THOMAS

EXHIBIT C

QFCI

JM

Date: 19/05/11

Exhibit Number: 425

STATEMENT OF EMMA THOMAS

I, Emma Thomas of 85 George Street, Brisbane in the State of Queensland, Acting Director-General of the Department of Transport and Main Roads, state as follows:-

Qualifications and experience

1. I am the Acting Director-General of the Department of Transport and Main Roads (**DTMR**) in the absence of David Stewart, Director-General, who is currently on recreational leave until 11 May 2011.

2. I joined the Queensland Government in January 2010 as General Manager of RoadTek, the commercialised government business unit responsible for carrying out minor infrastructure works predominantly for DTMR, but also servicing other customers.

3. In April 2010 I took up the role of acting Chief Operations Officer, and in November 2010 I was appointed Chief Operations Officer of DTMR in a substantive capacity.

4. As Chief Operations Officer I am accountable for leading the Operations Group of DTMR on state-wide delivery of road projects, asset management, operations, civil works and transport services and providing the department's regional representation across Queensland. The Operations Group is made up of the Major Infrastructure Projects, Asset and Operations, Transport Services and Roadtek Divisions.

5. I report to the Director-General, DTMR and am a member of DTMR's Board of Management and Audit and Risk Committee. The Board of Management is tasked with providing direction and leadership to the planning, management and evaluation of strategies to achieve the department's strategic objectives.

6. Before joining the Queensland Government, I worked in executive roles and project and operations management for Boeing, supporting complex programs for the Commonwealth Department of Defence. Prior to that I was an engineering officer of the Royal Australian Air Force. I hold an aeronautical engineering degree, a Masters of Science (Aerosystems Engineering), and a post-graduate Diploma in Management.

Requirement from the Queensland Floods Commission of Inquiry

7. I have received a letter from the Queensland Floods Commission of Inquiry dated 21 April 2011 and understand that I am required to provide information in my possession and identify the source or sources of that information, and make commentary and provide opinion I am qualified to give as to the appropriateness of particular actions or decisions and the basis for that commentary and opinions on the following topics pursuant to the *Commission of Inquiry Act 1950*:

   (a) My role and the role of the Director-General in relation to the upgrade of road or transport infrastructure, including crossings, generally, during and following the 2010/2011 floods ;
   referred to as "**Requirement 1 – decision-making framework**".

   (b) Any briefings or reports prepared by the department administered by the Minister or Ministers having responsibility for roads and infrastructure, or decisions made by

that department or the responsible Minister or Ministers, since 1 January 2006 in relation to potential upgrades to crossings (both road and rail), for the following waterways:

(i) Brisbane River;

(ii) Bremer River;

(iii) North Pine River;

(iv) South Pine River;

(v) Pine River;

(vi) Stanley River;

(vii) Reedy Creek; and

(viii) Lockyer Creek;

("the Waterways");
referred to as "**Requirement 2 – information about crossing upgrades**".

On Friday 29 April 2011 I received a clarification notice from the Commission advising that the Reedy Creek referred to above is a reference to the Reedy Creek which flows into Lake Wivenhoe and that Requirements 2 and 3 are confined to *"information about existing crossings over the waterways particularised in the above requirement which were subject to flooding or inundation during the 2010/2011 floods."*

(c) an account of all discussions and meetings, verbatim where possible, and any correspondence I, or the Director-General, participated in from 1 September 2010 to 30 April 2011 regarding potential upgrades to crossings for the Waterways;
referred to as "**Requirement 3 – meetings and discussions regarding upgrades**".

Requirement 1 – Decision-making framework

8. I am required to give information about the decision-making framework in operation within DTMR for upgrades to roads and transport infrastructure, before, during and after the 2010/2011 flood events. I am required to specify my, and the Director-General's role, in that framework.

9. I note at this time that my personal experience with, and knowledge of the decision-making process does not extend back beyond my appointment in 2010 and when I speak of processes prior to that time, I am reliant upon departmental information to inform my statements.

10. DTMR is a department formed under machinery-of-government changes of March 2009, by the integration of the former Departments of Main Roads and Transport. Prior to that integration the Department of Main Roads was responsible for decision-making with respect to the State-controlled road network.

11. In 2002 the former Department of Main Roads introduced its Road System Manager (RSM) Framework, based on the Austroads Integrated Asset Management Framework but modified to suit the Main Roads business context. This framework was introduced to ensure the broader government and departmental priorities were being reflected in how Main Roads determined road asset decisions. The RSM was subsequently expanded to offer a model for all departmental activities, both infrastructure and non-infrastructure

initiatives. A copy of the 2008 version of the RSM Framework summary is attached and marked **Annexure A.**

12. Upon integration of the two former departments in 2009, the RSM Framework provided a major influence on the formulation of the current integrated DTMR Business Model, a copy of which is attached and marked **Annexure B.** This Business Model provides the rationale for departmental decision-making, including decisions about upgrades to roads and transport infrastructure, balanced against the allocation of limited available funds to priority works.

13. Like the RSM, the DTMR Business Model provides a consistent state-wide approach to decision-making and prioritisation of competing needs. It allows the department to plan outcomes and outputs and program development and delivery of investments in road and transport infrastructure, including maintenance, preservation and enhancements of infrastructure, managing traffic operations and traffic demand, modal share and control of access to the road system.

14. Before major road and transport infrastructure projects proceed to strategic assessment of their service requirements, they must first be identified in the South-East Queensland Infrastructure Plan and Program 2010-2031(SEQIPP). SEQIPP is complemented by the state-wide Queensland Transport and Road Investment Program (QTRIP).

15. SEQIPP outlines estimated infrastructure investment across South East Queensland to 2031. SEQIPP was first released in 2005 and is updated annually to reflect and align with the latest planning and budget commitments. It sets timeframes and budgets to ensure infrastructure is delivered to support the region's growth. In 2011, SEQIPP is broken down into four greater regions of:

    - Greater Brisbane
    - Western Corridor and Western South East Queensland
    - Sunshine Coast
    - Gold Coast

    A copy of the current SEQIPP is attached and marked **Annexure C.**

16. SEQIPP is complemented by the QTRIP, which details the upcoming four-year program of transport and road works together in the same publication for the first time. Projects detailed in the QTRIP comprise a major proportion of the Queensland Government's infrastructure construction program to meet the needs of a rapidly-developing state. A copy of the QTRIP is attached and marked Annexure D.

17. Once identified in the QTRIP or SEQIPP, major projects are developed from concept to delivery according to the State Government's Project Assurance Framework (PAF), a copy of which is attached and marked Annexure E.

18. The Project Assurance Framework (PAF) is the foundation for ensuring that project management is undertaken effectively across Queensland Government agencies. It aims to deliver value for money from the significant investment in infrastructure projects. The PAF is a whole-of-government project assessment process. It establishes a common approach to assessing projects at critical stages in their life cycle. It aims to maximise the benefits returned to government from project investments.

19. In November 2007 the Queensland Government endorsed the PAF as the minimum standard for project initiation, evaluation, procurement and assurance across Queensland Government agencies.

20. The PAF process assists the department to evaluate major projects, including identifying appropriate funding models, better understanding the likely costs, delays, design amendments and other factors and requirements that could affect the delivery of the project.

21. The PAF has a number of steps (or gates), and each step has a specific purpose. Generally speaking, the steps required by the PAF are as follows:

    (a) Strategic assessment of service requirement

    (b) Preliminary evaluation

    (c) For traditional delivery:

        (i) Business case development;

        (ii) Supply strategy development;

        (iii) Source suppliers;

        (iv) Establish service capability;

        (v) Delivery serviced;

    (d) For delivery via the value for money framework (including potential PPP);

        (vi) PPP Business case development;

        (vii) Expressions of interest;

        (viii) Bidding process;

        (ix) Management of project agreements.

22. Briefly, the purpose of each step of the PAF process is as follows:

    Strategic assessment

    The purpose of the Strategic Assessment of Service Requirement pre-project stage is to provide information to the Director-General or appropriate delegate to assist him or her in making an informed decision regarding whether to initiate a project to meet an identified service need.

    The key activities undertaken during the Strategic Assessment of Service Requirement pre-project stage are to:

    (a) define the need to be addressed and outcome sought, and identify its contribution to government priorities and outcomes;

    (b) scope the outcome sought;

    (c) identify potential solutions to achieve the outcome;

    (d) develop a detailed plan and budget for conducting a preliminary evaluation of the potential solutions;

    (e) seek approval to proceed. The decision-maker is usually the chief executive. The primary criteria for not proceeding at this point is that the outcome sought is not a

government priority, or that there is no compelling case for government intervention on the grounds of market failure or inequity.

Preliminary Evaluation

The Preliminary Evaluation stage assesses the priority and affordability of the project options and the strategic decision of whether to invest in fully developing a business case. In this stage, it is also determined whether the project should progress as a potential PPP or non-PPP project.

The key activities undertaken during the Preliminary Evaluation stage are to:

(a) confirm the desired outcome;

(b) define the options to be evaluated;

(c) conduct a preliminary evaluation of the costs, risks and benefits associated with the identified project options;

(d) determine whether the project should be progressed through traditional delivery mechanisms or as a potential PPP project;

(e) establish initial project organisation and governance arrangements for leading and managing the project;

(f) develop a detailed plan and budget for progressing to the next stage in the project lifecycle (Business Case Development);

(g) seek approval to proceed from Cabinet Budget Review Committee (CBRC) or another project specific governing body.

Once the Project Evaluation Report (PER) has been completed, the project manager will finalise the report for the Department and submit it for approval to the appropriate level (which depends on cost of the project). A decision will then be made whether or not to proceed with the development of a business case for one or more of the options considered in the PER.

Business Case Development

The purpose of the Business Case Development stage is to undertake a more detailed analysis of the small number of potentially viable options identified during the Preliminary Evaluation stage to inform the project governing body's decision on whether to invest in the proposed project.

The key activities undertaken during the Business Case Development project stage are to:

(a) confirm the outcome sought;

(b) confirm the options to be evaluated;

(c) determine the project organisation and governance arrangements;

(d) conduct a detailed evaluation of the costs, risks and benefits associated with the identified project options;

(e) recommend a preferred option;

(f) develop a project implementation plan for the preferred option;

(g) seek approval to proceed from CBRC or another project specific governing body.

Supply Strategy Development

The purpose of the Supply Strategy Development stage is to develop and/or refine a proposed procurement approach and undertake all preparations in readiness for internal sourcing or a competitive offer (or tender) process.

The key activities undertaken in the Supply Strategy Development stage include:

(a) establish processes to ensure probity;

(b) gather demand and supply information;

(c) develop procurement specifications;

(d) undertake supply market analysis;

(e) undertake market sounding;

(f) develop a procurement strategy;

(g) develop offer (or tender) documents;

(h) develop the offer (or tender) evaluation strategy;

(i) refresh the business case (and update associated plans and registers);

(j) seek approval to proceed from CBRC or another project specific governing body.

Source supply

When the approved delivery method requires some form of procurement, the purpose of the Source Supplier/s stage, is to apply procurement policies in undertaking rigorous offer (or tender) processes and associated evaluation activities. It involves activities leading up to the point (but not including) the awarding of a contract to the preferred supplier/s. A submission is presented to CBRC or other project specific governing body seeking approval to proceed.

Establish Service Capability

The purpose of the Establish Service Capability stage is to ensure the robustness of a solution before its delivery and the readiness of the organisation/s involved in implementing any associated business changes. It may involve delivering training or implementing other change management processes.

The key activities undertaken in the Establish Service Capability project stage include:

(a) sign (award) the contract;

(b) establish contract management processes;

(c) develop change management mechanisms;

(d) create the good, service or output (product) required;

(e) check organisational readiness;

(f) refresh the business case;

(g) seek approval to proceed from CBRC or other project specific governing body.

Deliver Service

The outcome from the Deliver Service stage is to transition a project into its ongoing service delivery mode through commissioning, implementing or rolling out the goods,

services or outputs (products) produced by the project. A post-implementation evaluation is an important aspect of this stage.

23. On 18 November 2009, Transport and Main Roads established the Infrastructure Investment Committee (IIC) as DTMR's peak infrastructure investment decision-making body. It provides oversight and endorsement of the development, prioritisation and approval of the department's infrastructure investment strategies enabling the delivery of an integrated transport system. A copy of the IIC Charter is attached and marked **Annexure F.**

24. The IIC aims to improve infrastructure investment governance using an investment prioritisation framework, which focuses on ensuring consistent delivery of programs aligned with strategic priorities, and clear responsibility and decision-making processes to enable investment choices.

25. The IIC meets fortnightly and communicates its investment decisions to the senior team members (General Managers and Deputy Directors-General of DTMR) and Regional Directors via a Communique.

26. The IIC is chaired by the Deputy Director-General (Investment and Program Development), and comprises:
    - Director-General
    - Deputy-Director General (Policy and Planning)
    - Chief Operations Officer
    - Deputy-Director General (Corporate)
    - Chief Finance Officer
    - General Manager (Portfolio Investment)
    - General Manager (Program Development and Management)

28. In response to the recent flooding the IIC established a new program called the Transport Network Reconstruction Program (TNRP) to manage the recovery and reconstruction of Queensland's state-controlled transport system.

29. One of the seven objectives of this program is to identify asset enhancement opportunities for infrastructure requiring reconstruction, focusing on safety and immunity. The TNRP will identify planned opportunities in business and major programs, and if funded, integrate these with reconstruction works on damaged sections of our transport network. These works will improve immunity to flooding, improve safety on the network and continue to connect communities prior to, during and after disasters.

30. Currently DTMR is developing the 2011-12 to 2014-15 Queensland Transport and Roads Implementation Program. As the detailed TNRP is developed potential upgrading projects will be identified and funding sought from both the Australian Government for the National Highway and central state agencies for the state network. The prioritisation and progress of these submissions will be approved by the IIC.

31. It was the "gated" decision-making framework of the PAF, complemented by the DTMR Business Model, which applied to all decisions about upgrades to roads and transport infrastructure (including crossing upgrades) both before and after the 2010/2011 flood events. No decisions about upgrades to road and transport infrastructure were made during the floods as the department was in a disaster response and recovery mode. Upgrades of existing structures would be beyond the more immediate tasks involved in response and recovery.

32. It can be seen from this gated approach that there is never a sole decision-maker within DTMR who determines if a project is or is not to proceed. Such decisions are made by multiple, informed "decision-makers", both within DTMR and other related central agencies. I have attempted to articulate the role of the Chief Operations Officer and the Director-General in that complex, gated framework.

Requirement 2 – information about crossing upgrades

33. I am required to identify any briefings or reports prepared by the department administered by the Minister or Ministers having responsibility for roads and infrastructure, or decisions made by the department or the responsible Minister or Ministers, since 1 January 2006 in relation to potential upgrades to existing crossings (both road and rail), for the named Waterways that were flooded or inundated during the 2010/2011 flood events.

My comments relate to state-controlled crossings on these waterways that were affected by the floodwaters.

Brisbane River

34. I am informed that College's Crossing, Mount Crosby Road was closed three times since October 2010 as a result of floodwaters – on 15 October 2010, 15 December 2010 to 24 January 2011 and from 21 February for 10 days. Alternative arterial routes to Colleges Crossing include the Moggill ferry via Moggill Road and the Centenary Motorway and Ipswich Motorway links. When DTMR is made aware of planned releases it takes the necessary operational actions to ensure roads are closed and closures communicated to the public. I had at least one discussion with the Director-General prior to the closure of 21 February 2011, during which the Director-General and I were particularly focussed on ensuring that all necessary operational procedures had been put in place prior to this release.

35. The Honourable Craig Wallace, MP, Minister for Main Roads, Fisheries and Marine Infrastructure, has recently commissioned a study to investigate possible options to improve access during periods of increased flows in the Brisbane River, for the communities to the north and south of the Brisbane River in the vicinity of Moggill and Mount Crosby. The study is expected to commence in mid-2011 and conclude in late 2012.

36. No report currently exists for this yet to commence study. Briefings I have been able to identify and locate relevant to this study and crossing are the Parliamentary Briefing Note for the sittings of 5-7 April 2011 and the letter from Carmen Meshios, Principal Advisor to Minister Wallace to Ms Michele Rice, Manager, Ministerial Correspondence Unit, office of the Premier and Cabinet endorsed on 17 March 2011, copies of which are attached and collectively marked **Annexure G.**

Bremer River

37. I am advised that the department has, as part of the broader SEQIPP Western Ipswich Bypass study, examined the need for a new bypass road alignment to replace the existing Five Mile Bridge section of roadway. A business case examined a number of different options and recommended the construction of a 160 metre new reinforced concrete bridge upstream of the existing timber bridge. This project was proposed to be included in staging of the proposed Western Ipswich Bypass in future. The concrete bridge would be

delivered as a temporary stage 1 and under the masterplan for the Bypass, would be bypassed but retained as part of the local service road network. Funding for this project has not yet been achieved.

The Five Mile Bridge was closed due to flooding on 6, 9, 12 and 20 January 2011 and 14 February 2011.

Since the 2010/2011 floods DTMR has made a submission to the Queensland Reconstruction Authority for NDRRA funding to deliver (amongst other projects) an upgrade of the Five Mile bridge to deliver improved flood immunity.

38. Copies of briefings and/or reports about this crossing are attached and collectively marked **Annexure H.**

North Pine River

39. The A J Wyllie Bridge on Gympie Road, Petrie suffered significant damage as a result of the 2010/2011 flooding and was closed to all traffic as a result.

40. The bridge consists of two northbound lanes (low bridge) and two southbound lanes (high bridge). Both of these were closed following storm and flooding events and traffic was diverted via the Bruce Highway or Youngs Crossing Road. On one occasion Youngs Crossing Road was also closed.

41. DTMR gave high priority to restoring connectivity on the bridge. Emergency repairs were undertaken which enabled the re-opening of the southbound lanes to one lane of traffic in each direction on 25 January 2011.

42. Damage to the southbound bridge included scouring around the abutments at both ends of the bridge, damage to the embankment shoulders at the northern approach and damage to lighting ducts and cables. Design for repairs to the bridge and for replacement of abutment protectors on both the northern and southern ends of the bridge was completed in early February 2011. Damage to the northbound bridge includes major scouring around the piles on two of the piers and minor scouring at the southern abutment. It is still safe for pedestrians and cyclists to use the low bridge to cross Pine River.

43. Bridge load testing and detailed inspections were undertaken by the Bridge Design branch of DTMR, and were completed in March 2011. A copy of the AJ Wyllie Bridge Structural Repairs Report dated 9 March 2011 is attached and marked **Annexure I.**

44. A copy of the departmental briefing to the Honourable Craig Wallace, Minister for Main Roads, Fisheries and Marine Infrastructure dated 14 February 2011 is attached and marked **Annexure J.**

45. On 24 March 2011 the Honourable Craig Wallace, Minister for Main Roads, Fisheries and Marine Infrastructure announced the State Government proposal to replace the northbound section of the AJ Wyllie Bridge. The existing northbound bridge of the AJ Wyllie Bridge will be demolished and a new bridge constructed. A program of works, which includes demolition, is currently being prepared.

South Pine River

46. I am informed that the department holds no reports or records relevant to any proposed upgrade of existing crossings of the South Pine River.

Pine River

47. I am informed that the department holds no reports or records relevant to any proposed upgrade of existing crossings of the Pine River.

Stanley River

48. I am informed that the department holds no reports or briefings relevant to any proposed upgrades of existing crossings of the Stanley River.

Reedy Creek

49. I am informed that the department holds no reports or briefings relevant to any proposed upgrades of existing crossings of Reedy Creek.

Lockyer Creek

50. DTMR records reflect that on 23 February 2006, Bruce Ollason, the then Executive Director (Southern Queensland), Department of Main Roads, approved the concept of a new bridge over the Lockyer Creek on the Forest Hill- Fernvale Road to be on a minor realignment to the east, with an improved vertical alignment.

51. The Lockyer Creek Bridge was a replacement bridge delivered under the Regional Bridge Renewal Program (RBRP). I was not involved in the decision-making and delivery for this project and as it pre-dates my employment with DTMR and the state Government I can offer no informed comment on the appropriateness or adequacy of that decision and delivery, other than to say that the documentation available to me today suggests usual processes were followed. I can see nothing unusual in the decision-making and concept documentation which is attached and marked **Annexure K**.

52. I understand that programmed widening and strengthening works on the Lockyer Creek Bridge have resulted in DTMR preparing an options paper entitled *"Lockyer Creek Bridge (East bound) Strengthening Options"* dated April 2011. A copy of that options paper is attached and marked **Annexure L**. This work was programmed well prior to the recent floods and is currently moving into the detailed design phase.

53. I have above, referred to the Regional Bridge Renewal Program (RBRP). By way of clarification, and although this information is beyond the scope of this Requirement, I attach a list all the bridges built to date under the RBRP and the Accelerated Road Rehabilitation Program. This list is attached and marked **Annexure M**.

Requirement 3 – meetings and discussions regarding upgrades

53. I am asked, by Requirement 3, to provide an account of all discussions and meetings, verbatim where possible, and any correspondence I, or the Director-General, participated in from 1 September 2010 to 30 April 2011 regarding potential upgrades to existing crossings for the Waterways that were flooded or inundated in the 2010/2011 flood events.

54. I am unable to speak for the Director-General, David Stewart, with respect to all discussions and meetings he may have personally held, participated in, or convened, as the Director-General is currently overseas and unable to be contacted. For the purposes of this statement I have directed searches be undertaken of the calendar of the Director-

General (including for the period of time in December/January when Jack Noye was acting Director-General) for meetings or discussions he may have had scheduled and recorded and which fall within the scope of this Requirement.

55. I have directed that similar searches be undertaken of my calendar for my position of Chief Operations Officer, and more recently as acting Director-General.

56. All calendar records show no records for meetings or discussions by the Director-General or me with respect to the scope of this requirement. It is probable the Director-General participated in discussions of this nature, whether in formal meetings or not, but I am unable to speak to those discussions and meetings.

57. I can recall taking part in the following discussions and meetings in either my role as Chief Operations Officer or as acting Director-General with respect to the upgrades of the crossing listed above, as follows:

Colleges Crossing –Prior to the 21 February 2011 closure of Colleges Crossing due to a planned water release, I recall discussing this crossing with the Director-General, David Stewart and the Acting General-Manager (Assets and Operations), Shane Doran. I do not recall that discussion verbatim but do recall that both the Director-General and I were focussed on ensuing DTMR's operational response to the planned water release was appropriate and adequate to ensure safety of the travelling public.

I also recall discussing with the Acting General-Manager (Assets and Operations) the possibility of further consideration being given to options for Colleges' Crossing in the future. This study will be undertaken by DTMR commencing mid 2011.

I do not recall these discussions verbatim, nor the precise dates on which they took place.

Haigslea-Amberley Road crossing of the Bremer River – I have no recollection of being involved in any such discussions or meetings.

A J Wyllie Bridge on Gympie Road, Petrie – I recall receiving email correspondence relevant to the closure of the Bridge and the subsequent decision to upgrade the northbound section of this bridge. Copies of relevant email correspondence are collectively attached and marked **Annexure N.**

Lockyer Creek Bridge – this realignment pre-dates my employment with DTMR and I have no recollection of participating in any such discussions or meetings since joining DTMR.

58. I make this statement of my own free will believing its contents to be true and correct.

Dated at Marriott Hotel Sydney this Fourth day of May 2011.

[redacted] [redacted]

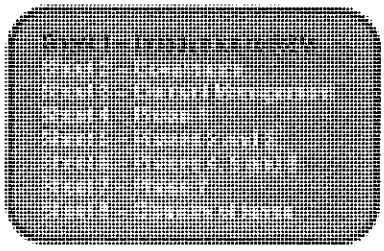
Emma Thomas Witness

Annexure A

Road System Manager Framework

RSM Information Sheet

Sheet 1: Introduction to the RSM Framework



Purpose

A series of information sheets have been planned to improve and promote a consistent understanding of the Road System Manager (RSM) Framework.

The main objective of these information sheets is to provide more clarity on the roles and accountabilities of various business units in the department with regard to the framework.

This information sheet outlines how the RSM Framework fits organisationally and introduces future Information Sheets which will describe key roles within them.

Refer to Sheet 8 for a complete glossary of terms used in these Information Sheets.

History

In 2002 Main Roads introduced its Road System Manager (RSM) Framework, based on the Austroads Integrated Asset Management Framework[1] but modified to suit the Main Roads business context.

The RSM Framework was introduced to ensure that broader government and departmental priorities were being reflected in how we determined road asset decisions. This has since been expanded to offer a model for all departmental activities, both infrastructure and non-infrastructure initiatives.

With Government increasing its expectations that the work we do will be appropriately costed, well-packaged and be delivered on time, and that it is designed to perform effectively throughout its entire life, the RSM framework has informed two of the key steps taken by Main Roads to respond to those expectations through:

- our departmental restructure; and
- the new strategic plan.

The Purpose of the RSM Framework

The Framework for Road System Management provides a consistent state-wide approach for Main Roads as a modern state road agency. It provides a high level view of Main Roads' end-to-end processes in meeting government priorities and community outcomes, and provides an environment for decision-making, policy development and support.

It describes what we do in Main Roads so together we can have a unified view of the part we play in our networked organisation.

Context

The RSM Framework comprises sound forward planning of outcomes and outputs, programmed development and delivery of investments in the road system, and review of how effective the investments have been in achieving the desired outcomes. The scope of investments can cover maintenance, preservation and enhancements of infrastructure, managing traffic operations, and also managing traffic demand, modal share and control of access to the road system. The framework does this through applying a consistent state-wide approach to identifying and prioritising investment needs.

The framework responds to systematic issues Main Roads had been experiencing over the years, such as inconsistencies in:

- work practices and standards,
- funding allocations, and
- road system performance.

It is a re-alignment of things we do to get more value, rather than a total change for the department.

[1] Austroads (2002) *Integrated Asset Management Guidelines for Road Networks* Report No. AP-R202/02.
Austroads (2006) *Guide to Asset Management Part 1: Introduction to Asset Management* Report No. AGAM01/06

Benefits of the RSM Framework

The framework improves portfolio outcomes through a better understanding of how investments in the network influence road system performance, and provides:

- a sound basis for managing risk at all levels of road system management;
- a sound approach to managing road system priorities through needs assessment against system performance targets;
- current investment needs (including backlogs) articulated across a comprehensive range of work elements;
- sound support for well informed submissions to government for substantial additional funding for asset maintenance and rehabilitation, through more reliable information on investment needs;
- a sound basis for well informed business cases for improving investment in element data and decision support systems;
- more scope for delivery options and better relationships with suppliers.

RSM within the Wider Main Roads' Business Framework

Main Roads' core business is the management and stewardship of the State-controlled road network on behalf of the people of Queensland. The department has in place a number of high level key frameworks that allow it to meet the requirements of its total business. These key frameworks define how specific parts of the business work.

The RSM Framework describes how Main Roads achieves the best road system performance for the available budget and resources, through a seven-phase process of objective setting, planning, delivery, monitoring and refinement of infrastructure and non-infrastructure initiatives. In this respect, the RSM Framework both focuses and plays a significant part in Main Roads' total business. It will not be as effective however, if it is not aligned with and enabled by the other departmental key frameworks.

Figure 1 presents the seven phase RSM Framework in relation to some of the other key frameworks in the department, to the nature of our organisation, and to the external drivers of our business.

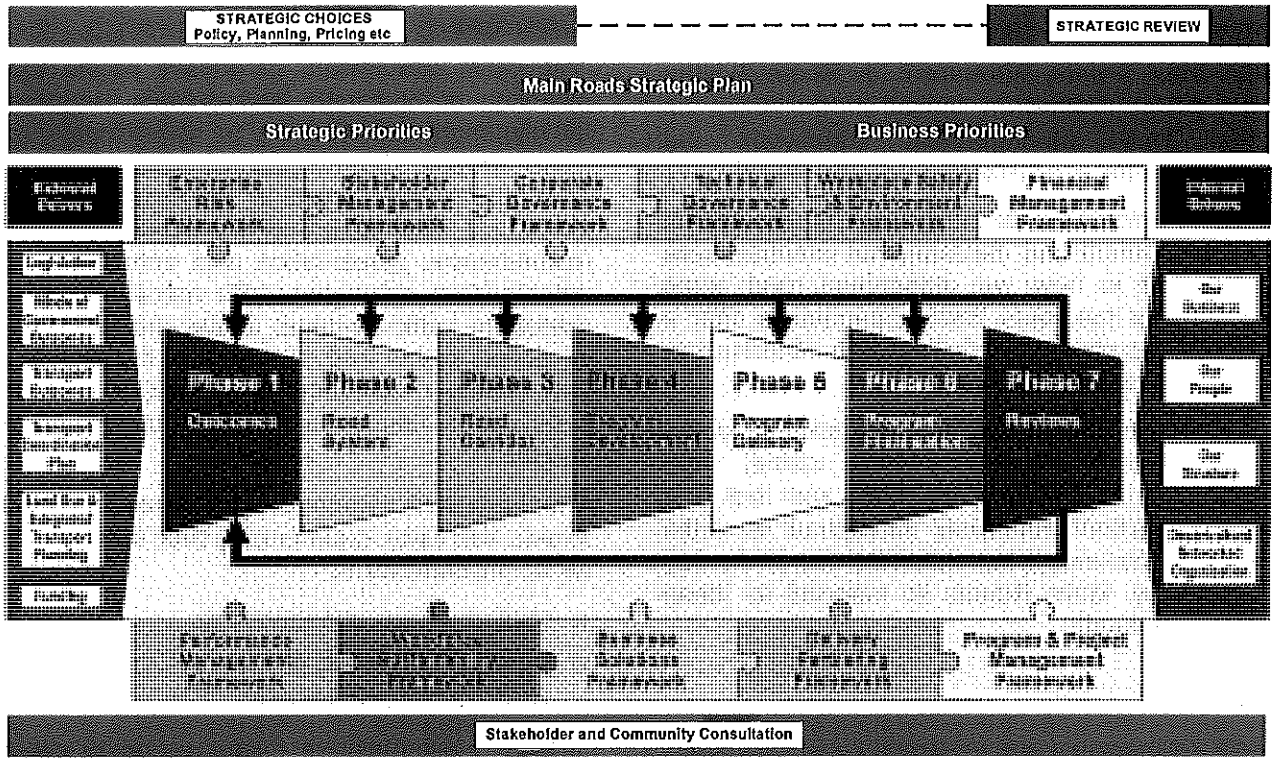


Figure 1 - Main Roads Business Framework

In September 2008, SMG adopted this Business Framework as a useful guide to explaining how the RSM Framework fits within the way Main Roads does its business, and also how all staff roles contribute to the business.

Our business structure and the accountabilities of our GMs have been revised to support the RSM Framework. We are a decentralised and networked business, so GMs with accountabilities under the RSM Framework will rely heavily on many areas of the department to meet these accountabilities.

RSM Phases

The work flow of Main Roads' core business is described in terms of seven RSM Phases. The scope of each phase is described in Table 1 attached. Further information about the framework and its phases is available through the **RSM Portal** on the Main Roads Intranet.

The phases represent the logical progression of road network stewardship tasks from planning and programming through to delivery of works, network operations and review of performance. In reality, work is occurring in most phases simultaneously at any time. Feedback of performance information and learnings from later to earlier phases is also critical to the effective performance of the RSM Framework.

While the RSM Framework represents our internal road network stewardship accountabilities and work flow, it operates in a context of external drivers and constraints that influence how Main Roads interacts with its external stakeholders in government and the Queensland community.

These drivers and constraints include legislation, government outcome expectations and priorities, state, national and international agreements, the Queensland Transport Coordination Plan, community and industry submissions, regional infrastructure plans and funding.

Regular, meaningful and productive engagement with our external stakeholders at all levels, and across all phases, is essential for the RSM Framework to operate effectively.

Information Sheets

This is the first information sheet of a set which will comprise the following:

1. Introduction to the RSM Framework
2. Governance of the RSM Framework
3. Element Management
4. Key Accountabilities in RSM Framework Phase 1
5. Key Accountabilities in RSM Framework Phases 2 and 3
6. Key Accountabilities in RSM Framework Phases 4, 5 and 6
7. Key Accountabilities in RSM Framework Phase 7
8. Glossary of Terms

The scope of these sheets covers only the RSM Framework. Information on other frameworks that enable the RSM Framework is available from other sources.

These information sheets are subject to review and change. Road System Governance Branch has been asked by the state-wide General Managers to collate feedback for response.

