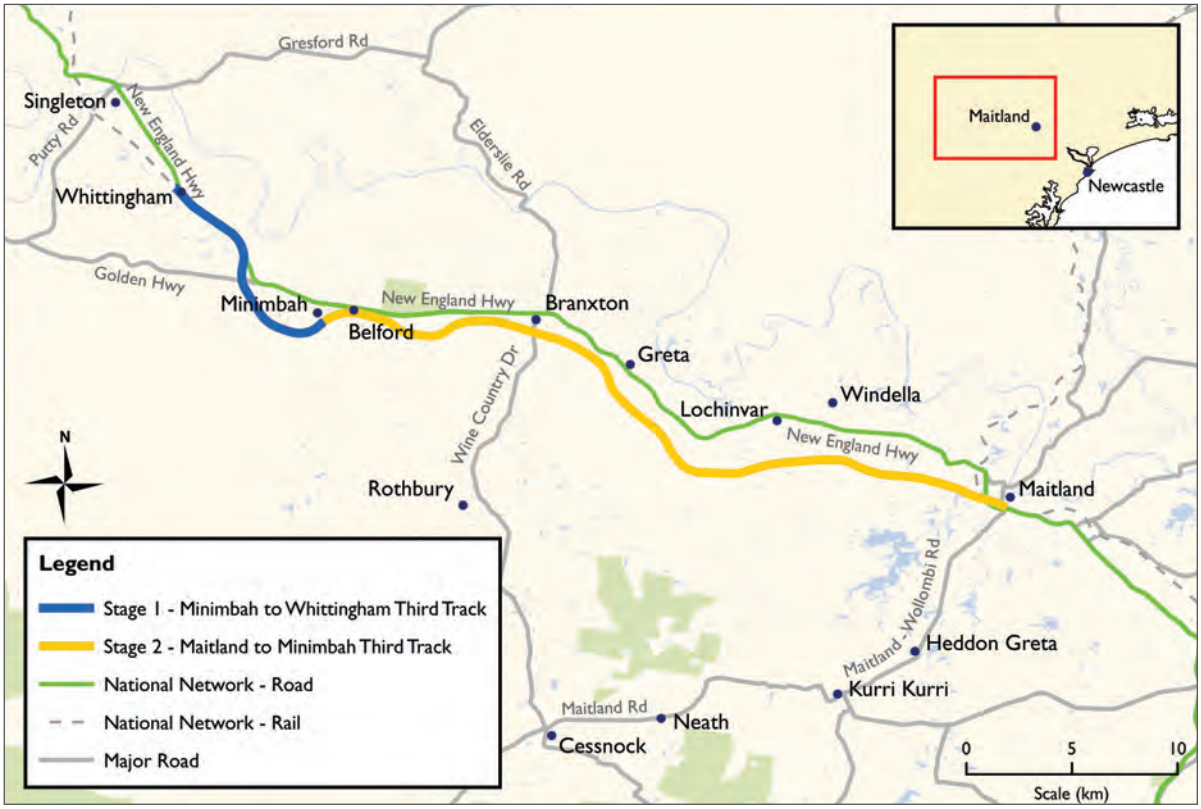


Figure 12 Maitland to Whittingham Third Rail Line, including stages 1 (complete) and 2 (scheduled for completion November, 2012)

8.2 Business case

Coal exports are vital to the NSW economy and rely on efficient rail infrastructure to transport products from the Hunter Valley coal mines to the Port of Newcastle. Constraints in the capacity of this 'pit-to-port' supply chain were identified in the rail and port infrastructure downstream from the mines in the Hunter Valley region, exacerbated by the steep gradients of the existing track.

In early 2005, the ARTC began to release annual Hunter Valley infrastructure enhancement strategies setting out how the ARTC planned to ensure that the rail corridor capacity in the Hunter Valley would stay ahead of coal demand. Current coal export capacity of the Hunter Valley rail network averages 95 million tonnes per annum (Mt/a). It is anticipated that the demand on the Hunter Valley rail network will increase to 180 Mt/a by 2012.

The Port of Newcastle is currently undergoing an upgrade, with the first stage of the project completed in May 2011. The port currently has a short-term capacity of 154 Mt/a and a medium-term capacity (following upgrade) of 210Mt/a.[29] Even with the port upgrade, the mine-to-port infrastructure would still be limited by the rail line capacity. The wider context of this challenge has been outlined in the Hunter Valley Corridor 2011–2020 Capacity Strategy.[30]

29 Department of Resources, *Energy and Tourism, Energy in Australia 2011*, ABARES, 2011, p. 70.

30 Australian Rail Track Corporation, *2011-2020 Hunter Valley Corridor Capacity Strategy Consultation Document*, March 2011.

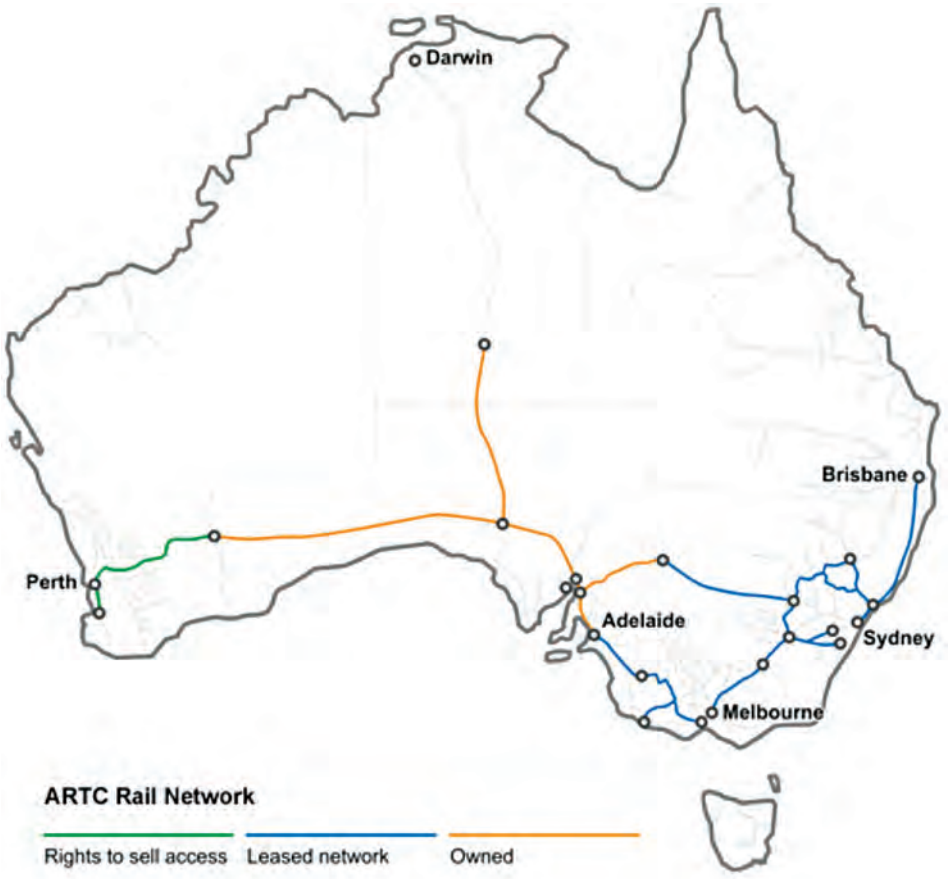


Figure 13 The ARTC rail network[31]

The ARTC has four investment strategies in place:

- a **North–South Investment Strategy** to achieve a step change in rail's competitiveness in the interstate intermodal market;
- a **Hunter Valley Investment Strategy** to provide capacity ahead of demand for coal haulage;
- the **National Train Communications System** project to provide a single national train communications network for the defined interstate rail network based on a modern telecommunications platform; and
- the **Train Control Consolidation** project to modernise train control within NSW.[32]

The 2011–2020 Hunter Valley Corridor Capacity Strategy sets out how the ARTC plans to ensure that rail corridor capacity in the Hunter Valley would stay ahead of coal demands.[33] The strategy identifies the constraints on the coal network's capacity in the Hunter Valley, the options to resolve these constraints and a proposed course of action to achieve increased coal throughput. The strategies were developed in consultation with the Rail Capacity Group (comprising coal industry representatives).

In developing the strategy, the ARTC has been mindful of the dependencies that exist in the coal supply chain and matched capacity programs against known developments and timing of mine, rail, terminal and port capacity. The Rail Capacity Group assisted the project through the business case and planning phases by providing timely endorsements and approvals. This was particularly important in addressing the risks and opportunities associated with the project.

31 Source: www.artc.com.au

32 Australian Rail Track Corporation, *Statement of Corporate Intent 2011/12*, 2011, p. 3.

33 Australian Rail Track Corporation, *2011–2020 Hunter Valley Corridor Capacity Strategy*, 2011.

The Rail Capacity Group's involvement was pivotal in the development of the Maitland-Whittingham Third Rail Line business case. Informed by the Rail Capacity Group, the ARTC demonstrated the importance of delivering additional capacity ahead of the coal export demand curve. This formed a key element of the ARTC submission to the Commonwealth Government, who provided the equity to undertake the project and operationalise the infrastructure following delivery.

Staging of the project to reduce the rail network bottleneck was of paramount importance. Some alternatives were considered, including the triplication of the rail line for its full length, which exceeded the eventual approved option by $60 million.[34] Exercises were undertaken to reduce the overall scope, with triplication of the rail line only in key areas where congestion was reducing overall capacity.

The annual Hunter Valley Corridor Capacity Strategy,[35] and the ARTC's submission to Infrastructure Australia in 2008 set out an integrated and optimised stream of projects to ensure adequate capacity for the forecast growth while securing efficiency gains at the earliest opportunities.[36] These strategies were comprehensive and included:

- current conditions traffic pattern and volume forecast analysis;
- capacity impediments to be addressed and options analysis; and
- consideration of the Hunter Valley system holistically.

8.3 Procurement, governance and policy

The ARTC determined that the Maitland–Whittingham Third Rail Line project would be delivered under an alliance procurement model to manage the difficult and complex operating environment which required minimal disruption to train operations. The ARTC formed two alliances, the Hunter 8 Alliance (John Holland and GHD) to design and construct the Maitland–Whittingham Third Track and the AANCSA (the ARTC and Ansaldo STS) to construct the signalling and communications for the project.

The selection of the alliance model would also mitigate forecast resource shortages at the time the project was planned to commence. To ensure that a contractor was committed to the project, the strategy was to progress to contract award as early as possible. To achieve this, the project was separated into two stages. In establishing the contract for Stage 1, flexibility was built in to extend the contract out to Stage 2.

The Maitland–Whittingham Third Rail Line project had to commence quickly. This meant limited opportunity for the ARTC to identify all risks prior to the finalisation of the project scope. The Hunter 8 Alliance assumed responsibility for the risk and provided a collective approach to assessing and managing risk throughout the project.

34 Australian Rail Track Corporation, *BIC submission – Maitland to Minimbah Third Track*, 2010, p. 27.

35 Australian Rail Track Corporation, *2011–2020 Hunter Valley Corridor Capacity Strategy*, 2011 and Australian Rail Track Corporation, *2009–2018 Hunter Valley Corridor Capacity Strategy*, 2009.

36 Australian Rail Track Corporation, *2008–2024 Interstate and Hunter Valley Rail Infrastructure Strategy*, 2008.

The Hunter 8 Alliance conducted risk workshops throughout the project, commencing in the planning stage. Operational risks formed part of the design review process, with key safety considerations reviewed throughout the design process. Safety considerations on an operational rail line were considered to be of paramount importance to the ARTC throughout the project.

The Hunter 8 Alliance formed for this project comes under the oversight of the ARTC Board. With the operational imperatives for the delivered project, any material changes to scope were formally considered by the Operational Steering Committee (OSC) representing all internal stakeholders.