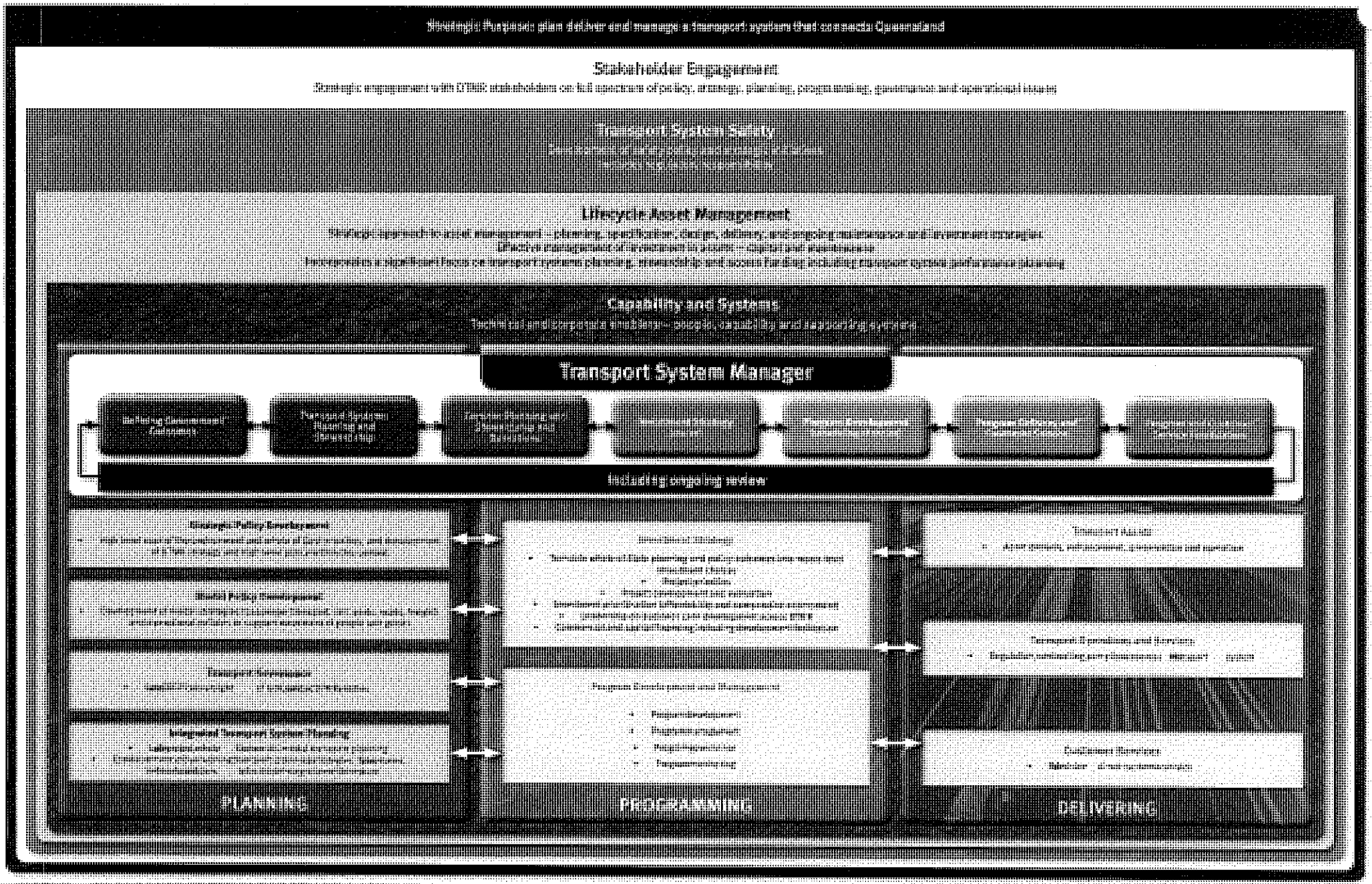
If you would like to provide any comments or require further information regarding this sheet, please contact Clare Driver, Principal Manager (RSM), Road System Governance Branch on 3834 3866 or via email

Table 1 - RSM Framework Phase Descriptions

Phase 1 Outcomes	Phase 2 Road System	Phase 3 Road Corridor	Phase 4 Program Development	Phase 5 Program Delivery	Phase 6 Project Evaluation	Phase 7 Reviews
This phase senses and interprets the external environment to provide tangible direction for Main Roads outcomes and high level outputs.	This phase translates the broad strategic choices and priorities identified under phase 1 into plans of action for improving the state-wide road network. It involves the setting of visionary targets, funding and implementation strategies for a 20 year period.	This phase concentrates on forward plans and road investment strategies at the corridor level which are consistent with the state-wide approach defined under Phase 2.	The aim of this phase is to produce a prioritised list of investment candidates and 5 year program funding (the RIP) across the regions and within the work element categories that make up maintenance, operations and enhancement of the network.	The aim of this phase is to deliver the RIP so that the infrastructure is in operational use and meets the needs identified in earlier phases. It includes the preliminary and detailed design, construction and maintenance of the infrastructure and management of operations within road corridors.	This phase evaluates the project and program performance against targets set in the RIP Business Rules and other departmental policies and directions.	This phase measures actual outcomes against the desired outcomes identified in Phases 1 and 2. The purpose of the phase is to produce performance results and analysis that will inform decision-making back at Phase 1 and 2.
KEY PHASE OUTPUTS						
Roads Connecting Queenslanders	State-wide Plan	Queensland Road System Performance Plan Road Route Strategies Road Link Plans Statement of Intent	Roads Implementation Program	Projects Delivery Progress Reports	Project Finalisation Reports Delivery Performance Report	Asset Performance Report Corridor Performance Report Element Performance Reports

Annexure B

DTMR Business Model


Stakeholder Engagement
Transport System Security
Lifecycle Asset Management
Capability and Systems
Transport System Manager
PLANNING
PROGRAMMING
DELIVERING

Annexure C

South-east Queensland Infrastructure Plan and Program 2010-2013

South East Queensland

Infrastructure Plan 2010–2031

Foreword

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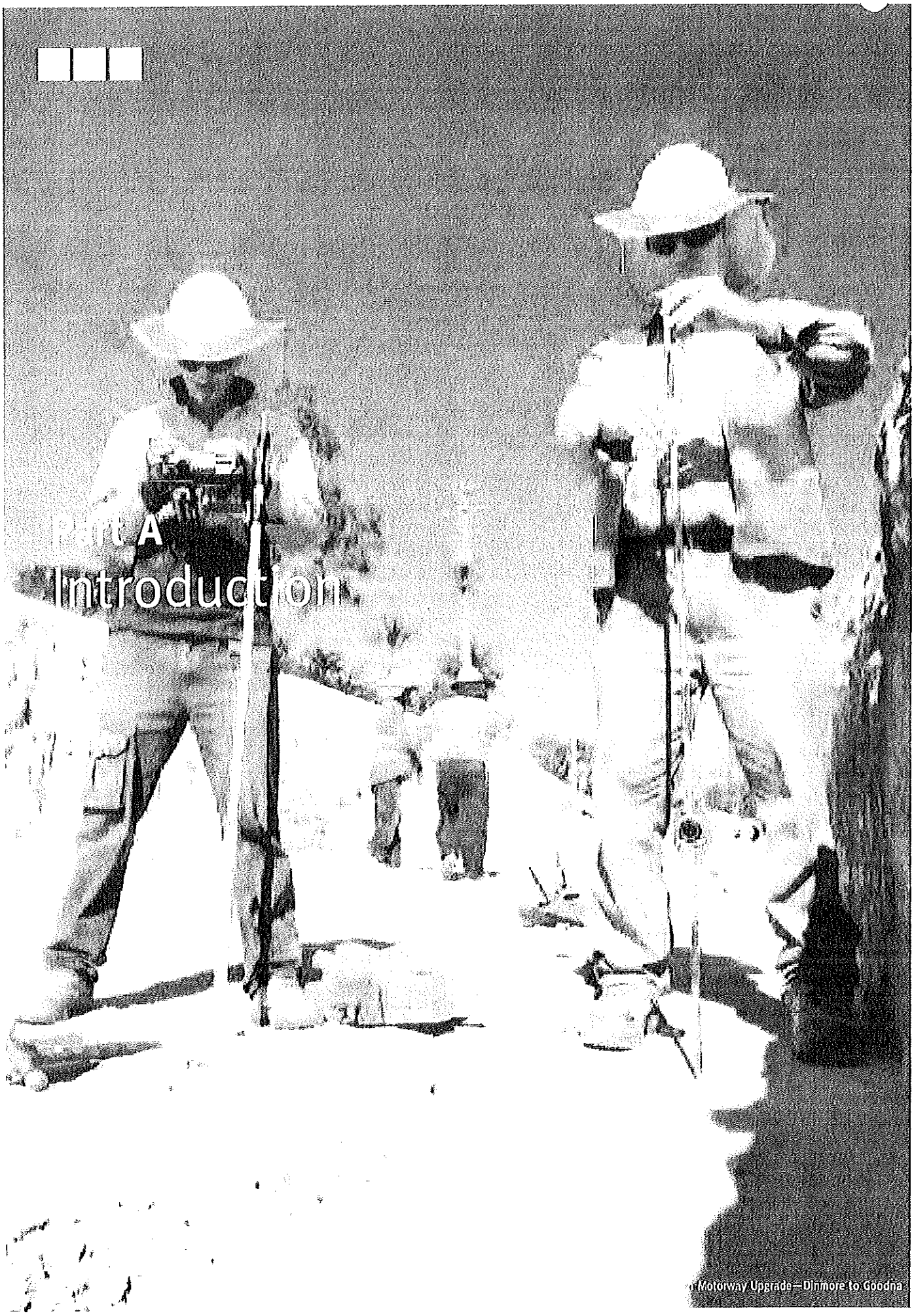
Introduction



Motorway Upgrade—Dinmore to Goodna

Role of SEQIPP

The *South East Queensland Infrastructure Plan and Program 2010–2031* (SEQIPP) outlines the Queensland Government's infrastructure priorities to support the *South East Queensland Regional Plan 2009–2031* (SEQ Regional Plan). It establishes priorities for regionally significant infrastructure over the next four years and outlines the longer-term planning horizon to 2031.

First released in 2005, the plan is updated annually to reflect and align with the latest planning and budget commitments. It sets relevant timeframes and budgets to ensure the timely delivery of infrastructure to support the region's growth.

This year's SEQIPP remains relatively unchanged. Next year when it transitions to a state-wide document it will be realigned to more effectively link to Growth Management Summit outcomes including regionalisation and feedback from Local Government's on population estimations.

The plan gives direction and momentum to infrastructure and services investment, taking into account other government plans and policies including:

- SEQ Regional Plan 2009–2031
- Queensland Growth Management Summit findings
- The Queensland Government budget process
- Toward Q2: Tomorrow's Queensland
- Queensland Transport and Roads Investment Program
- Queensland Government Economic Policy
- Health Services Strategy
- Queensland Skills Plan
- Queensland Housing Affordability Strategy
- South East Queensland Water Strategy.

As these plans are revised more detailed infrastructure planning takes place. This means that while the first four-year period will predominantly remain unchanged, projects listed in the longer-term planning horizon may change to better reflect the emerging needs of the region.

SEQIPP is integral to ensuring a sustainable future for South East Queensland.

Other Queensland Government plans and policies

While some areas of infrastructure are not covered in this plan, they are outlined in other Queensland Government plans and policies and are still significant for Queensland.

Information and communication technology

Toward Q2 through ICT 2009–2014 – the Queensland Government's strategy for government ICT outlines priorities and targets to help create more accessible, efficient and effective services for all Queenslanders.

For more information, visit www.qgcio.qld.gov.au.

Social housing

The South East Queensland region will continue to benefit from the social housing component of the Nation Building Economic Stimulus Plan. This will supply much-needed social housing and maximise the involvement of the not-for-profit sector across the state.

For more information visit www.public-housing.qld.gov.au.

Tourism

The recently released *Tourism Action Plan* to 2012 has a strong focus on tourism investment and infrastructure development.

For more information visit www.industry.qld.gov.au.

Queensland Growth Management Summit

The Queensland Growth Management Summit, held in March 2010, explored solutions for a way forward and delivered new strategies for the future of a growing Queensland population.

Experts in planning, development, infrastructure and sustainability led discussions around the three key themes of prosperity, sustainability and liveability.

As a result of the summit, the Queensland Government has announced 22 new initiatives and 25 new supporting actions as their official growth management response. Some of the key announcements related to SEQIPP include:

- Establishment of a Queensland Infrastructure Plan (QIP) that will be a long term planning document for infrastructure for the entire state, integrating SEQIPP and other state planning documents.
- Establishment of Growth Management Queensland, to improve development approval processes, create delivery timetables for land supply, accelerate development of infill sites and delivery of transit oriented development precincts and protect and improve liveability in our community.
- Establishment of a new Infrastructure Charges Taskforce to look at how local governments deliver infrastructure for new development in Queensland.
- Development of three new master planned cities at Ripley Valley, Greater Flagstone and Yarrabilba that will become Queensland's first model communities and drive population growth to the west of South East Queensland.
- Work in partnership with local government to confirm the distribution of dwelling targets within South East Queensland, helping to strengthen the link between infrastructure investment and accommodating dwelling targets.

For the full Queensland Government response to the Queensland Growth Management Summit visit www.qld.gov.au/growth.

Queensland Infrastructure Plan

In 2011, a Queensland Infrastructure Plan (QIP) will be developed to ensure the capital works program is ready to anticipate and manage population growth across the state.

QIP will clearly link infrastructure delivery with population and economic development priorities, simplifying infrastructure planning and delivery through the inclusion of existing successful infrastructure planning documents such as SEQIPP, Far North Queensland Infrastructure Plan and the Road Implementation Program.

The plan will clearly list infrastructure priorities linked to growth issues and link closely with regional and state-wide initiatives being delivered through Growth Management Queensland.

QIP will provide:

- A clear state-wide blueprint of road, public transport, health and education infrastructure needs to match forecast population growth.
- A clear state-wide pipeline of targets with the credibility to attract federal funding.
- A robust prioritisation, sequencing and maturity assessment of projects across all of Queensland's regional planning frameworks.
- A plan that incorporates significant economic development activities (such as the new LNG industry) and associated infrastructure needs.

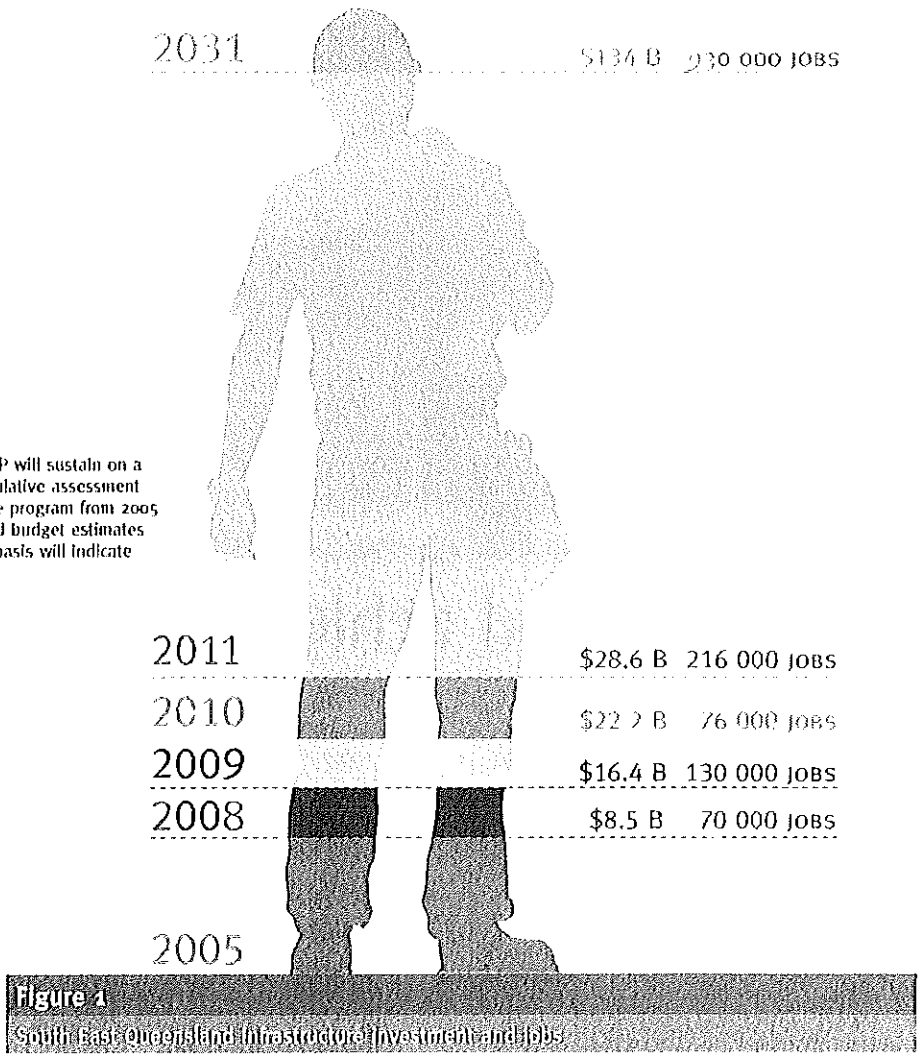


Figure 1
South East Queensland infrastructure investment and jobs

Note: This figure is an estimate of the job numbers SEQIPP will sustain on a year-by-year basis. The program job target is a cumulative assessment of the job numbers based on the total spend for the program from 2005 to 2031. The 2011 data is based on current projected budget estimates and program spend. Future investment on a yearly basis will indicate job numbers against the target estimate.

Job creation

The Queensland Government set a target to create 100 000 new jobs to guide Queensland through the global financial crisis and make the state even stronger than before.

The four-point plan to reach this target by 2012 is:

- keeping Queensland's record building program going
- preparing for recovery by developing skills for the future
- creating new jobs by supporting the new industries of the future like liquefied natural gas (LNG) and solar, while focusing on traditional strengths like tourism
- developing new job creation programs.

SEQIPP investment for the region through to 2031 is estimated to reach $134 billion.

This investment will fund regionally significant projects across the transport, water, energy, social and community infrastructure sectors.

These projects are estimated to support up to 930 000 jobs through to 2031.

Some of the major job generating infrastructure projects across the region include:

- Reconstruction of the 3.3 kilometre section of the Pacific Motorway between Springwood South and Daisy Hill. This will sustain an average of 1409 direct and indirect jobs over the life of the project.
- Construction of the Eastern Busway connecting the South East Busway at Buranda to Main Avenue at Coorparoo. This will generate 2509 direct and indirect jobs over the life of the project.
- Stage one of the Gold Coast Rapid Transit project linking Griffith University to Broadbeach via the key activity centres of Southport and Surfers Paradise. This will generate 6300 direct and indirect jobs over the life of the project.
- Construction of the 750 bed Gold Coast University Hospital. This will generate 9847 direct and indirect jobs over the life of the project.
- Construction of the 359 bed Queensland Children's Hospital. This will generate 7744 direct and indirect jobs over the life of the project.

Future major projects such as Cross River Rail, future stages of Gold Coast Rapid Transit and the Bruce Highway Upgrade have the potential to become some of the biggest job generators across the state.

To support this job generation, the Queensland Skills Plan outlines the measures the Queensland Government will take to ensure people with adequate skills are trained to deliver infrastructure projects into the future.

Highlights and achievements

SEQIPP remains the largest regional infrastructure plan in Australia. It gives a long-term outlook on investment, providing certainty to industry and the community. It also identifies an estimated $134 billion in infrastructure projects to support regional planning outcomes in South East Queensland to 2031.

Estimated SEQIPP funding in 2010-11 is about 33 per cent of capital spending across the state.

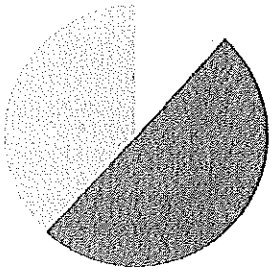
It is estimated that an average of $37 000 per South East Queensland resident will be spent to 2031 to deliver infrastructure across the region.

The Queensland Government is getting on with the job of delivering vital infrastructure for the region.

Some of the key projects completed over the past 12 months include:

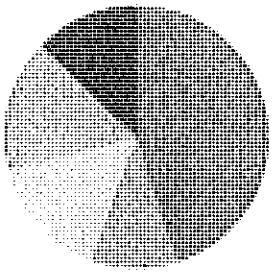
- The Ipswich/Logan Motorway Interchange—the completed $255 million federally-funded project opened to traffic in November 2009, improving both safety, reliability and traffic flow for Ipswich Motorway motorists and local access to Gailes and Goodna.
- Ipswich Courthouse, police station and watch house—the $110 million Ipswich legal precinct opened for business in December 2009. It includes a new major courthouse, a watch house and a new 24-hour police station. The courthouse includes eight Magistrates courtrooms, one of which is a specialist Children's Court, three District Court courtrooms, registry and office accommodation for Department of Justice staff.
- North Lakes Health Precinct—construction of the new North Lakes Health Precinct was completed in 2009, giving local residents access to services including children's health, dental clinics and antenatal clinics.
- Toowoomba Pipeline—opened in January 2010, the 38 kilometre Toowoomba Pipeline has the capacity to transport 14 200 megalitres a year and, ultimately, up to 18 000 megalitres a year to secure Toowoomba's water supply.
- Eastern Busway—stage one of the Eastern Busway was opened in August 2009 connecting the University of Queensland and the Eleanor Schonell Bridge to the South East Busway at Buranda. The busway includes a new station at Princess Alexandra Hospital and the new Boggo Road busway station located adjacent to the Park Road rail station.
- Northern Busway—stage one of the Northern Busway from Royal Children's Hospital to Windsor was opened in August 2009. It links with the Inner Northern Busway and includes a new station at the Royal Brisbane and Women's Hospital.
- Beerwah grade separation—opened to traffic in November 2009, the Beerwah rail crossing project eliminated the rail level crossing to improve safety for road and rail traffic. Safe and easy pedestrian access across the rail corridor and a new pedestrian and cycle path was also constructed as well as a new pedestrian underpass under Roberts Road.
- Robina to Varsity Lakes Rail Extension—this $324 million project included a new rail track from Robina to Varsity Lakes. It included the new Varsity Lakes Station complete with a 300-space commuter car park.
- Gold Coast Highway bus priority—opened in February 2010, the Gold Coast Highway T2 transit lanes run from Broad Street down to the Loder Creek bridges, providing priority and faster passage to high-occupancy vehicles such as taxis and buses.
- Go Between Bridge—Brisbane City Council's Go Between Bridge (formerly Hale Street Link) is now operational. The four-lane toll bridge connects the northern and western suburbs with South Brisbane and West End.
- Clem Jones Tunnel (CLEM7)—the CLEM7 tunnel opened to traffic on 15 March 2010. The 6.8 kilometre tollway links five major roads north and south of the Brisbane River. It is the first section of Brisbane's new M7 motorway, due to be fully completed in 2012 following the construction of the Airport Link tunnel. The M7 will provide a direct link from Woolloongabba to the airport and fast-growing northern suburbs.

Figure 2
Portion estimated investment



	Investment so far (119 projects) $16 B
	Planned investment to 2014 (152 projects) $67.3 B
	Estimated investment to 2031 (128 projects) $50.9 B
Total	$134.2 B

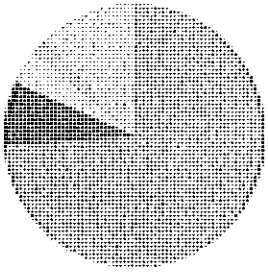
Figure 3
Summary of infrastructure by greater region



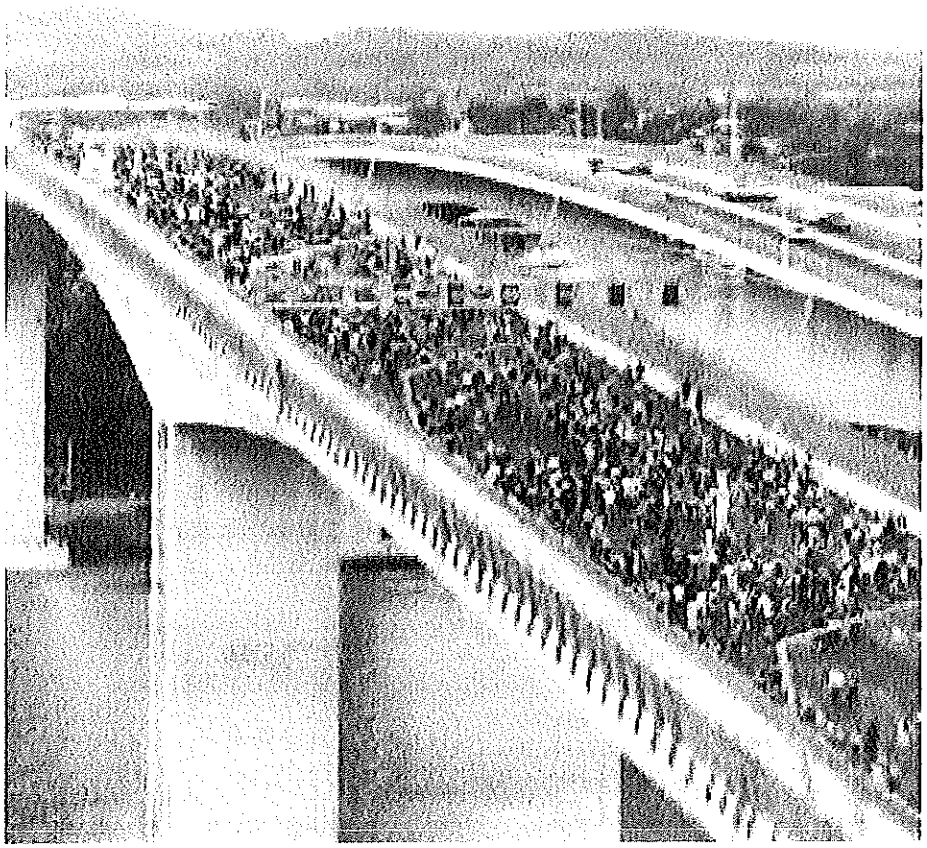
	Greater Brisbane $60.4 B
	Gold Coast $14.2 B
	Sunshine Coast $20.9 B
	Western Corridor and Western SEQ $21.7 B
	SEQ-wide $17 B

Note: These totals include completed project costs.

Figure 4
Estimated investment by asset class



	Transport $97.7 B
	Water $1.5 B
	Community services $3.8 B
	Health $6.8 B
	Energy $5.4 B
	Education and training $3 B
	Completed projects $16 B



Sir Leo Hielscher Bridges

The new Sir Leo Hielscher Bridge opened to traffic six months early in May 2010.

A community open day was held on 16 May 2010 to celebrate the opening.

This bridge is part of the Gateway Upgrade Project which includes construction of a second bridge, 12 kilometres of upgrades to the Gateway Motorway in the south and 7 kilometres of new motorway in the north.

In addition to the 10 minutes in travel time savings already being experienced due to free-flow tolling and completed upgrades, it is expected motorists will save an additional 15 minutes when the project is fully completed.

The entire project is expected to be opened in stages over 2010.

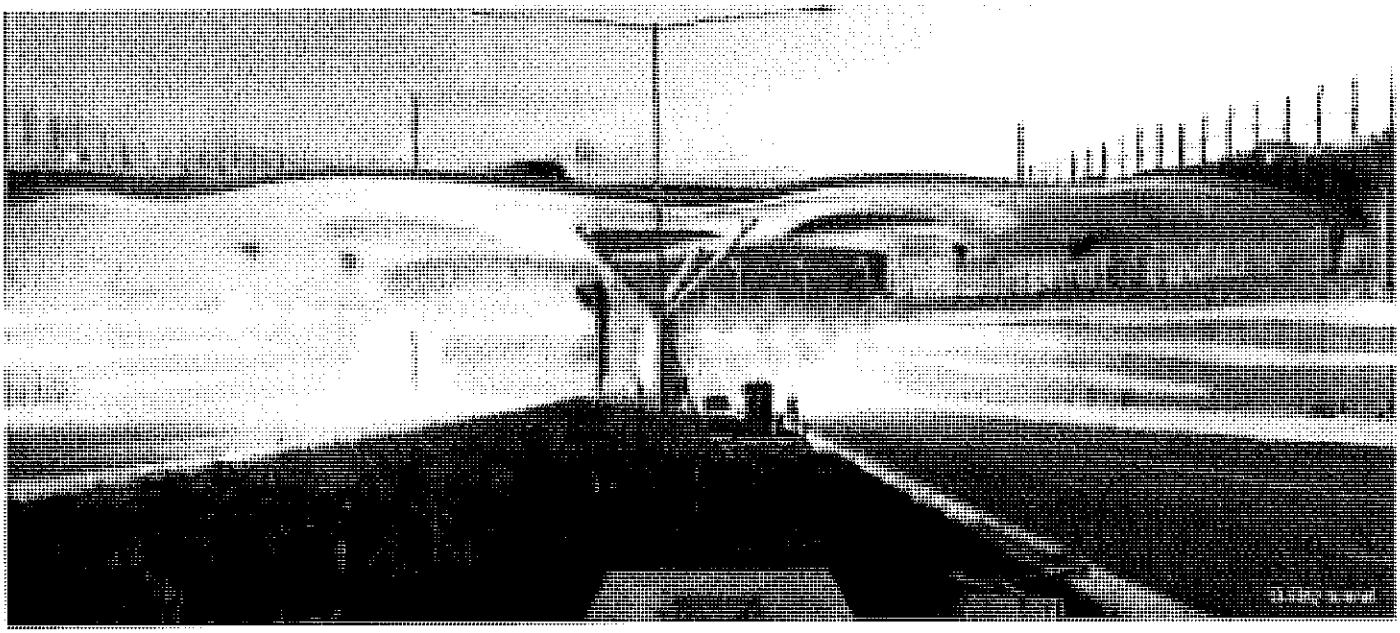
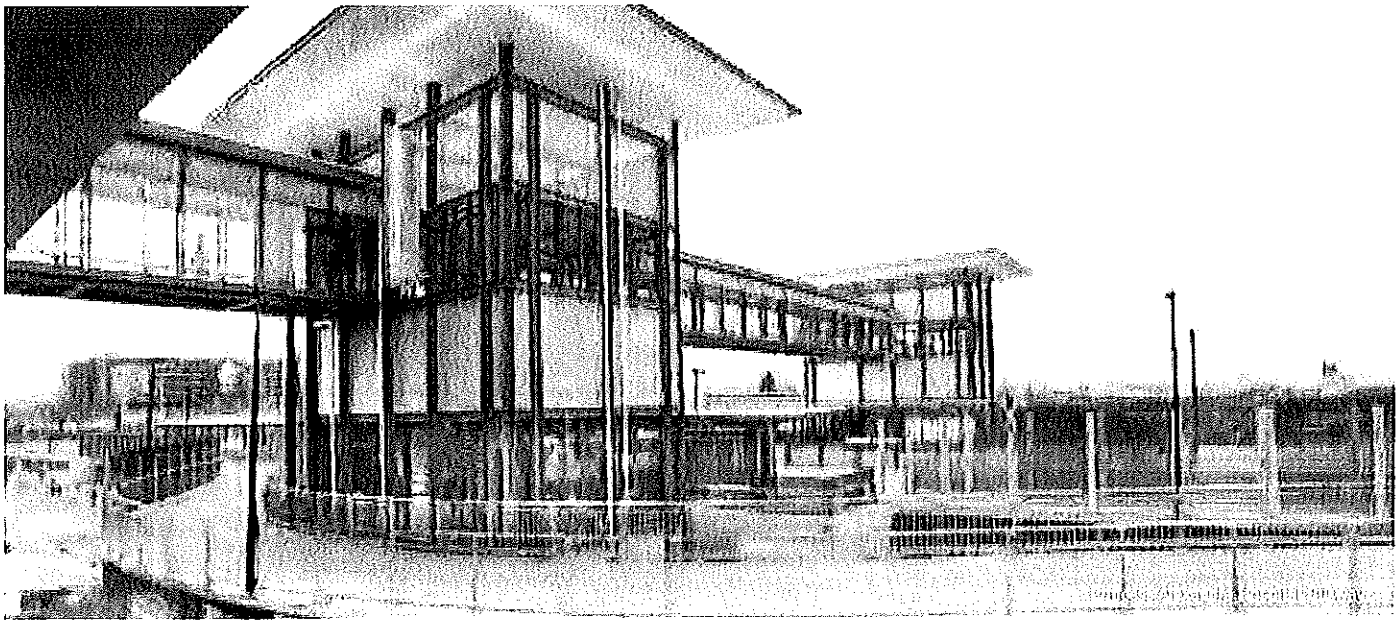


Figure 5 – Delivered projects pipeline (119 completed projects)
Projects completed in 2005–2009

Abermain substation
Aquatic Centre upgrades – Mt Gravatt, Runcorn and Redcliffe
Australian TradeCoast Transport Study
Automotive trade training facility – Toowoomba
Bounty Boulevard State School
Bribie Island Groundwater Project[1]
Brisbane Aquifer Project
Brisbane Cricket Ground Woolloongabba
Bromelton Off-Stream Storage
Browns Plains Health Precinct
Burpengary Meadows State School (Stage 1 and 2)
Bus priority on Smith Street – Olsen Avenue to Gold Coast Highway
Caboolture Northern Bypass
Caloundra Road – additional lanes from Bruce Highway to Pierce Avenue
Caltex Brisbane Recycled Water Project (BCC project)
Cedar Grove Weir
Centenary Highway Boundary Road underpass (joint Brisbane City Council and Main Roads project)
Centenary Highway two lanes – Springfield to Yamanto
Chancellor State College (Stage 2)
Clive Berghofer Stadium – Toowoomba upgrade
Construction of major substations at Algester (Brisbane), Goodna (Ipswich), Molendinar (Gold Coast) and Sumner (Brisbane)
Construction of new transmission lines between Belmont and Murarrie (Brisbane), between Greenbank (Logan) and Maudsland (Gold Coast) and between Middle Ridge (Toowoomba) and Greenbank (Logan)
Coomera Springs State School (Stage 1 and 2)
Cricket Centre of Excellence, Albion – Stage 1
Eastern Pipeline Interconnector
Enoggera Reservoir Water Treatment Plant
Further TransApex investigations – Airport Link
Gold Coast Convention and Exhibition Centre extension
Greenbank substation
Hamilton/Eagle Farm Transport Investigation
Helensvale to Robina, Salisbury to Kuraby – additional rail track and upgrades
Highland Reserve State School
Inner City Bus Access Capacity Study
Inner Northern Busway improvements and new busway stations
Ipswich Motorway alternative northern corridor investigation
Ipswich to Springfield Public Transport Corridor Study
KTIA Nicklin Way – additional lanes
Lamington – Springbrook Great Walk
Linkfield Connection Road
Merdian State College (Stage 1 and 2)
MMTC – Caloundra–Mooloolaba Road (new two-lane road) – Caloundra Road to Creekside Boulevard
New passenger rail stock – (24 x 3-car sets)
New zone substations in Currumundi, Holland Park and Wacol South
Norfolk Village State School
Northern Link – Toowong to Kelvin Grove tunnel investigation
Northern Pipeline Interconnector – Stage 1 and Ewen Maddock Water Treatment Plant
Ormeau to Coomera – rail track duplication
Ormeau Woods State High School
Pacific Motorway – Stewart Road Currumbin interchange (Tugun Bypass)
Pacific Motorway – Tugun Bypass
Park Lake State School
Pine Rivers Courthouse, Strathpine
Qld Sport and Athletics Centre, Nathan upgrade – hydrotherapy centre
Queensland Sport and Athletics Centre, Nathan
Queensland Tennis Centre, Tennyson
Recycling, desalination and groundwater investigations and preliminary studies
Salisbury to Flagstone/Greenbank passenger rail investigation
Sandgate Courthouse
Skilled Park, Robina
South Pine substation



Southbank Institute of TAFE
Southern Regional Water Pipeline
Springfield Lakes State School
State Softball Centre, Ormiston
Stretton State College (three stages)
Subsidies paid for completed local government projects
Sunshine Motorway – Sippy Downs to Kawana Arterial
Sunshine Motorway upgrade – Maroochydore Road to Pacific Paradise (including Maroochy River Bridge)
The Prince Charles Hospital – upgrade to general hospital
Underground subtransmission cables between Crestmead and Browns Plains North substations
Warrego Highway – Plainlands interchange
Western Corridor Recycled Water Project

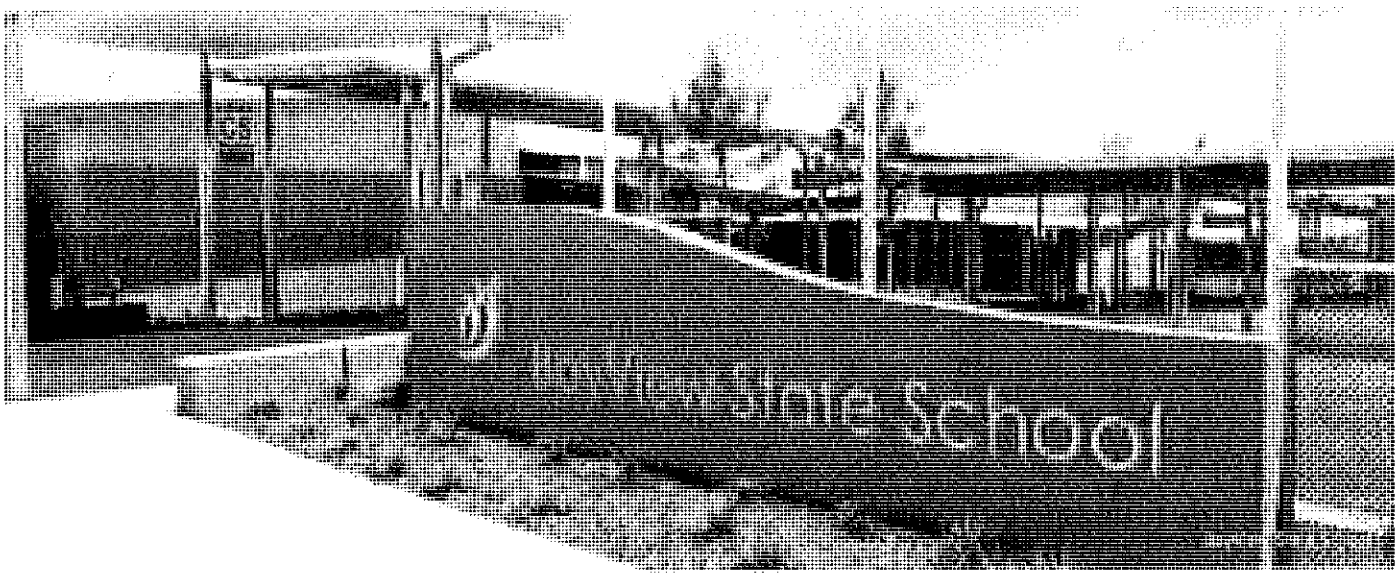
Project completed in 2009–10

Bay View Primary School (Stage 1)
Brisbane North Institute of TAFE – Grovely
Bruce Highway additional lanes from Boundary Road to Caboolture
Campus establishment – Kawana
Clem7 (North–South Bypass Tunnel)
Conondale Range Great Walk
Cooloola Great Walk
Eastern Busway – Buranda to PA Hospital to Boggo Rd to Eleanor Schonell Bridge
Annerley – replace underground cables nearing end life with new larger cables
Southport – increase substation capacity by installing third transformer
Gateway Motorway, Nudgee Rd to Bruce Highway planning study
Gold Coast Highway – bus priority and bus stations
Grade separation of Mt Lindesay Highway and interstate rail, Acacia Ridge
Hale Street Link (Go Between Bridge - BCC project)
Highfields indoor multi-purpose auditorium
Houghton Highway duplication and bus priority (Ted Smout Memorial Bridge)
Ipswich court, watchouse and police station
Ipswich/Logan Motorway interchange
Kurilpa Bridge
Metropolitan South Institute of TAFE – Loganlea
Mt Lindesay Beaudesert strategic network investigation
Nautilus study
North Lakes Health Precinct
Pacific Motorway Bikeway
Peregian Springs Primary School (Stage 1)
Powerlink upgrades – South Pine to Sandgate line (275/110 kV)
Rail crossing grade separation – Beerwah
South East Queensland (Gold Coast) Desalination Facility
Southern Freight Rail Corridor Study
Toowoomba Pipeline – Wivenhoe to Cressbrook
Pressure Reduction and Leakage Management Program[1]
Western Brisbane transport network investigation

Completed under Stage 2 – 06 to 2009–10

Caboolture to Beerburrum additional rail line
Caboolture to Bribie Island Road additional lanes from Aerodrome Road to Pasturage Road
Cunningham Highway to Warrego Highway connection study
Hope Island Road – duplicate 2 to 4 lanes from Columbus Avenue to Lae Drive
Maroochydore Road – additional lanes from Bruce Highway to Martins Creek
Mitchelton to Keperra rail line – track duplication
Mt Lindesay Highway upgrade – Green Road to Rosia Road section
Nerang–Broadbeach Road – intersection upgrades
Southern extension of rail line (Robina to Varsity Lakes extension)
Warrego Highway–Brisbane Valley interchange study

Notes:
1. All works within the project scope have been completed, however some works are continuing to optimise project outcomes.
2. This figure does not include three Energex network program upgrades across South East Queensland completed during 2005 and 2009.