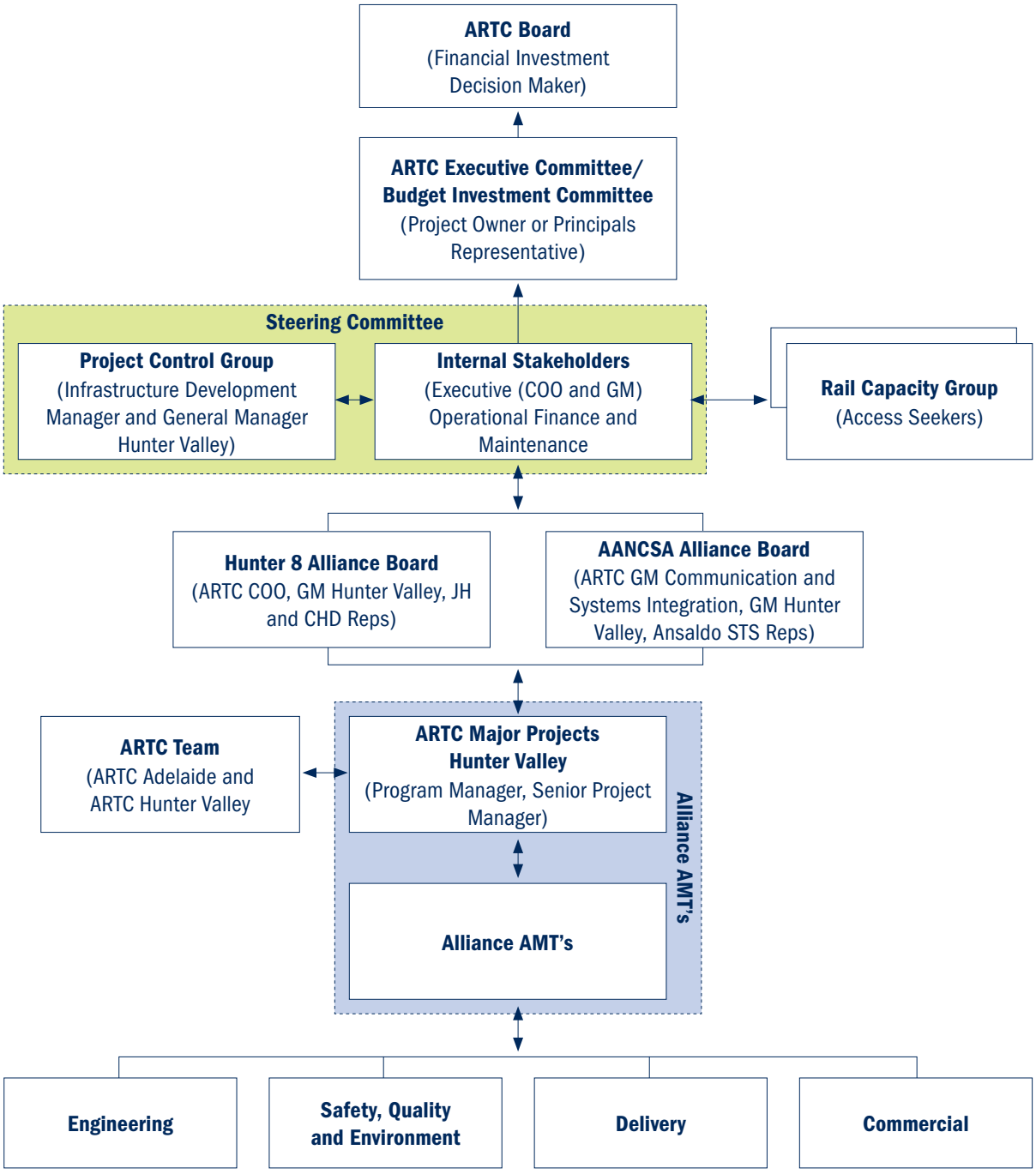


Figure 14 Governance structure for Third Rail Line project[37]

37 Australian Rail Track Corporation, *Maitland to Minimbah Third Track Stage 2: Phase 3 — Project Assessment Report; Phase 4 — Project Approval*, June 2010, p. 17.

Project highlight

Operational considerations are fundamental to this project. Operational risks and their impact on the design, in particular safety, are paramount in the design reviews.

8.4 Planning and delivery

Remaining ahead of the demand curve for the Hunter Valley coal exports and achieving the strategic objectives of the ARTC business case were important.

In establishing the project team, a key consideration for the ARTC was to ensure the skills of the team were diverse and relevant in order to manage anticipated risk areas. To that end a generalist project manager with appropriate risk management experience was engaged rather than a specialist sector project manager. The roles and responsibilities of the Hunter 8 Alliance team were clearly defined, documented and communicated, ensuring a shared understanding of the roles and responsibilities of each team member. A gap analysis was also undertaken to ensure there was no misalignment in these responsibilities and roles. Deliverables and individual responsibilities were established early.

Project highlight

ARTC embedded representatives throughout the alliance structure in critical areas. It allowed ARTC to have greater visibility on how critical areas of the project, in particular the interfaces, were being planned and developed.

Given the scale and complexity of this project, it was critical that the Hunter 8 Alliance functioned harmoniously and specialist consultants were appointed to guide the transition of team members. A project management office was established and allowed team members to work side by side to benefit from collaboration and intellectual capital.

One particular improvement in the design was the distance between tracks to allow maintenance on one track while the adjacent track was still operational. A life cycle cost analysis demonstrated that while there was an additional cost, this would provide long-term commercial benefits to the coal industry.

The Hunter 8 Alliance has been committed to the management of expectations and communications with the public and stakeholders. The stakeholder and communication plans identified a range stakeholders including Commonwealth and state governments, the wider community and the ARTC. The communication team comprised of people with rapport and credibility, and of sufficient standing in the community.

Project highlight

The Rail Capacity Group contributed significantly to the project business case and has been kept well informed throughout. This has increased the intellectual capital available to the project team and enhanced the ability of the team to anticipate how scope changes to the project will affect the infrastructure delivered on completion.

The Maitland – Whittingham Third Rail Line project was identified to the public as being strategically important to the Hunter Valley in terms of economic development and employment. During the construction, monthly community forums were held to keep community members informed about the progress of the project and to allow them to raise any construction related queries or issues.

Following agreement to the concept design during the first phase of planning and the determination that the concept was feasible in the second phase, concurrent land planning processes (State and Commonwealth) were required to gain the necessary approvals and undertake land acquisition.

Land acquisition was also a challenge for this project as there were a number of properties to be considered for acquisition due to the linear nature of the rail line alignment. Ongoing engagement with the community provided transparency and allowed the process to move forward without incident.

Land planning incorporated the statutory requirements specified in the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) and the statutory framework for planning and assessment in NSW. The project was affected by local, state and Commonwealth legislation covering the Singleton Local Government Area (for example the Singleton Local Environmental Plan 1996) and Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.

The project required clearing areas native flora (*Eucalyptus glaucina*, or Slaty Red Gum). Agreements were made with property owners to fence and protect areas of land containing this species and therefore allow the population to potentially expand. This process was challenging and lengthy, with a 'points' system utilised to find similar species of tree on adjacent land and 'offset' clearance activity required for the project.

Project highlight

The Maitland–Whittingham Third Rail Line project achieved the first successful implementation of 'biodiversity offsets'.

8.5 Outcomes

Stage 1 – Minimbah Bank was completed and opened in June 2010. By lowering the grade of the existing railway line at Minimbah Bank, the project has reduced the time for coal trains to traverse this section and enhanced the capacity and efficiency of the coal export transport system. The steep grades on Minimbah Bank previously slowed down trains to such an extent that it is not possible to obtain an adequate frequency of trains irrespective of how closely the signals were spaced. The third track at Minimbah Bank has significantly relieved the problems encountered previously.[38]

Stage 2 – Maitland to Minimbah third track construction is now underway and is expected to be completed in November 2012. Theoretical capacity of the rail line will be increased to 203 Mt/a[39] on completion, in excess of the 2012 forecast coal demand of 180 Mt/a.

8.6 Summary of key conclusions

Following a review of the Maitland–Whittingham Third Rail Line project the following key conclusions regarding best practice can be identified:

- Projects that have identified strategies which have strong stakeholder and industry ownership are more likely to result in positive outcomes.
- Where a strategic outcome is important, allowing redundancy and running concurrent processes during the planning process can compress the project schedule, achieve outcomes more quickly and realise better outcomes for the wider community.
- The alliance team (which includes the client) achieves better integration of the project elements through the client's knowledge and involvement. Client involvement provides an avenue to change dynamically as circumstances require. The effectiveness of the project is increased when the roles and responsibilities of all team participants are defined, documented and communicated and the accountabilities are established and agreed to upfront. For stakeholder management those engaged with communicating with the particular group need the respect of that group. Consistent leadership of a project is a key for success.
- The alliance model may be chosen for a number of reasons and on this project it was chosen because it best mitigated risk. The procurement method for any infrastructure project should be selected based on what bests suits the project and optimises its chances for success.
- For many organisations, infrastructure is a second priority to its business operations. Where the delivered project has a significant operational component, then operational requirements including safety are paramount and need to be introduced into the design from project inception and for each design review thereafter.

38 Australian Rail Track Corporation, *2011–2020 Hunter Valley Corridor Capacity Strategy*, 2011, p. 15.

39 Australian Rail Track Corporation, *BIC Submission*, p. 27.

Rosebery Schools, Northern Territory

Project description	The Rosebery Schools project delivered a new 16-building Rosebery Schools Campus comprising a primary and middle school to accommodate up to 1,350 students
Project cost	$60 million
Funded by	Northern Territory Government ($3 million funded by the Commonwealth Government)
Project commencement	March 2009
Project completion	January 2011
Consistent with Infrastructure Australia's Strategic Priorities	SP5 – Develop our cities and/or regions SP6 – Reduce green-house gas emissions SP7 – Improve social equity and quality of life
Method of procurement	Design and Construct (D&C)
Contractor	Halikos Group

9.1 Project overview

Northern Territory's Rosebery Schools project involved the construction of a new 16-building campus in the City of Palmerston. The development includes a pre-school, a primary school for 600 students and a middle school for 850 students. The co-location of the schools enables shared sports and performing arts facilities including an oval and gymnasium. The gymnasium also functions as a community cyclone shelter and there is provision on the site for a future childcare centre for up to 50 children.

The Department of Construction and Infrastructure delivered the Rosebery Schools project under a design and construct contract. This procurement model was selected due to project time constraints and to best manage project risks. It is the largest education project in the Northern Territory and was delivered on budget and ahead of time for the commencement of the 2011 school year.

The Rosebery Schools construction contract was awarded to the Halikos Group, a Darwin-based company with a reputation for building interesting and innovative designs and delivering major projects on time.

In 2011 this project was awarded Northern Territory Project of the Year by the Australian Institute of Project Management.

Palmerston is located 22 kilometres from the centre of Darwin and is situated near Darwin Harbour. It is the second-largest and fastest growing city in the Northern Territory. The population of Palmerston is 25,000 with an average age of 28 years and is primarily made up of families. Approximately 30 percent of the population is under 15 years old. The City of Palmerston had to meet the demand for all years of schooling to match the population growth and to support the community vision for a sustainable future.

The objectives for the Rosebery Schools were to:

- incorporate the current policies for education delivery including innovative, seamless education and well-being services;
- maximise public assets through futuristic, flexible and student-centred design; and
- support and promote strong communities (social sustainability), cultural diversity and expression (cultural sustainability), a clean, green city (environmental sustainability) and a diverse and vibrant economy, as articulated in the Palmerston 2015 Community Plan.