About SEQIPP

SEQIPP was first released in 2005, and is updated annually to reflect and align with the latest planning and budget commitments. This year it has transitioned to better complement the new priorities and timeframes set in the SEQ Regional Plan.

The format takes a greater-region approach to allow communities to get a snapshot of infrastructure planned or underway in their local area, from transport through to schools and hospitals.

The four greater-regions are Western Corridor and Western South East Queensland, Sunshine Coast, Gold Coast and Greater Brisbane. There is an additional section for South East Queensland outlining infrastructure spanning the entire region including water, energy, ports and freight.

The plan has been broken down into these four greater-regions to best reflect the regional growth areas within the Urban Footprint—defined in the SEQ Regional Plan 2009–2031—and the connecting transport and infrastructure supporting these areas.

The document provides a snapshot of the population, infrastructure and expenditure, information on regional outcomes and the infrastructure to meet these goals in each of the four greater-regions.

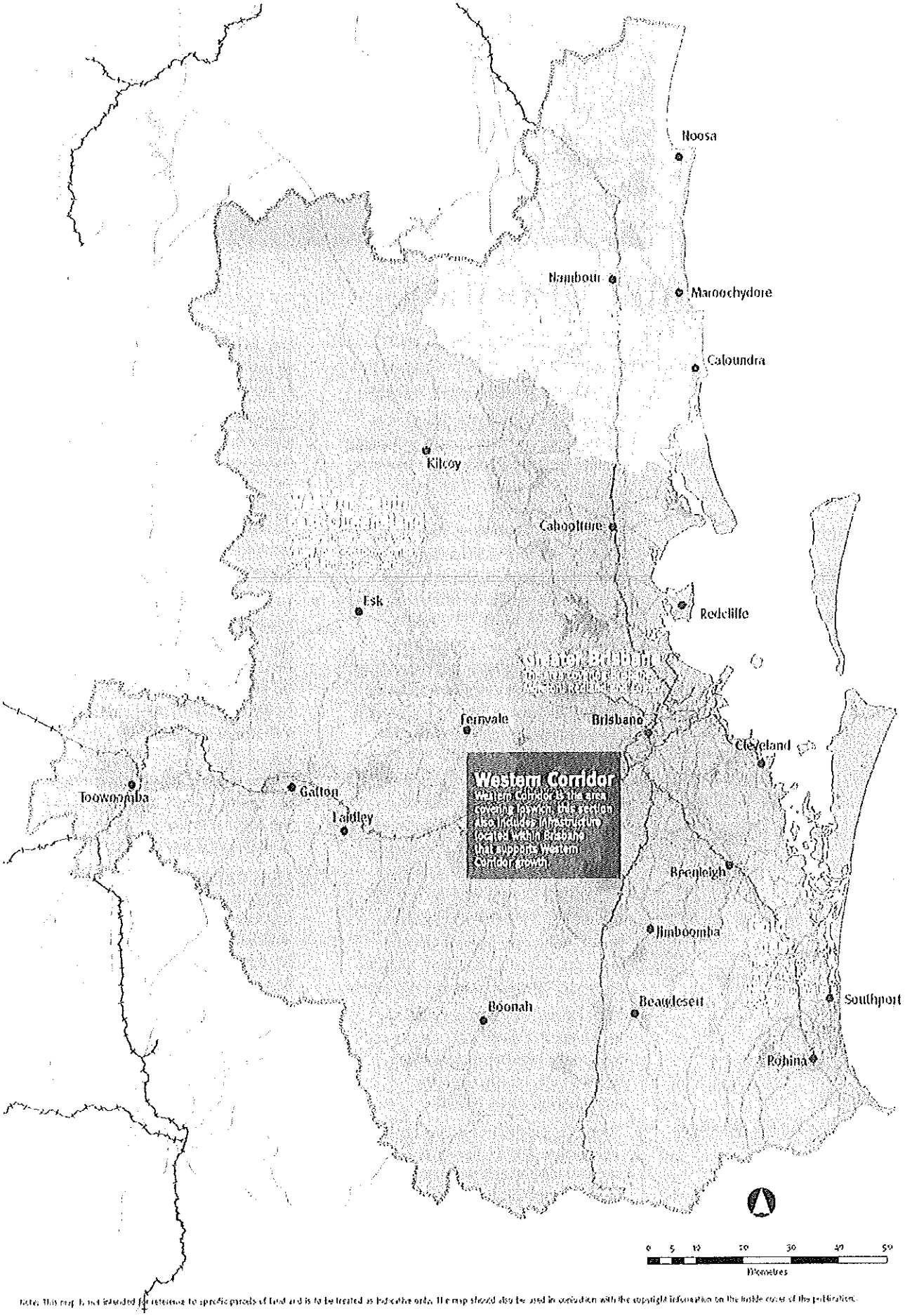
SEQIPP not only establishes priorities for regionally significant infrastructure over the next four years, it also outlines the longer-term planning horizon through to 2031. There are two tables in each greater-region section reflecting this split in timing.

Greater region break down

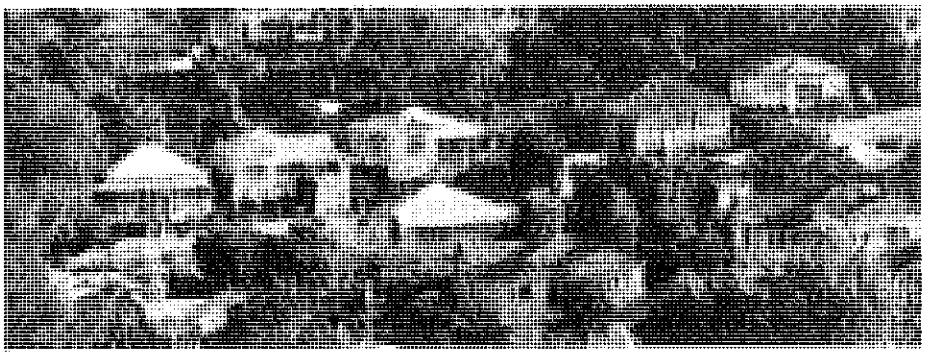
South East Queensland comprises 11 regional and city councils. The area covered by SEQIPP includes the following local governments:

- Brisbane City Council
- Gold Coast City Council
- Ipswich City Council
- Lockyer Valley Regional Council
- Logan City Council
- Moreton Bay Regional Council
- Toowoomba Regional Council (part of)
- Redland City Council
- Scenic Rim Regional Council
- Somerset Regional Council
- Sunshine Coast Regional Council.

Map 1—Greater region breakdown



Note: This map is not intended for reference to specific parcels of land and is to be treated as indicative only. The map should also be used in conjunction with the copyright information on the inside cover of the publication.



Strategic regional priorities

The SEQ Regional Plan articulates a vision for a region of interconnected communities, with excellent accessibility and an extensive and efficient public transport system assisting in the reduction of greenhouse gas emissions.

A subtropical world-class city, Brisbane is the heart of South East Queensland and is surrounded by large urban areas separated by open space and small to medium-sized towns and villages, each with its own character and identity.

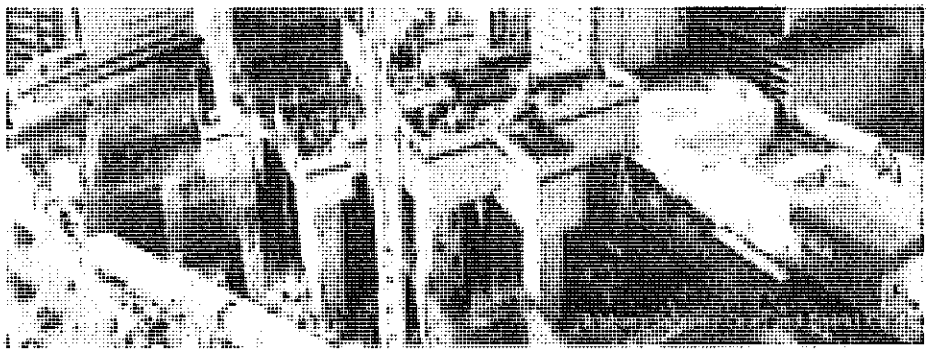
The vision for South East Queensland is a future that is sustainable, affordable, prosperous, liveable and resilient to climate change. The regional priorities from the SEQ Regional Plan which SEQIPP support include:

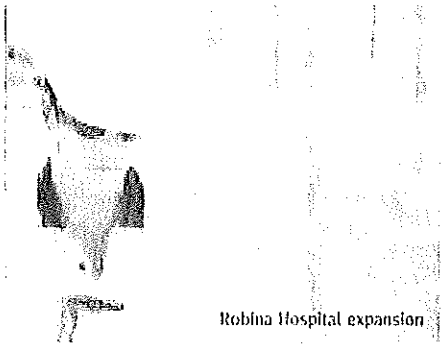
- creating a more sustainable future
- addressing climate change and oil vulnerability
- protecting the regional landscape
- supporting rural production
- accommodating future residential and employment growth
- facilitating growth in the west
- delivering smart growth
- regional accessibility
- building a series of strong and identifiable communities
- providing infrastructure and services
- supporting strong and healthy communities.

SEQIPP supports the regional plan by outlining infrastructure projects designed to contribute to the desired regional outcomes:

1. Sustainability and climate change—the region grows and changes in a sustainable manner, generating prosperity, maintaining and enhancing quality of life, minimising the use of resources, providing high levels of environmental protection, reducing greenhouse gas emissions and becoming resilient to natural hazards including the projected effects of climate change and oil supply vulnerability.
2. Natural environment—a healthy and resilient natural environment is protected, maintained and restored to sustainably support the region's rich biodiversity and ecosystem services including clean air and water, outdoor lifestyles and other community needs that critically underpin economic and social development.
3. Regional landscape—key environmental, economic, social and cultural values of the regional landscape are identified and secured to meet community needs and achieve ecological sustainability.
4. Natural resources—regional natural resources and rural production areas are protected, managed and used sustainably.
5. Rural futures—rural communities are strong and viable with sustainable economies contributing to the health, wealth, character and liveability of the region.
6. Strong communities—cohesive, inclusive and healthy communities have a strong sense of identity and place, and access to a full range of services and facilities that meet diverse community needs.
7. Engaging Aboriginal and Torres Strait Islander peoples—Aboriginal and Torres Strait Islander peoples are actively involved in community planning and decision-making processes and Aboriginal traditional owners are engaged in business about their country.
8. Compact settlement—a compact urban structure of well-planned communities, supported by a network of accessible and convenient centres and transit corridors linking residential areas to employment locations establishes the context for achieving a consolidated urban settlement pattern.
9. Employment location—a plan for employment to support a strong, resilient and diversified economy that grows prosperity in the region by using its competitive advantages to deliver exports, investment and sustainable and accessible jobs.
10. Infrastructure—plan, coordinate and deliver regional infrastructure and services in a timely manner to support the regional settlement pattern and desired community outcomes.
11. Water management—water in the region is managed on a sustainable and total water cycle basis to provide sufficient quantity and quality of water for urban, industrial and rural uses and to protect ecosystem health.
12. Integrated transport—a connected and accessible region based on an integrated transport system that is planned and managed to support more compact urban growth and efficient travel; connect people, places, goods and services; and promote public transport use, walking and cycling.

Further information on these desired regional outcomes can be found in the SEQ Regional Plan.





Robina Hospital expansion

SEQIPP funding and delivery

The Queensland Government is committed to maintaining a strong infrastructure program.

SEQIPP outlines an estimated $134 billion in infrastructure investment to 2031.

The government funds infrastructure from government cash flows, borrowings and alignment of capital portfolio. Additional innovative funding models for infrastructure delivery are being investigated.

It is important for government to maintain a strong balance sheet to provide stability, flexibility and the capacity to deal with any emerging financial and economic pressures. This is why SEQIPP identifies priorities for regionally significant infrastructure over the next four years, but also outlines the longer-term planning horizon to 2031. While there is some certainty around the projects outlined in the immediate four-year period, projects in the longer-term planning horizon may be updated in the future to reflect shifting planning priorities.

Contributions for infrastructure projects identified in SEQIPP come from all three levels of government as well as the private sector. Some identified projects may be subject to contributions from other levels of government which could affect timing for delivery.

Successful examples of where infrastructure has been delivered (or is being delivered) in partnership with the private sector and other levels of government are outlined.

- Partnerships with industry were used to deliver the South East Queensland Water Grid, the Southbank Institute of TAFE Redevelopment Project and multiple road and rail projects.
- The Queensland Government and the Gold Coast City Council are working together to deliver the Gold Coast Rapid Transit project. The Australian Government has made provision for a contribution of $365 million for the project.
- Seven new schools will be built as part of the South East Queensland Schools public private partnership project. The Aspire Schools consortium will design, build and maintain for 30 years six new primary schools and one new high school in the rapidly growing Sunshine Coast, Western Corridor, Gold Coast and Redland areas.
- Airport Link is currently one of Australia's largest road tunnel public private partnerships. BrisConnections will finance, design, construct, commission, operate and maintain Airport Link for a period of 45 years.

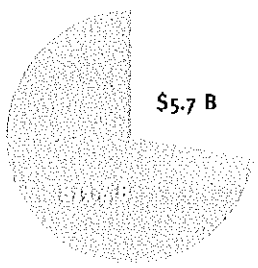
The government uses the Project Assurance Framework, Value for Money Framework, Capital Works Management Framework and Gateway Review process to initiate, evaluate and deliver projects. These frameworks are the minimum standard for Queensland Government projects and their processes help decide the best delivery model for individual projects.

The planning and delivery of SEQIPP is coordinated by the Department of Infrastructure and Planning.

Figure 6
Indicative activity of SEQIPP to 2031

Note: This figure shows how the program is maturing from its establishment phase, marked by a significant period of growing investment and gear-up by both industry and government, especially in delivering the SEQ Water Grid, into a stabilisation phase of sustained delivery of infrastructure over the term of the plan. This represents total funds from all sources and is presented in 2010 dollars.

Figure 7
Snapshot of capital spending across the state



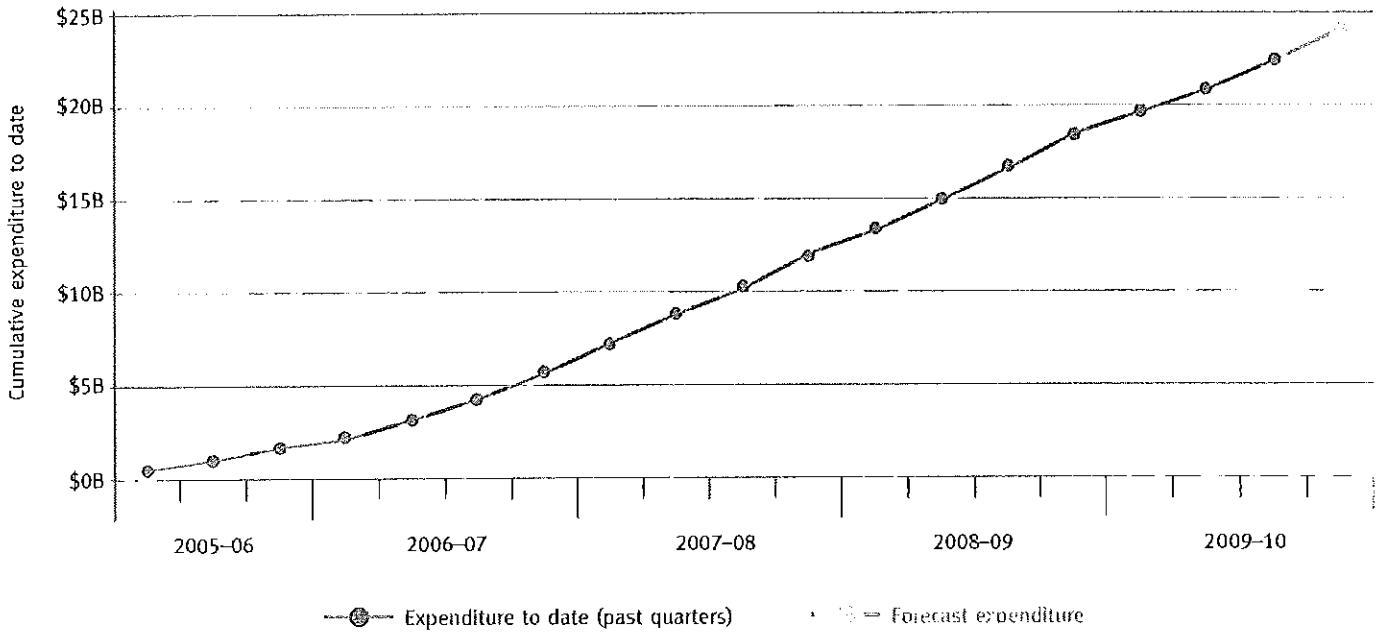
Capital expenditure in 2010–11 across Queensland - **$17.1 B**

SEQIPP capital expenditure in 2010–11 33%

Rest of capital expenditure in 2010–11 across the state 67%

Note: SEQIPP capital expenditure does not include all capital spending in South East Queensland.

Figure 8
Program expenditure to date

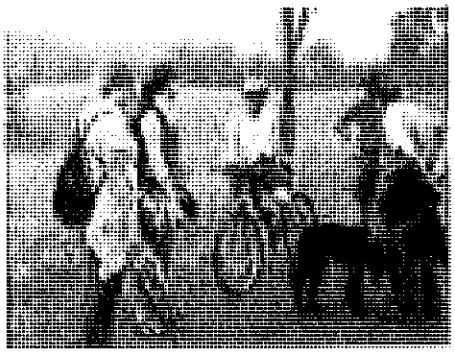


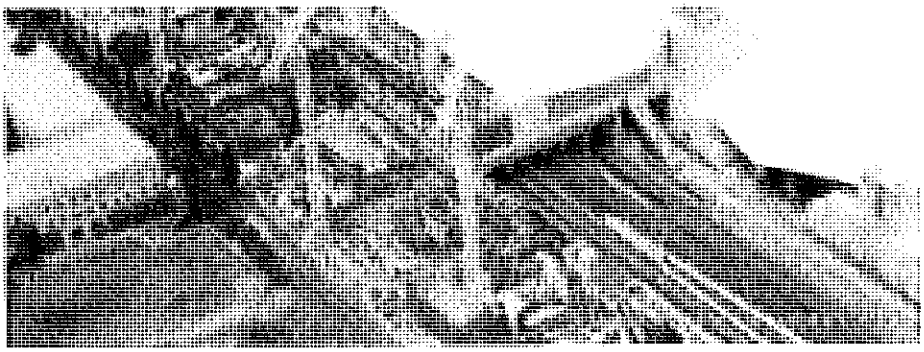
Australian Government contributions

Nation Building Program

Building Australia Fund

A National Health and Hospitals Network





SEQIPP guidelines

Infrastructure tables

In the 2010 version of SEQIPP, the infrastructure projects are represented in two tables:

1. Infrastructure table—shows the forward estimates (FE) period outlining the immediate projects and priorities that are underway within the four-year forward estimates period (2010–11 to 2013–14).
2. Planned infrastructure table—outlines the post FE period providing an indicative delivery timeframe for planned infrastructure projects that align with the medium to long-term needs for the region (2014–15 to 2030–31).

Previous versions of SEQIPP represented staged projects as a single project, for example the South Queensland Correctional Precinct was previously listed as one project. This version breaks projects into stages providing clarity of delivery and funding timeframes, for example the South Queensland Correctional Precinct is now listed on two separate lines.

This separation provides more detailed information and clearly identifies where projects and project stages are subject to change. This is particularly relevant in the post FE table where there are a number of factors or triggers providing indicators of the need for a project.

To have a long-term commitment to an infrastructure program, it is necessary to recognise that some of the broader infrastructure drivers change over time, influencing the scope, sequencing and priority of projects across the region.

These factors include:

- the realisation of population growth and densities consistent with the SEQ Regional Plan
- impacts of climate change
- the availability of funding and investment from federal, state and local government and private investment
- consideration of the ongoing costs associated with operating and maintaining significant assets
- ensuring sufficient capacity and skills are available in the market to deliver projects in a timely manner
- consideration of the dependencies between projects such as hospitals, schools, public transport and roads
- the ability to procure significant corridors and land that aligns with the urban footprint, key activity centres and development areas
- the realisation of economic development opportunities such as increased exports and imports that trigger the need for additional commercial and social infrastructure
- changes to population demographics such as an ageing population.

Estimate categories

All cost estimates provided in SEQIPP represent the most relevant and timely information available at the time of publication. The estimated investment is calculated using a combination of budget approved, agency estimated, contract and/or construction costs where available.

Estimates in the state budget and other documents may differ, as they may incorporate costs reflecting anticipated changes in input prices between initial planning and the time of construction.

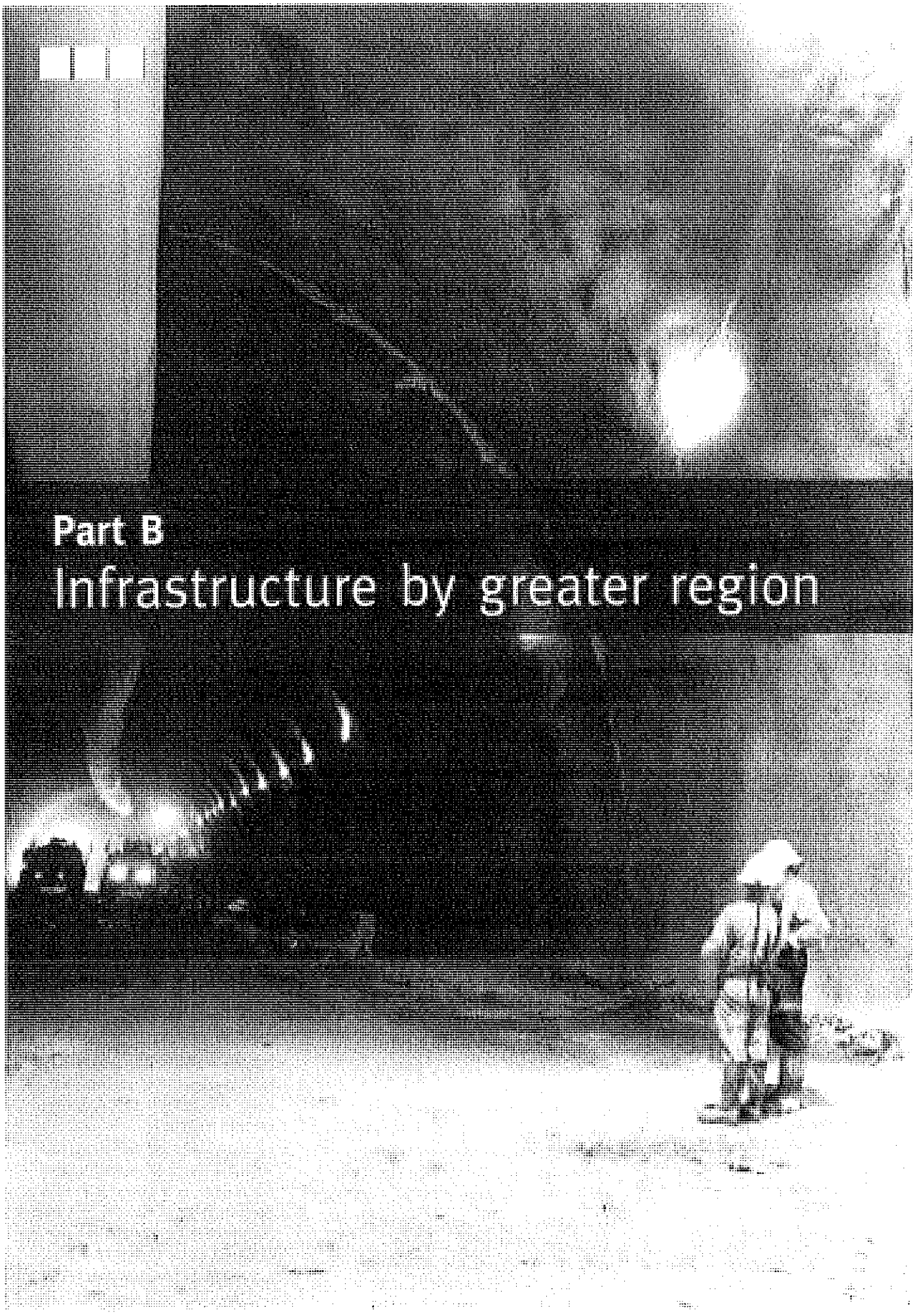
The level of planning that underpins the cost estimate varies for each project. Where detailed investigations have been completed and funding has been approved by the Queensland Government, estimates in SEQIPP reflect that funding. This is usually the case for projects within the first four years.

Estimates for individual projects outside the four-year horizon have not been identified. They are unlikely to have undergone detailed evaluation. A summed total for each greater region, calculated on an estimated basis and including contingency margins to reflect various project uncertainties, is shown at the end of the table.

Infrastructure investment is classified into five types depending on the level of investigation, approval and progress as follows:

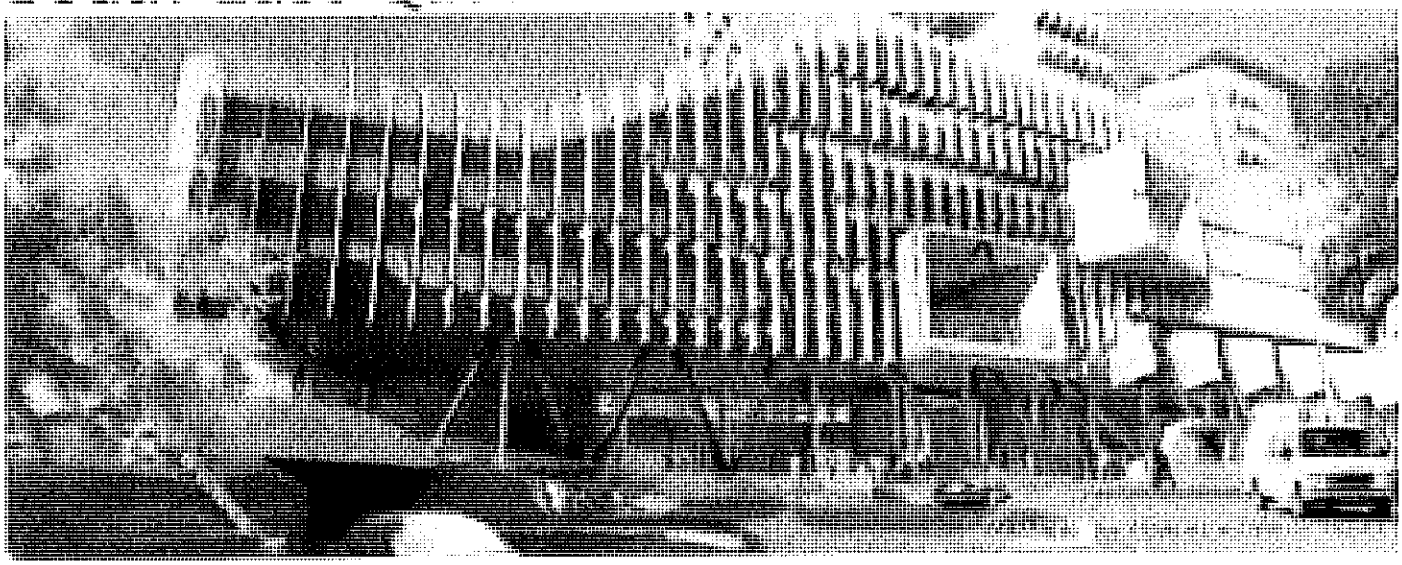
- A pre-project estimate is the earliest estimate of project cost. It is undertaken before concept design and is generally based on the cost of similar projects plus a contingency.
- A concept estimate is typically undertaken in the initial planning stages and is based on a concept design.
- A pre-market estimate is based on a more detailed review of scope and requirements. This estimate is determined after the government has assessed the costs and benefits of a project.
- The market price is the price which has been agreed with the contractor. It is no longer an estimate or cost, since it has not been incurred.
- An ongoing program includes the total estimated cost of an ongoing program that is made up of several projects. It is generally based on the costs of individual projects currently underway and also within the program's planning.

Rounding has been applied to projects with a pre-project, concept or pre-market cost estimate.



Part B
Infrastructure by greater region

South East Queensland



2.8 million (2006), 4.4 million (2031)

399 projects across the region (43 SEQ specific projects)

$134.2 billion across the region ($17 billion on SEQ specific projects)

$37 000

Airport Link, Cross River Rail, Eastern and Northern busways, Northern Link, principal cycle network, energy transmission network, Queensland Children's Hospital, Translational Research Institute, Ipswich Motorway Upgrade, Queensland Police Academy, Gateway Upgrade Project, SEQ Water Grid, SEQ HOV network, Gold Coast Rapid Transit

Regional outcomes

South East Queensland is Australia's fastest growing metropolitan region. Its population is expected to grow from 2.8 million in 2006, to 4.4 million people by 2031. The region covers 22 890 square kilometres, stretching 240 kilometres from Noosa in the north to the Queensland-New South Wales border in the south, and 160 kilometres west to the city of Toowoomba.

The South East Queensland region encompasses land within 11 city and regional local governments. Its regional landscape is a rich mix of bushland and beaches, mountain ranges and farm lands, rivers and lakes, surrounding an Urban Footprint limited to less than 15 per cent of the region.

The population is highly urbanised and is generally concentrated in greater Brisbane, the Gold Coast, Sunshine Coast and Toowoomba.

The SEQ Regional Plan establishes a compact settlement pattern (Urban Footprint) for the region to outline how projected growth will be accommodated while protecting around 85 per cent of the region from urban development.

The compact settlement pattern will be delivered through a stronger focus on infill development within established urban areas concentrated around activity centres and public transport corridors. Broadhectare land will accommodate about 50 per cent of growth, predominantly within areas such as the Western Corridor in Ipswich and South Western Corridor in Logan.

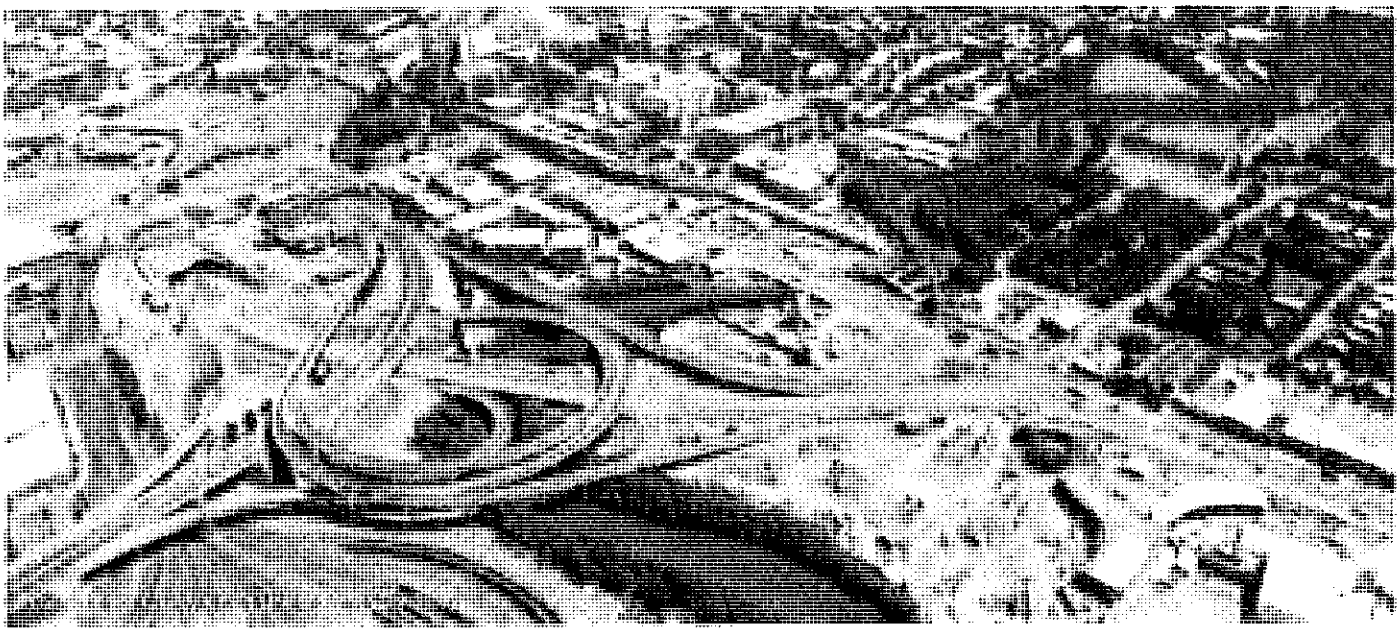
The delivery of infill development will be assisted by the facilitation of transit-oriented communities providing a high-quality, medium to high-density mix of uses—housing, shops, offices and other facilities—within a comfortable 15 minute walk of established or planned rail and busway stations.

The SEQ Regional Plan requires the delivery of well-planned communities, supported by a network of accessible and convenient centres and transit corridors linking residential areas to employment and community infrastructure such as new hospitals and schools.

SEQIPP plans, coordinates and delivers infrastructure and services to achieve the visions of these plans.

The government is planning infrastructure to manage urban congestion, support infill development and improve access to community services through a range of transport initiatives:

- providing more public transport infrastructure through the South East, Northern and Eastern busways, Cross River Rail and rail network capacity improvements and planning for the Darra to Springfield rail corridor, Gold Coast Rapid Transit and CAMCOS



- major investments in cycling facilities through delivery of the Principal Cycle Network Plan, Brassall-Ipswich Bikeway, the Royal Brisbane Hospital and King George Square cycle centres
- major road projects to increase network capacity such as the Gateway Upgrade Project, Airport Link, CLEM7 tunnel, Northern Link, Pacific Motorway upgrades and the Bruce Highway upgrade.

The proposed Cross River Rail project in Brisbane is a key initiative in meeting future public transport needs. It will help transform South East Queensland's rail system by providing more capacity for the region's rail services, meaning more people can move into and through the city more frequently. The project will enable the rail network to expand to new areas and link people to key inner city places, jobs and education.

The Gateway Upgrade Project will ensure better connections for business, industry and tourism including easier travel between the Gold and Sunshine coasts and improved access to the Australia TradeCoast precinct, including the Brisbane Airport and the Port of Brisbane.

The first stage of Gold Coast Rapid Transit, Griffith University to Broadbeach, is a key element in delivering a well-connected set of communities on the Gold Coast. It links key activity and employment centres as well as the Gold Coast University Hospital currently under construction with tourism nodes such as Surfers Paradise and Broadbeach.

In the Western Corridor, the Ipswich Motorway Upgrade and Centenary Highway Upgrade are providing vital links and improving network capacity.

On the Sunshine Coast, the Bruce Highway is being upgraded to improve safety and connections for this growing region.

Investment in social infrastructure is also essential for the health, wellbeing and economic prosperity of communities. It plays an important part in bringing people together, developing social capital, maintaining safety and quality of life and developing the skills and resilience essential to strong communities.

For example, a world-class police academy at Wacol will help meet the challenges of modern day policing and maintaining a safe community, while water management projects such as the South East Queensland Water Grid will protect our lifestyle and ensure water security into the future.

The Queensland Children's Hospital in Brisbane will not only be a centre of expertise in treating childhood illnesses and provide thousands of jobs, it will also be located within a health, education and technology hub. The hub benefits from high accessibility to the Goodwill pedestrian and cycle bridge, the South East busway, cycleway and freeway and the rail network. It is also within an area identified to accommodate increased residential and employment growth.

The major investment in health infrastructure at numerous sites across the region also positions South East Queensland well to respond to changes in the way the Australian health system may be funded by the Australian Government in the future.

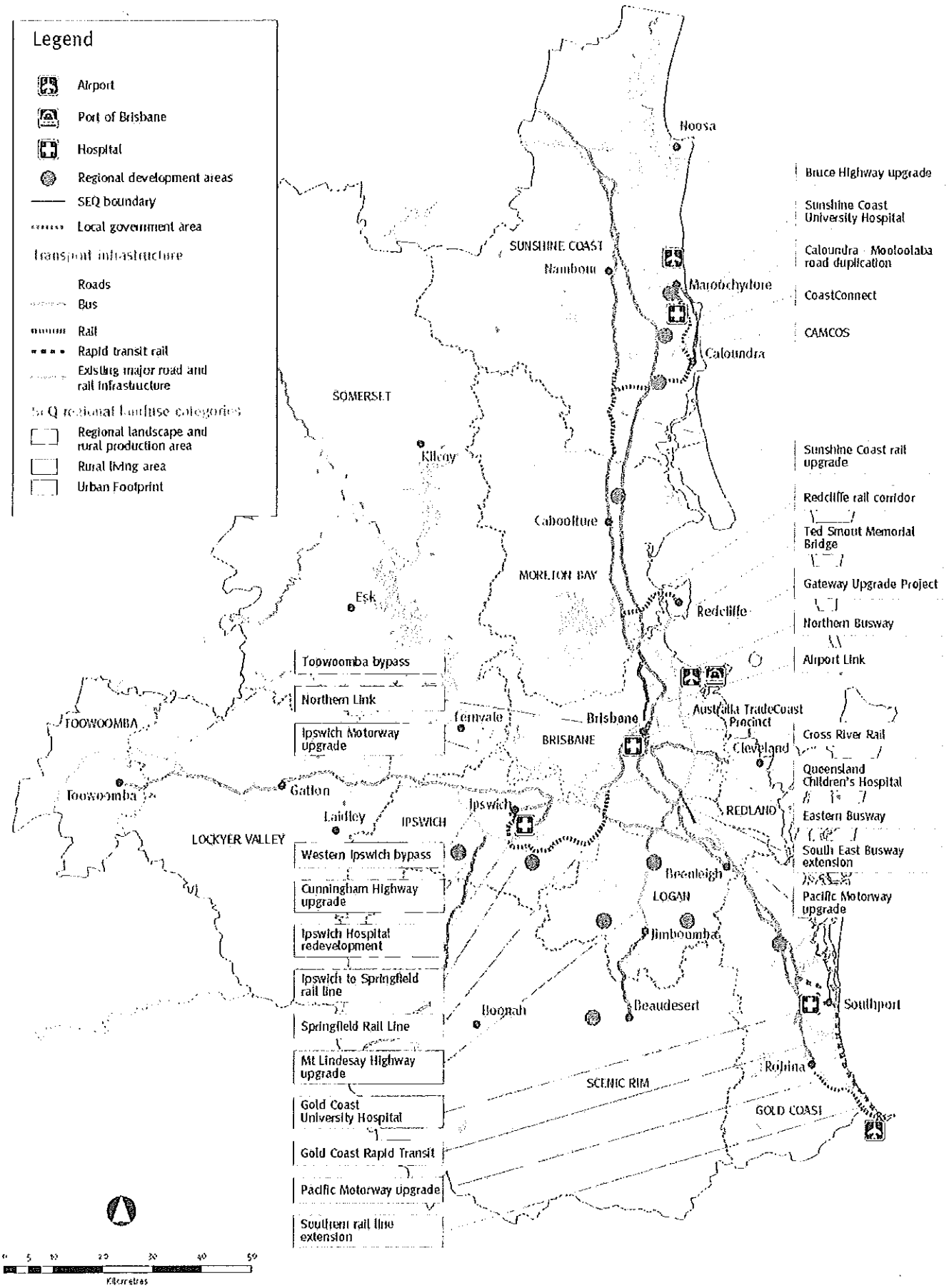
The next generation of environmental planners can train at the new Sustainability Interpretive Centre at the Mooloolaba campus of the Sunshine Coast Institute of TAFE. The convention centres in Brisbane and the Gold Coast and the State Equestrian Centre at Caboolture will also expand the region's tourism and support its economy.

Integrated land use and infrastructure planning is integral to enhancing diverse communities through the provision of affordable housing options in South East Queensland.

Initiatives under the Queensland Housing Affordability Strategy will ensure state land and housing is brought to the market quickly and at the lowest cost. This includes the provision of infrastructure to meet planned demand and consideration of various funding mechanisms to assist delivery. This will create a more competitive and responsive land and housing market by reducing the timelines and associated holding costs of bringing new housing to the market.

Well planned infrastructure projects are critical to ensuring sustainable communities while protecting the region's enviable lifestyle.

Map 2—South East Queensland strategic infrastructure



Note: This map is not intended for reference to specific parcels of land and is to be treated as indicative only. The map should also be used in conjunction with the copyright information on the inside cover of the publication.

Infrastructure goals

While infrastructure is broken down by greater region in SEQIPP, some asset classes support the entire region, including energy, water, the Port of Brisbane and freight. These asset classes are outlined here in the South East Queensland section, however some individual projects may also be referred to in the greater region where they are physically located.

Energy

Electricity demand in Queensland is growing at a faster rate than other states in the National Electricity Market. Over the next 10 years, Queensland peak demand is forecast to grow at an average 3.8 per cent per annum while consumption of electrical energy is forecast to grow at 3.1 per cent per annum.

The Queensland Government is meeting these challenges by diversifying its energy sources to include gas and renewable sources, funding a range of demand management initiatives and encouraging competition in energy markets. The Queensland gas market is also growing rapidly with demand doubling since 2000.

Electricity

South East Queensland represents about 60 per cent of Queensland's total electricity demand. Peak electricity demand in South East Queensland has grown by 32 per cent over the past five years (at an average of 5.7 per cent per annum) and is forecast to grow by another 24 per cent over the next five years (at an average of 4.3 per cent per annum). Electricity demand is growing at a higher rate than population growth.

Most of South East Queensland's power is generated outside the region primarily due to the location of fuel sources. Electricity is transported to the demand centres within South East Queensland via the high voltage electricity transmission network owned, developed and operated by Powerlink Queensland.

To ensure that future demand for electricity in South East Queensland can continue to be reliably met in the longer term, Powerlink plans to develop 500 kilovolt infrastructure in Southern Queensland as the next step in upgrading the capacity of the transmission network. The new 500 kilovolt transmission network will facilitate the increased transfer of electricity generated in South Western Queensland, including potential future low greenhouse gas emission and renewable generation sources, into South East Queensland. Powerlink is also acquiring easements for future projects in South East Queensland such as the proposed Woolooga to Cooroy South (Eerwah Vale) project which will reinforce high voltage electricity supply to the large area encompassing the northern Sunshine Coast, Gympie and surrounds.

Powerlink invested $675 million in capital works in Queensland during 2008–09 and expects to invest more than $2.9 billion over the five-year period to 2013–14 to develop Queensland's transmission network in time to meet growth in electricity demand.

ENERGEX, which is responsible for the low voltage distribution networks in South East Queensland, is expecting to spend $5.72 billion over the next five years, from 2010–11 to 2014–15, to meet the forecast electricity demand growth.

Gas

South East Queensland is currently the state's single biggest market for natural gas, with average annual consumption projected to be around 63 petajoules per annum—approximately 40 per cent of the state's overall gas consumption. Demand in South East Queensland is expected to continue to grow over the next 20 years.

Gas infrastructure, like electricity, consists of major transmission lines (pipelines) and localised distribution networks. Queensland has more than 4500 kilometres of high-strength steel gas transmission pipelines, which move gas from gas-producing regions to customers. This infrastructure is owned by the private sector and associated projects are not listed in SEQIPP.

The 440 kilometre Roma to Brisbane gas transmission pipeline is the sole transporter of gas from the Surat and Bowen gas fields to the growing South East Queensland market. The private owners of the pipeline are currently working to increase the capacity of the pipeline (by increasing compressor capacity) to meet growing customer demand for gas.

Queensland's Energy Policy has been successful in increasing the use of gas in the state's energy mix. In particular, the Queensland Gas Scheme requires at least 15 per cent of electricity sold in Queensland to be from gas-fired generation. The scheme has encouraged the commercialisation of new gas resources, in particular coal seam gas, and has led to the development of the state's emerging liquefied natural gas industry. The commissioning of the following gas fired powered stations brought Queensland's gas-fired power station capacity to more than 3000 megawatt:

- Braemar 1 Power Station (450 megawatt) in 2006
- Braemar 2 Power Station (450 megawatt) in 2009
- Condamine Power Station (144 megawatt) in 2009
- Darling Downs Power Station (630 megawatt) in June 2010.

Water

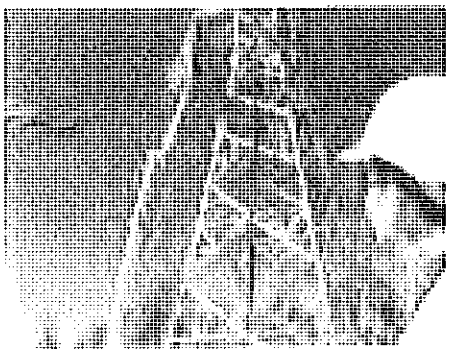
The South East Queensland Water Strategy is an adaptive plan to meet the water supply requirements to 2050 and beyond. It will deliver a 'water supply guarantee', supplying sufficient water to support a comfortable, sustainable and prosperous lifestyle while meeting the needs of urban, industrial and rural growth and the environment. This vision will be delivered through demand management, timely investment in infrastructure and the efficient operation of the South East Queensland Water Grid.

The Queensland Government's South East Queensland Water Grid is the largest urban drought response in Australia, securing the region's water supply now and for the future. The water grid is a network of connected water supplies, storages and pipelines allowing water to be transported from areas of water surplus to areas facing a shortfall.

The Queensland Government has worked in collaboration with other levels of government and in partnership with the private sector to deliver on its multi-billion dollar water plan.

Completed projects:

- Western Corridor Recycled Water project
- Gold Coast Desalination project
- Southern Regional Water pipeline



- Northern Pipeline Interconnector – Stage 1
- Bromelton Off-stream storage
- Toowoomba Pipeline
- Eastern Pipeline Interconnector
- Cedar Grove Weir.

Projects underway

Construction of Wyaralong Dam is expected to be completed by December 2011. The completion of this project will provide additional water for the South East Queensland Water Grid.

The Northern Pipeline Interconnector – Stage 2 is planned for completion by December 2011. This will ensure security of supply for the Sunshine Coast, in particular Noosa, by permitting the bi-directional transfer of water.

Hinze Dam Stage 3 is now underway and is planned for completion in late 2010. This stage includes increasing the height of the dam wall and spillway, lengthening the saddle dam, increasing the height of the intake towers and relocation and refurbishment of recreational facilities.

Proposed projects

Priority sites for desalination plant construction have been identified at Lytton and Marcoola. These sites are currently undergoing investigations to ensure new bulk water supplies can be delivered efficiently when required. New bulk water supplies may be required by 2017 at the earliest, depending on regional growth and water demand.

The Wyaralong water treatment plant will be constructed in stages to supply water into the South East Queensland Water Grid through the proposed Cedar Grove Connector pipeline.

Port of Brisbane

The Port of Brisbane is Australia's third largest and fastest growing container port. It is a key driver of economic growth throughout South East Queensland. The port provides world-class cargo-handling and warehousing facilities and, despite the global financial crisis during 2008–09, total trade increased by 5.6 per cent.

Despite any short-term slowing in economic growth, positive growth in the long term is expected. The General Purpose Berth was commissioned in March 2010 to significantly boost project cargo and bulk trading capacity and, within the next five years, an additional two container berths will be completed and 80 hectares of terminal space developed. The capacity to continue meeting the demands of long-term growth has been assured through construction of a 4.5 kilometre seawall to enclose an additional 230 hectares. This will enable the construction of up to four new berths and provide back-up land for terminals and port-related uses.

In the coming year, the Port of Brisbane Corporation Limited will continue construction of Berth and Wharf 11 and 12 at Fisherman Islands to cater for strong growth across a range of commodity areas. Berth and Wharf 11 is expected to be finalised by 2012 and Berth and Wharf 12 by 2014.

The port is one of five government-owned assets being leased or sold under the Renewing Queensland Plan. It is expected that its lease will be finalised by the end of 2010, subject to market conditions. The levels of ownership by port users and their associates will be restricted to a cap of 20 per cent on port users and their associates.

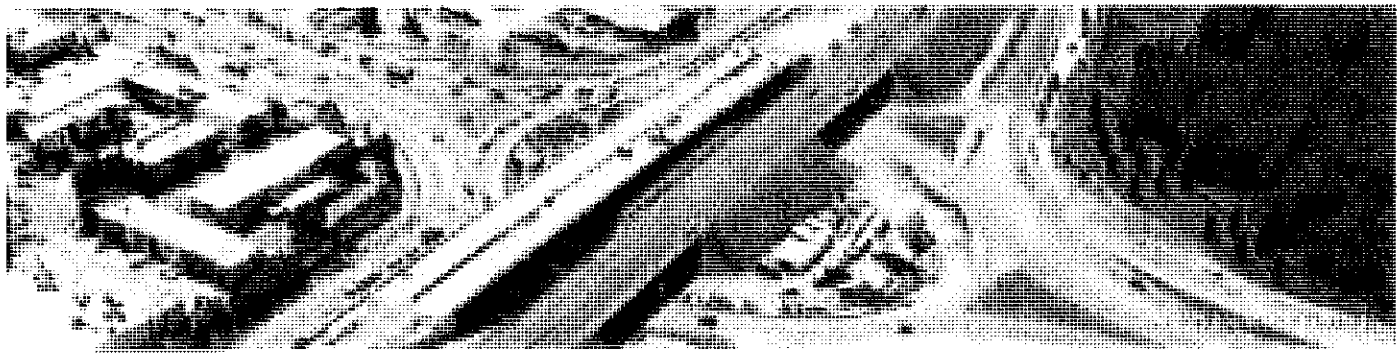
Freight

Transportation of goods and services is vital to economic development and growth. The freight task in Queensland is expected to continue to grow, driven by strong population growth and economic activity. This is likely to place increasing pressure on the transport system, particularly those linkages supporting key industrial areas, commercial business parks and major retail centres.

South East Queensland is the gateway for interstate trade between Queensland and other states, and has a key role supporting international trade. Enhancing freight movement through the region is critical to the competitiveness and economic performance of the state. The challenge is to support trade through the provision of an integrated transport system that delivers sustainable freight solutions. This includes:

- exploring opportunities for integrated transport solutions that effectively utilise transport modes or a combination of modes to facilitate efficient freight movement
- optimising the existing transport system capacity and performance for freight
- planning and positioning the transport system to accommodate and exploit future freight opportunities
- supporting freight movement through cost-effective and affordable investment
- developing a more cohesive freight environment with local government, the Australian Government, industry and community.

The *South East Queensland Regional Freight Network Strategy* supports the implementation of the SEQ Regional Plan. This strategy aims to ensure the region's transport system continues to support the efficient movement of freight to achieve the best possible economic development, safety, quality of life and environmental outcomes.



Key infrastructure projects

Cross River Rail – Stage 1

Status:	Under planning
Description:	A new north-south rail line in Brisbane's inner city including a tunnel under the Brisbane River and new underground inner city train stations
Cost:	$8.2 billion (to be confirmed as part of the current detailed feasibility phase)
Delivery:	Pending a decision from government to proceed to procurement, phase one construction could commence in 2012 for delivery by 2016
Key benefit:	When complete, it will provide the capacity to move up to 120 000 people in the morning peak into the inner city from the north and south. It would take a 30-lane motorway to match this

Airport Link

Status:	Under construction
Description:	A 6.7 kilometre toll road, mainly underground, connecting the CLEM7 Tunnel, Inner City Bypass and local road network at Bowen Hills to the northern arterials of Gympie Road and Stafford Road at Kedron, Sandgate Road and the East West Arterial leading to the airport
Cost:	$3.3 billion
Delivery:	Construction is expected to be complete in 2012
Key benefit:	Airport Link will be the first major motorway linking Brisbane city to the northern suburbs and airport precinct, avoiding up to 18 sets of traffic lights

Queensland Police Academy

Status:	Under planning
Description:	World-class police academy at Wacol
Cost:	$460 million
Delivery:	In planning and development
Key benefit:	This project will help position the Queensland Police Service to meet the challenges of modern day policing. When finished, the academy will have an educational and an operational precinct to support training in the latest investigative techniques and technologies

Queensland Children's Hospital

Status:	Under construction
Description:	The new Queensland Children's Hospital will amalgamate the state's two leading children's hospitals—Royal Children's Hospital and Mater Children's Hospital
Cost:	$1.39 billion
Delivery:	Construction began in 2009 and is planned for completion in 2014
Key benefit:	The new hospital will have 359 beds—71 more than the combined total now at the Mater and Royal Children's,—along with new obesity, pain and allergy clinics and a new renal treatment centre

Halys to Springdale to Blackwall electricity project (500 kilovolt)

Status:	Under planning
Description:	Part of Powerlink's planned 500 kilovolt network to increase the transfer of electricity from the major generating centres in South West Queensland into South East Queensland to meet the region's growing electricity demands
Cost:	$530 million
Delivery:	Construction of the line and associated works is expected to be completed in 2014–15
Key benefit:	The line will provide a secure and reliable supply of high voltage electricity to South East Queensland

Wyaralong Dam

Status:	Under construction
Description:	Construction of Wyaralong Dam
Cost:	$348 million
Delivery:	Construction is planned for completion in December 2011
Key benefit:	Wyaralong Dam will provide a supply of 18 000 megalitres per annum of water for the South East Queensland Water Grid

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[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
TRANSPORT								
Public transport network								
New Passenger Rail Stock (20 x three-car sets)	Market	297		●	●			
New Passenger Rail Stock (20 x three-car sets)	Market	327		●	●	●		
New Passenger Rail Stock (38 x three-car sets)	Pre-market	600				●	●	→
Public Transport Corridor preservation fund	Ongoing program	260		◌	◌	◌	◌	→
Rail Capacity upgrades	Pre-project	130		●	●	●		→
Translink sub-regional station upgrade	Ongoing program	650		●	●	●	●	→
Strategic road network								
Intelligent Transport Systems	Pre-project	400		●	●	●	●	→
New Transport Investigations	Ongoing program	13		●	●			
Active transport network								
Sub-regional cycle network	Ongoing program	600		●	●	●	●	→
Freight network								
Port of Brisbane infrastructure - including Berth and Wharf 11 and 12 and Hamilton site redevelopment	Ongoing program	2,265		●	●	●	●	→
ELECTRICITY TRANSMISSION AND DISTRIBUTION NETWORKS								
Powerlink								
Halys to Springdale to Blackwall project (500kV)[5]	Concept	530		●	●	●	●	→
Swanbank A Substation Rebuild (Blackstone)	Market	35		●				
Energex								
New substations	Ongoing program	1,156		●	●	●	●	→
Substation upgrades	Ongoing program	246		●	●	●	●	→
Subtransmission and distrubution network upgrades	Ongoing program	3,477		●	●	●	●	→
WATER								
Northern Pipeline Interconnector – Stage Two	Market	450		●	●			
Raising of Hinze Dam - Stage 3	Market	395		●				
Southern Regional Water Pipeline extension - Cedar Grove Connector	Pre-project	250		●	●	●		
Wyaralong Dam	Market	348		●	●			
Wyaralong Dam Water Treatment Plant - Stage 1	Pre-market	100				●	●	→

Total estimated investment of projects underway in 2010-2014 = $12,629 million

1. Energy authorities budget on a five year basis. Project costs and timing beyond that period are not included in the above table. kV = kilovolt.
2. Timing of future investments will depend on demand. Expenditure will be adjusted as necessary to ensure the South East Queensland distribution network is able to meet demand while also meeting mandated reliability requirements.
3. The timing of energy projects seeks to ensure that mandated reliability requirements are maintained as forecast demand increases.
4. In 2007, the Australian Energy Regulator set Powerlink's allowable regulated revenue for the five year period between 1 July 2007 and 30 June 2012, including an allowance for capital expenditure.
5. Timing for Wyaralong Dam Water Treatment Plant - Stage 1 is subject to further investigations by the Queensland Water Commission which will include consideration of the demand-supply balance.
6. The table identifies infrastructure projects to 2014 that contribute to the whole of South East Queensland.
7. Estimates in the state budget and other documents may differ, as they may incorporate costs that reflect anticipated changes in input prices between initial planning and the time of construction. Estimated investment includes funds already expended on projects.
8. Where funding is required from other sources other than the Queensland Government, their estimated costs have been included.
9. For an explanation of estimate categories, refer to page 15.
10. Estimated investment for projects within this table refer to the total project cost, which may be beyond the four year period. This is relevant for projects with an arrow in the last column.
11. There are high occupancy vehicle (HOV) components within some of the projects outlined in this table including Northern and Eastern busways.

Investigation/study projects · ◌ Corridor preservation projects · ● Infrastructure construction projects · ▲ Subject to federal funding · → Project continues in later years

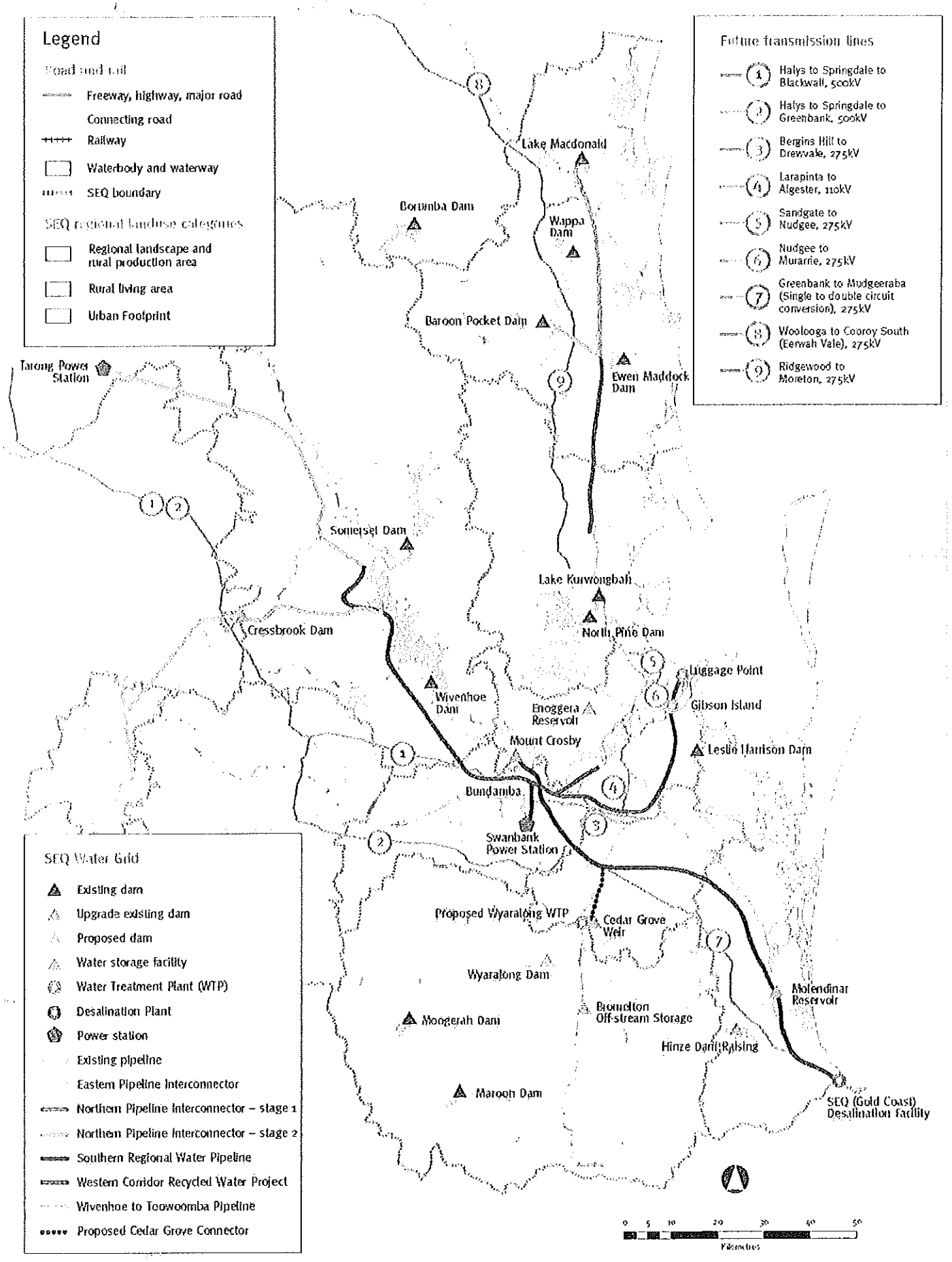
South East Queensland planned infrastructure 2014–2031

Project	Subject to federal funding	Indicative delivery timeframe		
		2014–15 to 2019–20	2020–21 to 2025–26	2026–27 to 2030–31
TRANSPORT				
Public transport network				
New Passenger Rail Stock (40 x three-car sets)		●		
Rail Crossing grade separation program			●	
Active transport network				
Sub-regional walking program			●	

Project	Subject to federal funding	Indicative delivery timeframe
		2014–15 to 2030–31
Strategic road network		
SEQ HOV program[10]		●
ELECTRICITY TRANSMISSION AND DISTRIBUTION NETWORKS		
Powerlink		
Bergins Hill to Drewvale project (275kV)		●
Future substations (dependent on electricity demand) - Brisbane, Moreton, Redland and Logan		●
Future substations (dependent on electricity demand) - Gold Coast		●
Future substations (dependent on electricity demand) - Sunshine Coast		●
Greenbank to Mudgeeraba project (275kV)		●
Halys to Springdale to Greenbank project (500kV)		●
Larapinta to Algester project (110kV)		●
Nudgee to Murarrie project (275kV)		●
Sandgate to Nudgee project (275kV)		●
Southern Gold Coast bulk supply		●
Woolooga to Cooroy South (Eerwah Vale) project (275kV)		●
Total planned investment: $17.6 billion[7]		

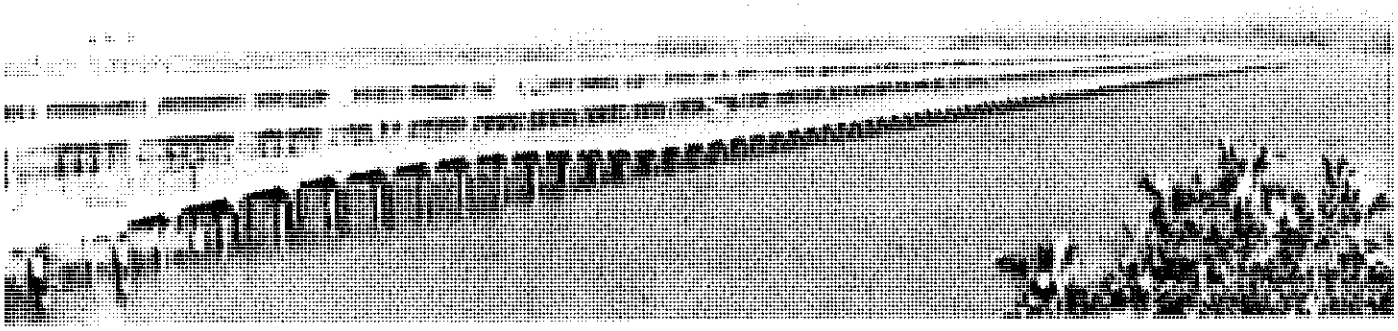
1. Energy authorities budget on a five year basis. Project costs and timing beyond that period are not included in the above table.
2. Timing of future investments will depend on demand. Expenditure will be adjusted as necessary to ensure the South East Queensland distribution network is able to meet demand, while also meeting mandated reliability requirements.
3. The timing of energy projects seeks to ensure that mandated reliability requirements are maintained as forecast demand increases.
4. In 2007, the Australian Energy Regulator set Powerlink's allowable regulated revenue for the five year period between 1 July 2007 and 30 June 2012, including an allowance for capital expenditure.
5. kV = kilovolt.
6. The table identifies planned infrastructure projects to 2031 that contribute to the whole of South East Queensland.
7. Total planned investment for South East Queensland does not include Powelink projects.
8. Projects listed in the longer-term planning horizon may change to better reflect the emerging needs of the region.
9. The indicative delivery timeframe outlines the estimated timeframe for completion of the project. However, project planning or commencement may occur before this timeframe.
10. Planning for this project will occur in the 2010–14 timeframe.

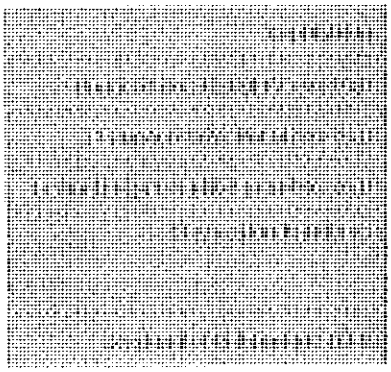
Map 3—South East Queensland energy and water infrastructure



Note: This map is not intended for reference to specific parcels of land and is to be treated as indicative only. The map should not be used in isolation with the copyright information on the back cover of the publication.

Greater Brisbane





1.7 million (2006), 2.4 million (2031)

157

$60.4 billion

$34 000

Pacific Motorway Upgrade, Gateway Upgrade Project, Airport Roundabout Upgrade, Northern and Eastern busways, Brisbane Supreme and District Court, SkillsTech Australia, Logan Hospital Emergency Department Upgrade, Keperra to Ferny Grove Rail Duplication

Elimbah East, Park Ridge, Flagstone and Yarrabilba North

Regional outcomes

Greater Brisbane includes Brisbane City, Logan, Moreton Bay and Redland, and is home to more than 1.7 million people.

The Greater Brisbane region is expected to house a significant proportion of the projected growth in South East Queensland. In areas such as Caboolture and Logan, most of this development will occur on broadhectare sites. Within Brisbane City, an increasing amount of redevelopment will occur around existing activity centres, public transport nodes and infill development sites to better utilise existing infrastructure.

Brisbane

The city of Brisbane supports the largest proportion of South East Queensland's population and comprises significant economic drivers including the central business district (CBD) and the region's major sea and air ports located within the Australia TradeCoast region.

For Brisbane, public and active transport will need to play a much bigger role in the future. This will mean improved public transport infrastructure and services to the CBD. A higher standard of cross-town public transport services will also be needed.

Land surrounding urban centres and transit corridors will be planned appropriately to accommodate a majority of infill growth, without the need to remove the traditional backyard. This will provide a range of dwelling choices to suit diverse lifestyles.

To support infill development and manage urban congestion, a range of transport initiatives are underway or have been completed including:

- increasing capacity for public transport through the South East, Northern and Eastern busways, and major improvements to rail network capacity
- investing in active transport through the Principal Cycle Network Plan on projects such as the Northern Brisbane Cycleway Investigation and South East Freeway Bikeway
- major road programs to complete a network of regional motorways and highways. This will allow the movement of road freight and link workplaces to labour, as well as removing long-distance heavy vehicle trips from the local road network. Strategic projects include the CLEM7 tunnel, Airport Link, Gateway Upgrade Project and future planned projects such as Northern Link. This will also be supported by the continuing implementation of the managed motorways program to make more efficient use of the motorway network.

A focus will be to prioritise infrastructure that supports residential and employment opportunities in centres close to public

transport nodes. For example, the Princess Alexandra (PA) Hospital upgrade links to the Boggo Road and Eastern busways and PA Hospital cycleway, connecting key areas for health, education and technology as well as areas identified to accommodate additional residential growth.

Another focus in Brisbane is to improve current public transport, road and rail infrastructure to link employment centres and services to broadhectare areas identified as future growth areas.

Network extensions will focus on delivery of high level services to newly established and planned broadhectare lands in areas such as Rochedale and Oxley Wedge.

Growth in the region has placed significant demand on our health services. A major regional health infrastructure renewal and enhancement program is underway including construction of the new Queensland Children's Hospital at South Brisbane and upgrades to the emergency departments at the Princess Alexandra Hospital, Queen Elizabeth II (QEII) Hospital and The Prince Charles Hospital.

Logan

The city of Logan comprises a range of urban and rural communities benefiting from access to major road and rail corridors, in particular the Pacific and Logan motorways, Mt Lindesay Highway and the Brisbane to Gold Coast rail line.

Logan includes the South Western Corridor (Browns Plains to Flagstone and includes Park Ridge, Greenbank, Yarrabilba) that has the longer term potential to accommodate regionally significant levels of growth and alleviate long-term growth pressures on the southern area of South East Queensland such as the Gold Coast.

Developing these regionally significant growth areas will require water, sewerage and transport infrastructure to be enhanced and extended. Appropriate sequencing of infrastructure in the South Western Corridor is integral to achieving dwelling targets set in the SEQ Regional Plan.

Growth will be achieved by establishing a series of communities linked by sub-regional public transport and road networks with existing urban areas in Logan and employment and services in Brisbane, Ipswich and the Gold Coast.

The Queensland Government recently announced three brand new communities at Ripley Valley, Greater Flagstone and Yarrabilba. These will be model communities where children can walk to school, workers can live near public transport and families will be guaranteed greenspace for recreation and easy living lifestyle.

Infrastructure projects like the Metropolitan South Institute of TAFE and Logan Hospital Emergency Department upgrade will generate additional local employment opportunities in the area and increase employment diversity and local services. Further planning will be undertaken on expansion of health services required in this growing area. Planned upgrades to the Pacific Motorway and Logan Motorway will assist in linking local communities.

The upgrade of the Mt Lindesay Highway will not only assist in linking communities, it will enhance public transport access to broadhectare areas like Flagstone by supporting existing infrastructure corridors and networks.

Moreton Bay

Moreton Bay includes a diverse range of coastal, hinterland and urban communities. Two major areas of urban settlement have been established—a southern area and a northern growth corridor.

In Moreton Bay, the focus is on linking major regional activity centres to proposed areas of residential growth and providing additional capacity to service new development areas. Additionally, increasing sub-regional transport network capacity and providing public transport infrastructure along key routes is essential to cater for projected growth and provide access to employment and services.

Caboolture–Morayfield is the principal regional activity centre and the focus for infill development within the northern growth corridor. Other significant infill opportunities will be generated through efficient use of land close to the Brisbane–Sunshine Coast rail line.

To support infill development and accessibility to employment, projects such as the Burpengary to Caboolture Road Upgrade, duplication of the Houghton Highway bridge and Bruce Highway intersection upgrades at Pumicestone, Boundary and Bribie Island roads will link residential areas in the east to the Brisbane–Sunshine Coast rail line.

This infrastructure will also accommodate the increasing role of Caboolture as a principal activity centre and a location for employment growth.

The planned Moreton Bay Rail Link (formerly Petrie to Kippa Ring Rail Corridor) would ensure long-term connectivity to employment and services for the Redcliffe Peninsula.

Development of health services delivered through the Caboolture Hospital Emergency Department upgrade and the Caboolture Health Precinct will ensure communities have local access to essential health services. Planning for the future health services required to service this growing population is also an important initiative and contributes to the SEQ Regional Plan outcome of strong communities.

Long-term infrastructure planning decisions, including corridor location and protection, will continue to consider areas that may accommodate long-term growth like Caboolture West and will protect the function of the Bruce Highway.

Redland

Redland City comprises urban, rural, bushland and island communities. Urban development is focussed around activity centres that are linked through an established rail and road network.

The priority for Redland is the timely provision of transport infrastructure—including increased road capacity and increasing levels of public transport services—in line with growth.

Rail corridor upgrades will assist in accommodating residential and employment growth in activity centres including Cleveland, Ormiston, Birkdale, Thorneside and Wellington Point.