The transport objectives for the project were to:

- provide safe and efficient access for all modes;
- be well integrated with the surrounding land uses;
- not adversely impact on the surrounding land uses; and
- not adversely impact on the surrounding transport networks and the users of those networks.

In addition, the school design would ensure long-term viability, flexibility, sustainability and durability of indoor and outdoor learning environments.

The design features are focused on age-appropriate learning spaces bringing primary school infrastructure in the Northern Territory into the 21st century. The Rosebery Middle School has been designed on the same principles used for the Darwin Middle School.

Innovative, flexible, multipurpose learning spaces allow for the integration of new and evolving technologies. The schools have leading-edge information technologies including wireless computer systems and interactive white boards throughout the teaching spaces.

9.2 Business case

The Rosebery Schools project was funded by the Northern Territory Government with a $3 million contribution from the Commonwealth Government. The Department of Construction and Infrastructure (Construction Division) was assigned to deliver the project on behalf of the Department of Education and Training in the Northern Territory.

The Rosebery Schools development is part of a larger strategy for the development of the Palmerston area. In 2003, planning for new schools for Palmerston commenced, with land at Rosebery set aside for future education and community uses. It was clear that additional enrolment places were required to support the growing population in the newer suburbs of Rosebery and Bellamack. The City of Palmerston is an area of rapid population growth and is expected to reach approximately 40,000 by 2021.

The project was identified in the Palmerston Municipal Plan[40] which was a regional strategy that aligns with Infrastructure Australia's Strategic Priorities to develop our cities and/or regions, improve social equity and quality of life and reduce greenhouse gas emissions.

The Rosebery Precinct Education Plan provided a rationale for the proposed new community and education precinct. It demonstrated the demand arising from existing capacity constraints and defined the requirements for the schools. The current and future needs of young people and the community were the drivers and was informed by a stakeholder consultation paper developed in 2008 in support of the Palmerston Community Plan. It ensured that community requirements for the school were understood and reflected in the communication plan.[41]

Transport was a key consideration, noting increased traffic load immediately adjacent to the schools had a significant impact on the community living near the proposed site. An extensive transport assessment was undertaken to establish the requirements for the planned transport systems, during the project and after infrastructure delivery.[42]

The project control group conducted regular process and milestone reviews through the project life cycle.

Project highlights

- There was effective and detailed planning for the schools project, in particular with the education plan and the transport assessment.
- Project requirement sat within the larger framework for the development of new communities in and around Palmerston and the school has been delivered to help cater for the influx of residents to new developments. As such it aligns strongly with the imperative to support the growth of the Palmerston area.
- The delivery of the schools also supports key outcomes for Australia, through the development of the region in which it resides and the improvement of social equity and quality of life.

40 City of Palmerston, *Municipal Plan 2010/15*, 14 July 2010.

41 ibid.

42 *Rosebery Pre-primary, Primary, Middle School and Childcare Centre Complex Transport Assessment*, 17 October 2008.

9.3 Procurement, governance and policy

The Department of Construction and Infrastructure built the Rosebery Schools under a design and construct contract. Under this procurement model the contractor undertook design development manage, documentation and construction of the facilities. This procurement model was selected taking into account factors such as project time constraints and risks. The design and construct procurement methodology was a low-risk option, where the contractor assumed some of the financial and quality risk on the project.

The Halikos Group, a Darwin-based construction contractor, won the work based on its submitted tender following rigorous tender assessment of all tenders received. Selection of an experienced local contractor ensured there was an understanding of the resource and seasonal constraints specific to the Territory.

The governance structure was simple with the project team reporting to the Project Control Group (PCG). This structure had been successfully applied by the Department of Construction and Infrastructure on other projects, including the Darwin Middle School (value $25 million) and the Alan Walker Cancer Centre (value $17 million). The project team had worked with the Halikos Group on the Darwin Middle School and Alan Walker Cancer Centre projects.

The PCG included representatives from the Department of Education and Training, the Department of Construction and Infrastructure, school principals and two members of the local Palmerston City Council. This ensured that the local community was represented throughout the project and was offered the opportunity to comment and guide the project team towards the best outcomes for the operationalisation of the school.

The Project Development Group (PDG) provided oversight of the project and the design development and included representatives from the Department of Education and Training, Department of Construction and Infrastructure, educators and the architects designing the school. The PDG also included two members of the City of Palmerston Council. This allowed key stakeholders to influence the design of the school and engage with the architect charged with the overall design. The benefit of this was that a functional concept design would be developed under the guidance of the PDG, increasing overall satisfaction of the school.

The Department of Construction and Infrastructure appointed a project manager and team with prior experience in the construction of educational buildings; this was undertaken primarily as a risk-mitigation measure. The knowledge of the project team was maximised, resulting in the project being nominated for, and winning the AIPM Northern Territory Project of the Year award.

Given the scale of the project and the fact that such a large education project had not been attempted before in the Northern Territory, the levels of governance was deemed appropriate by the Department of Education and Training. Community and stakeholder representation within the governance structure enhanced the success and functionality of the Rosebery Schools on completion.

Project highlights

- The design and construct procurement method was adopted based on the project time constraints and to best manage the project risks.
- Involving key operational stakeholders in design can result in better functionality and long-term viability of facilities and infrastructure.
- Allowing key stakeholders a voice in the governance of the project maximises the project's chances of success.

9.4 Planning and delivery

The Rosebery Schools Campus was proposed to be built on land zoned in the current Northern Territory Planning Scheme as 'future development' (no specific use was designated for the land).

Planning to accommodate the regional conditions was vital and therefore needed to include the selection of appropriate building materials. Errors in material selection or ordering (quantities and delivery) could not be quickly remedied, due to local production constraints, high costs associated with ordering from interstate and lead times of up to six weeks. The Northern Territory construction industry has a limited subcontractor reserve and delays to schedules may have seen subcontractors rapidly redeployed to other sites.

The Halikos Group had successfully delivered other school building projects in the Northern Territory and understood the project requirements, including quality, resource and materials acquisition and was experienced in building in locations subject to 'wet' and 'dry' seasons. This experience significantly reduced risks by providing increased schedule certainty. Halikos appointed a strong design manager who ensured the project received innovative design considerations; this selection has been identified by the Department of Construction and Infrastructure as a contributor to the project team's success.

A robust risk management plan was developed and implemented during project delivery. A key risk in the planning context was management of traffic pathways and modal conflicts. Traffic planning had to accommodate 16 school buses per day[43] transiting the area once the schools had opened and increased volume of cars taking children to and from school. The traffic management solutions were developed from the Safe Routes to School strategy, which includes footpaths, crossings and cycle paths to allow safe access to school grounds.

The intent of the transport assessment was to clearly demonstrate that the Rosebery Schools development would achieve several key outcomes. It was necessary to provide safe and efficient access for all modes, integrate well with, and avoid impacts on surrounding land, transport networks and network users.

43 *Rosebery Pre-primary, Primary, Middle School and Child Care Centre Complex Transport Assessment*, 17 October 2008.

Biting midges found in the local mangrove area were identified as a health risk to construction workers and school children. Investigations determined the best positioning of the school buildings and the Department of Health and Community Services prepared a biting midge information sheet, a midge calendar and an awareness strategy was included in the schools management plans.

Workers' safety was a key management consideration, particularly for the subcontractor workforce — there was a 50 percent turnover of workers during the construction of the project meaning that safety training was important and an ongoing requirement. There were no lost time injuries recorded during the construction of the schools.

Project highlight

Overall planning and management of the project needs to be cognisant of constraints of geographic locations, access to trades, skills and other resources (e.g. the transit nature of some of the taskforce).

The Rosebery Schools project had a diverse cross-section of stakeholders. A comprehensive communication plan[44] was prepared to manage the stakeholder and community interests. The Communication Plan articulated the project objectives, target audiences, key project messages, sensitivities, communication mediums and an action plan to ensure that the Palmerston community were informed of progress and received factual and consistent information.

Communications included: internal newsletters, print and television media, fixed signage, letterbox drops to local residents, fact sheets and a project website.

Recognising that information would be communicated via informal networks in the relatively small community of Palmerston, the timely provision of information to the stakeholder groups was important. With this in mind, the project team established two-way channels of communication with stakeholder groups to ensure issues were quickly identified and addressed, such as the importance of minimising environmental impacts during construction and improved amenities.

9.5 Outcomes

The Rosebery Schools project offers a modern school facility with flexible and adaptable open work spaces while also incorporating the latest in teaching technology and a focus on 'energy smart' principles. Maximising natural light using the building layout to encourage air flow between the buildings, internal motion sensor lighting that switches off when no movement is detected and an air conditioning system linked to a Building Maintenance System (BMS) will result in operational cost savings.

The delivery of the schools ahead of time (completed prior to the end of 2010, ahead of a January 2011 opening date) and on budget was a major success, noting that this was the largest education project ever undertaken in the Northern Territory. Management of the project timeline was not only a matter of construction being completed in alignment with the school year, but in addition, construction had to be scheduled around the wet and dry seasons which can arrive early or late, depending on climatic conditions. This required sound scheduling and a great deal of flexibility to deal with potential timing impacts from an early wet season (as was experienced in late 2010 with the onset of early rains).

44 Department of Planning and Infrastructure, *Communications Strategy: Rosebery Schools*, September 2008.

Proactive stakeholder management through the PDG and PCG committees provided the wider community with a voice. Consequently, there was enthusiastic and positive community feedback at the open day held in February 2011.

The Rosebery Schools project has enabled the development of a modern teaching facility for Palmerston, as well as enhancing the delivery of senior year education with expanded course offerings.

Project highlights

Some of the key outcomes required of the project and considered to have been delivered included:

- a strong and healthy Palmerston community;
- increased education attainment and participation;
- a safer, more confident community;
- better access to community and health services and facilities; and
- concurrent provision of social infrastructure commensurate with population growth.

The broader benefits for the community from the schools include:

- the school ovals are made available for sporting clubs and other users;
- the gymnasium and performing arts facility are to be made available for community use after hours; and
- the gymnasium would also serve as a community cyclone shelter.

9.6 Summary of key conclusions

Following a review of the Rosebery Schools project the following key conclusions regarding best practice can be identified:

- Projects that have been identified from departmental strategies, informed by solid feasibility studies, risk assessed contextually for the region and have strong stakeholder engagement in their development have proven successful. Thorough planning is more likely to deliver a successful project.
- Projects benefit positively from a project team/project manager with experience on similar projects and when the team has worked together on previous projects. Consistent leadership of a project is a key to success.
- The governing parties (or client) should select a procurement methodology that best suits the project, the client and the team and best manages the risks identified on the project.
- Active stakeholder and community engagement in the development of a project (including the objectives and benefits to be achieved) and then ongoing consultation during project delivery, works towards ensuring stakeholder and community acceptance on delivery and in operation.

Gallipoli Underpass (South Road Upgrade ANZAC Highway Underpass), South Australia

Project description

The Gallipoli Underpass project is part of the South Road Upgrade focused on improving the operational efficiency of South Road to meet the transport needs of industry and freight terminals, depots and warehouses along the industrial north–south corridor to the west of the city (including the airport) and the northern industrial area.

Project cost	$118 million (construction)[45]
Funded by	South Australian Government, Department for Transport, Energy and Infrastructure
Project commencement	July 2007
Project completion	December 2009
Consistent with Infrastructure Australia's Strategic Priorities	SP1 – Expand Australia's productive capacity SP5 – Develop our cities and/or regions SP6 – Reduce green-house gas emissions (by reducing traffic congestion and revegetation program)
Method of procurement	Early Contractor Involvement (ECI)
Contractor	AdelaideConnect Joint Venture, consisting of: Department for Transport, Energy and Infrastructure Thiess Pty Ltd LEED Engineering and Construction Hassell BECA Parsons Brinckerhoff [46] Kath Moore and Associates

45 Government of South Australia, Department for Transport Energy and Infrastructure website http://infrastructure.sa.gov.au/completed_projects/anzac_highway

46 Whilst Parsons Brinckerhoff was involved with this project, the Commonwealth Department of Infrastructure and Transport has been assured that there was no conflict of interest.