Development of social infrastructure services like the Redland Hospital emergency department upgrade and Redland Fire and Rescue Station will ensure communities have access to essential services.

Infrastructure planning will respond to the significant environmental and biodiversity values of the area, particularly the Queensland Government's commitment to the long-term viability of Redland's koala population.

Infrastructure goals

Transport

Greater Brisbane is expected to accommodate a large proportion of development and population proposed for the region. This will increase demands on public transport, freight and access to new growth areas.

The Queensland Government is working on a combination of projects to build an integrated transport network to assist people to move efficiently, while managing congestion and climate change.

South East Queensland's transport system supports the lifestyle enjoyed by residents and visitors, enhances the state's economic vitality and protects the natural environment.

Transport infrastructure planning goals for Greater Brisbane include:

- providing quality public transport infrastructure and services along key routes linking activity centres and the CBD
- building and maintaining a high-standard orbital motorway system to support a hierarchy of roads and protect the multi-modal functionality of key arterials
- managing congestion and travel demand
- accelerating development of the principal cycle network
- increasing public transport and road network capacity to cater for growth
- investigating the long-term transport requirements and preserving transport corridors to cater for future growth
- using existing transport infrastructure more efficiently.

In delivering these priorities, there are a range of challenges to be overcome including:

- congestion on the rail and road network impacting travel times and reliability
- limited ability to improve rail services until an additional rail river crossing is in place
- encouraging job growth in activity centres, placing further pressure on congested road networks
- providing adequate transport infrastructure to keep pace with rapid population growth, particularly in outer suburbs
- encouraging more trips by active transport, particularly to activity centres
- delivering new arterial roads in conjunction with the development of new communities to protect the motorway network from excessive use for local trips
- ensuring freight and commercial traffic can move efficiently around the network as traffic volumes grow.

Projects completed

Recently completed projects such as the Airport Roundabout Upgrade and the Bruce Highway upgrade between Uhlmann Road and Caboolture enhance connectivity and improve the efficiency of Greater Brisbane's road network by connecting suburbs with the central business district and important economic areas.

The Mt Lindesay Highway upgrade between Green Road and Granger Road at Park Ridge is complete. Work included duplicating the existing highway, constructing service roads and constructing an overpass at the Park Ridge Road Intersection, now known as the Cordingly Bridge.

The Acacia Ridge rail crossing overpass on Beaudesert Road was completed as part of the AusLink Program, jointly funded by the Queensland Government, the Australian Government and Queensland Rail. This project provides for a grade separation of the Mt Lindesay Arterial over the Brisbane–Sydney rail line at Acacia Ridge. This is being undertaken in conjunction with major upgrading of the Acacia Ridge rail terminal.

In the public transport arena, construction of the Eastern Busway from the Eleanor Schonell Bridge in Dutton Park to the South East Busway at Buranda is improving networks, reducing commute times and providing better services.

Specially designed bike paths such as the PA Hospital Cycleway offer commuters the opportunity to leave their cars at home and travel to work sustainably, contributing to a long-term vision for improved active transport in the region.

The new Royal Brisbane Women's Hospital (RBWH) Cycle Centre provides cyclists, pedestrians and joggers access to a state-of-the-art, end-of-trip facility with 750 secure bike parking spaces, male and female shower facilities, secure lockers, towel service and bike maintenance capabilities—making active transport an attractive choice not just for the journey, but at the destination.

The Northern Busway to Herston—the first stage of the Northern Busway—opened in August 2009. The busway links the Royal Children's Hospital to Herston via the RBWH. This section of the Northern Busway provides easy access to Queensland's largest public hospital from the CBD and makes travel to and from the city's northside faster and more reliable.

Projects underway

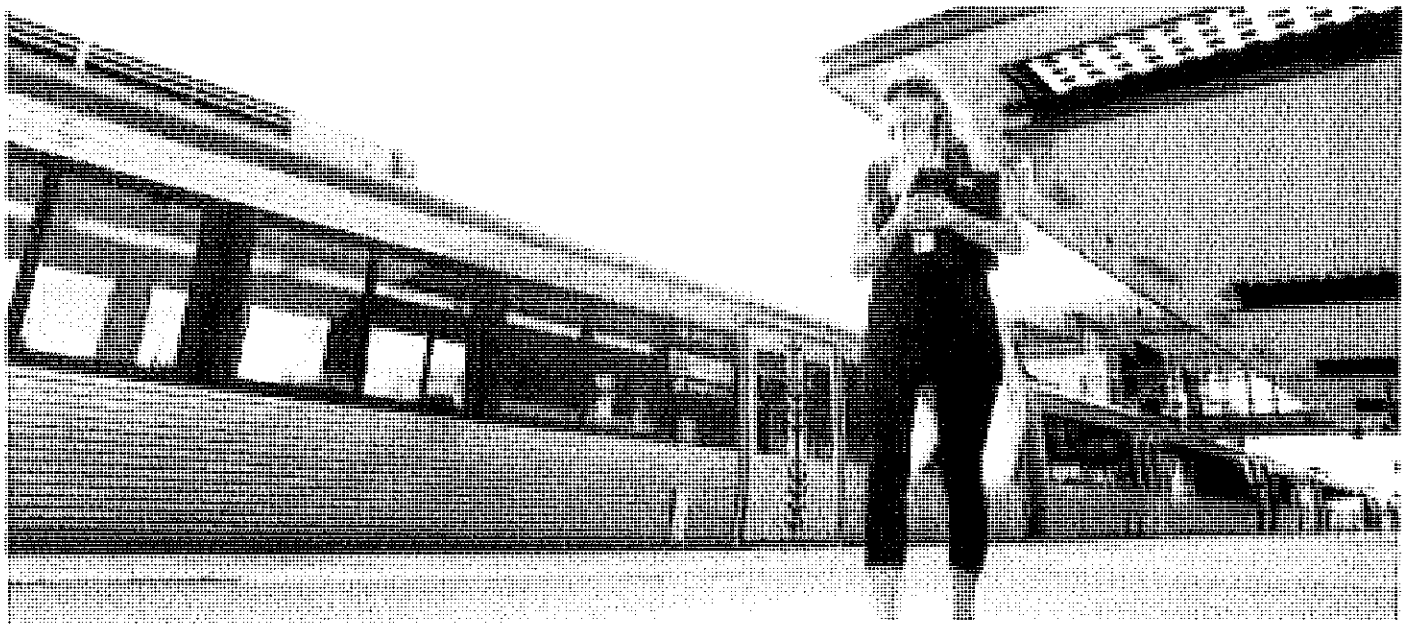
The Pacific Motorway upgrade from Springwood South to Daisy Hill is currently underway. The upgrade will increase traffic flow and improve safety on the Pacific Motorway.

The purchase of 20 three-car rail sets and construction of stabling facilities is also underway. This follows the successful delivery of 24 three-car rail sets completed in January 2009. The new rolling stock will be used to provide extra passenger services on the Citytrain network.

In August 2009, buses began operating along the Eastern Busway from the University of Queensland and the Eleanor Schonell Bridge at Dutton Park to the South East Busway at Buranda. The Queensland Government is expanding the Eastern Busway from Buranda to Main Avenue at Coorparoo. The Eastern Busway will ultimately connect the University of Queensland to Capalaba via Buranda, Stones Corner, Coorparoo, Camp Hill, and Carina, and will be the eastern link in Brisbane's world-class busway network, reducing bus travel times for thousands of commuters from all over the eastern suburbs.

The Northern Busway is an integral part of the Queensland Government's long-term plan to meet the transport needs of Brisbane's growing northside communities. The Northern Busway connects with the Inner Northern Busway which was completed in 2008. The section of the Northern Busway from the Royal Children's Hospital at Herston to Windsor was completed in August 2009.

The next stage, from Windsor to Kedron, is currently under construction and is being delivered in conjunction with Airport Link. It is due for completion in



2012. The final stage from Kedron to Bracken Ridge is in the planning stage.

Brisbane City Council has commenced a staged upgrade of Kingsford Smith Drive between Breakfast Creek Road and the Sir Leo Hielscher Bridges. The first stage, now under construction, is due for completion in early 2011 and will provide improved connectivity between the new and old Gateway Motorway.

Projects planned

The Queensland Government is also actively working to meet the future transport infrastructure needs in Greater Brisbane, planning projects such as Cross River Rail.

Cross River Rail is a proposed new north-south rail line in the inner city, including a tunnel under the Brisbane River and new underground inner city rail stations. The project will unlock South East Queensland's constrained rail network by providing more capacity for the region's rail services, meaning more people can move into and through the city more frequently.

The Australian and Queensland governments have committed $25 million to progress the detailed feasibility phase of the project. This is now underway and is due for completion in mid 2011. The detailed feasibility phase includes investigations to determine the location of the new route and new underground stations, preparing an environmental impact statement and a business case, and extensive community consultation. At the end of the detailed feasibility phase, the Australian and Queensland governments will consider the outcomes of the study, how it could be funded and when it should proceed to procurement.

Projects planned to increase rail network capacity across the region include completion of the Darra to Springfield Transport Corridor project and upgrades on the Ferny Grove and Cleveland lines. Other planned public transport infrastructure includes high occupancy vehicle and bus priority lanes throughout South East Queensland.

Brisbane City Council is well progressed with the tender process for Northern Link, the 5 kilometre underground toll road linking the Western Freeway at Toowong to the Inner City Bypass at Kelvin Grove. Three consortia have been shortlisted to develop bids to design, construct and operate the tunnel, with construction due to begin in late 2010.

Further upgrades are planned to major routes including the Ipswich, Logan, Gateway and Pacific Motorways and connecting roads.

Health

The Queensland Government is focused on increasing the capacity and provision of high quality, safe and sustainable health services to meet the needs of communities. This includes expanding the range of health services available in the home, workplace or community to allow public hospitals to focus on those most in need.

In Greater Brisbane, the focus is on undertaking service and infrastructure planning for the significant pressure experienced in the areas of Logan, Caboolture and inner Brisbane.

The Queensland Government is aiming to provide new and refurbished facilities to ensure Greater Brisbane residents have access to good health services and programs that effectively maintain and improve their overall health and wellbeing and provide them with a good quality of life.

Some of the health system projects include upgrades at the Princess Alexandra Hospital, The Prince Charles Hospital, Caboolture Hospital, Logan Hospital, Redland Hospital and QEII Emergency Department. In addition, the new Queensland Children's Hospital will provide expanded specialist paediatric care.

The demand for health services has been reflected in bed pressures, elective surgery waiting lists and emergency department attendances and waiting times. It has also had a significant impact in terms of infrastructure capacity, driving both demand for new infrastructure and efforts to ensure existing space is utilised efficiently.

Projects completed

One of the state's biggest hospitals, The Prince Charles Hospital, has undergone a major redevelopment including a new general adult emergency department, a new and expanded intensive care unit, a major upgrade of the existing operating suites and 150 additional adult beds.

Stage one of the Pharmacy Australia Centre of Excellence was completed in 2009. The centre will provide a new facility for the University of Queensland's School of Pharmacy.

Projects underway

Work on the Queensland Children's Hospital is continuing, with the 359 bed new tertiary facility to provide world-class care for Queensland children in a purpose-built facility adjacent to the Mater Hospital site.

Stage one of the Queensland Children's Hospital—the Hancock Street car park—opened in November 2009 and stage two prior works began in December 2009.

Children's health service improvements include the Caboolture Hospital Paediatric Emergency Services upgrade to expand the current facility, a new paediatric emergency department at The Prince Charles Hospital and an expansion of paediatric emergency services at Redland Hospital.

Delivery of the redevelopment of the Princess Alexandra Hospital Emergency Department comprising: a new and expanded emergency department; a new medical assessment and planning unit; mental health emergency assessment area; helipad with elevator to ground level; new radiation oncology bunkers for cancer treatment; and a new scanner, is well underway and forecast for completion by early 2011.

Projects planned

The Queensland Health Services Plan 2011–2026 is currently being drafted and will replace the existing Queensland Statewide Health Services Plan 2007–2012. This plan will outline objectives, strategies and service models to guide government to meet future demand.

Education and training

Early childhood education and care

Local and international research shows high quality education early in life gives children the best start and a solid foundation for their development.

The priority is to provide access to a kindergarten program for all children turning four by 30 June in the year before Prep. To do this, Queensland must have the infrastructure required to meet the demand for high-quality, accessible, affordable and integrated early childhood services.

The extra kindergarten services will double the capacity of the Queensland community kindergarten sector and cater for the 12 000 children not currently accessing any centre-based early education or care services.

Projects completed

Kindergarten facilities at Moorooka State School and Stretton State College were completed in January 2010 and are currently in operation.

An early years centre was opened at Browns Plains in October 2009.

A Best Start early childhood education and care centre was completed at West End in June 2008 on the site of the former pre-school.

Projects underway

Projects for new kindergartens are currently underway at Beachmere, Deception Bay North, Crestmead, and Rochedale South State Schools. These projects are all expected to be operational for first term in 2011. An extension of the Carindale kindergarten is planned for Carina State School, also to be completed by first term in 2011.

Projects are currently underway on the non-state school sites of Forest Lake College and Prince of Peace Lutheran College, Everton to deliver new kindergarten facilities for first term in 2011.

Projects for early childhood education and care centres are currently underway at Beenleigh, Beaudesert, The Gap and Acacia Ridge State School.

Projects planned

The Queensland Government has announced plans to develop new kindergartens on the following sites to be operational for first term of 2012:

- Bald Hills State School
- Durack State School
- Gumdale State School
- Kingston State School
- Logan Reserve State School
- Logan Village State School
- Mount Gravatt East State School
- Seven Hills State School
- St Anthony's School, Alexandra Hills
- St Paul's School, Bald Hills

A children and family centre is planned for Marsden and is expected to be operational by July 2012.

Primary and secondary education

The Greater Brisbane region will see significant growth over the next 20 years. Schools are closely linked with the planning process, with provision of schools aligned to the settlement pattern of the state.

There is an increasing need to emphasise both new schools in new broadhectare areas and the renewal of current schools serving older areas. The government continues to closely monitor trends such as what household structures favour different dwelling types and their implications on school planning.

To meet these demands, a 20-year plan of new schools is maintained and rolled out.

Projects completed

Recent new primary schools in Greater Brisbane include the Bounty Boulevard State School (North Lakes), Bay View State School (southern Redland) and a secondary replacement facility, Brisbane Bayside College (Wynnum).

Projects underway

A secondary school and a primary school are planned for northern Pine Rivers District and a further primary school is planned for Brisbane within the short-term period (up to and including 2014).

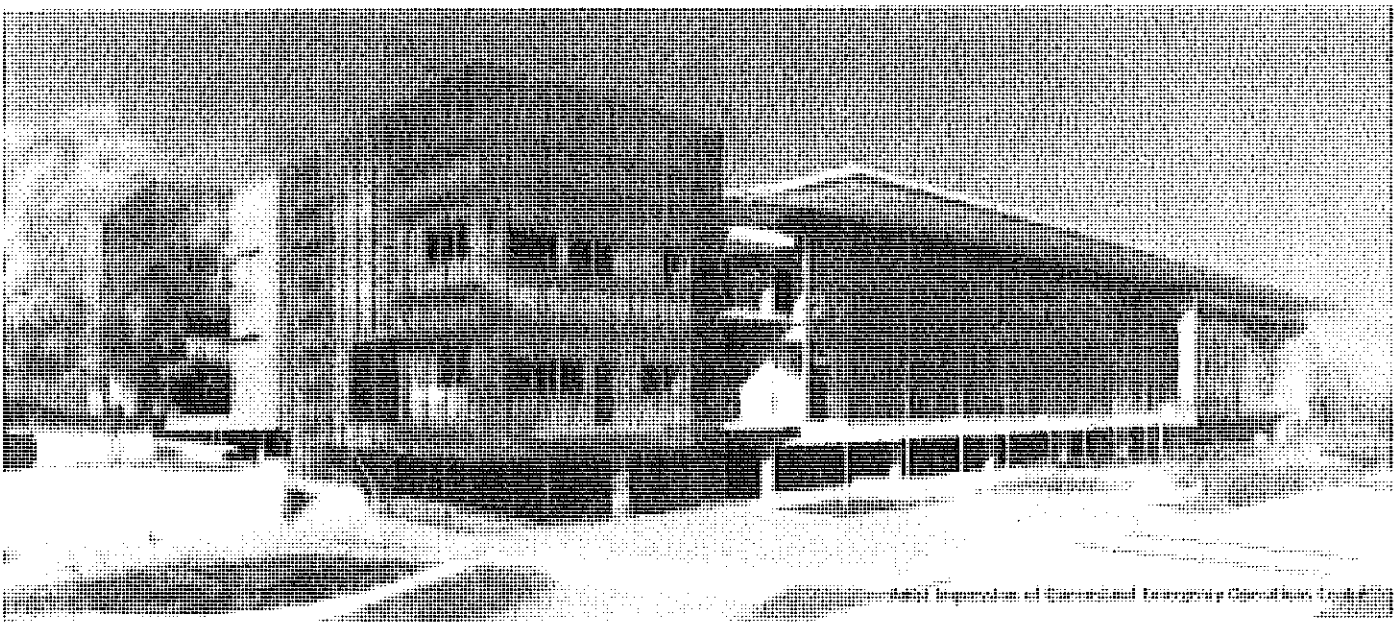
Projects planned

Longer-term future infrastructure plans for the Greater Brisbane region include six primary schools and one secondary school from 2015 to 2020, and seven primary and two secondary schools from 2021 to 2031.

Vocational education and training

Queensland's continuing economic strength depends on the state's workforce possessing the skills to meet the dynamic needs of business and industry.

The Queensland Government's vision is for a highly skilled, flexible workforce that will underpin the state's continuing growth and prosperity. The Queensland Skills Plan 2008 is a major investment in achieving this vision. To meet the needs of business and industry, the government is building workforce capacity and skills—particularly professional capacity and skills—to meet workplace requirements.



The Queensland Government is implementing the Queensland Skills Plan to deliver 17 000 training places a year by 2010. In addition, the government will invest over $124 million to help create nearly 150 000 training places over the next four years in a record expansion of the Queensland skills base.

The successful implementation of the initiatives within SEQIPP relies heavily on the availability of a skilled workforce.

Projects completed

The Trade Training Centres in Schools Program, funded by the Australian Government, has continued with the Aviation High Trade Training Centre at Clayfield opened in January 2010.

Projects underway

The major SkillsTech Australia trade training campus at Acacia Ridge in Brisbane continues to be developed. In 2009, construction industry training facilities were underway for refrigeration, electrical, painting and decorating trades.

Work is continuing on the modernisation of the Metropolitan South Institute of TAFE, Mt Gravatt and Loganlea facilities, to become a lead institute for programs in aged care, small business and fashion, with stage one completed in January 2009 and further works underway.

Projects planned

There are a range of trade training centre projects planned for Greater Brisbane at Brisbane North West, Marsden, Rochedale-Springwood, Morayfield and Redcliffe Peninsula.

Community services

Queensland Police Service

Queensland's police service aims to ensure the Greater Brisbane region is a safe and secure place to live, visit and do business. This is achieved by delivering high quality, innovative, progressive and responsive policing services.

The growing population brings with it the need for increased policing and safety measures. New policing facilities that complement and support service delivery are being planned and progressed to assist in meeting that need.

Policing infrastructure such as law enforcement centres, administration facilities, training facilities and specialist police services need to be easily accessible, integrated and fit-for-purpose to ensure the safety and security of communities. Infrastructure must be designed to respond to future demographic and technological changes.

Several new police stations within the greater region are currently being planned and progressed while existing infrastructure is progressively upgraded to accommodate existing, new and emerging challenges the Queensland Police Service may face.

Projects completed

The upgrade to the Upper Mt Gravatt Police Station and new police stations at Carseldine, Crestmead and Mango Hill/North Lakes will continue to assist in delivering high quality policing services.

Projects underway

The development of a state-of-the-art police academy at Wacol has continued during the year. Renovations on Lillypilly House are now complete and will provide accommodation for the Driver Training Unit when the track is constructed. The construction of the driver training track and associated classrooms, renovation of the heritage listed cricket pavilion and the demolition of surplus buildings are close to completion.

Projects planned

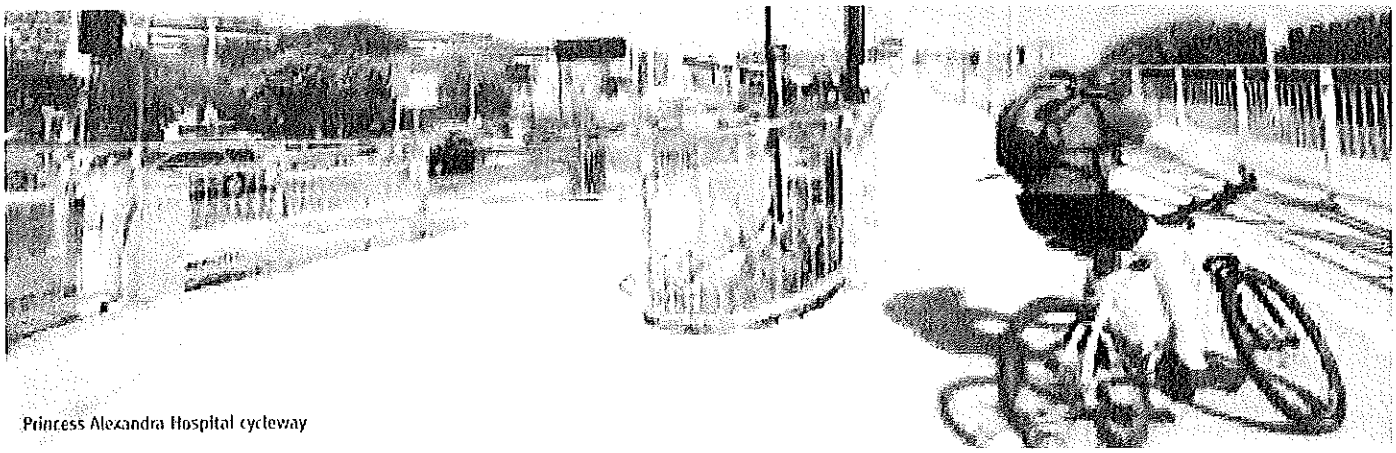
The planned upgrade to the Pine Rivers district office, refurbishment of the Richlands watch house, a replacement forensic facility for the Oxley Police district and a replacement Camp Hill Police Station at Carina will assist in delivering high quality policing services into the future.

Emergency services

The provision of emergency services infrastructure shadows population and may be delivered either through the enhancement of existing assets or the development of new facilities.

Emergency services infrastructure includes the provision of fire, ambulance and emergency management facilities, appliances and equipment. This infrastructure supports essential service delivery and contributes to the achievement of safe, resilient and sustainable communities.

As population growth in South East Queensland continues, the need for emergency services also increases,



Princess Alexandra Hospital cycleway

particularly in and around the major growth areas identified in the SEQ Regional Plan. Higher density development could also impact on urban permeability and emergency service delivery.

The Queensland Government is addressing these challenges by providing a network of emergency services infrastructure. New or enhanced fire and ambulance services are produced in direct response to current and projected service delivery needs.

Projects completed

The Redland Bay Fire and Rescue station was completed in December 2009.

Projects underway

The $70 million Queensland Emergency Operations Centre in Kedron will provide a coordinated operational and communication facility for the delivery of emergency services in the region. It will co-locate currently dispersed communication centres into one, state-of-the-art communication facility capable of responding to the most complex emergency situations in the region and across Queensland. Construction is due to be completed in 2010 and commissioning will begin in 2011.

Woodridge and Pullenvale stations are scheduled for completion in 2010.

Justice services

As the population grows, so does the demand for justice services. The Queensland Government is committed to improving the quality, timeliness and accessibility of justice services.

These services ensure the community operates in safe, fair and productive work environments that contribute to the social and economic wellbeing of all Queenslanders. Appropriate services need to be strategically located within high growth regions to achieve this.

The challenge for justice services is to fully utilise the improved infrastructure to ensure a high level of service is maintained.

Projects underway

The construction of the new Brisbane Supreme Court and District Court is underway and will deliver one of the largest court facilities in Australia. The 19-storey building will increase the number of courtrooms available to the Supreme Court and District Court by 14, and provide sufficient accommodation for the courts to meet the expected growth in court business for at least the next 30 years.

The building will be integrated with the highly successful Brisbane Magistrates Court which was opened in 2004 and create a major new public square between the two buildings.

The project is scheduled for completion by the end of 2011, which will coincide with the 150th anniversary of the Supreme Court's establishment in Queensland.

Sport and recreation

The Queensland Government supports the development of healthy and socially inclusive communities through sport and recreation activities and programs, the development of the state's elite athletes and grants to support construction of sport and recreation facilities.

The government's sport and recreation services encourage Queenslanders to lead active and healthy lifestyles, from participation at a community level through to enhanced achievement at elite levels. Linked to this is a commitment to increase the land dedicated to nature conservation and public recreation by 50 per cent.

Rapid population growth in South East Queensland has contributed to an increase in the demand for community sporting facilities. The availability of land and a range of complex land tenures for outdoor recreation have also led to increased demand levels for sport and recreation infrastructure.

This increased demand requires both the construction of new infrastructure and the most efficient use of existing space.

Projects underway

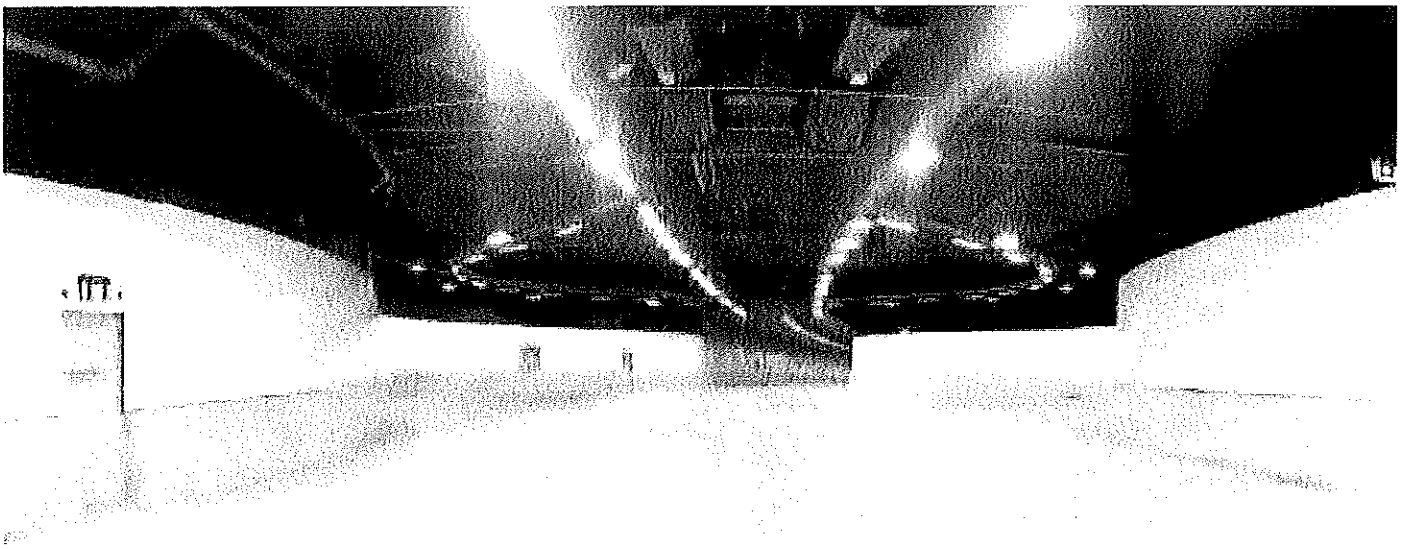
The Redcliffe Tennis Centre Upgrade will provide fresh facilities for northern suburbs residents.

The Queensland Government has committed to a number of community greenspace initiatives including the provision of three new urban parks at Kangaroo Point, Long Pocket and Fitzgibbon. The new Kangaroo Point Cliffs Park, opened in January 2010, also features five public artworks that are currently under construction. State land at Long Pocket will be developed into parklands, including 300 metres of river front land for the public to enjoy. A 40 hectare parcel of state-owned bushland at Fitzgibbon has been dedicated as a public park as part of the development of state land by the Urban Land Development Authority.

Construction of an aquatic facility incorporating a 50-metre, eight-lane heated swimming pool at Colmslie is expected to be completed in July 2010. The facility will host learn to swim programs and physical activity programs including water aerobics and lap swimming. The project aligns with the strategic direction of Swimming Queensland.

Projects planned

Construction of playing fields, a clubhouse and ancillary facilities for rugby union and touch football are planned for Logan. The project will support local sporting clubs, giving them a home and providing capacity to increase participation within the relevant sporting fraternities.



Key infrastructure projects

Eastern Busway – Buranda to Main Avenue

Status:	Under construction
Description:	Construction of a busway connecting the South East Busway at Buranda to Main Avenue at Coorparoo
Cost:	$466 million
Delivery:	Construction commenced August 2009 and is planned for completion early 2012
Key benefit:	A total of 2509 direct and indirect jobs will be generated over the life of the project. It will be the eastern link in Brisbane's world-class busway network, reducing bus travel times for thousands of commuters from all over the eastern suburbs

Logan Hospital Emergency Department Upgrade

Status:	In planning
Description:	Expansion of the emergency department
Cost:	$33 million (part of a $67 million program of emergency department upgrades across South East Queensland)
Delivery:	The project is planned for completion in 2012
Key benefit:	The project will result in reduced emergency department waiting times

Pacific Motorway Upgrade – Springwood South to Daisy Hill

Status:	Under construction
Description:	Reconstruction of a 3.3 kilometre section of the Pacific Motorway between Springwood South and Daisy Hill
Cost:	$422 million
Delivery:	The project is planned for completion late 2011
Key benefit:	An average of 1409 direct and indirect jobs will be sustained over the life of the project. It will increase traffic flow and improve safety on the busy Pacific Motorway

SkillsTech Australia new Campus at Acacia Ridge

Status:	Under construction
Description:	Construction of a major skills training campus at Acacia Ridge
Cost:	Part of a $214 million SkillsTech Australia: Redevelopment of Trade Training Facilities program
Delivery:	Expected to be complete by 2012
Key benefit:	The campus will enable consolidation of SkillsTech Australia to lead product development and delivery in key trade areas

Brisbane Supreme Court and District Court

Status:	Under construction
Description:	Development of a new Supreme Court and District Court building including 45 courtrooms, associated support functions, registry, judges' chambers and cells
Cost:	$600 million
Delivery:	Construction commenced in late 2007 and is planned for completion late 2011
Key benefit:	The project will create a new integrated legal precinct and public amenity for the western end of the CBD

Northern Busway – Royal Children's Hospital to Kedron

Status:	Under construction
Description:	Extending the Northern Busway from the Royal Children's Hospital to Kedron
Cost:	$743 million
Delivery:	Scheduled for 2012
Key benefit:	When completed, travel between Kedron, Herston and the city will be greatly improved

TRANSPORT

Public transport network

	Cross River Rail - Study	Market	25	▲	◐	◐			
GB1	Cross River Rail	Pre-project	8,200	▲			◐	◐	→
GB2	Lawnton to Petrie third rail track	Concept	170				◐	◐	
GB3	Mayne – Ferny Grove Line connection	Concept	20				◐	◐	
GB4	Mitchelton to Ferny Grove track duplication - Keperra to Ferny Grove	Pre-market	90		◐	◐			
	Train Servicing Depot	Pre-project	260					◐	→
GB5	CBD Bus Infrastructure Capacity Program - Cultural Centre safety upgrades	Pre-project	10			◐	◐		
GB6	Eastern Busway - future stages	Pre-project	1270	▲	◐	◐	◐	◐	→
	Eastern Busway - Buranda to Main Avenue	Market	466		◐	◐			
GB7	Northern Busway - Royal Children's Hospital to Kedron	Market	743		◐	◐			
	Northern Busway - Kedron to Chermside - Investigation	Pre-project	11		◐				
	Northern Busway - Carseldine/Fitzgibbon bus station	Pre-project	45					◐	→
	Northern Busway - Chermside Station and early works	Pre-project	30			◐			
	Northern Busway - Royal Children's Hospital to Bracken Ridge - Interim HOV	Pre-project	340			◐			→

Strategic road network

GB8	Acacia Ridge intermodal access - road network investigations	Pre-market	2		◐				
GB9	Airport Link	Market	3,302		◐	◐			
-	Brisbane - Gold Coast transport network investigation	Concept	30		◐	◐			→
GB10	Brisbane Urban Corridor intersection upgrades - Mains to Kessels Road interchange	Pre-market	300	▲	◐	◐	◐	◐	
GB11	Bruce Highway intersection upgrades - Pumicestone Road, Boundary Road and Bribie Island Road	Concept	200	▲	◐	◐	◐	◐	
GB12	Burpengary-Caboolture Road upgrade - Bruce Highway to Gaffield Street	Concept	150		◐	◐	◐	◐	→
GB13	Cleveland-Redland Bay Road upgrade - South Street to Boundary Road - three intersection upgrades	Market	25		◐				
GB14	East-West Arterial upgrade - Airport Link to Gateway Motorway	Market	326		◐	◐	◐		
GB15	Gateway Motorway - extension south of Logan Motorway - Investigation	Pre-project	7		◐	◐	◐		
GB16	Gateway Motorway - Mt Gravatt-Capalaba Road to Nudgee Road (including Sir Leo Hielscher bridge duplication)	Market	1,750		◐				
GB17	Gateway Motorway - Mt Gravatt-Capalaba Road to Pacific Motorway - Corridor Preservation	Pre-project	70	▲	◐	◐			
	Gateway Motorway - Mt Gravatt-Capalaba Road to Pacific Motorway[7]	Pre-market	1,400	▲	◐	◐	◐	◐	→
GB18	Gateway Motorway - Nudgee to Bruce Highway - Sandgate Road to Deagon Deviation third lane	Concept	250	▲	◐	◐	◐	◐	→
-	Gympie Arterial - Stafford Road to Roghan Road - Investigation	Pre-market	7		◐	◐			
GB19	Kingsford Smith Drive Corridor (BCC project)	Concept	650		◐	◐	◐	◐	→
GB20	Logan Motorway Upgrade - Ipswich Motorway to Pacific Motorway	Pre-project	4,300		◐	◐	◐	◐	→
GB21	Logan Road intersection upgrade - Miles Platting Road-Padstow Road	Pre-project	11		◐				
GB22	Mt Lindesay Highway - Green Road to Jimboomba - Rosia Road to Chambers Flat Road	Market	142		◐	◐			→
GB23	Northern Link - Toowong to Kelvin Grove (BCC project)	Pre-project	1,800		◐	◐	◐	◐	→

GB24	Pacific Motorway Upgrade - Daisy Hill to Logan Motorway - Corridor Preservation	Pre-market	19	▲	○				
	Pacific Motorway Upgrade - Gateway Motorway to Springwood South - Corridor Preservation	Concept	18	▲	○				
	Pacific Motorway Upgrade - Springwood South to Daisy Hill	Market	422	▲	●	●			
GB25	Pacific Motorway Upgrade - Juliette Street to Klumpp Road	Pre-project	90				●	●	→
GB26	Port of Brisbane Motorway - Lindum Street to Pritchard Street[8]	Pre-market	650	▲	●	●	●	●	
	Stafford Road - Gympie Road to South Pine Road - Investigation	Pre-project	5					○	
Freight network									
GB27	Metro Freight Capacity Upgrades - Stage 1	Market	84		●				
HEALTH									
GB28	Caboolture Health Precinct	Pre-project	21				●	●	
GB29	Emergency Department upgrades - Logan, Redland, QEII and Caboolture	Concept	67		●	●	●		
GB30	Princess Alexandra Hospital - additional bed capacity	Market	52		●				
GB31	Queensland Children's Hospital - Academic and Research Centre	Concept	80		●	●	●	●	→
	Queensland Children's Hospital	Pre-market	1,397		●	●	●	●	→
GB32	The Prince Charles Hospital - Paediatric Emergency Department	Pre-market	46		●	●			
GB33	Translational Research Institute	Pre-market	334		●	●			
EDUCATION AND TRAINING									
	State school infrastructure in Brisbane, Moreton Redland and Logan	Ongoing program	910		●	●	●	●	→
GB34	Metropolitan South Institute of TAFE - Mt Gravatt Stage 2	Pre-market	13		●	●			
GB35	SkillsTech Australia - redevelopment of Brisbane Trade Facilities	Pre-market	214		●	●			
COMMUNITY SERVICES									
GB36	Queensland Police Academy	Concept	460		●	●	●	●	
GB37	Brisbane Supreme Court and District Court	Market	600		●	●			
GB38	Brisbane Convention and Exhibition Centre expansion	Market	136		●				
GB39	Aquatic Centre - Colmslie	Market	8		●				
GB41	Kippa Ring Indoor Multi-Purpose Facility	Concept	5		●				
GB42	Meadowbrook Multi-Sport Fields	Concept	3		●				
GB43	Redcliffe Tennis Centre Upgrade	Market	3		●				
GB44	State Equestrian Centre - Caboolture	Market	5		●				
Total estimated investment of projects underway in 2010–2014 = $32,044 million									

1. The table identifies infrastructure projects to 2014 in Greater Brisbane.
2. Estimates in the state budget and other documents may differ, as they may incorporate costs that reflect anticipated changes in input prices between initial planning and the time of construction. Estimated investment includes funds already expended on projects.
3. Where funding is required from other sources other than the Queensland Government, their estimated costs have been included.
4. For an explanation of estimate categories, refer to page 15.
5. State school infrastructure includes 19 planned schools in Brisbane, Moreton, Redland and Logan to 2031.
6. Estimated investment for projects within this table refer to the total project cost, which may be beyond the four year period. This is relevant for projects with an arrow in the last column.
7. This project incorporates funds announced in the State Budget 2010–11 for Gateway Upgrade South.
8. This project incorporates funds announced in the State Budget 2010–11 for the Port of Brisbane Motorway Upgrade.