10.1 Project overview

The Gallipoli Underpass was opened to traffic in March 2009, ahead of time and on budget. The Gallipoli Underpass project is part of the long term plan for a non-stop, north–south corridor from the Port River Expressway to the Southern Expressway in Adelaide. The strategy for upgrading South Road was to tackle the worst bottlenecks first and eliminate the longest delay (occurring at the intersection with ANZAC Highway) through the construction of the Gallipoli Underpass. The Gallipoli Underpass project was funded fully by the South Australian Government.

The Gallipoli Underpass is situated at the intersection of South Road and ANZAC Highway. Construction works included the realignment of the existing section of South Road to the east of the underpass to service traffic moving between ANZAC Highway and South Road. Large landscaped areas were constructed on each side of the underpass and included four feature walls honouring the Army, Navy, Air Force and the New Zealand Defence Force and a memorial garden to recognise the ANZAC spirit and legacy.

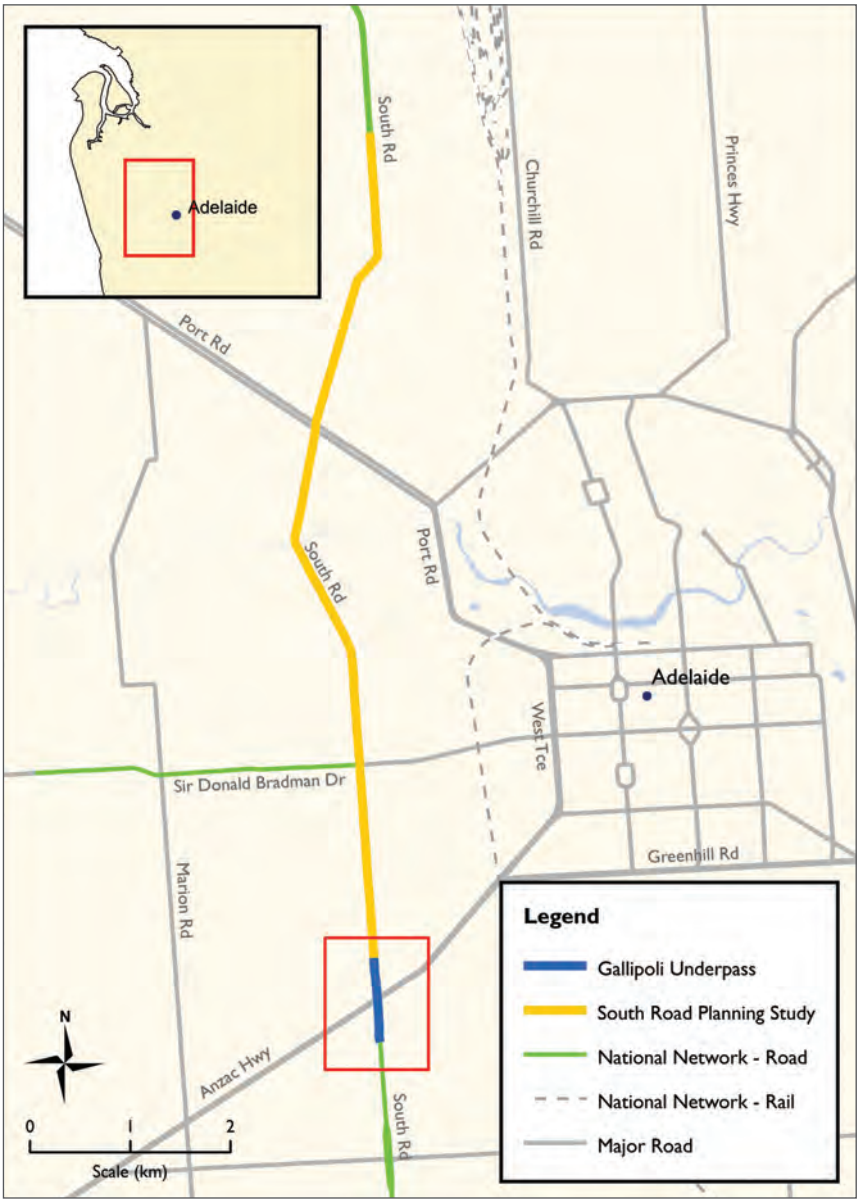


Figure 15 Gallipoli Underpass, including the South Road Planning Study

The project features an underpass (700m) and a span bridge (31m) and five memorials to honor the ANZAC tradition. The project won the 2009 Civil Contractors Federation Earth Award recognising excellence in construction technique, environmental and project management. It also won the 2007 Malcolm Kinnaird Engineering Excellence Award for the process adopted in developing the design and construction.[47]

The key driver for the project was to provide a free-flow, north–south corridor through Adelaide which was a major priority in the State's Strategic Infrastructure Plan. The project scope included the underpass, extensive retaining walls, a new intersection layout and urban design enhancements. The objectives were to increase freight efficiency, reduce traffic congestion and improve road safety.

The challenge was to produce a cost-effective solution for achieving major road improvements, construct with minimal disruption to the community and traffic and deliver within the Department for Transport, Energy and Infrastructure's (DTEI) budget.[48]

10.2 Business case

The *Strategic Infrastructure Plan for South Australia* (2004/5–2014/15)[49] maps out infrastructure priorities for the subsequent 10 to 15 years. In 2005, the South Australian Government announced plans to transform South Road into a continuous non-stop route from the Southern Expressway to the Port River Expressway (a distance of 22 kilometres). This requirement to upgrade emerged from increasing traffic issues on South Road currently catering for up to 40,000 vehicles per day, South Road traffic volumes are expected to increase by 6 percent per annum by 2020.[50] Limited options existed for alternative routes and construction of a new motorway was cost prohibitive. The upgrade of South Road was the preferred option as it would ease congestion, increase freight efficiency and improve road safety.

A detailed business case was prepared and presented to the South Australian Parliament Public Works Committee. DTEI used its departmental and the South Australian Government's review processes.

Project highlights

The Gallipoli Underpass upgrade contributes to the following South Australia Strategic Plan 2007[51] targets:

- strategic infrastructure — increase investment in key economic and social infrastructure (Target T1.21);
- exports — treble the value of South Australia's export income to $25 Billion (Target T1.14);
- road safety — by 2010, reduce road fatalities to less than 90 persons per year (Target T2.9);
- quality of life — improve quality of life for all South Australians through maintenance of a healthy work–life balance (Target T2.12) with improved traffic flow; and
- greenhouse-gas emissions reduction (Target T3.5) — through reduced traffic congestion and planting of more than 18,000 trees and shrubs as part of the Gallipoli Underpass revegetation program.

47 Australian National Construction Review, *Gallipoli Overpass: Ahead of the Game*, 2010, p. 216–7.

48 Australian National Construction Review: *Gallipoli Underpass* http://www.ancr.com.au/Gallipoli_Underpass.pdf

49 Government of South Australia, DTEI: *Strategic Infrastructure Plan for South Australia* http://www.infrastructure.sa.gov.au/strategic_infrastructure_plan

50 Government of South Australia, Department for Transport Energy and Infrastructure website http://infrastructure.sa.gov.au/completed_projects/anzac_highway

51 South Australia Strategic Plan website, Targets 2007 and alignment with 2011 http://saplan.org.au/pages/target-history

South Australia's strategic plan broadly aligns with IA's Strategic Priorities of increasing productivity of the region, quality of life and reducing greenhouse-gas emissions. While this project was not funded by the Commonwealth Government, the overall objectives of the state and Commonwealth were aligned.

The key objectives of the project were to enhance the operational efficiency of freight in and around Adelaide and provide enhanced opportunities for industry, as well as the reduction of greenhouse-gas emissions by relieving congestion on and in the vicinity of South Road.

The business case broadly followed the IA Reform and Investment Framework through clear goal definition and identification of solutions to relieve congestion on South Road. Problem identification was clear, as were the stages of assessing and analysing the problem which was to deliver additional road capacity to south Adelaide through the upgrade of South Road. Options for the road alignment were considered but ultimately the decision was made base on the most economically viable solution. Other proposed solutions would have involved extensive planning challenges in the alignment of an alternative route. Land acquisition was also important for the Gallipoli Underpass project, and the *Highways Act 1926* was utilised early to allow land acquisition necessary for construction.

10.3 Procurement, governance and policy

The Gallipoli Underpass project was delivered under an Early Contractor Involvement (ECI) procurement model, where the contractor was required to competitively tender for the project. This achieved greater value for money, as the early involvement of the contractor assisted in value management, addressed key risks and ensured constructability. The ECI model was therefore selected to ensure the most efficient, constructible and effective solution was developed to meet all project drivers. It is important to note the distinction between an alliance and joint venture — under the AdelaideConnect arrangement there was no 'pain/gain' share outcomes usually found under an alliance.

The ECI process included development of the construction cost with complete transparency to the DTEI before a lump-sum 'design and construct' contract was signed. This allowed the government to understand the costs as they were developed, and demonstrated value for money. Costs were also subject to external and independent review.

A key challenge of this methodology, was the perception within some areas of government that owing to the nature of the final procurement, the ECI methodology does not comply with extant policy. It was considered that better value for money may be achieved using a traditional procurement route, however would potentially not have delivered the same benefits to the community, environment, traffic or urban design. Consequently, cost estimates were developed under the 'open book' methodology.

Using the ECI engagement model was a significant challenge for the DTEI in the early stages of the project, with considerable effort applied to demonstrating value from this arrangement. The transparency required by the DTEI under this process was fundamental to the ECI model being approved.

The ECI procurement model is beneficial where there are project risks that are not well defined at the outset — early contractor involvement can assist in the management of this risk. Risk registers were developed and maintained by the design development team and discussed during project reviews and joint leadership team meetings.

Value for money was a key consideration and was dealt with in the delivery strategy. Design and cost estimates were produced during the development phase and all parties were advised that the construction phase would go out to open tendering if a satisfactory solution and price were not produced under the ECI model. This provided an incentive to the contractor during the early engagement phase to keep costs at a reasonable level through the design process and to appropriate risk management processes. The prices and assumptions were closely reviewed by the DTEI and ultimately a satisfactory solution was achieved.

Project highlights

- The ECI model allowed all aspects of the project to be subject to detailed review and scrutiny to ensure value for money and delivery of project drivers.
- ECI enabled the issues and risks to be thoroughly investigated in the development phase before the commencement of construction.

10.4 Planning and delivery

A critical element of this project was the impact on traffic flows on South Road as a major arterial route through Adelaide – to this end, construction staging was vital to the success of the project, and to minimising the impacts on the community. The design was therefore developed to suit construction staging constraints; an unusual departure from normal procedure, but considered necessary to ensure the project minimised social impacts. The ECI methodology was central to this outcome and provided the DTEI with the confidence that the project could be built on time with minimal disruption to the community and industry.

Construction had to take place while maintaining traffic flows of up to 40,000 vehicles a day and without disrupting adjoining community facilities, including a medical centre and was achieved through innovative design and a staged delivery programme. In Stage 1, the southern half of the bridge and underpass were constructed allowing traffic flow on the ANZAC Highway north of the construction work. The southern half of the bridge was designed to accommodate live loading prior to the entire bridge being completed allowing diversion of ANZAC Highway traffic onto the southern half of the bridge while the northern half was built.[52]

Co-location of the joint venture team facilitated formation of relationships, and through the ECI process, a significant portion of the team had effectively functioned together. This provided the nucleus of a successful project team for the remainder of the project. The joint leadership team, with representatives from both the public and private sectors, provided appropriate overview of the development and delivery of the project, ensuring that decisions were made in a timely manner and that relevant constraints and different perspectives were considered.

In selecting the ECI contractor, specific attention was paid to the appointment of the project manager and design manager. The selection involved assessing both their ability, and their commitment to the desired behaviours for the roles.

52 Australian National Construction Review, *Gallipoli Overpass: Ahead of the Game*, 2010, p. 216–7.

Successful project delivery has been credited to the collaborative team approach – an example of this was in the area of urban design. The urban designer was a key member of the leadership team and by championing this aspect, created enthusiasm within the rest of project team. The urban design theme aimed to reflect and acknowledge the ANZAC history and the collaborative nature of the ECI process allowed this perspective to be included in the engineering design. This meant that urban design was fully integrated with the design rather being a 'tacked on' feature at the end of the design process.

Communication with stakeholders and the community was a high priority and was well resourced given the proximity of the site to residents and the intersection's high profile. A comprehensive communications plan was developed by Kath Moore and Associates, which engaged stakeholders and the community during design development under the ECI strategy.

There were 12 community liaison meetings scheduled during the project and involved councillors from the cities of Unley and West Torrens. In addition, a local industry participation plan was established for the project to inform local companies about the project.

Under the ECI model, risk registers were developed and maintained by the design development team. During the construction phase, identified risks were effectively managed by the contractors (Thiess and Leed Engineering) within the joint venture.

During design development, value management processes were regularly conducted. The ECI model allowed all aspects of the project to be reviewed in detail to ensure value for money and achievement of project objectives. The transparency inherent in the ECI methodology provided clarity in regard to value management, particularly when checked against key project drivers; a secondary benefit of this was the ability to 'sell' the more unconventional ECI methodology internally within the South Australian Government.

Project highlights

- The success of the Gallipoli Underpass project was due to the strength and leadership skills of the project manager, design manager and construction manager and a commitment to information sharing across all project disciplines during the design development phase.
- Strong relationships were established which were maintained during the delivery phase of the project.
- Integration of community engagement into the project leadership ensured a successful project and outcomes for all stakeholders.

10.5 Outcomes

The Gallipoli Underpass project was the second project delivered by the South Australian Government under ECI and was considered highly successful in that all disciplines worked in an integrated manner to produce solutions. Through collaboration and integrated design and construction methodologies, the project was delivered ahead of time and budget, resolved complex traffic and engineering issues and created a new and revitalised public space for the benefit of the local and wider community.[53]

The target completion date was December 2009 and this was achieved while maintaining traffic flow through the intersection throughout the construction period. The underpass was opened in March 2009 and the final layer of asphalt was laid in November 2009.[54]

The project has addressed major traffic congestion issues at the South Road intersection with ANZAC Highway. The total benefits of the Gallipoli Underpass as part of South Australia's Strategic Infrastructure Plan will be fully realised on the completion of the non-stop, north–south corridor from the Port River Expressway to the Southern Expressway, which is currently part of a larger initiative in place from the South Australian Government.

The stakeholders and community were engaged as the design was developed under the ECI strategy. The core methodology included adequate resourcing of the community and stakeholder function and the integration of the function into the design development phase.

The success of the project has been attributed to the leadership team as well as the combination of the project manager, the design manager and the construction manager. Also acknowledged was the willingness for open and strong communication and information sharing as well as respectful challenge and review processes.

Occupational health and safety was also given high priority by the contractors during project delivery through dedicated resourcing and strong demonstration of organisational commitment.

10.6 Summary of key conclusions

This review of the Gallipoli Underpass project has identified and concluded the best practices which contributed to the project success are:

- The Early Contractor Involvement (ECI) process can allow all disciplines to work together in an integrated manner from early in the project to produce solutions, and optimise opportunities for collaboration.
- Engaging the community and stakeholders fully during the design phase can assist in incorporating functional integration into the design development phase and ensure minimum disruption to the community during construction.
- A commitment to strong communication and information sharing ensures a project's success.

53 Urban Design Forum, *Space for Thought: The role of urban design on the Gallipoli Underpass* http://udf.org.au/udf-quarterly/udfq-90-june-2010/article

54 Department for Transport, Energy and Infrastructure SA, *New Connections*, Issue 5, Summer 2009/2010 http://www.dtei.sa.gov.au/__data/assets/pdf_file/0008/43748/New_Connections_Issue_5_lowres.pdf

Melbourne Convention and Exhibition Centre, Victoria

Project description

The Melbourne Convention and Exhibition Centre project involved the design and development of a new convention centre fully integrated with and adjacent to the existing exhibition centre on the banks of the Yarra River.

Project cost	$1.4 billion[55] (The State of Victoria contributed approximately $370 million towards construction of the centre. The remaining commercial development was financed privately)[56]
Funded by	Victorian Government
Project commencement	May 2006
Project completion	July 2009
Consistent with Infrastructure Australia's Strategic Priorities	SP3 – Diversify Australia's economic capabilities SP4 – Build on Australia's global competitive advantages SP6 – Reduce Australia's greenhouse-gas emissions
Method of procurement	Public Private Partnership (PPP)
Contractor	Plenary Group Consortium: Plenary Group Deutsche Bank Multiplex Constructions Brookfield Multiplex Services NH Architecture Woods Bagot Larry Oltmanns

55 For entire South Wharf redevelopment associated with this project.

56 MCCD, Government of Victoria audit report: *Melbourne Convention Centre Development* http://download.audit.vic.gov.au/files/Partnerships_melb_conv_ppp_report.pdf

11.1 Project overview

In April 2004, the Victorian Government committed to develop a 'world-class' convention centre on the banks of the Yarra River, adjacent to the existing Melbourne Exhibition Centre.

In July 2009, the new Melbourne Convention Centre on the land adjacent to the exhibition centre was opened. The convention and exhibition centre precinct provides an important link to Docklands and the city in an exciting public space for all Victorians and visitors to enjoy. The convention centre, operated by Melbourne Convention and Exhibition Trust, is fully integrated with the existing exhibition centre to create the most versatile and advanced convention and exhibition centre in Australia.

The Melbourne Convention Centre development consists of a 5,541-seat plenary hall that can be divided into three separate theatres, 32 meeting rooms of various sizes and a grand banquet room. The development also includes a Hilton hotel, office, residential, and retail space. The convention centre was developed by a consortium led by Plenary Group, designed by Larry Oltmanns, Woods Bagot and NH Architecture and built by Multiplex Constructions. The new centre uses a range of features in order to achieve a six-star Green Star environmental rating and became the first convention centre in the world with that environmental rating.

The project's primary objective was to increase economic benefits to Victoria through the direct and indirect benefits of increased conventions and delegate attendance. The convention centre has been designed to allow for the future extension of the existing exhibition centre without loss of functionality for exhibition organisers, exhibitors or exhibition visitors.

The Melbourne Convention and Exhibition Centre development had the benefit of Melbourne Convention and Exhibition Trust's (the Trust) involvement as an operator of the (old) convention centre. The trust provided advice on operational matters during the development, design, construction and commissioning stages of the project.

The new convention centre was designed to be:

- an attractive and well-designed public building adding to the collection of existing heritage and modern buildings that characterise Melbourne;
- a building acknowledging its unique setting at the Yarra River's edge and in the maritime precinct adjacent to the previous Melbourne Convention Centre;
- a building that complements the existing Melbourne Exhibition Centre; and
- an iconic building providing Melbourne with world-class meeting and convention facilities.[57]

57 *Melbourne Convention and Exhibition Trust Annual Report 2008–09*, p. 7.

11.2 Business case

The business case for the Melbourne Convention Centre development leveraged off an extensive risk identification exercise, and was developed using the Victorian Government's Department of Treasury and Finance model for Public Private Partnership (PPP) projects. The PPP approach was selected on the basis of its ability to optimise the integration of services and deliver value for money outcomes.

A 2002 feasibility study for a new convention centre was commissioned by Major Projects Victoria and this informed the business case. It included a number of strategic considerations:

- greater recognition of the economic value of the Meetings, Incentives, Conventions and Exhibitions (MICE) market segment;
- development of new capacity and competition in the regional (Australasia and Asia–Pacific) MICE market; and
- capacity of the largest plenary hall in the existing Melbourne Exhibition and Convention Centre being 1,500 people only.[58]

The Government referred the feasibility study to the Department of Treasury and Finance's Gateway Review Process for a 'Gateway 2 — business case' review. Recommendations from the Gateway Review were incorporated into the business case and submitted to the Government in 2003. The *Melbourne Convention Centre development audit report*[59] concluded that the business case was comprehensive and evidence-based, and transparently analysed the issues and challenges of the project given its scale and economic importance.

A key feature of the business case and procurement strategy analysis was the examination of three delivery options. A base case project delivery by the State of Victoria and two alternative PPP variants:

- design, build, operate and maintain by the private sector party; and
- design, build and maintain by the private sector party and operations (events) management by a government entity —Melbourne Convention and Exhibition Trust.

Project highlight

The second PPP option was seen to provide enhanced realisation of economic benefits, the flexibility for whole of government outcomes, event prioritisation and accordingly adopted as the 'best' option for project delivery.

58 MCCD, Government of Victoria Audit Report: *Melbourne Convention Centre Development* http://download.audit.vic.gov.au/files/Partnerships_melb_conv_ppp_report.pdf

59 ibid.

Project highlights

A socioeconomic analysis was undertaken for the proposed project. The benefits considered were:

- the economic impacts of increased visitation;
- expenditure by convention centre delegates and accompanying persons;
- pre- and post-touring tourist activities and induced tourism; and
- the economic impact of direct construction expenditure.

Other benefits of tourism and business as well as social and community benefits were noted but not quantified.

The primary goal of the Melbourne Convention Centre development was to support increased opportunities for business in the City of Melbourne, enhance local opportunities for conventions and support the region's economic outcomes. The provision of a world-class convention centre in Melbourne enhances economic opportunities in the city, building on the nation's competitive advantages through provision of a world-class facility and reduction of greenhouse-gas emissions as the world's only six-star Green Star convention centre.

Different convention centre size options were also considered and the decision was made on the basis of best economic outcome. At a high level, the scope of the project remained consistent; noting that PPP encouraged private sector parties to submit innovative design proposals.

11.3 Procurement, governance and policy

The procurement model selected for the Melbourne Convention Centre development was a PPP. It complied with the required Victorian Government Purchasing Board and Partnerships Victoria policy and guidance framework. Prior to the commitment to the PPP model, a public sector comparator was used to determine whether the cost attributed to the project by tenderers would provide value to the Victorian Government. Probity was enforced throughout key procurement stages, including structured negotiations and risk allocation was consistent with the Partnerships Victoria policy and guidance framework.[60]

The Plenary Group Consortium (Plenary) was awarded and subsequently delivered the project. The consortium included:

- Plenary Group (consortium lead, equity investor and project management);
- Deutsche Bank (financial underwriter);
- Multiplex Constructions (builder);
- Brookfield Multiplex Services (service delivery over the 25-year concession period); and
- NH Architecture/Woods Bagot/Larry Oltmanns (architecture and urban design).

For adjacent commercial development, Plenary partnered with AUSTEXX and Hilton International as the hotel operator.

The principles of value engineering were implemented during project development to define the outcomes and outputs sought and in the negotiations with the successful tenderer. Key stakeholders were involved in these discussions.

The risk management processes used in the Melbourne Convention Centre development were guided by Partnerships Victoria policy and the Australian Standard for Risk Management AS4360:2004. They included detailed consideration of risk in preparing tender documents, the tender process and contract settlement. Appropriate oversight was provided by the Steering Committee during those processes.[61] A risk matrix was the product of an extensive risk identification exercise conducted as part of the original business case and was used by the Steering Committee.