○ Investigation/study projects ○ Corridor preservation projects ● Infrastructure construction projects ▲ Subject to federal funding → Project continues in later years

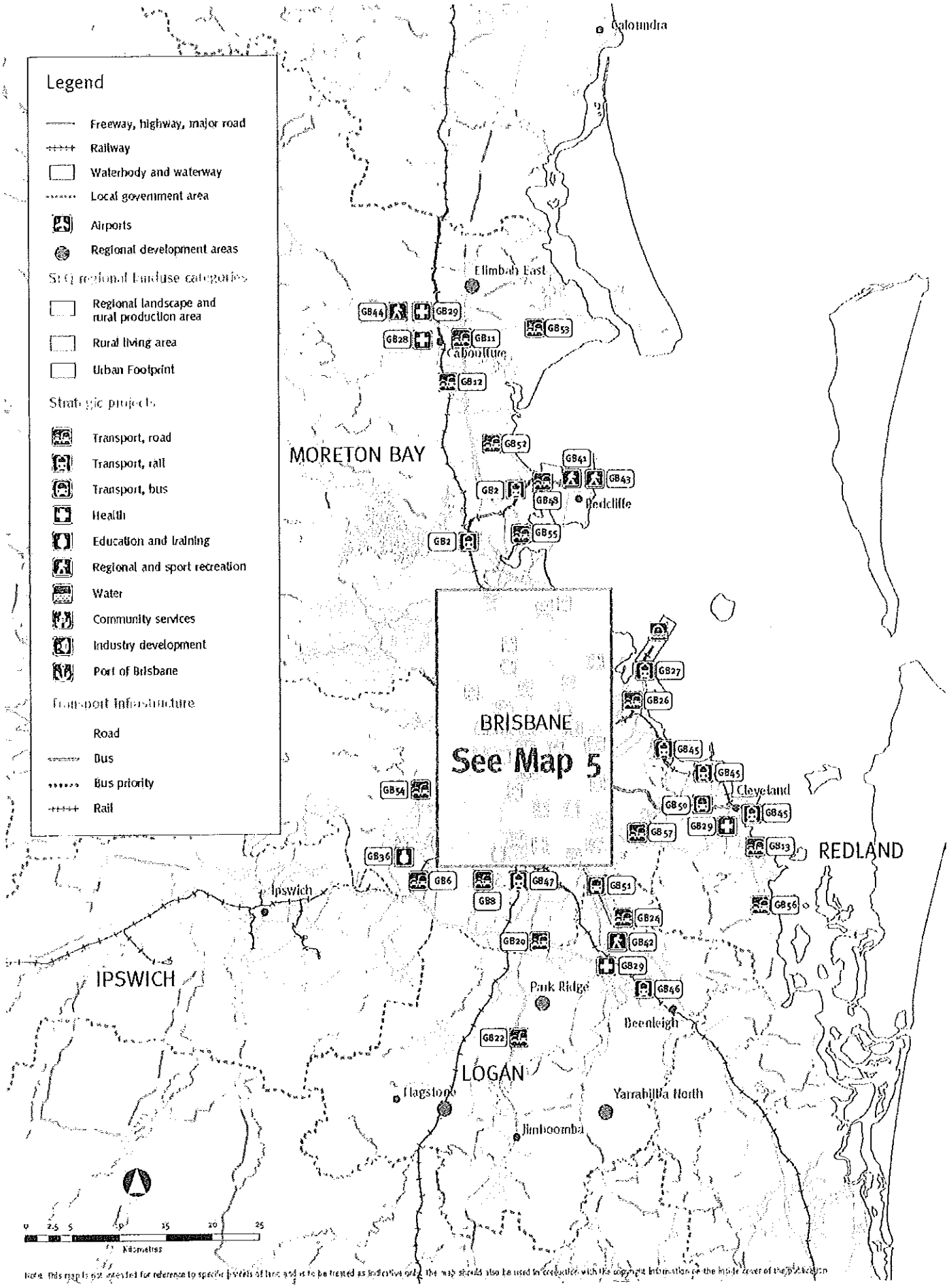
Greater Brisbane planned infrastructure 2014–2031

Map ref	Project	Subject to federal funding	Indicative delivery timeframe		
			2014–15 to 2019–20	2020–21 to 2025–26	2026–27 to 2030–31
TRANSPORT					
Public transport network					
GB45	Cleveland Rail Corridor upgrades - Manly to Cleveland			●	
GB46	Kuraby to Loganlea third rail track			●	
GB47	Inner Brisbane Underground Rail	▲		●	
GB48	Petrie to Redcliffe Rail Corridor			●	
GB49	Sandgate to Shorncliffe track duplication			●	
GB5	CBD Bus Infrastructure Capacity Program		●		
GB6	Eastern Busway - Bennetts Road to Capalaba			●	
GB7	Northern Busway - Kedron to Bracken Ridge			●	
GB50	Redland bus priority measures				●
GB51	South East Busway - Eight Mile Plains to Rochedale to Springwood			●	
Strategic road network					
GB10	Brisbane Urban Corridor - intersection upgrades	▲		●	
GB13	Cleveland-Redland Bay Road upgrade - South Street to Boundary Road - four lane duplication			●	
GB52	Deception Bay Road upgrade - Bruce Highway to Lipscombe Road		●		
GB53	East-West links - Caboolture to Bribie Island Road - Pasturage Road to Saints Road - additional lanes			●	
GB15	Gateway Motorway - extension south of Logan Motorway - Corridor Preservation		●		
GB18	Gateway Motorway - Nudgee to Bruce Highway	▲		●	
–	Gympie Arterial - Stafford Road to Roghan Road - Corridor Preservation		●		
GB54	Kenmore Bypass - Western Freeway to Moggill Road			●	
GB22	Mt Lindesay Highway - Chambers Flat Road to Jimboomba (including Green Road Interchange)			●	
GB55	North-South Arterial - Mango Hill			●	
GB24	Pacific Motorway Upgrade - Gateway Motorway to Springwood South and Daisy Hill to Logan Motorway	▲		●	
GB26	Port of Brisbane Motorway - Pritchard Street to Boat Passage	▲		●	
GB56	Redland Bay Road upgrade - Tingalpa Creek to Cleveland-Redland Bay Road - four lane duplication			●	
GB57	Redland sub-arterial road upgrade - Mt Gravatt-Capalaba Road to Tingalpa Creek - intersection upgrades and four lane duplication		●		
–	Stafford Road - Gympie Road to South Pine Road - Corridor Preservation		●		
Active transport network					
GB58	Additional pedestrian/cycle bridge in the CBD		●		
Freight network					
GB27	Metropolitan freight capacity upgrades - Stage 2			●	
Total planned investment - $27.7 billion					

1. The table identifies planned infrastructure projects to 2031 in Greater Brisbane.
2. Projects listed in the longer-term planning horizon may change to better reflect the emerging needs of the region
3. The indicative delivery timeframe outlines the estimated timeframe for completion of the project. However, project planning or commencement may occur before this timeframe.

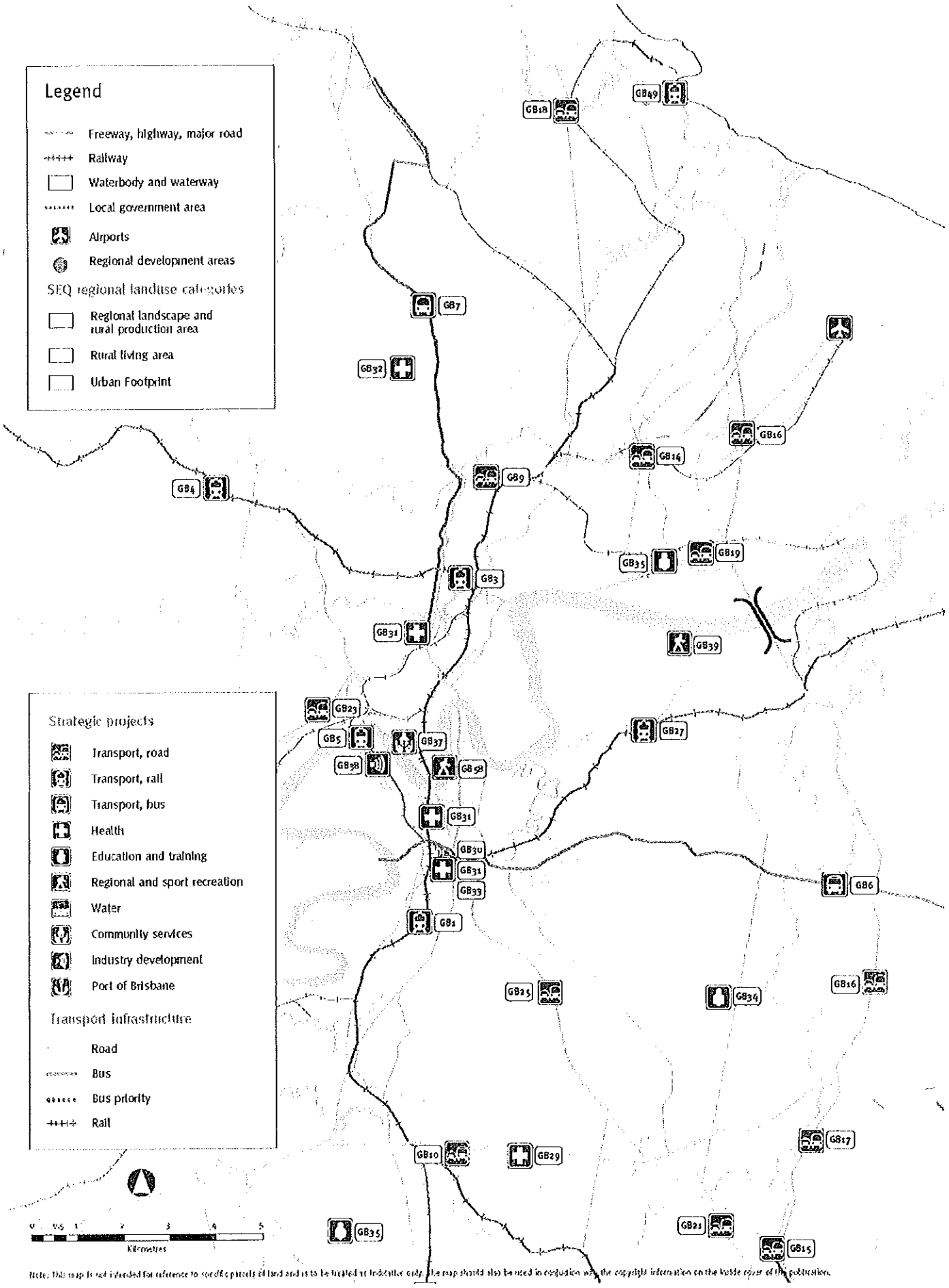
▲ Subject to federal funding

Map 4 – Greater Brisbane strategic infrastructure



Note: This map is not intended for reference to specific parcels of land and is to be treated as indicative only. The map should also be used in conjunction with the copyright information on the inside cover of this publication.

Map 5 Greater Brisbane strategic infrastructure (inset)



Note: this map is not intended for reference to specific parcels of land and is to be treated as indicative only. The map should also be used in conjunction with the copyright information on the inside cover of this publication.

Western Corridor and Western South East Queensland

Population	350 500 (2006), 798 000 (2031)
Dwellings required to 2031	76
Infrastructure investment to 2026	$21.7 billion
Annual household income 2031	$42 000
Key regional projects	Toowoomba Bypass, Ipswich Hospital Redevelopment, South Queensland Correctional Precinct, Ipswich Motorway Upgrade, Centenary Highway Upgrade, Darra to Springfield Transport Corridor, Corinda to Darra Rail Upgrade
Regional development	Ebenezer, Ripley Valley and Bromelton

Regional outcomes

The Western Corridor and Western South East Queensland greater-regions include Ipswich, Scenic Rim, Lockyer Valley and part of Toowoomba and Somerset.

The majority of growth in this area is expected to occur within the Ipswich area known as the Western Corridor.

It is essential that job opportunities, housing, utilities, transport and social infrastructure are planned and developed within the Western Corridor to accommodate growth.

The greater region provides substantial opportunities to accommodate new residential communities and employment growth, but this growth must be supported by infrastructure provision.

The SEQ Regional Plan has identified additional urban growth opportunities along existing and proposed infrastructure corridors, including regionally significant employment areas.

Infill, broadhectare and other residential opportunities will ensure residential capacity is enhanced.

Western Corridor

The Western Corridor includes the area covered by Ipswich City Council, less than an hour's drive from Brisbane. The corridor will house the majority of the region's residential and employment growth.

This significant population growth will be driven by increased employment opportunities anticipated at the RAAF Base and Ipswich Aerospace Park at Amberley, two universities, significant industrial lands and commercial growth within identified centres, including Springfield, Ripley Town Centre and Ipswich city centre.

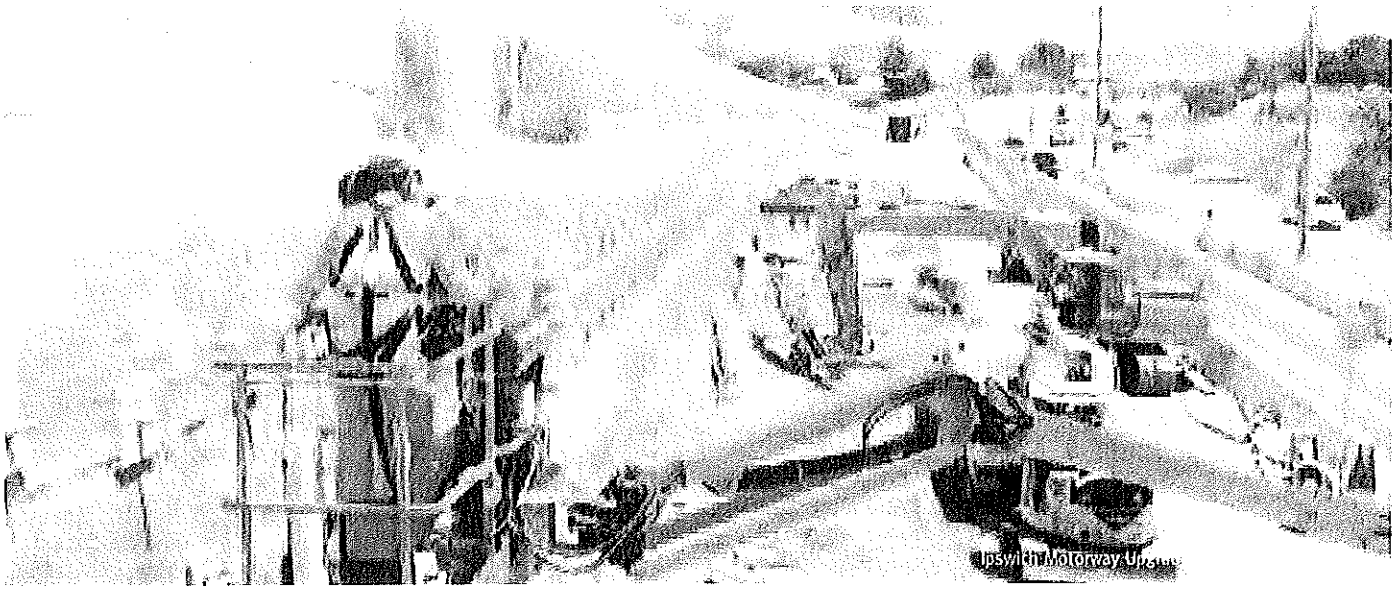
The Queensland Government recently announced three brand new communities at Ripley Valley, Greater Flagstone and Yarrabilba. These will be model communities where children can walk to school, workers can live near public transport and families will be guaranteed greenspace for recreation and easy living lifestyle.

The bring forward of the 10-kilometre rail line to Springfield by two years demonstrates the Queensland Government's commitment to its go west for growth strategy.

The redevelopment of the Ipswich city centre will strengthen the prosperity and economic vitality of the area and reinforce the role of Ipswich as a principal activity centre.

The city centre will have increased commercial, retail and residential roles and upgraded multi-modal public transport. A planned bypass of Ipswich CBD will take traffic out of the city centre, supporting its redevelopment and growth for business, services and retail.

The Ipswich Motorway, Centenary Highway, Cunningham Highway, Warrego Highway and Ipswich Rail Line will be upgraded to improve safety and increase transport capacity in and out of the region. Construction has



commenced on a new rail line from Darra to Springfield which, in the longer term, is planned to continue to Ipswich. The rail projects will increase connectivity within the region by linking Ipswich City with Ripley and Springfield town centres.

Broadhectare projects will deliver the majority of residential growth in the Western Corridor. These projects will need a broad range of transport options, community infrastructure and diverse employment opportunities.

Ripley Valley and Springfield, alongside smaller broadhectare areas such as South Redbank Plains, Walloon-Thagoona and West Brassall, will provide most of the new residential development.

To ensure these areas have adequate education infrastructure, several new schools have been built or are scheduled to be built and the Bremer TAFE is being modernised to cater for existing and future needs.

The Ipswich Hospital redevelopment, two health precincts, the Tivoli multi-purpose sporting facility and the Brassall to Ipswich bikeway are among the projects supporting the health and wellbeing of the region.

Western South East Queensland

Western South East Queensland includes the Lockyer Valley Regional Council, Scenic Rim Regional Council and Somerset Regional Council areas. These regions are comprised primarily of world heritage-listed mountains and agricultural land. The region also hosts South East Queensland's core water supply —Somerset Dam and Wivenhoe Dam (the region's two largest dams) and the Western Corridor Recycled Water Plant.

Western council areas are expected to double their population size between 2006 and 2031. Consolidation of development is necessary to help protect the rural and natural values of the region and provide the most cost-effective delivery of infrastructure.

Gatton, Beaudesert, Lowood and Fernvale have the capacity to accommodate further residential development.

Stage one of the South Queensland Correctional Precinct will support employment opportunities and economic development within Western South East Queensland.

The Warrego Highway–Brisbane Valley Highway interchange is being upgraded to improve safety and accessibility to Western South East Queensland from the Western Corridor, providing easier employment access for people living in the Fernvale and Lowood areas.

Eastern area of Toowoomba Regional Council located within South East Queensland

Toowoomba is located at the western edge of South East Queensland and comprises a range of urban and semi-urban settlements. Part of the Toowoomba Regional Council local government area is outside the South East Queensland boundary and is therefore not included in SEQIPP.

Toowoomba city is the principal activity centre for the area, with urban development focused around this area and other satellite urban centres such as Highfields, Glenfields, Cambooya and Kingsthorpe.

A combination of broadhectare, infill development and redevelopment will facilitate growth in the area.

Infill development will focus on Toowoomba's central business district with medium to high-density living and mixed-use developments. Broadhectare will accommodate the majority of growth, particularly in Highfields, Glenvale, Drayton and Westbrook.

The Toowoomba Bypass and Warrego Highway improvements are planned to provide greater access to Highfields and provide heavy vehicles with an alternative to travelling through the city centre on their way to the Darling Downs and Surat Basin. This will help reduce congestion in the CBD, improve safety —particularly in known black spots—and improve freight accessibility.

Critical for the government is providing a secure water supply. The Toowoomba Pipeline became operational on 28 January 2010 and connects Wivenhoe Dam with Cressbrook Dam. This is helping to secure the water supply for the Toowoomba region.

An upgrade to the emergency department and the development of two new birthing suites at the Toowoomba Hospital to support the needs of the growing population are two of the projects contributing to the health and wellbeing of the region.

The University of Southern Queensland continues to be a significant contributor to the region—both in terms of education and recreational facilities. The new tennis facilities located on campus will be made available to students and non-students.

Infrastructure goals

Transport

A significant share of the region's growth will occur in the Western Corridor from Goodna through to Ipswich city and Amberley and will encompass Ebenezer, Swanbank, Ripley Valley and Springfield. The timely provision of transport infrastructure to support this population and industrial growth is vital.

South East Queensland's transport system supports the lifestyle enjoyed by residents and visitors, enhances the state's economic vitality and protects the natural environment.

The transport infrastructure priorities for Western Corridor and Western South East Queensland include:

- strategic capacity upgrades and improving safety on existing key road links, especially the Ipswich Motorway, Warrego Highway and Centenary Highway
- improving and providing new roads and public transport infrastructure to service growing population centres including expanding the rail network to Springfield (Darra to Springfield Rail Project) and from Ipswich to Ripley
- redirecting heavy vehicles from highly populated areas
- accelerating the development of the principal cycle network within 5 kilometres of centres such as Ipswich city centre, Springfield and Ripley and on corridors connecting these centres
- investigating the long-term transport requirements of the region and preserving transport corridors to cater for future growth
- providing greater connectivity to Brisbane's CBD, airport and the Port of Brisbane
- providing park'n'ride and interchange facilities for bus and rail commuters to encourage the use of public transport to get to Brisbane's CBD.

In delivering these priorities, there are a range of challenges to be overcome including:

- providing adequate transport infrastructure to keep pace with rapid population growth
- managing the impact of increasing road network congestion on freight and commercial vehicle movements
- supporting growth in local jobs so local employment opportunities are available for residents
- staging of new urban development to allow timely provision of transport infrastructure and public transport services in new development areas to support sustainable outcomes
- encouraging more trips by public and active transport for travel to the Ipswich city centre as it grows as a service and employment centre.

Projects completed

Projects recently completed include the Ipswich Motorway Upgrades (Ipswich/Logan Motorway Interchange Upgrade Project and Wacol to Darra Upgrade Project), the resurfacing of the Warrego Highway at Tivoli, Muirlea and Blacksoil and the Centenary Highway Extension—Springfield to Yamanto. Many of these projects include the provision of cycling facilities and contribute to the Queensland Government's vision of an interconnected, efficient road network for the Western Corridor, connecting regional activity centres with the Ipswich CBD.

Projects underway

The duplication of the Centenary Highway from Ipswich Motorway to the Logan Motorway, the upgrade of the Ipswich Motorway (Dinmore to Goodna), the Corinda to Darra Rail Upgrade and the Darra to Springfield Transport Corridor project will improve safety, connectivity and reduce congestion. The work will also enhance access to rail stations, provide improved facilities for pedestrians and cyclists and deliver extensive service roads and local connectors to remove local trips from the motorway.

Detailed planning for a 3 kilometre realignment of the Cunningham Highway has commenced to determine final design for the new Amberley Interchange. This project will improve safety at the intersection of Ipswich-Rosewood Road and increase capacity to accommodate growth

Projects such as the new passenger rail line from Richlands to Springfield and the Cunningham Highway Amberley interchange – which will include a 3 kilometre deviation and the expansion of the Cunningham Highway between Ripley Road to Ebenezer—will ensure infrastructure needs are delivered in a timely fashion to cater for emerging demand.

Projects planned

The Queensland Government is actively working to meet the future transport infrastructure needs of Western Corridor and Western South East Queensland through the identification of growth areas and potential transport corridors.

Health

The Queensland Government is working towards providing new and refurbished health facilities across the Western Corridor. This will ensure residents have access to services and programs that effectively maintain and improve their overall health and wellbeing and provide them with a good quality of life.

By improving and increasing the services available within the Ipswich precinct, self-containment and liveability is greatly increased. In addition, the Queensland Government is looking at alternative methods of delivering these services in the home, workplace or the community to allow public hospitals to focus on those most in need.

The redevelopment of the Ipswich Hospital and service planning for high priority areas incorporating Ipswich and the Western Corridor will help deliver the necessary infrastructure needed for this high growth area.

Health precincts are a new service approach designed to provide convenient and flexible access to a range of community and ambulatory health services in major urban and regional growth areas.

Population growth and an ageing population are core considerations when it comes to delivering health services. The health infrastructure planning goals for Western Corridor include:

- reducing waiting times for public hospital services
- reducing inequities that exist across specific population groups
- providing high quality, safe and sustainable health services to meet the needs of the community
- better utilising people and resources to improve the overall health and wellbeing of Queenslanders.

The demand for health services has been reflected in bed pressures, elective surgery waiting lists and emergency department attendances and waiting times. It has also had a significant impact in terms of infrastructure capacity, driving both the demand for new infrastructure and efforts to ensure existing space is utilised efficiently.

Projects underway

Master planning is underway for the expansion of the Ipswich Hospital site to create an additional 90 beds (including six paediatric short stay beds).

An upgrade to the emergency department at the Toowoomba Hospital is also underway to provide a new 12 person transit lounge for use by people awaiting discharge or transfer by ambulance.

In addition, five projects identified and funded under the Queensland Mental Health Plan are being progressed to provide 35 new beds and 35 replacement beds within the region.

Projects planned

The changing demographic profile of the Western Corridor and Western South East Queensland has identified the need for greater children's health services and birthing centres. The expansion of the Ipswich Hospital Paediatric Emergency Services department and the new birthing suite at the Toowoomba Hospital will assist in meeting this growing demand, while two new health precincts in Ipswich will provide additional services for all residents.

Education and training

Early childhood education and care

Local and international research shows high quality education early in life gives children the best start and a solid foundation for their development.

The priority is to provide access to a kindergarten program for all children turning four by 30 June in the year before Prep. To do this, Queensland must have the infrastructure required to meet demand for high-quality, accessible, affordable and integrated early childhood services.

The extra kindergarten services will double the capacity of the Queensland community kindergarten sector and cater for the 12 000 children not currently accessing any centre-based early education or care services.

As employment opportunities in the Western corridor of South East Queensland grow, so will the demand for early childhood education and care services. Early childhood education and care services will be provided to match the growing demand in identified high-growth areas.

Projects completed

A Best Start early childhood education and care centre was completed at Toowoomba North in October 2009 on the site of the former pre-school.

An early learning and care centre was opened on the site of Amberley District State School in March 2010.

Projects underway

A project for a new kindergarten facility is currently underway at Fairview Heights State School in Toowoomba and is due for completion in time for first term in 2011.

Projects planned

The Queensland Government has announced plans to develop new kindergartens on the following sites to be operational for first term in 2012:

- Gabbinbar State School, Toowoomba
- St Augustine's College, Springfield
- St Francis Xavier's School, Goodna

A children and family centre is planned for Ipswich and is expected to be operational by 2011.

Primary and secondary education

The Western Corridor is expected to double in size over the next 20 years.

Demand for primary and secondary education facilities is expected to increase significantly within this region as increased employment opportunities grow.

Schools are closely linked with the planning process, with provision of schools aligned to the settlement pattern of the state. A 20-year plan of new schools is maintained and rolled out.

There is an increasing need to emphasise both new schools in greenfield areas and the renewal of current schools serving older areas. The Queensland Government continues to closely monitor trends such as what household structures favour medium-density dwelling types and whether or not these tend to be families with school-aged children.

Projects completed

Springfield Lakes State School opened in 2007 and the replacement Amberley District State School opened in 2010 within Ipswich city area.

Projects underway

The relocation of Bremer State High School (Ipswich) is to be completed for opening in 2011. Further primary and secondary facilities are to open within the strong growth areas of Ipswich in 2011.

Projects planned

Three primary schools and one additional secondary school are planned for delivery between 2015 and 2020. From 2021 to 2031, eight further primary schools and three further secondary schools are to be provided.

Vocational education and training

Queensland's continuing economic strength depends on the state's workforce possessing the skills to meet the dynamic needs of business and industry.

The Queensland Government's vision is for a highly skilled, flexible workforce that will underpin the state's continuing growth and prosperity. The Queensland Skills Plan 2008 is a major investment in achieving this vision. To meet the needs of business and industry, the government is building workforce capacity and skills—particularly professional capacity and skills—to meet workplace requirements.

The Queensland Government is implementing the Queensland Skills Plan to deliver 17 000 training places a year by 2010. In addition, the government will invest more than $124 million to help create nearly 150 000 training places over the next four years in a record expansion of the Queensland skills base.

The successful implementation of the initiatives within SEQIPP relies heavily on the availability of a skilled workforce.


Ipswich Magistrates Court

Planned projects

There are trade training projects identified in Western Corridor and Western South East Queensland that may be funded in future rounds of the Trade Training Centres in Schools program.

Community services

Queensland Police Service

The increase in demand for Queensland police services within the Western Corridor and Western South East Queensland is directly correlated to the population growth and settlement pattern of the region.

To meet these demands and ensure police stations are equipped with appropriate technology, existing facilities will be progressively reviewed and upgraded and new facilities are being planned and progressed.

New infrastructure will be developed in line with population growth, demand and settlement patterns. This will ensure Queensland policing services are easily accessible, integrated and fit-for-purpose.

Projects completed

A newly completed replacement police station and watch house at Ipswich and new police stations at Crestmead and Springfield, are part of the Queensland Government's plan to ensure community safety for the growing Western Corridor population.

Projects planned

Upgrades of the Goodna Police Station and Richlands watch house are planned to meet community needs.

Emergency services

The provision of emergency services infrastructure shadows population and may be delivered either through the enhancement of existing assets or the development of new facilities.

Emergency services infrastructure includes the provision of fire, ambulance and emergency management facilities, appliances and equipment, supporting essential service delivery and contributing to the achievement of safe, resilient and sustainable communities.

The aim is to provide infrastructure that will support the achievement of safe, resilient and sustainable communities.

As population growth in South East Queensland continues, the need for emergency services will increase, particularly in and around the major development areas identified in the SEQ Regional Plan. Higher density development could also impact on urban permeability and emergency service delivery.

The Queensland Government is addressing these challenges by providing a network of emergency services infrastructure. New or enhanced fire and ambulance services are produced in direct response to current and projected service delivery needs.

Projects Underway

The Ipswich Regional Ambulance Station is due for completion in 2010. The project will significantly improve service delivery in direct response to the demands of growth in Ipswich. A new ambulance station is also being constructed at Springfield to meet the needs of this growing population.

Corrective services

The Queensland Government aims to provide South East Queensland with high quality, state-of-the-art facilities that support demand, encourage rehabilitation and provide adequate protection for staff, inmates and the surrounding community. In addition, facilities should encourage self-containment and sustainability.

The Southern Queensland Correctional Precinct at Gatton will service the prisoner population growth within South East Queensland for the duration of this plan.

Corrective Services is faced with the ongoing challenge of developing effective and efficient correctional facilities that address future demands for the prison population.

Projects completed

The capacity for male prisoners in South East Queensland was increased by 720 in 2008 following the completion of the redevelopment of Brisbane Correctional Centre and the expansion of the Arthur Gorrie Correctional Centre.

Projects Underway

The first stage of the South Queensland Correctional Precinct will provide a new 300 bed centre including a secure perimeter and gatehouse, visitor facilities, buildings for education and rehabilitation programs, a sports hall and sports field. Construction of this stage is due for completion by December 2011.

Projects Planned

The South Queensland Correctional Precinct, incorporating a number of correctional centres, will ultimately have the capacity to accommodate approximately 3000 beds.

Justice services

Western Corridor and Western South East Queensland areas are expected to double in size over the next 20 years. Justice services ensure the community operates in safe, fair and productive work environments which contribute to the social and economic wellbeing of all Queenslanders.

The recently completed Ipswich courthouse will provide improved access to justice services in the Western Corridor and Western South East Queensland over the next 30 years. The new courthouse is approximately twice the size of the previous courthouse and has been designed to meet the substantial growth in this region.

The challenge for justice services is to fully utilise the improved infrastructure to ensure a high level of service is maintained.

Projects completed

The recently completed Ipswich courthouse project included the creation of 12 courtrooms for the District Court and Magistrates Courts, a court registry, judges and magistrates chambers, court support facilities and office accommodation for the Director of Public Prosecution and the State Reporting Bureau. The new courthouse provides diverse employment opportunities for the region.

Projects Underway

The refurbishment and expansion of the Toowoomba courthouse will be completed in the second half of 2010. This will provide an additional courtroom and expanded court support services and will meet the needs of the increasing population for the short to medium-term.

Sport and recreation

The Queensland Government supports the development of healthy and socially inclusive communities through sport and recreation activities and programs, the development of the state's elite athletes and grants to support construction of sport and recreation facilities.

The Queensland Government encourages Queenslanders to lead active and healthy lifestyles, from participation at a community level through to enhanced achievement at elite levels. Linked to this is a commitment to increase the land dedicated to nature conservation and public recreation by 50 per cent.

Rapid population growth in South East Queensland has contributed to an increase in the demand for community sporting facilities. The availability of land and a range of complex land tenures for outdoor recreation have also led to increased demand levels for sport and recreation infrastructure.

This increased demand requires both the construction of new infrastructure and the most efficient use of existing space.

Projects completed

Projects such as the recently completed Highfields indoor multi-purpose auditorium are part of the Queensland Government's work to encourage sport and recreation activities for South East Queensland. This is a jointly funded project with the Australian Government through the Building the Education Revolution program. This community facility will provide a venue for sport, recreation, dance and cultural community programs.

Projects underway

Continuing works on the 148 kilometre Brisbane Valley Rail Trail project will provide a walking, cycling and horse riding track through Fernvale, Lowood, Esk, Toogoolawah, Harlin, Moore and Linville that will provide a family friendly outdoor recreation facility for residents and visitors.

A 745 hectare block of Queensland Government land at Wyaralong, near Beaudesert, has been set aside for South East Queensland's first dedicated off road motorcycling facility. Jointly funded by the Queensland Government and the Council of Mayors (SEQ), the project will give the community a place to legally ride their motorbikes. Construction of the first stage is expected to be complete in 2011.

Projects planned

Future planning for sport and recreation in Western Corridor and Western South East Queensland include development of stage one of a multi-purpose facility including fields, clubhouse, change rooms and recreation areas for AFL, cricket, athletics, soccer, rugby league and rugby union at Tivoli.

A project to create 12 international standard tennis courts, club house, a centre court, centre court seating and night lights is planned for the University of Southern Queensland.

Construction of a community-based, off-road criterium cycling track at Toowoomba will provide the community with enhanced opportunities for participation in off road cycling in a safe environment.

The Gatton Aquatic Centre is planned to include a 50-metre swimming pool, a 25-metre heated training pool and amenities. The development of this pool will provide the local community with a place to gather for swimming, training and recreation.