60 ibid.

61 'Project agreement in relation to the Melbourne Convention Centre Development'. The agreement can be located on the Partnerships Victoria website: http://www.partnerships.vic.gov.au/CA25708500035EB6/0/0902EAD8013746EDCA2570B1008095BC

The Victorian Government entered into an agreement with Plenary for payment of the cost of the construction, facility management and ancillary services through service payments for the 25 year term of facility management. The project agreement provided for the majority of risk to reside with Plenary. During construction, a cost claim for the clean-up of unidentified site contamination was shared between the Victorian Government and Plenary (in accordance with the risk allocation in the agreement).

For the operations phase, the contract included a provision for abatement if the contracted services were delivered below the required standard;[62] This provided an additional incentive to ensure effective delivery. Plenary entered into a contract with Multiplex Constructions for design and construction and engaged Brookfield Multiplex Services as the facility manager for the operations phase of the project.

The Trust was retained as operator on the basis that broader state interests, such as realisation of economic benefits, prioritisation of events and flexibility for whole of government outcomes were best served by retaining a government operator.

Key project highlight

The involvement of Melbourne Convention and Exhibition Trust, optimised the ability of the project team to deliver a suitable facility that would meet the strategic aims of the project.

A governance structure was developed for the design and construct phase of the project (**Figure 16**) and adjusted during key phases. During the delivery phase a project-specific governance structure was developed which included a steering committee, project control group and project development team, each with their own terms of reference. The Steering Committee consisted of:

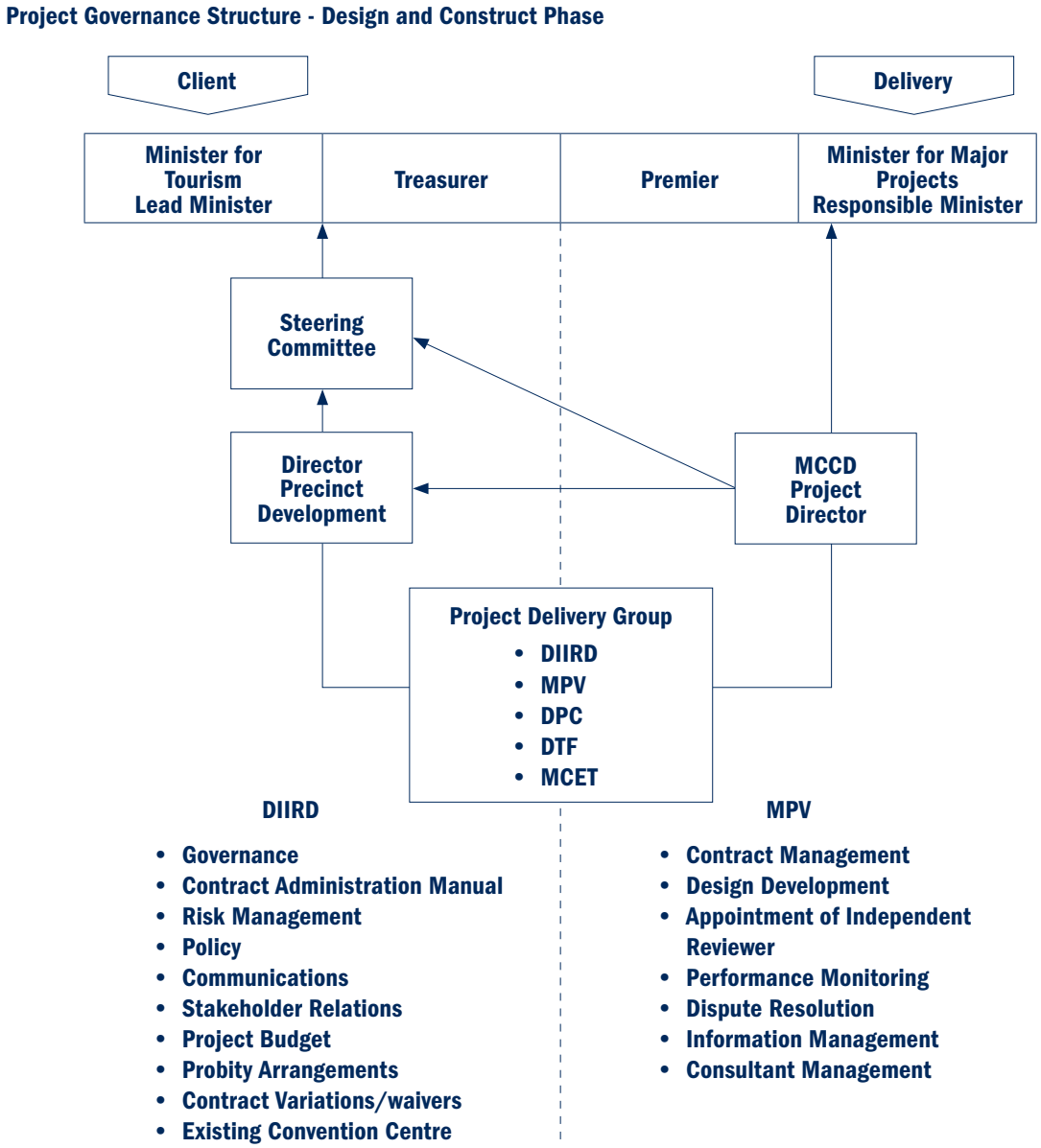
- Secretary of Department of Innovation, Industry and Regional Development (DIIRD) as Chair;
- Director, Precinct Development, DIIRD;
- Executive Director, Major Projects Victoria;
- Melbourne Convention Centre Development Project Director, Major Projects Victoria; and
- nominated representatives from the Department of Premier and Cabinet, the Department of Treasury and Finance, Tourism Victoria and Melbourne Convention and Exhibition Trust.

While there was some change to delegated representatives over time, representation was always at a very senior level.

The Minister for Tourism was appointed as the project client (through DIIRD for the design and construction phase) and the Minister for Major Projects was responsible for project delivery. The relationships and the associated roles and responsibilities across both the design and construct phases were defined and articulated across the project documents.[63]

62 MCCD, Government of Victoria Audit Report: *Melbourne Convention Centre Development* http://download.audit.vic.gov.au/files/Partnerships_melb_conv_ppp_report.pdf

63 ibid.



Source: Victoria Auditor-General's Office analysis of DIIRD document

Figure 16 Melbourne Convention Centre development project governance structure

Agreement with the private sector party resulted in development and implementation of a project-specific governance structure including regular reporting against project deliverables. By capturing this information in the contract, the Victorian Government ensured that the governance structure was formalised, noting the number of project team members representing different organisations. This did not preclude the adjustment of the structure as the project progressed.

A contract administrator was appointed by the Victorian Government prior to commencement of operations. A significant number of operational contract administration matters were delegated to the Trust. Contract management appointments were made within the DIIRD and within the Trust, reflecting the integrated nature of the team throughout the project.

The Trust's involvement throughout the project provided continuity and aided in the planning of outputs. The Trust worked closely with Major Projects Victoria (primarily responsible for the delivery of the project) throughout the design and construction phases to ensure that the project met their end use requirements. For the operating phase, the project governance structure was altered to ensure focus on the private sector party's performance of its continuing facility management obligations.

11.4 Planning and delivery

The project was delivered for DIIRD (the client) by Major Projects Victoria, a Victorian government agency specialising in the delivery of major infrastructure with extensive involvement of the operator of the former convention centre; Melbourne Convention and Exhibition Trust.

Plenary Conventions Pty Ltd was appointed as the contractor to design, build and maintain the new Melbourne Convention Centre and to maintain the existing Exhibition Centre.

Plenary used the design specifications endorsed by Major Projects Victoria and DIIRD to ensure that the final design would satisfy the functional brief and to control and manage the project scope. The company was contractually obliged to satisfy the performance and functionality requirements of the facility in order to reach commercial acceptance and trigger the commencement of payments by the Victorian Government.[64]

The development was in line with the Victorian Government (general) project development and Partnerships Victoria principles and practices at the time. These include all project phases — development, procurement, delivery and operation. The development was also reviewed under the Gateway Review Process and as a PPP project received oversight and input from the Department of Treasury and Finance.

An important consideration was the developments adjacent to the Melbourne Convention Centre and their impact on land planning. In terms of land acquisition, there were some issues relating to consolidating land titles and how to provide the commercial development land to the Plenary Consortium.

To avoid possible conflicts over adjacent maritime and commercial interests, the National Trust and Heritage Victoria oversaw the housing of the Polly Woodside (a nineteenth century sailing ship) in Duke's Dock and the refurbishment of cargo sheds as restaurants. These works were factored into the project's planning and staging phases.

The Development was conceived as a PPP in order to foster private industry involvement in the project and stimulate thought leadership. A degree of flexibility was planned throughout the project to promote innovation that would enhance the asset. Consequently, project scope was enhanced prior to the formal engagement of the contractor in order to benefit the long-term operation of the Melbourne Convention Centre; this adjustment included two important initiatives. Firstly, a pre-tender adjustment to the scope raised the environmental standard of the proposed building from a three-star to a five-star Green Star design rating. The project ultimately achieved a six-star Green Star rating — the first in the world for a convention centre. The second initiative was a complementary commercial development adjacent to the Melbourne Convention Centre, proposed by the Plenary Consortium.

64 MCCD, Government of Victoria Audit Report: *Melbourne Convention Centre Development* http://download.audit.vic.gov.au/files/Partnerships_melb_conv_ppp_report.pdf

The development included an office tower, retail and food precincts and a five-star hotel. This exceeded the expected level of commercial development envisaged at the business case stage. However, this initiative demonstrated significant increases in the project benefits through the economic multiplier effect in the wider community. The redefined scope secured increased funding and promoted the development of the local precinct to complement the convention centre.

The Green Star Convention Centre Design PILOT was created in 2005 specifically to rate the new Melbourne Convention Centre. The Green Star Convention Centre Design PILOT rating tool and technical manual were funded by the Victorian Department of Major Projects and piloted on the Melbourne Convention Centre. After the PILOT phase of the project, it was decided that the Green Star Convention Centre Design PILOT would be incorporated into the Green Star Public Buildings rating tool.[65]

An important part of delivery was the involvement of the Trust in providing advice on operational matters during project development, design, construction and commissioning.

A communications strategy was an important element of planning and one in which the Trust was closely involved. This was fundamental given the value of the project, but also the visible contribution it would make to Melbourne's Southbank development. Key industry and other stakeholders were involved in developing the business case and regularly consulted during the delivery of all stages of project development and delivery.

Communication was primarily through media releases, stakeholder newsletters, signage around the development site, a large presentation in the existing exhibition facility and a project website.[66]

The strategy development and implementation was overseen by the Project Steering Committee and a communications plan continues to be maintained between the Victorian Government, the Trust and the private sector party (Plenary) consortium. A key benefit of involving the Trust throughout was continuity in communications.

Personnel changed throughout the project. To reduce the impact of these changes to project planning and delivery, the structure and processes for working together promoted integration between the Government and private sector team.

Key project highlight

The involvement of Melbourne Convention and Exhibition Trust throughout the project has ensured the ongoing delivery of consistent messages to key stakeholders.

65 Green Building Council Australia: *Green Star — Convention Centre Design PILOT, August 2009* http://www.gbca.org.au/green-star/rating-tools/green-star-convention-centre-design-pilot/2406.htm

66 MCCD, Government of Victoria Audit Report: *Melbourne Convention Centre Development* http://download.audit.vic.gov.au/files/Partnerships_melb_conv_ppp_report.pdf

11.5 Outcomes

The new Melbourne Convention and Exhibition Centre was completed and commenced operations on 1 July 2009 in the midst of the global financial crisis. The project was delivered on time and within budget.

The convention centre achieved a six-star Green Star rating — the first convention centre in the world to achieve this rating.

The project's success has enabled the Trust to operate its business successfully. The 2010–11 financial year marked the second complete year of operations of the new Melbourne Convention and Exhibition Centre. The number of events held in the centre in comparison to the previous financial year had grown from 700 to over 900. There were 17 international and more than 70 national conferences. During the past 12 months 215,000 people visited the Melbourne Convention and Exhibition Centre. In excess of 18,000 were delegates to international conferences and more than 40,000 were delegates to national conferences.[67]

The Melbourne Convention and Exhibition Centre development has been recognised with six awards:

- 2010 Victorian Architecture Medal;
- 2010 Australian Construction Achievement Award;
- 2010 Australian Interior Design Award — Environmentally Sustainable Design;
- 2010 Australian Interior Design Award — Best of State Commercial Design;
- 2010 Urban Development Institute of Australia National Environmental Excellence Award; and
- 2009 Urban Development Institute of Australia Environmental Excellence Award.

11.6 Summary of key conclusions

This review of the Melbourne Convention and Exhibition Centre project has identified and concluded the best practices which contributed to the project's success are:

- Drawing on the knowledge of a key operational stakeholder throughout the project can result in better outcomes from all points of view, and potentially increased useability of the delivered infrastructure.
- If the structure of the project allows for flexibility in innovation, this should be provided as a method for delivering enhanced strategic outcomes from the project and/or the delivered infrastructure.
- The commitment of public funds to a project and the potential for private public partnerships can attract private investment. Early engagement with industry to discuss this form of procurement is critical to maximising opportunity for innovation.
- An integrated project team provides additional redundancy, and in a multi-organisational project can provide opportunities for mutual support when the project structure will support it.

67 *Melbourne Convention and Exhibition Trust Annual Report 2010–11.*

New Perth-Bunbury Highway, Western Australia

Project description

The New Perth–Bunbury Highway (Kwinana Freeway Extension — Forrest Highway) project involved the construction of a 70.5-kilometre four-lane dual carriageway from the previous southern end of the Kwinana Freeway at Safety Bay Road to join the Old Coast Road near Lake Clifton.

Project cost	New Perth–Bunbury Highway $705m[68]
Funded by	New Perth–Bunbury Highway Commonwealth Government ($330m) Western Australian Government ($375m)
Project commencement	New Perth–Bunbury Highway December 2006
Project completion	New Perth–Bunbury Highway September 2009
Consistent with Infrastructure Australia's Strategic Priorities	SP2 — Increase Australia's productivity SP5 — Develop our cities and/or regions SP7 — Improve social equity and quality of life
Method of procurement	Alliance
Contractor	Southern Gateway Alliance: Main Roads WA Leighton Contractors WA Limestone GHD

68 See www.nationbuildingprogram.gov.au/projects/ProjectDetails.aspx

12.1 Project overview

The New Perth–Bunbury Highway (NPBH) was the largest infrastructure project undertaken by Main Roads Western Australia (Main Roads) and the largest road construction project ever undertaken in Western Australia. The project consists of 70.5 km of highway that directs freight and regional traffic away from built-up areas. The New Perth-Bunbury Highway project was highly innovative and successful — opening three months early, under budget and collecting seven awards, including two WA Engineers Australia Achievement Awards, two Spatial Sciences Excellence Achievement Awards, the Bradken Gold Hard Hat Award 2008, the IFAP Gold Award 2008 and the WorkSafe Platinum Award 2009.

The NPBH has reduced the journey time between Perth and Bunbury by 30 minutes, providing an efficient transport link for up to 30,000 vehicles per day from the Peel and south west regions to Perth's markets and airport. In addition, the NPBH's six interchanges, 10 intersections, 19 bridges, 21 underpasses and 32 km of principal shared path for pedestrians and cyclists, enhances the efficiency and accessibility of the state's road network.

The project was delivered through the Southern Gateway Alliance (the Alliance) which combined expertise from Main Roads WA, Leighton Contractors, WA Limestone and GHD. An alliance model offered greater flexibility in achieving value for money and to best manage the project risks.

With 15 million tonnes of raw materials required for the project, a critical success factor was the inclusion of WA Limestone as an alliance partner rather than as a traditional subcontractor resulting in reduced cost and efficient delivery of materials throughout the project.

The project was heralded by the Premier of Western Australia, the Hon Colin Barnett MLA as a 'strategic piece of infrastructure [which] provides a world-class transport corridor, in the form of a continuous dual carriageway from Perth to Bunbury. It brings the South West significantly closer to the metropolitan area, bringing with it immeasurable long term economic benefits'.[69]

69 Western Australian Government Media Release, *Kwinana Freeway Extension — Forrest Highway opens up South-West*, 20 September 2009.

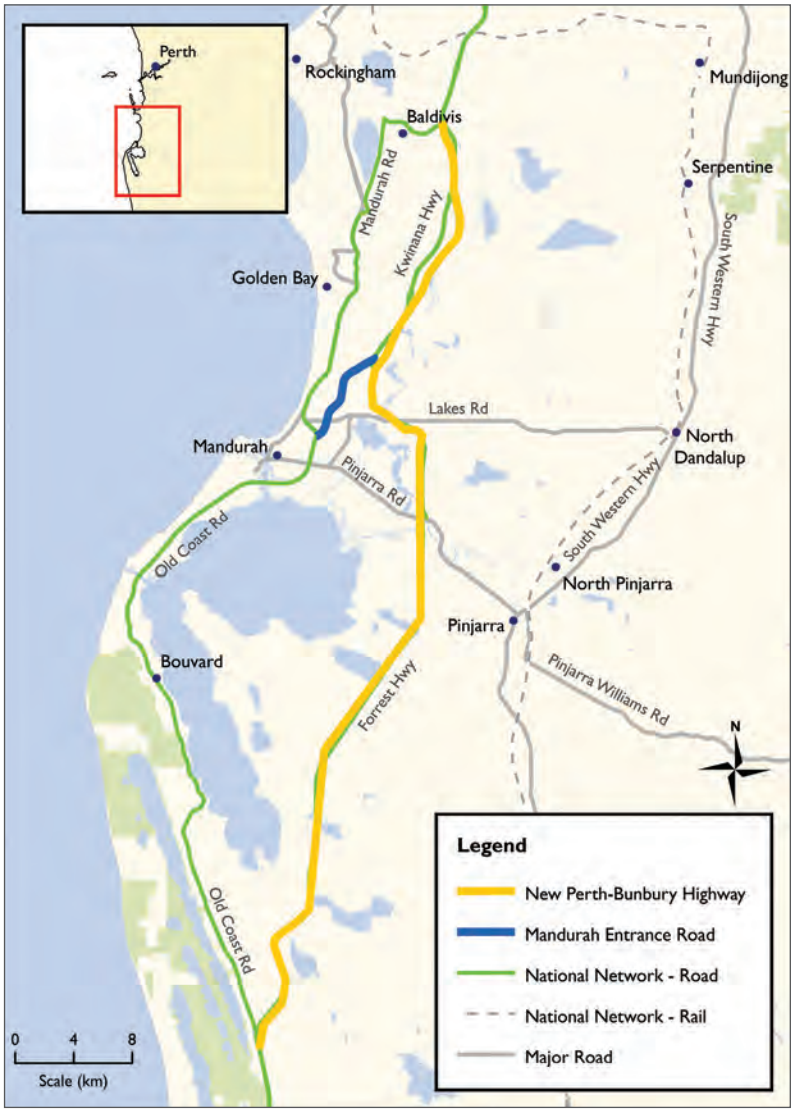


Figure 17 New Perth-Bunbury Highway, including the Mandurah Entrance Road

12.2 Business case

The New Perth–Bunbury Highway (NPBH) was the principal route between Perth, the Peel and South West regions and ran through the cities of Rockingham and Mandurah, which saw an increase in freight and commuter traffic of 7 percent per annum and over 2,000 trucks per day due to significant growth in the region.[70] Perth's population growth, traffic congestion and long-distance haulage traffic prompted Main Roads to initiate a project to design and construct the NPBH. The NPBH aligned with the broader Western Australian State Planning Strategy: 'regional centres will have a range of realistic transport options to Perth and other parts of the state and will be protected from the impacts of through traffic.'[71]

The Peel and South West regions are the most populous regions outside the Perth metropolitan area with a projected population growth of about 190,000 to 390,000 over the next 25 years. Centres within these regions have some of the highest growth rates in Australia, with Mandurah being the fastest growing regional city in the State. These areas support a wide variety of industries including mining, agriculture and tourism.

70 Department of Transport and Regional Services, *2007 Perth-Bunbury Corridor Strategy – building our national transport future*, June 2007

71 Western Australian Planning Commission, *State Planning Strategy Final Report*, December 1997, p. viii

Economic development of the Peel and South West regions was constrained by the lack of a quick and efficient transport route linking the cities of Perth, Mandurah and Bunbury and the ports of Fremantle and Bunbury. Investment in land transport infrastructure was required to cater for:

- large population growth concentrating in the coastal parts;
- continued development of Mandurah as a satellite city to Perth;
- preference for private vehicle use to access the recreational and tourist destinations;
- increase in tourism; and
- increase in the freight (primarily from mining, forestry and agricultural sectors).

Traffic modelling indicated that about 45 percent of the traffic on the Perth–Bunbury Highway north of Mandurah, 20 percent of the traffic within Mandurah and more than 90 percent of the traffic south of Mandurah would shift to the NPBH. In addition, the analysis indicated that on the South Western Highway about 50 percent of the traffic north of Pinjarra and about 30 percent of the traffic south of Pinjarra would shift to this route.

The Perth–Bunbury Highway Route Development Strategy prepared in 2001, considered the development strategy for the regional road network between Perth, Mandurah and Bunbury and was informed by the long-term strategy for the corridor. This was summarised in the Peel Regional Road Network Strategy (2003) and determined the improvement works required on the existing road network over the following 25 years to maintain acceptable levels of service over the network during that period (base case). The base-case scenario focussed on maintaining the level of service and did not result in an improvement to travel times or road safety.

The Perth–Bunbury Highway Route Development Strategy considered the development of the road network through the construction of new roads, including construction of the NPBH and the construction of the Mandurah Entrance Road. Several project options were investigated including construction of:

- NPBH and Mandurah Entrance Road as one project;
- Mandurah Entrance Road only;
- Mandurah Entrance Road followed by NPBH; and
- NPBH followed by Mandurah Entrance Road.

Construction of the NPBH and the Mandurah Entrance Road as one project was not investigated in detail, as this was cost prohibitive. The construction of the Entrance Road (2006) and the NPBH (2011) represented the optimal solution for planning at that time, however with the availability of Commonwealth funds, the construction of both assets could be undertaken.

Business case options were generated and analysed individually and the goals were well defined and aligned with Infrastructure Australia's Strategic Priorities. The injection of Commonwealth funding released the full potential for the project, where the NPBH and Mandurah Entrance Road were delivered as one. This project was not subject to the gateway review process.

The NPBH project aligned with state and national infrastructure strategies and were selected for the Commonwealth Government's Nation Building Program[72] for funding. The NPBH fulfils the intent of the Western Australian State Planning Strategy which articulates the need to have a strong, efficient and integrated intra-regional and inter-regional transport network. The project also complemented the Southern Province Transport Strategy which concludes that due to cost efficiency, time and flexibility requirements, road transport will remain the preferred mode of transport for freight in the Perth–Bunbury region.[73]

The preliminary budget was agreed on during the business case stage, however, a scope change was necessitated by the requirement to change the materials used in the concept stage, which would not be available during delivery. This necessitated a budget amendment for an additional $40 million.