Key infrastructure projects

Status:	Stage one under construction
Description:	Construction of an environmentally sustainable correctional facility that will ultimately accommodate approximately 3000 inmates, dog squad training facility and staff training centre at Spring Creek
Cost:	$486 million
Delivery:	Stage one due for completion in 2011
Key benefit:	The correctional facility will inject an estimated $19.5 million per annum into the region's economy and will provide employment for more than 200 staff

Status:	In planning
Description:	Increase bed capacity by an additional 84 beds
Cost:	$122 million
Delivery:	Due for completion in 2016
Key benefit:	The project will mean shorter waiting times for patients

Status:	Under construction
Description:	Upgrade of 8 kilometres of the Ipswich Motorway between Dinmore and Goodna funded by the Australian Government (including a cycleway)
Cost:	$1.95 billion
Delivery:	Construction started in mid 2009 and is due for completion in 2012
Key benefit:	The upgrade will provide additional traffic capacity and improve safety by diverting at least 50 per cent of the vehicles currently using the motorway

Status:	Under construction
Description:	New rail track from Darra to Richlands and duplicated Centenary Highway from Ipswich Motorway to Logan Motorway. This is a combination of the Springfield Passenger Rail Line—Darra to Richlands and Centenary Highway—Ipswich Motorway to Logan Motorway projects
Cost:	$805 million
Delivery:	Due for completion in 2011
Key benefit:	It will provide improved transport connectivity and address the future transport needs of the growing region west of Brisbane

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]				
TRANSPORT									
Public transport network									
WC1	Ipswich Rail Line - Corinda to Darra third track	Market	219		●	●			
WC2	Springfield Passenger Rail Line - Darra to Richlands	Market	390		●				
	Springfield Passenger Rail Line - Richlands to Springfield	Concept	650		●	●	●	●	
Strategic road network									
WC3	Centenary Highway - Ipswich Motorway to Logan Motorway - four lanes	Market	415		●	●			
WC4	Centenary Highway - Ipswich Motorway to Toowong - bus priority/transit lanes	Pre-project	400		●	●	●		→
WC5	Gatton to Esk road upgrade	Pre-market	35		●	●			
WC6	Ipswich Motorway Upgrade - Goodna Bypass - Corridor Preservation	Pre-market	70	▲	●				
	Ipswich Motorway Upgrade - Dinmore to Goodna	Market	1,950	▲	●	●	●		
	Ipswich Motorway Upgrade - Progress Road interchange	Market	470	▲	●	●	●	●	→
	Ipswich Motorway Upgrade - Rocklea to Darra	Concept	1,100	▲	●	●	●	●	→
	Ipswich Motorway Upgrade - Wacol to Darra	Market	824	▲	●				
WC7	Ipswich Regional Centre Strategy - Bremer River Crossing (ICC project)	Pre-project	11		●	●	●		
–	Southern Infrastructure Corridor - Yatala to Cunningham Highway - Investigation	Concept	2		●	●			
–	Toowoomba Bypass - Investigation	Pre-market	2		●				
WC8	Warrego Highway-Brisbane Valley Highway Interchange	Pre-market	70	▲	●	●			
WC9	Warrego Highway - Ipswich to Gatton - safety improvements	Pre-market	40		●				
WC10	Warrego Highway - Toowoomba intersection upgrades	Pre-project	85	▲				●	→
WC11	Western Ipswich Bypass - Cunningham Highway Amberley - New Interchange and 3km Deviation	Concept	200	▲	●	●			→
HEALTH									
WC12	Emergency Department Upgrades - Ipswich and Toowoomba	Concept	9		●	●	●	●	→
WC13	Ipswich Hospital - additional bed capacity	Pre-project	122		●	●	●	●	→
EDUCATION AND TRAINING									
–	State school infrastructure in Western Corridor	Ongoing program	950		●	●	●	●	→
WC14	Campus modernisation - Bremer TAFE	Pre-market	18		●	●			
COMMUNITY SERVICES									
WC15	South Queensland Correctional Precinct - Stage 1	Market	486		●	●			
WC16	Boonah to Ipswich Trail	Market	3		●	●			
WC17	Brisbane Valley Rail Trail	Market	4		●	●			
WC18	Gatton Aquatic Centre	Pre-market	3			●			
WC20	Regional Tennis Facility - University of Southern Queensland	Pre-market	3		●				
WC21	Tivoli Multi-Purpose Facility - Stage 1	Concept	4			●			

Total estimated investment of projects underway in 2010–2014 = $8535 million

Western Corridor and Western South East Queensland planned infrastructure 2014–2031

Map ref	Project	Subject to federal funding	Indicative delivery timeframe		
			2014–15 to 2019–20	2020–21 to 2025–26	2026–27 to 2030–31
TRANSPORT					
Public transport network					
WC22	Gowrie to Grandchester rail line				⊙
WC1	Ipswich rail line - Darra to Redbank third rail track			◎	
WC23	Ipswich to Springfield rail line			◎	
Strategic road network					
WC3	Centenary Highway - Logan Motorway to Springfield - four lanes		◎		
WC24	Cunningham Highway four lanes - Ripley Road to Ebenezer - Stage 1 and 2	⚠	◎		
WC25	Cunningham Highway to Warrego Highway Connection		◎		
–	Southern Infrastructure Corridor - Yatala to Cunningham Highway - Corridor Preservation		◎		
WC26	Toowoomba Bypass			◎	
WC27	Warrego Highway - Muirlea interchange and service roads	⚠	◎		
WC28	Western Ipswich Bypass - Five Mile Creek and approaches		◎		
WC11	Western Ipswich Bypass - new road, interchange and four lane bypass			◎	
HEALTH					
WC29	Health Precincts x 2 - Ipswich area			◎	
	Ipswich Hospital redevelopment		◎		
COMMUNITY SERVICES					
WC15	South Queensland Correctional Precinct - Stage 2, 3 and 4			◎	
	Total planned investment – $900 million				

1. The table identifies planned infrastructure projects to 2031 in Western Corridor and Western South East Queensland.
2. Projects listed in the longer-term planning horizon may change to better reflect the emerging needs of the region.
3. The indicative delivery timeframe outlines the estimated timeframe for completion of the project. However, project planning or commencement may occur before this timeframe.

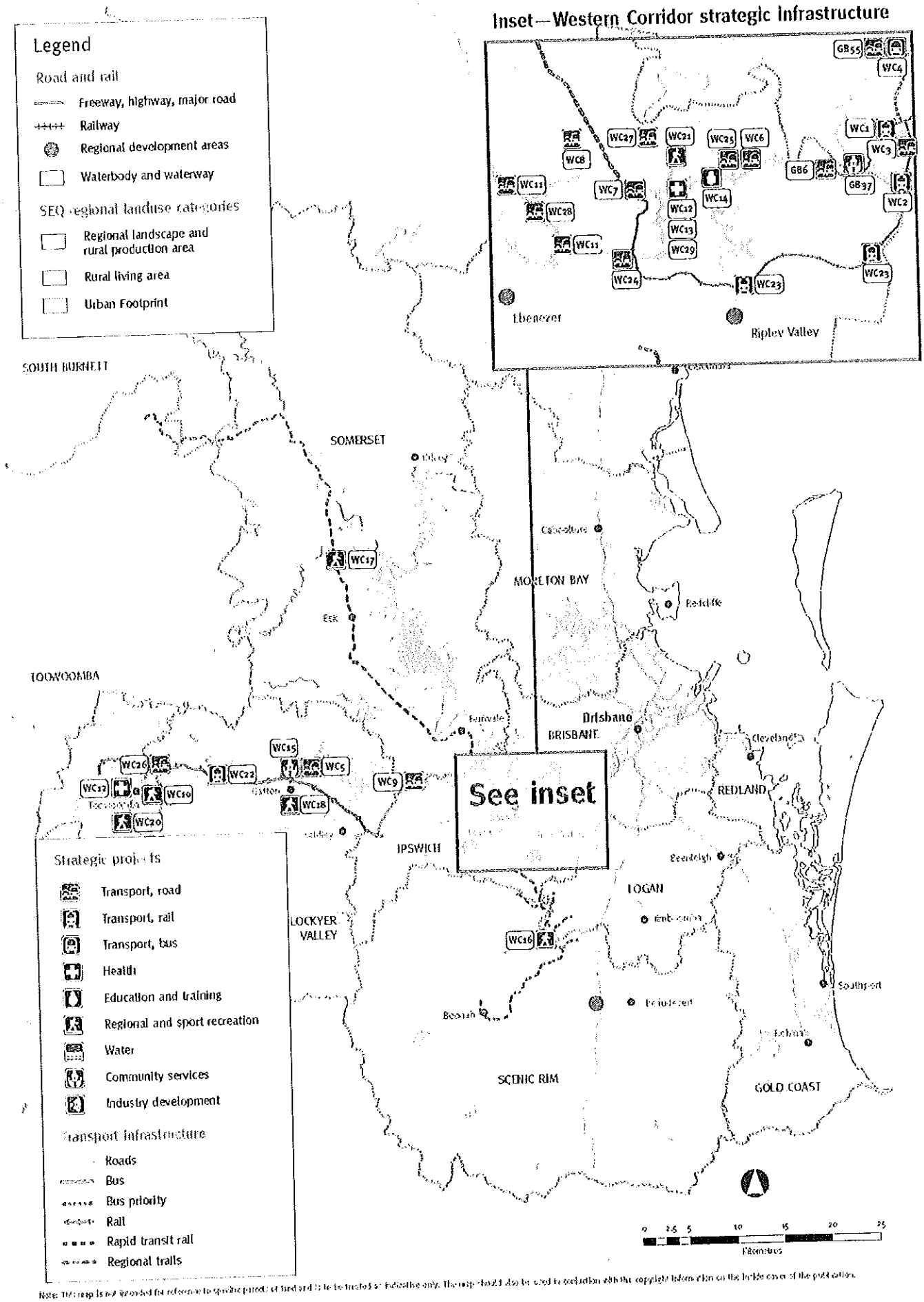
⚠ Subject to federal funding

Notes and keys for table on page 46

1. The table identifies infrastructure projects to 2014 in Western Corridor and Western South East Queensland.
2. Estimates in the state budget and other documents may differ, as they may incorporate costs that reflect anticipated changes in input prices between initial planning and the time of construction. Estimated investment includes funds already expended on projects.
3. Where funding is required from other sources other than the Queensland Government, their estimated costs have been included.
4. For an explanation of estimate categories, refer to page 15.
5. State school infrastructure includes 19 planned schools in Western Corridor and Western South East Queensland to 2031.
6. Estimated investment for projects within this table refer to the total project cost, which may be beyond the four year period. This is relevant for projects with an arrow in the last column.
7. Ipswich Regional Centre Strategy - Bremer River Crossing is subject to Ipswich City Council funding.

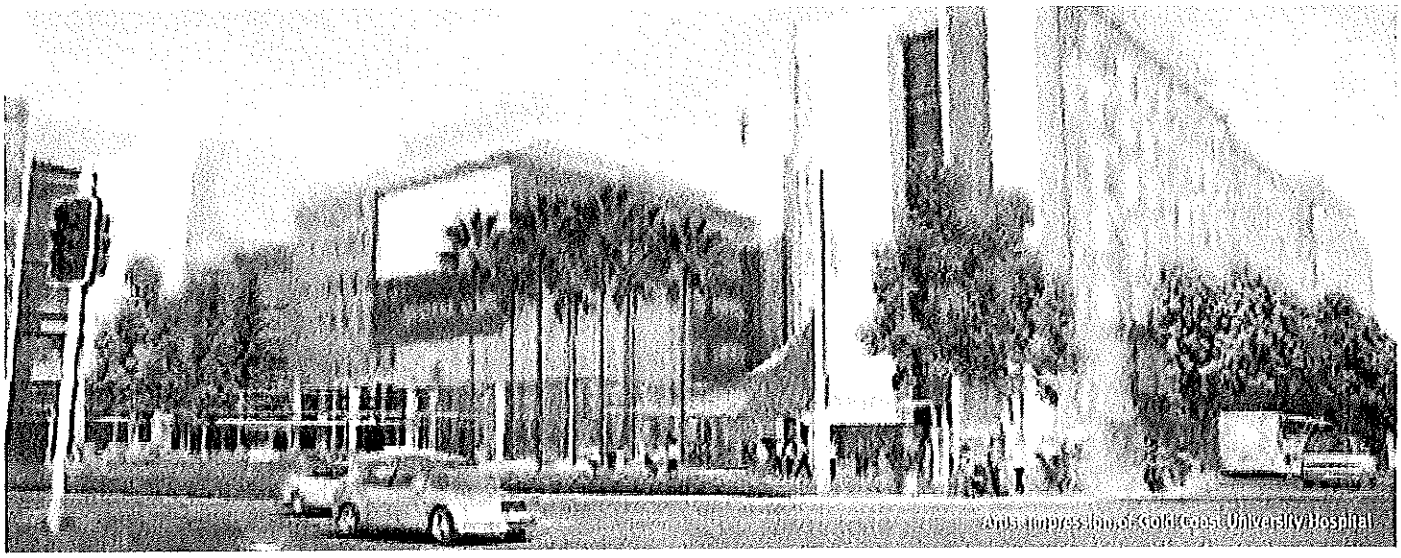
○ Investigation/study projects ◎ Corridor preservation projects ⊙ Infrastructure construction projects ⚠ Subject to federal funding → Project continues in later years

Map 6: Western Corridor and Western South East Queensland strategic infrastructure



Note: This map is not intended for reference to specific parcels of land and is to be treated as indicative only. The map should also be used in conjunction with the copyright information on the inside cover of the publication.

Gold Coast



Artist impression of Gold Coast University Hospital

466 500 (2006), 749 000 (2031)

59

$14.2 billion

$31 000

Gold Coast University Hospital, Gold Coast Stadium at Carrara, Gold Coast Rapid Transit, Robina Hospital Expansion and Robina Health Precinct, Pacific Motorway Upgrade: Nerang to Stewart Road, Gold Coast Highway Upgrade: Government Road to Stevens Street

Coomera

Regional outcomes

The Gold Coast area extends from Yatala in the north to the New South Wales border in the south. It is the second largest region in South East Queensland with urban development concentrated between Yatala and Coolangatta.

The SEQ Regional Plan ensures growth is managed to protect the Gold Coast's coastal, estuarine, river and hinterland environments.

The supply of broadhectare land is limited, therefore infill development will play a significant role in meeting the demands of growth on the Gold Coast.

Infrastructure priorities for the region include accommodating growth and employment within established urban areas in close proximity to activity centres such as Southport, Robina, Surfers Paradise, Broadbeach, Coolangatta, Nerang, Helensvale and Bundall.

These priorities will be achieved by linking major destinations and regional activity centres through improved public transport services and upgrading of the road network.

Future extensions of the Gold Coast heavy rail line will improve public transport in the southern Gold Coast region. In addition, the Gold Coast Rapid Transit system will run along the high-density coastal spine from Helensvale, Southport, Broadbeach, Burleigh and Coolangatta, with bus services providing local connections. The rapid transit system will also link into the new 750 bed Gold Coast University Hospital due for completion in 2012.

In addition, upgrades to the Gold Coast Highway, Nerang-Broadbeach Road and the Pacific Motorway will assist in linking destinations, particularly to new broadhectare development land.

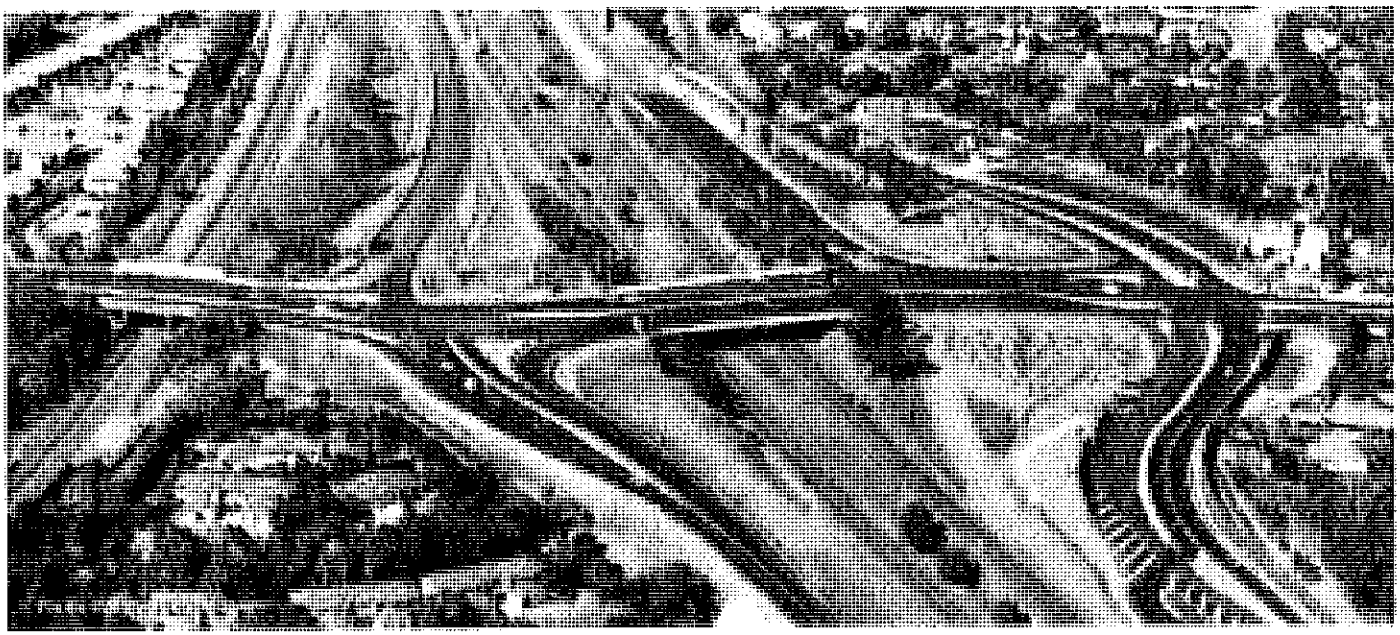
Broadhectare development will focus around the Brisbane-Gold Coast transport corridor along the Pacific Motorway and Brisbane-Gold Coast rail line, linking areas such as Coomera, Hope Island, Pimpama, Ormeau, Maudsland and Reedy Creek to the rest of South East Queensland.

Coomera is also recognised as a priority area for delivery of residential land and the establishment of a regional activity centre to accommodate employment. Infrastructure such as the Pacific Motorway additional Coomera interchange and Coomera TAFE will be prioritised to accommodate this growth.

While it has been traditionally reliant on a tourism and recreation-based economy, new employment growth in the Gold Coast will focus on a range of science, health, education and training opportunities. The Gold Coast Health and Knowledge Precinct and Robina Hospital projects will stimulate new economic opportunities.

The Gold Coast Stadium Redevelopment at Carrara will not only provide a sporting facility capable of hosting national and international premier events, but is also expected to create up to 1100 full-time equivalent positions during construction.

The Queensland Government is focusing on a balance between ensuring the lifestyle of the easy living Gold Coast community is maintained while building infrastructure to support growth, jobs and the economy.



Infrastructure goals

Transport

Quality public transport links are required to connect major centres and developing areas on the Gold Coast. Road projects will support additional investment in public transport services by providing additional corridor space for public transport. This will also benefit local and inter-regional road freight movements.

Transport infrastructure planning goals for the Gold Coast include:

- linking major destinations and coastal activity centres with improved transport services
- connecting new development areas such as Coomera to the coast
- improving passenger rail services on the Gold Coast rail line
- upgrading the Pacific Motorway and other roads to alleviate congestion
- accelerating the development of the Principal Cycle Network
- preserving transport corridors to cater for future growth
- new arterial links to service growth areas and reduce local trips on the motorway network
- infrastructure improvements such as implementing the high occupancy vehicle (HOV) network program to help increase accessibility to employment centres and services.

In delivering these priorities, there are a range of challenges to be overcome including:

- planning for significant increases in transport activity during peak tourist periods
- ensuring that public transport, walking and cycling plays an increasing role in moving people efficiently to ensure accessibility
- increasing capacity on Gold Coast to Brisbane passenger rail services, especially in peak periods
- consideration of the traditional north-south settlement pattern and creating east-west public transport links to enhance accessibility between growing residential areas in the west and major centres in the east
- an over-reliance on the Pacific Motorway for local trips due to lack of urban arterial roads providing connections to centres.

Projects completed

The completed $150 million Gold Coast Highway upgrade includes 24-hour T2 transit lanes running from Broad Street down to the Loder Creek bridges. The transit lanes provide priority and faster passage for high-occupancy vehicles such as taxis and buses.

Existing residential areas are also benefiting from better city links with the recently completed extension of the 4.1 kilometre dual track rail line south from Robina to Varsity Lakes and the construction of a new station at Varsity Lakes.

Projects underway

Priority projects, such as the Gold Coast Rapid Transit Project—linking Griffith University, Parkwood via Southport and Broadbeach—will provide an efficient, accessible light rail system connecting commuters with important educational, business and entertainment areas.

The widening of sections of the Pacific Motorway between Pappas Way, Nerang and the Worongary interchange (Exit 77) are underway as well as upgrades to the Varsity Lakes and Mudgeeraba interchanges along the Pacific Motorway.

Projects planned

Planned road projects for the region include the upgrading of 2.6 kilometres of the Gold Coast Highway to four lanes between the intersections of Brisbane Road/Government Road and Frank Street/Robert Street, Labrador. The two added lanes will be combined T2 transit lanes and cycle lanes.

Health

The Queensland Government is committed to increasing the capacity and provision of high quality, safe and sustainable health services to meet the needs of communities. This includes expanding the range of health services available in the home, workplace or community to allow public hospitals to focus on those most in need.

The priority for the Gold Coast is to complete the Gold Coast University Hospital and Robina Hospital Expansion and Health Precinct.

The demand for health services has been reflected in bed pressures, elective surgery waiting lists and emergency department attendances and waiting times. It has also had a significant impact in terms of infrastructure capacity, driving both the demand for new infrastructure and efforts to ensure existing space is utilised efficiently.

Projects completed

Existing health facilities are being upgraded, with an expansion of the Robina Hospital to be delivered in three stages. The Robina Hospital project will almost double the number of available beds from 185 to 364. Stage one of the Robina Hospital expansion was completed in 2007, delivering 25 beds.

Projects underway

Current health projects at the Gold Coast include the new 750 bed Gold Coast University Hospital, which will offer specialist cancer and cardiac services as well as neurosciences, trauma and neonatal intensive care by the end of 2012. The Gold Coast University Hospital will be the focal point of a new health and knowledge precinct, which is planned for a 130 hectare site adjacent to the hospital.

Stages two and three of the Robina Hospital Expansion are scheduled for completion in May 2011, with refurbishment of the existing buildings due for completion in mid 2012. The expansion will provide 154 additional beds, the refurbishment of two existing operating theatres and building of two additional operating theatres, which will increase service capacity to five operating theatres and one endoscopy suite. The project also includes expanded infrastructure services for mental health, coronary care, general medicine, intensive care, medical imaging, pathology and pharmacy to support the additional bed and operating theatre capacity.

A new health precinct to be delivered in Robina by late 2011 will complement the services being delivered by the Gold Coast University Hospital.

Projects planned

Land acquired hy Queensland Health at Coomera is earmarked as the site of a future health facility to meet growing demand in the area.

Education and training

Early childhood education and care

Local and international research shows high quality education early in life gives children the best start and a solid foundation for their development.

The priority is to provide access to a kindergarten program for all children turning four by 30 June in the year before Prep. To do this, Queensland must have the infrastructure required to meet demand for high-quality, accessible, affordable and integrated early childhood services.

The extra kindergarten services will double the capacity of the Queensland community kindergarten sector and cater for the 12 000 children not currently accessing any centre-based early education or care services.

Projects completed

An early years centre was opened at Nerang in October 2008.

Projects underway

A new kindergarten facility is currently under construction at Mudgeeraba State School and is due for completion in July 2010.

Projects for new kindergartens are currently underway at Gaven and Flagstone State Schools. These projects are all expected to be operational for first term in 2011.

Projects planned

The Queensland Government has announced plans to develop new kindergartens on the following sites to be operational for first term in 2012:

- Coomera Springs State School
- Coomera State School
- Elanora State School
- Emmaus College, Jimboomba
- Norfolk Village State School
- Palm Beach State School
- Lutheran Ormeau Rivers District.

Primary and secondary education

Population growth is expected to continue over the next 20 years at the Gold Coast.

The region's settlement pattern has traditionally been along the coastal corridors, however in recent years, significant settlement has also occurred further inland.

Schools are closely linked with the planning process, with provision of schools aligned to the settlement pattern of the state. A 20-year plan of new schools is maintained and rolled out.

There is an increasing need to emphasise both new schools in greenfield areas and the renewal of current schools serving older areas. The Queensland Government continues to closely monitor trends such as what household structures tend to favour medium-density dwelling types, and whether or not these tend to be families with school-age children.

The adequate and timely provision of education services is a critical factor in serving the region's existing and future communities.

Projects completed

Ormeau Woods State High School and Norfolk Village State Primary School opened in 2009.

Projects underway

Two further primary schools and a further secondary school will open between 2011 and 2014.

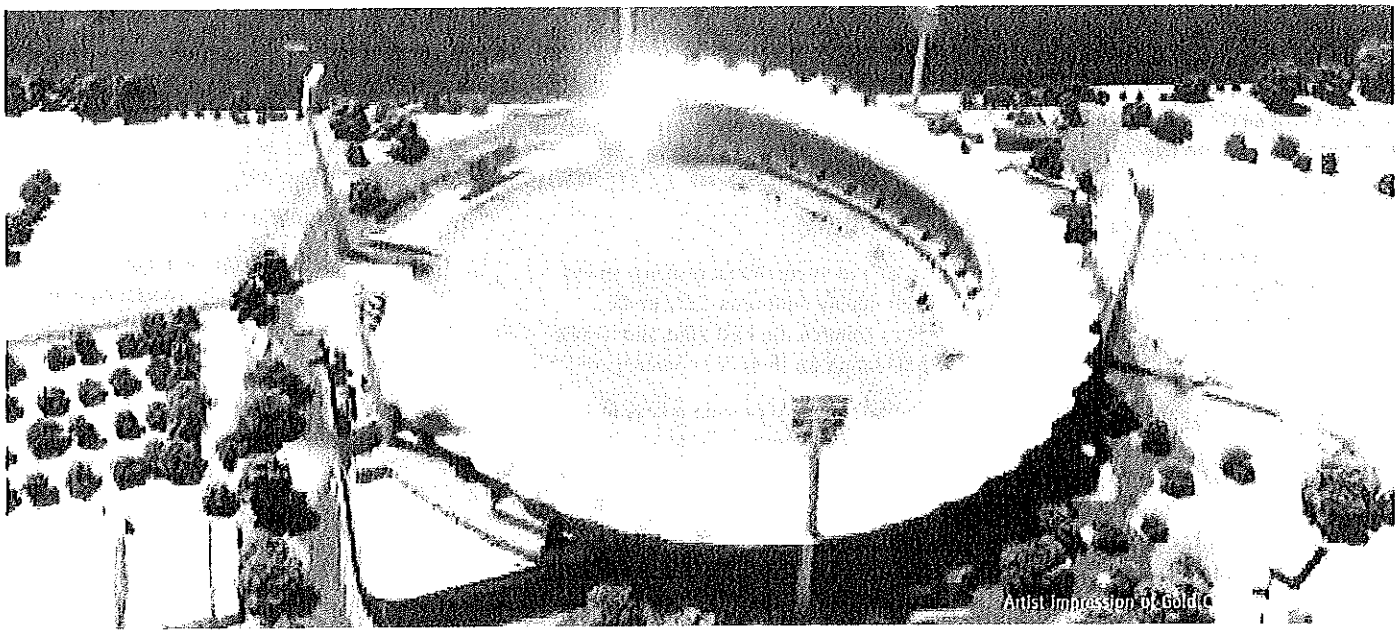
Projects planned

Future planning for education infrastructure at the Gold Coast includes two primary and one secondary school from 2015 to 2020 and two primary schools from 2021 to 2031.

Vocational education and training

Queensland's continuing economic strength depends on the state's workforce possessing the skills to meet the dynamic needs of business and industry.

The Queensland Government's vision is for a highly skilled, flexible workforce that will underpin the state's continuing growth and prosperity. The Queensland Skills Plan 2008 is a major investment in achieving this vision. To meet the needs of business



and industry, the government is building capacity and skills, particularly professional, to meet workplace requirements.

The Queensland Government is implementing the Queensland Skills Plan to deliver 17 000 training places a year by 2010. In addition, the government will invest more than $124 million to help create nearly 150 000 training places over the next four years in a record expansion of the Queensland skills base.

The successful implementation of the initiatives within SEQIPP relies heavily on the availability of a skilled workforce.

Projects underway

Some training courses at the Gold Coast TAFE will be moved to a new campus at Coomera closer to transport-centred locations with better access to employment and lifestyle areas.

Projects Planned

Some of the projects planned at the Gold Coast include hospitality facilities through a Trade Training Centre on the southern Gold Coast.

Community services

Queensland Police Service

The growing need for police services within the Gold Coast region is in proportion with population growth and settlement patterns. Infrastructure within the region is constantly being assessed and updated to ensure the facilities support current, emerging and new challenges faced by the police service.

Additional facilities are being planned and progressed across the greater region as demand increases.

The Queensland Police Service is working closely with other agencies including local government to ensure the safety and security of communities.

Strong investment in infrastructure ensures the community has ready access to policing services and that police response times are timely and effective.

Projects completed

A new police station at Robina and the new Coomera District Headquarters will continue to assist in delivering high quality policing services in South East Queensland.

Projects underway

Infrastructure projects to meet the demand for police services at the Gold Coast include upgrades to the police facility at Burleigh Heads.

Emergency services

The provision of emergency services infrastructure shadows population and may be delivered either through the enhancement of existing assets or the development of new facilities.

Emergency services infrastructure includes the provision of fire, ambulance and emergency management facilities, appliances and equipment, supporting essential service delivery and contributing to the achievement of safe, resilient and sustainable communities.

The aim is to provide infrastructure that will support the achievement of safe, resilient and sustainable communities.

As population growth in South East Queensland continues, the need for emergency services will increase, particularly in and around the major development areas identified in the SEQ Regional Plan. Higher density development could impact on urban permeability and emergency service delivery.

The Queensland Government is addressing these challenges by providing a network of emergency services infrastructure. New or enhanced fire and ambulance services are provided in direct response to current and projected service delivery needs.

Projects completed

The Southport station upgrade was completed in February 2010 in line with the latest technological and operational standards and will improve emergency service capability across the region.

Projects underway

The fire station at Nerang is scheduled for completion in 2010.

Justice services

The Queensland Government's aim is to provide justice services to the increasing population to support social interaction and business activity.

The Southport courthouse will remain the major courthouse in this region and its capacity to cope with the increased population will be maintained. The smaller Coolangatta courthouse has capacity to provide support for the southern part of the region.

The challenge is to utilise the existing expanded infrastructure to meet the needs of the growing population.

Projects underway

An expansion of Southport courthouse commenced in early 2010. This extension will increase the number of courtrooms by three and expand the size of the large arrest court. Additional accommodation will also be provided for magistrates.

Sport and recreation

The Queensland Government supports the development of healthy and socially inclusive communities through sport and recreation activities and programs, the development of the state's elite athletes and grants to support construction of sport and recreation facilities.

The government's sport and recreation services encourage Queenslanders to lead active and healthy lifestyles, from participation at a community level through to enhanced achievement at elite levels. Linked to this is a commitment to increase the land dedicated to nature conservation and public recreation by 50 per cent.

Rapid population growth in South East Queensland has contributed to an increase in the demand for community sporting facilities. The availability of land and a range of complex land tenures for outdoor recreation have also led to increased demand levels for sport and recreation infrastructure.

This increased demand requires both the construction of new infrastructure and the most efficient use of existing space.

Projects completed

Construction of a skate park facility at Arthur Earl Park, Nerang, is complete. It is one of three skate parks developed on the Gold Coast to provide local skaters with different skills and an environment to learn new skills from more experienced skaters.

Projects underway

The Runaway Bay Sports Complex will be home to local sporting competition. The Runaway Bay project will provide six new irrigated fields, maximising existing land designated for sport and recreation purposes. The development is part of an integrated sport and recreation precinct of more than 60 hectares for sport, recreation and community activities.

The Gold Coast Stadium Redevelopment at Carrara will provide a sporting facility capable of hosting national and international premier events. The stadium will host home fixtures of the new Gold Coast team in the AFL competition, commencing in 2011.

The stadium will provide a significant flow-on effect for the Gold Coast economy, not just during construction, but in the longer term as the venue hosts events that will bring visitors to the region. It is projected that the economic benefits from this completed project to the local economy will be $340 million over 10 years.

Projects planned

Construction of a motorcycle sporting precinct including a motocross track with pit area, marshalling areas, safety exclusion barriers, race control tower, club administration building and amenities block is planned at Stapylton. This precinct will provide a long-term solution for motorsport for the Gold Coast and surrounding areas.

Key infrastructure projects

Gold Coast Rapid Transit

Status:	Stage one underway
Description:	Stage one of this light rail project links Griffith University, Parkwood to Broadbeach via the key activity centres of Southport and Surfers Paradise
Cost:	$950 million
Delivery:	Stage one is planned for completion in 2014
Key benefit:	The rapid transit system will provide high quality, frequent passenger services on the busy coastal corridor. Construction of the project will create 6300 jobs

Gold Coast Stadium at Carrara

Status:	Under construction
Description:	Sporting stadium and facilities
Cost:	$144 million
Delivery:	Due for completion in 2011
Key benefit:	The project will provide up to 950 full time jobs during construction and up to 700 jobs an event once operational. Seating at the stadium will be increased to 25 000 seats

Gold Coast Highway – Government Road to Stevens Street (additional lanes)

Status:	Under construction
Description:	Widening of the highway to two lanes in each direction
Cost:	$151 million
Delivery:	Due for completion in 2011
Key benefit:	Additional road capacity will be provided for Gold Coast commuters and 396 direct and indirect jobs will be generated

Gold Coast University Hospital

Status:	Under construction
Description:	750 bed hospital, offering specialist cancer and cardiac services, neurosciences, trauma and neonatal intensive care
Cost:	$1.76 billion
Delivery:	Completion is expected in late 2012
Key benefit:	The project will create 9847 jobs and will support provision of specialist health services for Gold Coast residents

Robina Hospital Expansion

Status:	Under construction
Description:	Three stage expansion to provide an additional 179 beds, refurbishment of two existing operating theatres and the provision of two new operating theatres and expanded mental health, coronary care, general medicine, intensive care, medical imaging, pathology and pharmacy to support the additional bed and operating theatre capacity
Cost:	$274 million
Delivery:	Due for completion in 2012
Key benefit:	The expansion will create 1506 jobs over life of project

TRANSPORT										
Public transport network										
GC1	Gold Coast Rapid Transit - Griffith University to Broadbeach	Pre-market	950	▲	◎	◎	◎	◎	→	
Strategic road network										
GC2	Gold Coast Highway - Government Road to Stevens Street - additional lanes	Market	151		◎	◎				
GC3	Gold Coast University Hospital access improvements	Concept	140		◎	◎	◎	◎	→	
GC4	Hope Island Road - Pacific Motorway to Columbus Drive - additional lanes	Market	71		◎					
GC5	Intra-Regional Transport Corridor - Nerang to Stapylton - Corridor Preservation	Concept	30		○	○				
GC6	Pacific Motorway additional lanes and interchange upgrades - Nerang to Varsity	Market	233	▲	◎	◎	◎			
	Pacific Motorway additional lanes and interchange upgrades - Nerang to Stewart Road	Market	3,790	▲	◎	◎	◎	◎	→	
GC7	Pacific Motorway - Coomera Interchange - Foxwell Road - Stage 1	Market	19		◎					
GC8	Smith Street - Pacific Motorway to Olsen Avenue - additional lanes	Concept	70					◎	→	
GC9	Southport–Nerang Road - Minnie Street to Queen Street - Corridor Preservation	Concept	40		○	○	○		→	
HEALTH										
GC10	Gold Coast University Hospital	Market	1,762		◎	◎	◎			
GC11	Robina Health Precinct	Concept	36		◎	◎				
GC12	Robina Hospital expansion	Market	274		◎	◎				
EDUCATION AND TRAINING										
	State school infrastructure in Gold Coast	Ongoing program	400		◎	◎	◎	◎	→	
GC13	New Gold Coast TAFE campus - Coomera	Market	26		◎					
COMMUNITY SERVICES										
GC14	Gold Coast Stadium redevelopment - Carrara	Market	144		◎					
GC15	Motorcycle Sporting Precinct - Northern Gold Coast	Concept	3			◎				
GC16	Runaway Bay Sports Precinct - new playing fields	Concept	4		◎					
Total estimated investment in projects underway in 2010–2014 = $3,313 million										

1. The table identifies infrastructure projects to 2014 on the Gold Coast.
2. Estimated investment includes funds already expended on projects.
3. Where funding is required from other sources other than the Queensland Government, their estimated costs have been included.
4. For an explanation of estimate categories, refer to page 15.
5. State school infrastructure includes eight planned schools on the Gold Coast to 2031.
6. Estimated investment for projects within this table refer to the total project cost, which may be beyond the four year period. This is relevant for projects with an arrow in the last column.