12.3 Procurement, governance and policy

Main Roads conducted a workshop to explore the characteristics of the New Perth-Bunbury Highway (NPBH) project and determine the most appropriate contract strategy for project delivery. The assessment included analysis of the characteristics of each of the delivery options, as well as consideration of project drivers and potential risks.

The workshop identified that for a project of this size and complexity, an alliance contract was the most appropriate delivery mechanism. While the conventional design and construct contracts used by Main Roads for major infrastructure projects have previously delivered satisfactory results, an alliance approach offered greater flexibility to achieve value for money and provide additional benefits to all parties.

An alliance contract was also selected to manage the project risks, including community and stakeholder concerns, tight completion dates, budget, and the strategic importance of the project to Main Roads and the WA Government. It was also believed that an alliance would focus on solutions, foster innovative thinking and be driven by the values that incorporate views of stakeholders and the community.[74]

The project was delivered through the Southern Gateway Alliance, formed and led by Main Roads WA, and involving Leighton Contractors, WA Limestone and GHD. WA Limestone held a formal position in the alliance team (rather than a traditional subcontractor) to ensure accountability for raw material availability and associated downstream costs. This ensured a supply of raw materials in the Western Australian market where competition with major resource projects can have a significant impact on projects (and which had already seen a major scope change and budget variation to this project).

A Board was appointed to oversee the project. The project governance and management team comprised executive management staff from participant companies and Main Roads personnel. Line managers with extensive experience on large construction projects were selected to contribute their leadership and knowledge at the delivery end of the project.

Accountability for areas of performance was allocated to individuals within the leadership team and the Board to ensure all key performance indicators were achieved. This accountability resulted in the project attracting a high calibre of experienced leaders who were committed to delivering results for the duration of the project.

72 Australian Government, *New Perth– Bunbury Highway (Kwinana Freeway Extension — Forrest Highway)*, http://www.nationbuildingprogram.gov.au, Department of Infrastructure and Transport.

73 Department of Transport and Regional Services, *2007 Perth-Bunbury Corridor Strategy – building our national transport future*, June 2007

74 ibid.

Project highlights

- Selecting an alliance model allowed Main Roads to manage key risks, such as the availability of labour and raw materials to undertake such a large scale project.
- Individual accountability resulted in the project attracting a high calibre of experienced leaders who were committed to delivering results for the duration of the project.

The Metropolitan and the Peel Region Schemes managed land use planning for the area through which the route passes. Planning for a new route between Perth and Bunbury commenced in the 1970s as part of the original corridor plan for Perth and continued throughout the 1980s and 1990s as part of the regional planning for the south-west corridor. The alignment for the Kwinana Freeway section was included in a strategy plan for the south-west corridor published in 1980, with little adverse reaction on the alignment. In 2003, the preferred route was finalised with environmental reviews and extensive community consultation.

The alliance seconded advisers from the Department of Environment and Conservation and the WA Conservation Council for 18 months. Differences between federal and state regulatory frameworks led to duplication of approvals which resulted in schedule delays at the planning stages of the project. The seconded environmental staff responded quickly and resolved these issues with the development of practical delivery plans to satisfy all parties. The environmental impact assessments identified a rare and protected orchid and resulted in design innovation to reduce the clearing footprint.

The project set new standards on a wide range of environmental issues for the design and construction of roads in WA and Main Roads WA have noted an intention to adopt many of these initiatives in future projects.

12.4 Planning and delivery

The Southern Gateway Alliance was responsible for planning the work (normally held by Main Roads) and included researching traffic volumes and extensive consultation with stakeholders to optimise road connectivity, lane configuration and interchange locations. Design and construction staff, being less familiar with this early stage of planning, gained valuable experience and insight and a better understanding of project decisions which reduced impacts on the community and environment.

In Western Australia, road infrastructure projects compete with well-established mining companies to recruit experienced project personnel. To attract a more experienced workforce, New Perth-Bunbury Highway (NPBH) tailored a 'quality of life' work package, including a five day working week. This resulted in the successful recruitment and retention of personnel and contributed to the project's overall performance.

Design and construction engineering staff were co-located where possible and the construction team was mobilised early so they could be involved in the integrated design process for 'constructability' reviews and squad checks at each stage. This resulted in a culture of continuous improvement, prompt resolution of issues and inclusion of community and stakeholder feedback.

Project highlights

- Across four million labour hours, there were no lost time injuries recorded. The experienced workforce ensured quality decision-making during site works and resulted in high safety performance.
- A 'quality of life' work package tailored for the New Perth–Bunbury Highway project resulted in the successful recruitment and retention of personnel.

The community relations team included an ex-farmer who provided the team with a thorough understanding of the farming community's needs and desires to reach mutually beneficial outcomes. By implementing community engagement strategies throughout the project, excellent community relations were achieved. These included community relations training for all 3,000 workers in the field and 116 bus tours of the site for more than 2,300 visitors.

Although there were no Native Title contests, the Southern Gateway Alliance was committed to the respectful engagement of local Aboriginal elders to discuss matters of heritage and cultural significance. One of these consultations identified that the proposed alignment of the highway encroached a site of significance. The alignment was subsequently modified to avoid such a disturbance.

12.5 Outcomes

The New Perth-Bunbury Highway (NPBH) was completed in September 2009. The project was completed in less than three years and was three months ahead of schedule, which is a significant achievement for a project of this magnitude and complexity. The Southern Gateway Alliance's collaborative team culture captured opportunities for improvement and innovation.

The new highway has reduced the journey time between Perth and Bunbury by 30 minutes, providing an efficient transport link for up to 30,000 vehicles per day from the Peel and South West regions to Perth's markets and airport. Pressure and congestion relief has been achieved on the existing coastal route through Mandurah and the South Western Highway.[75]

The Mandurah Entrance Road provides a safe and efficient link between the Kwinana Freeway Extension (a part of the NPBH) and Mandurah. It is approximately half the length of alternative routes to the extended Kwinana Freeway, providing savings in travel times. The new road is expected to carry up to 11,000 vehicles per day, most of which would otherwise travel on local and arterial roads, such as Lakes and Gordon Roads. This provides the benefit of significantly reducing congestion on alternative routes.

The forecast budget was modified at an early stage of business case planning when it was realised that materials used in the concept stage would not be available during delivery. A major scope change and additional budget request was submitted to the WA Government (approximately $40 million). This did not impact project delivery.

Community engagement and relations strategies were very successful and achieved excellent community relations throughout the project. The Southern Gateway Alliance's commitment to being flexible and open to improvements achieved win-win outcomes, such as road alignment changes to avoid areas of environmental and cultural significance. A community satisfaction level of 77 percent was achieved compared to a target 65 percent.

The project also exceeded Indigenous and trainee recruitment targets.

12.6 Summary of key conclusions

This review of the NPBH project has identified and concluded the best practices which contributed to the project success are:

- Effective planning for the project years in advance provided ample opportunity for public consultation well ahead of the project requirement. This resulted in stakeholders being well-informed and engaged in the development of the project.
- A critical success factor was the inclusion of WA Limestone as an alliance partner, rather than as a traditional subcontractor. This is a departure from normal alliance methodology, but proved advantageous as it provided increased certainty regarding value of raw materials, and early engagement ensured the supply of materials to the project.
- The early contractor involvement optimised the chances of success in a constrained market and ensured providers were committed to the project from the outset.
- Individual accountability with contractual incentives and penalties resulted in the project attracting a high calibre of experienced leaders who were committed to delivering results for the duration of the project.

75 Australian Government, *New Perth–Bunbury Highway (Kwinana Freeway Extension — Forrest Highway)*, http://www.nationbuildingprogram.gov.au, Department of Infrastructure and Transport

New Perth-Bunbury Highway, Western Australia

Appendix 1

Infrastructure Australia's Reform and Investment Framework[76]

Stage	Description	Components Required	Rationale
1. Goal Definition	Definition of the fundamental economic, environmental and social goals that Australia seeks to achieve. For example: • sustained economic growth and increased productivity; • lower carbon emissions and pollution; and • greater social amenity and improved quality of life.	• Formalised, comprehensive, and agreed goals, objectives, targets and indicators. • Specific and quantified goals, objectives and targets. • Outline how the initiative fits within existing infrastructure plans. • Outline of how the goals and objectives align with those of other parties (e.g.: National – including Infrastructure Australia's Strategic Priorities, State/Territory, Regional, and Local level) and across sectors.	Goals are needed against which problems and solutions can be assessed.
2. Problem Identification	Objective, specific, evidence-based, and data rich identification of problems of infrastructure systems and networks that may hinder the achievement of those economic, environmental and social goals.	• Situation Assessment – a review and analysis of the current status. • Scenario Assessment – a review and analysis of the future status that identifies: - Driver and trends of the current and future situation - Base-case using the current trends (certainties) - Alternative futures using future trends (uncertainties) • A list of Problem Statements that can be accurately defined and quantified.	Specificity regarding inadequacies is essential in order to take targeted and therefore more effective action.
3. Problem Assessment	Objective and quantified appraisal of the economic, environmental and social costs of those deficiencies, so that the most damaging deficiencies can be identified and prioritised.	• Accurate and objective assessment of the economic /environmental/ social impacts of those problems. • Priorities identified which reflect the scale of impacts.	Understanding the costs/ impact of deficiencies allows the worst problems to be identified and prioritised.

Continued...

76 ibid, p. 5

Stage	Description	Components Required	Rationale
4. Problem Analysis	Objective policy and economic analysis of why these deficiencies exist – i.e. what is the underlying cause (depending on the sector, reasons could include market failure, government failure, capital restrictions, etc). This should include an assessment of non-infrastructure reasons for the problem – e.g. land use patterns, peak demand; or education/ business hours.	• For each deficiency, analysis of why those problems have developed. • Covers both immediate and underlying causes (e.g. not just 'lack of investment', but causes of underinvestment, e.g. regulatory environment).	Understanding the causes allows effective and targeted solutions to be created. Infrastructure is often not the only cause of problems.
5. Option Generation	Development of a full range of interventions that address the issue in the domains of: • reform (regulation, legislation, governance); and • investment.	Identify the full range of Options for each problem from the domains of: • reform – e.g. independent pricing, regulation, approvals, coordination; and • investment – e.g. better use through demand management, capacity increases.	Identification of a broad range of options – across reform and investment areas – rather than relying on early judgements or pre-conceived ideas – is more likely to identify the best Solution or package of Solutions.
6. Option Assessment	Strategic analysis and cost-benefit analysis to assess those options. The appraisal should incorporate the full range of economic, environmental and social impacts (including agglomeration and trade impacts, carbon impacts, noise, and social amenity) so that the impact on all goals is measured and understood.	Qualitative and quantitative analysis including: • Strategic analysis – using high-level profiling assessment – to assist in the analysis of a large number of Options; and • Rapid analysis – using a high-level Appraisal assessment – such as a Rapid Cost-Benefit Analysis (CBA) – to assist in the analysis of a smaller of Options.	An understanding of the strategic and economic value along with the risks and uncertainties in delivery – is essential to understand how the Options or package of Options will achieve the fundamental goals outlined in Stage 1.
7. Solution Prioritisation	Identification of policy and investment priorities from the list of solutions, on an objective basis that gives primacy to the Benefit-Cost Ratio (BCR) of initiatives, but is balanced by considerations such as strategic fit and deliverability (including risk, affordability).	• A structured and objective evaluation framework – that reflects the primacy of Cost Benefit Analysis along side of the strategic value and deliverability risk – is used to make decisions on the long term infrastructure pipeline. • A review of the Solution is made against the fundamental goals/ problem identification.	BCRs provide the best available objective evidence as to how well solutions will impact on the goals outlined in Stage 1 – but is not the whole story.

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