○ Investigation/study projects ◔ Corridor preservation projects ◎ Infrastructure construction projects ▲ Subject to federal funding → Project continues in later years

Gold Coast: planned infrastructure 2014–2031

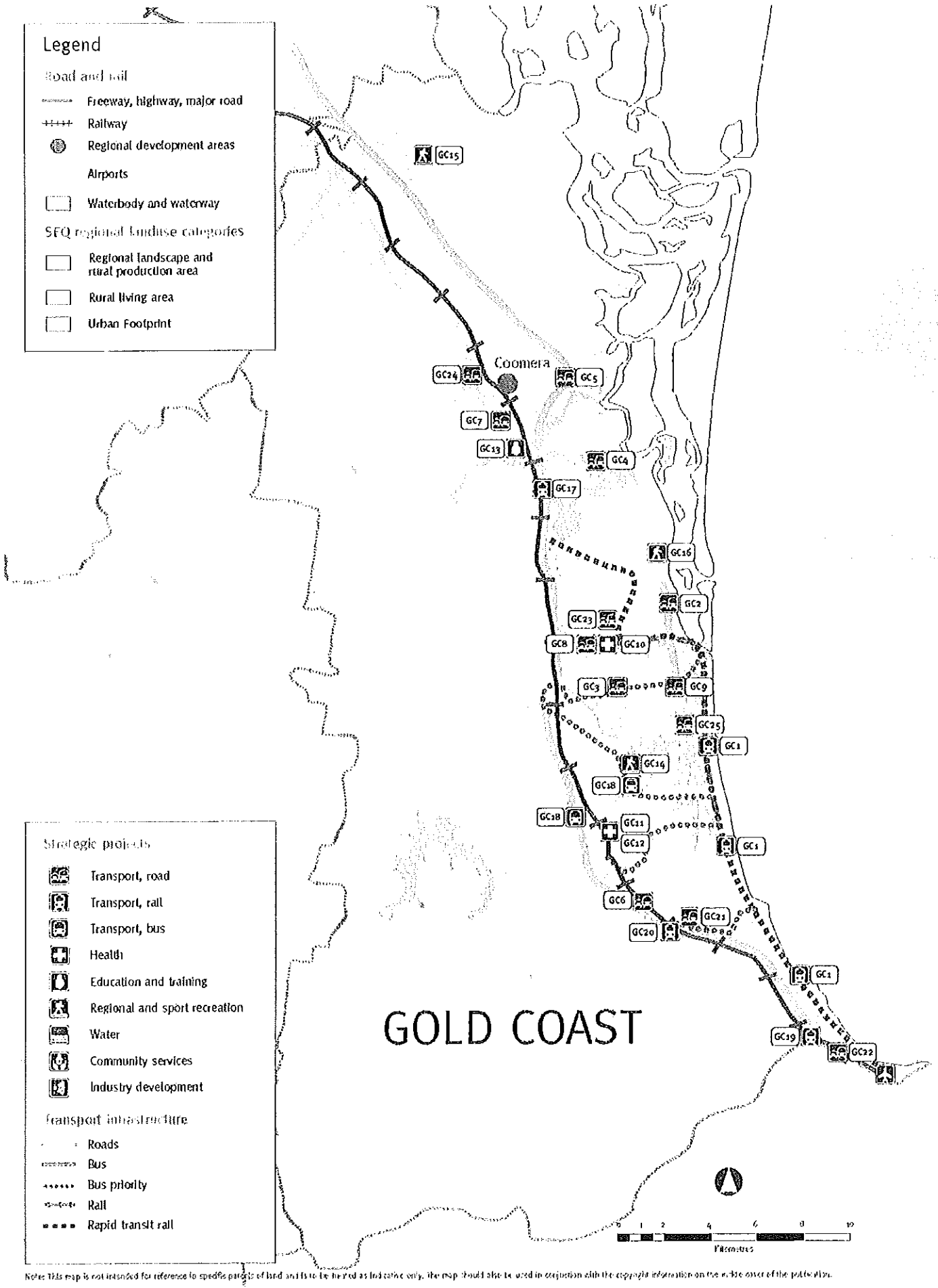
Map ref	Project	Subject to federal funding	Indicative delivery timeframe 2014–15 to 2019–20	2020–21 to 2025–26	2026–27 to 2030–31
TRANSPORT					
Public transport network					
GC17	Coomera to Helensvale - second track		●		
GC1	Gold Coast Rapid Transit - Helensvale to Griffith University and Broadbeach to Coolangatta			●	
GC18	Nerang–Broadbeach Road upgrades - bus lanes		●		
GC19	Southern extension of rail line - Elanora to Coolangatta				●
GC20	Southern extension of rail line - Varsity Lakes to Elanora			●	
Strategic road network					
GC21	Burleigh Connection Road - Mattocks Road to Kortum Drive - additional lanes		●		
GC22	Gold Coast Airport Access Upgrade		●		
GC23	Gold Coast Knowledge Precinct Access		●		
GC4	Hope Island Road - Duplicate Coombabah Creek Bridges		●		
GC7	Pacific Motorway - Coomera Interchange - Foxwell Road - Stage 2 and 3		●		
GC24	Pacific Motorway - Coomera North Interchange	▲		●	
GC25	Southport–Burleigh Road - intersection upgrades			●	
GC9	Southport–Nerang Road - Minnie Street to Queen Street - additional lanes			●	

Transport project investment = $2,038 million

1. The table identifies planned infrastructure projects to 2031 at the Gold Coast.
2. Projects listed in the longer-term planning horizon may change to better reflect the emerging needs of the region.
3. The indicative delivery timeframe outlines the estimated timeframe for completion of the project. However, project planning or commencement may occur before this timeframe.

▲ Subject to federal funding

Map 7 - Gold Coast strategic infrastructure



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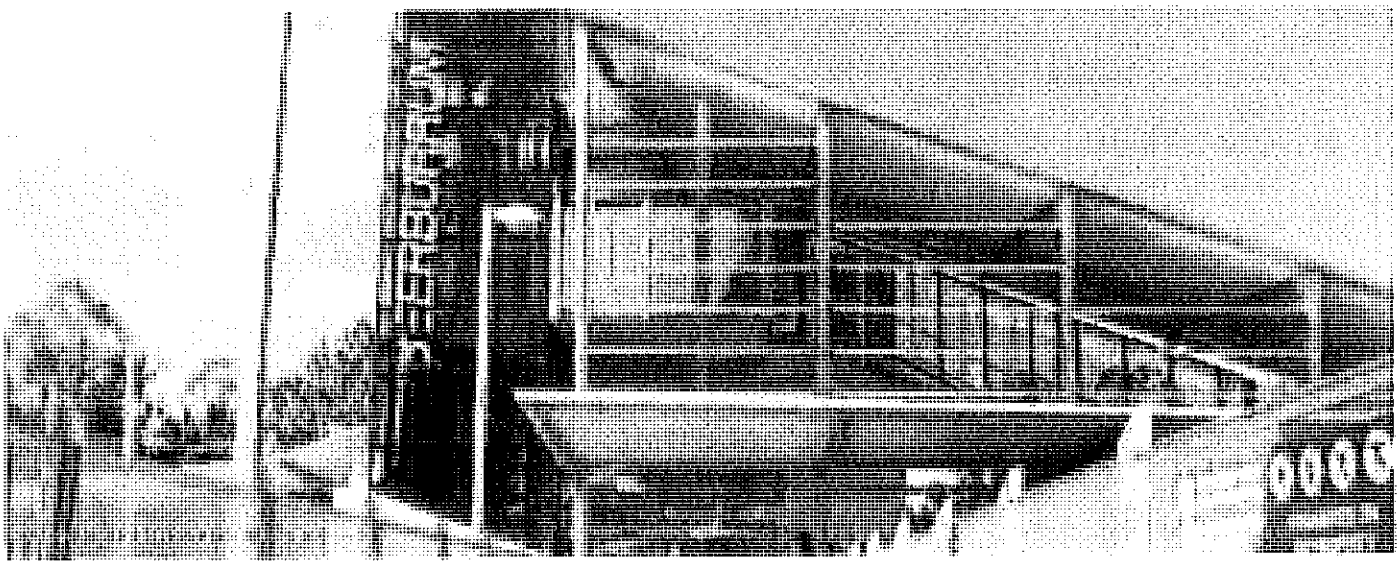
Sunshine Coast



Population:	295 000 (2006), 497 000 (2031)
Estimated no. of projects to 2031:	64
Estimated investment to 2031:	$20.9 billion
Estimated per capita spend to 2031:	$57 000
Key regional projects:	Bruce Highway Upgrade Cooroy to Gympie, MMTC, Caboolture to Landsborough Rail Upgrades, Nambour Hospital, Sunshine Coast University Hospital and Caloundra to Maroochydore Corridor Study
Regional development areas:	Maroochydore, Palmview and Caloundra South

Regional outcomes

The Sunshine Coast greater region incorporates the former shires of Noosa and Maroochy and the City of Caloundra.

The Sunshine Coast's settlement pattern is diverse. The majority of settlement is located within close proximity to the beaches and foreshore.

The principal activity centre for the region is Maroochydore which accommodates the key business, service and retail enterprises. Other major centres in the region are Caloundra, Nambour and Noosa.

The Sunshine Coast is expected to experience significant growth. The provision of infrastructure in line with growth is integral to protecting the quality of life for the Sunshine Coast.

Growth will be accommodated by developing existing urban-zoned land and the major long-term regional growth areas of Caloundra South and Palmview.

Broadhectare has been identified as the primary residential source for growth within the next 15 years, while infill is expected to enhance investment and tourism within the region.

As the region's permanent population grows, increased employment and economic opportunities are emerging.

The Sunshine Coast Airport runway extension will ensure continued diversification of the economic base of the Sunshine Coast, promoting further employment growth in the greater-region.

As the population increases, so will the demand for public transport and pressure on the road system.

By securing infrastructure corridors now, infrastructure can be planned in advance and provided as required. This is particularly relevant for areas identified as significant areas of growth, such as Caloundra South and Palmview. It will also enable future connectivity of Caloundra South and other broadhectare areas with regional activity centres such as Kawana and Maroochydore.

Transport projects currently under construction or recently completed include the upgrade of the Bruce Highway between Cooroy and Gympie, the Sunshine Motorway from Pacific Paradise to Doonan, Steve Irwin Way and the Nambour Connection roads. In addition to this, the Caloundra to Mooloolaba roads and the Caboolture to Beerburrum rail lines were duplicated to improve accessibility and increase capacity throughout the Sunshine Coast region.

Social infrastructure such as health, education and community services are also being planned for the region. The Sunshine Coast University Hospital, the modernisation of the Nambour and Mooloolaba TAFEs and additional schools are currently being planned or are in progress across the region.

The Queensland Government is investing in infrastructure to ensure current and future infrastructure needs are met, while ensuring the lifestyle of the region is maintained. In order to protect this enviable lifestyle, environmental protection and sustainability are paramount.

Infrastructure goals

Transport

As the resident population expands and employment activity expands on the Sunshine Coast, particularly in the emerging areas of Sippy Downs and Caloundra South, transport demand will increase and its focus will change.

The transport network on the Sunshine Coast must mature to cater for future growth and provide adequate access between key community facilities, emerging residential areas and the existing coastal activity centres

The transport infrastructure program at the Sunshine Coast focuses on:

- providing improved access between Maroochydore and Caloundra and emerging population centres, including improved public transport
- increasing the capacity of the north coast rail line and upgrading connections between the rail line and coastal activity centres
- enhancing the safety and efficiency of the Bruce Highway, part of the national transport network
- accelerating development of the principal cycle network
- investigating the long-term transport requirements and preserving transport corridors to cater for future growth.

In delivering these priorities, there are a range of challenges to be overcome including:

- relatively dispersed residential areas and centres located along an extensive coast spine that are difficult to service with public transport
- significant increases in transport activity during peak tourist periods
- a lack of arterial road network to cater for local trips, forcing use of the Bruce Highway for many local trips and compromising the function of the highway
- an ageing population, presenting a major challenge to ensure people can continue to access health care facilities and recreational opportunities, particularly when they are no longer able to drive.

Projects completed

Recently completed projects such as the $73 million Beerwah grade separation and $283 million Sunshine Motorway Upgrade have improved safety and accessibility in the region.

Projects underway

The Sankeys Road to Traveston Road project will upgrade a priority section of the Bruce Highway to a four lane grade-separated motorway standard, meeting safety and capacity needs.

Duplication of the Steve Irwin Way between the Mooloolah Connection Road and the Caloundra Interchange at Landsborough is underway. This project will improve safety for road users, reduce congestion, cater for future growth and improve flood immunity.

Projects planned

The Queensland Government is also actively working to meet the future transport infrastructure needs on the Sunshine Coast through planning for projects.

The CoastConnect bus corridor from Maroochydore to Caloundra via Kawana Town Centre, will provide frequent fast, efficient and reliable bus services between Maroochydore and Caloundra South.

Other projects in planning include a new arterial road from Caloundra west to Sunsbine Motorway via Creekside Boulevard (MMTC), the duplication of the rail line from Beerburrum to Landsborough and a new rail line from Beerwah to Maroochydore.

Health

The Queensland Government is aiming to provide new and refurbished facilities to ensure Sunshine Coast residents have access to good health services and programs that effectively maintain and improve their overall health and wellbeing and provide them with a good quality of life.

Expansion of existing facilities at the Sunshine Coast is in progress alongside planning for the new Sunshine Coast University Hospital.

Demand for health services has been reflected in bed pressures, elective surgery waiting lists and emergency department attendances and waiting times. It has also had a significant impact in terms of infrastructure capacity, driving both demand for new infrastructure and efforts to ensure existing space is utilised efficiently.

Projects completed

A new 45 bed residential aged care facility at Nambour was completed in early 2010.

Stages one and two of the Sunshine Coast Health Services District additional bed capacity project at Nambour and Caloundra were completed in 2008. These stages have provided a new ante-natal clinic, 30 additional beds and bed alternatives, additional car parking at the Nambour Hospital and an additional 30 beds and bed alternatives at Caloundra Hospital.

Projects underway

Stage three of the Sunshine Coast Health Services District additional bed capacity project involves construction of a new 103 bed ward block, provision of a specialist outpatient department, training and development centre, and refurbishment of clinical support areas at the Nambour Hospital.

Projects planned

The Sunshine Coast University Hospital will provide 450 overnight beds by 2016 and 738 beds by 2021. The project is one part of a major expansion of Sunshine Coast health services to meet the future health care needs of a growing region and its people.

New services will be developed at Nambour Hospital in 2011 including the development of new procedural suites for endoscopy, vascular surgery and a cardiac catheterisation laboratory. An expansion of the Caloundra Hospital Emergency Department is also planned in 2011.

A tender process for a co-located private hospital on the Sunshine Coast University Hospital site at Kawana is now underway. Construction will commence in mid 2011 with the new facility due to open in 2013. The Queensland Government will provide 70 public beds in 2013 and 110 beds by the following year.

Education and training

Early childhood education and care

Local and international research shows high quality education early in life gives children the best start and a solid foundation for their development.

The priority is to provide access to a kindergarten program for all children turning four by 30 June in the year before Prep. To do this, Queensland must have the infrastructure required to meet demand for high-quality, accessible, affordable and integrated early childhood services.

As employment opportunities at the Sunshine Coast grow, so will demand for early childhood education and care services. Early childhood education and care services will be provided to match the growing demand in identified high growth areas.

The extra kindergarten services will double the capacity of the Queensland community kindergarten sector and cater for the 12 000 children not currently accessing any centre-based early education or care services.

Projects completed

An early years centre was opened on the site of Caboolture East State School in October 2008.

A Best Start early childhood education and care centre was completed at Nanango in September 2009 on the site of the former pre-school.

Projects underway

A single unit kindergarten facility is currently under construction at Woodford State School and is due for completion in July 2010.

Projects planned

The Queensland Government has announced plans to develop new kindergartens on the following sites to be operational for first term in 2012:

- Kawana Waters State College
- Pacific Lutheran College, Caloundra
- Peregian Springs State School
- Yandina State School.

Primary and secondary education

Population growth on the Sunshine Coast is expected to continue. The region's median population age is also increasing.

The region's traditional settlement pattern has been on the coastal corridor, while population increases in identified growth areas such as Palmwoods and along transport corridors are expected to continue.

The challenge will be to provide affordable and accessible education facilities for the dispersed inland community. Demand will be met through greater utilisation of existing facilities and the establishment of new facilities.

There is an increasing need to emphasise both new schools in broadhectare areas and the renewal of current schools serving older areas. The government continues to closely monitor factors such as what household structures tend to favour different dwelling types and their implications on school planning.

Projects completed

Peregian Springs State School opened in 2010.

Projects underway

Two primary schools are planned for opening in the short-term.

Projects planned

Planned education infrastructure includes two primary schools and one secondary school to be constructed between 2015 and 2020, and four primary schools and one secondary school to be constructed between 2021 and 2031.

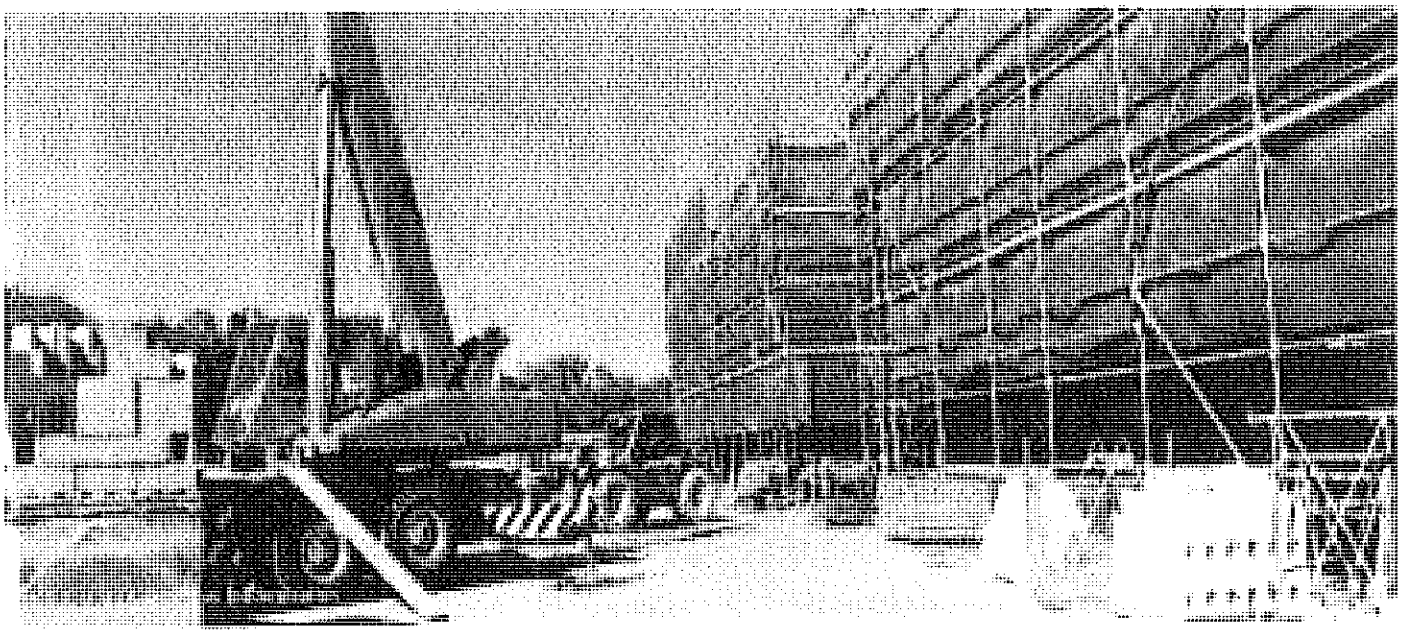
Vocational education and training

Queensland's continuing economic strength depends on the state's workforce possessing the skills to meet the dynamic needs of business and industry.

The Queensland Government's vision is for a highly skilled, flexible workforce that will underpin the state's continuing growth and prosperity. The Queensland Skills Plan 2008 is a major investment in achieving this vision. To meet the needs of business and industry, the government is building capacity and skills, particularly professional, to meet workplace requirements.

The Queensland Government is implementing the Queensland Skills Plan to deliver 17 000 training places a year by 2010. In addition, the government will invest over $124 million to help create nearly 150 000 training places over the next four years in a record expansion of the Queensland skills base.

The successful implementation of the initiatives within SEQIPP relies heavily on the availability of a skilled workforce.



Projects underway

Vocational education and training master planning is underway for the upgrade of Trade Training Facilities at Nambour (Sunshine Coast Institute of TAFE).

Projects planned

The Coastal Cookery at Maroochydore involves constructing a purpose-built commercial training kitchen and restaurant facility at a local state high school. Funding will also be used to purchase equipment and upgrade hospitality facilities at other Sunshine Coast state high schools.

The Sunshine Coast Technical Trade and Training Centre at Caloundra includes construction of a Trade Training Centre at a local state high school to facilitate building and construction qualifications including: bricklaying, carpentry, plastering, painting, decorating and wall and floor tiling. The funding will also be used to purchase course equipment.

Queensland Police Service

Establishing and maintaining infrastructure is an essential component of the Queensland Police Service's approach to delivering high quality policing services. The Sunshine Coast region incorporates onshore and offshore policing. With an increasing population and the popularity of water activities, identified demand areas such as Caloundra South, Beerwah, Palmview, Kawana and Maroochydore will be provided with appropriate services through the upgrade of existing facilities, relocation of facilities to more centralised locations, or new facilities. The relocation of the Sunshine Coast District Water police to a more strategic location is currently being progressed.

In order to deliver high quality, innovative, progressive and responsive policing services across the region, the Queensland Police Service is constantly reviewing and upgrading existing facilities. In addition, new facilities are being planned in high growth areas and where increased demand is identified.

Projects completed

New police stations at Burpengary and Sippy Downs and the upgrade of the Bribie Island Police Station are part of the Queensland Government's work to ensure community safety for the Sunshine Coast.

Projects underway

The relocation of the Sunshine Coast Water Police will provide continued high quality policing services.

Sport and recreation

The Queensland Government supports the development of healthy and socially inclusive communities through sport and recreation activities and programs, the development of the state's elite athletes and grants to support construction of sport and recreation facilities.

The government's sport and recreation services encourage Queenslanders to lead active and healthy lifestyles, from participation at a community level through to enhanced achievement at elite levels. Linked to this is a commitment to increase the land dedicated to nature conservation and public recreation by 50 per cent.

Projects completed

The Conondale Great Walk is the last of the Great Walks to be completed as part of the Queensland Government's commitment to spend $16.5 million over 10 years to develop 10 world-class walking tracks. It is set among the natural beauty of the Conondale Range and required careful consideration of the unique flora and fauna found in the area. This Great Walk is the only one to have an Art+Place component to help create a space where visitors can appreciate another dimension to nature.

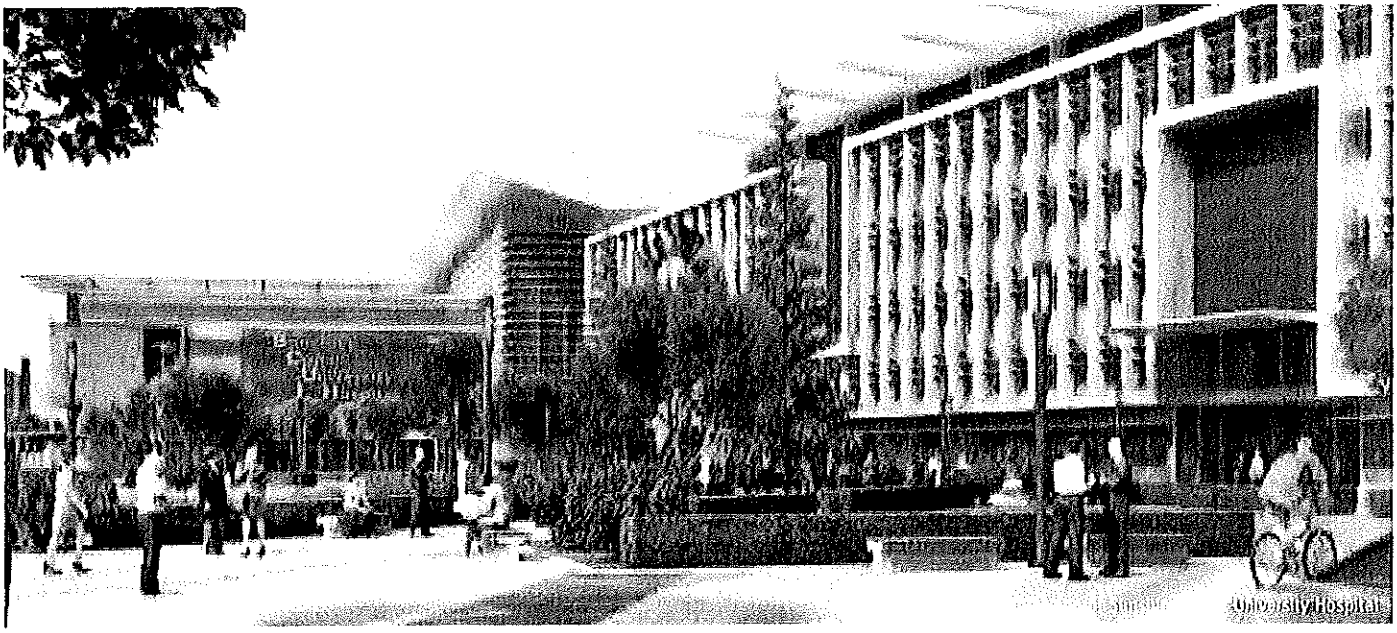
Projects underway

Upgrade of a 25 metre heated swimming pool at Caloundra Aquatic Lifestyle Centre at Caloundra is part of the central park master plan.

Projects planned

Construction of an Olympic swimming pool at the University of the Sunshine Coast at Sippy Downs will provide community access for competition, training and general recreation. It will also enable enhanced and increased teaching and research opportunities for the university.

The Queensland Government has contributed funding to the Sunshine Coast Regional Council to construct a multi-use sports complex for soccer, little athletics and cycling at Noosa. This project is expected to be complete in mid 2012.



Key infrastructure projects

Status:	Under construction
Description:	A two directional 48 kilometre water pipeline from Landers Shute water treatment plant near Eudlo to the Noosa water treatment plant near Cooroy
Cost:	$450 million
Delivery:	Due for completion in December 2011
Key benefit:	The pipeline will secure water supply for the region by supplying up to 65 megalitres a day of treated water in either direction between the Sunshine Coast and Brisbane

Status:	In planning
Description:	A tertiary referral facility for the Sunshine Coast and surrounding areas
Cost:	$1.97 billion
Delivery:	Planned delivery date is late 2016
Key benefit:	The hospital will provide 450 overnight beds with room to expand to 650 beds plus a range of specialist clinical services and acute care facilities to the region

Status:	Under Construction
Description:	Construction of the Bruce Highway to a four lane grade-separated motorway standard between Sankeys Road and Traveston Road
Cost:	$673 million
Delivery:	The Sankeys Road and Traveston Road stage is planned for completion in 2014
Key benefit:	This project, ultimately, will provide an upgrade of 65 kilometres of the Bruce Highway between Cooroy and Curra

Status:	In planning
Description:	Modernisation of trade training facilities at Nambour
Cost:	$12 million
Delivery:	Planned delivery date is 2011
Key benefit:	The project will provide a facility to produce skilled Queenslanders

Status:	Under construction
Description:	To increase the bed capacity across Nambour and Caloundra Hospitals by 175 bed and bed alternatives
Cost:	$191 million
Delivery:	Staged delivery to end 2011
Key benefit:	The expansion includes increased bed capacity and creation of 792 jobs over the life of project

Public transport network										
	MMTC - Creekside Boulevard to Kawana Town Centre - Corridor Preservation	Concept	35		○					
Strategic road network										
SC1	Bells Creek connection - Bruce Highway to Caloundra Road - Investigation	Pre-project	5		○	○				
SC2	Bruce Highway interchanges - Johnstone Road to Bells Creek Road	Pre-project	110	▲	◎	◎	◎			
SC3	Bruce Highway - Cooroy to Gympie - Corridor Preservation	Pre-project	250		○					
	Bruce Highway - Cooroy to Gympie - Sankeys Road to Traveston Road (including access road for Bruce Highway)	Market	673	▲	◎	◎	◎	◎		
	Bruce Highway - Cooroy to Gympie - Cooroy to Sankeys Road and Traveston Road to Keefton Road	Pre-market	1,800	▲		◎	◎	◎	→	
SC4	East–West links - Steve Irwin Way upgrade - Mooloola Connection Road to Caloundra Road interchange	Market	48		◎					
SC5	Maroochydore Road - Bruce Highway to Martins Creek - additional lanes	Market	18		◎					
Airports										
SC6	General Aviation Strategy - Replacement Aerodrome Study for Caloundra and Caboolture Aerodromes	Market	1		◎					
SC7	Sunshine Coast Airport Masterplan Implementation Project (SCRC project)	Concept	440		◎	◎	◎	◎	→	
SC9 & SC10	Sunshine Coast - expansion of existing facilities	Market	191		◎	◎				
SC8	Sunshine Coast Health Precinct	Pre-project	28				◎	◎	→	
SC9	Sunshine Coast Interim Service Enhancements - Caloundra Hospital Emergency Department Expansion	Market	12		◎	◎				
SC10	Sunshine Coast Interim Service Enhancements - Nambour Hospital Elective Surgery	Market	15		◎	◎				
SC11	Sunshine Coast University Hospital	Pre-market	1,972		◎	◎	◎	◎	→	
–	State school infrastructure in Sunshine Coast	Ongoing program	480		◎	◎	◎	◎	→	
SC12	Campus modernisation - Mooloolaba	Pre-market	5		◎					
SC13	Campus modernisation - Nambour	Pre-market	12		◎	◎				
SC14	Aquatic Centre - University of the Sunshine Coast	Concept	3			◎				
SC15	Maroochy River Canoe Trail	Market	1		◎					
	Total estimated investment in projects under way 2010–2014		$600 million							

1. The table identifies infrastructure projects to 2014 at the Sunshine Coast.
2. Estimates in the state budget and other documents may differ, as they may incorporate costs that reflect anticipated changes in input prices between initial planning and the time of construction. Estimated investment includes funds already expended on projects.
3. Where funding is required from other sources other than the Queensland Government, their estimated costs have been included.
4. For an explanation of estimate categories, refer to page 15.
5. State school infrastructure includes 10 planned schools on the Sunshine Coast to 2031.
6. Estimated investment for projects within this table refer to the total project cost, which may be beyond the four year period. This is relevant for projects with an arrow in the last column.

○ Investigation/study projects ◎ Corridor preservation projects ◎ Infrastructure construction projects ▲ Subject to federal funding → Project continues in later years

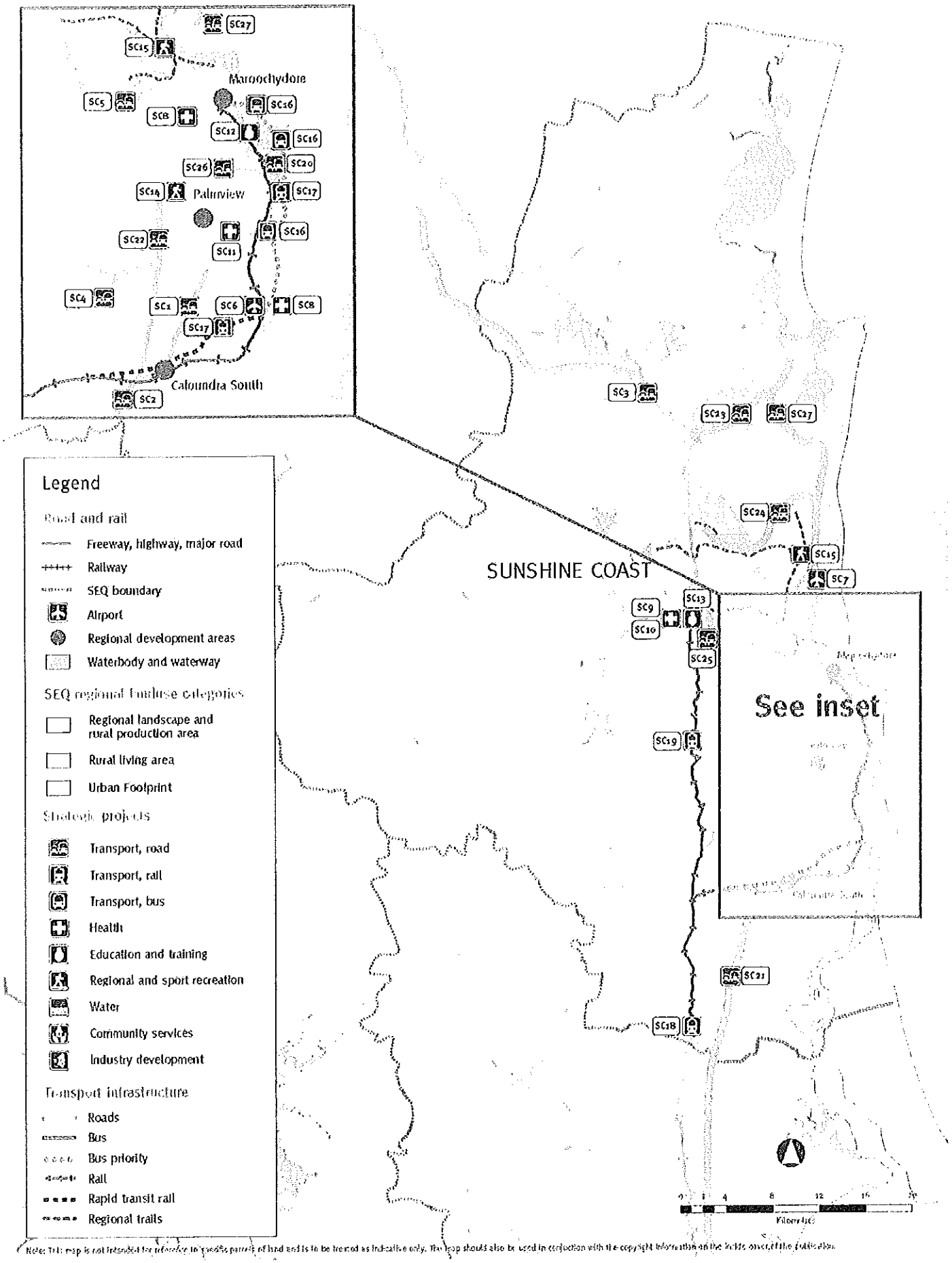
Sunshine Coast planned infrastructure 2016–2031

Map ref	Project	Subject to federal funding	Indicative delivery timeframe		
			2014–15 to 2019–20	2020–21 to 2025–26	2026–27 to 2030–31
TRANSPORT					
Public transport network					
SC16	CoastConnect - Caloundra to Maroochydore - quality bus corridor		●		
SC17	CAMCOS - Beerwah to Maroochydore			●	
SC18	Beerburrum to Landsborough - additional rail line			●	
SC19	Landsborough to Nambour - additional rail line				●
SC20	MMTC - Caloundra–Mooloolaba Road duplication - Creekside Boulevard to Maroochy Boulevard (including Mooloolah River Bridge)				●
Strategic road network					
SC1	Bells Creek connection - Bruce Highway to Caloundra Road				●
SC21	Bruce Highway upgrade - Caboolture to Caloundra Road - investigation		●		
SC22	Bruce Highway upgrade - Caloundra Road to Sunshine Motorway	⚠	●		
SC3	Bruce Highway upgrade - Cooroy to Gympie - remaining stages	⚠	●		
SC23	East–West links - Eumundi to Noosa Road				●
SC4	East–West links - Steve Irwin Way upgrade - Landsborough to Mooloolah Connection Road		●		
SC24	East–West links - Yandina to Coolum				●
SC25	Nambour Connection Road upgrades				●
SC26	Sunshine Motorway extension - Mooloolah River to Kawana Way		●		
SC27	Sunshine Motorway upgrade - Pacific Paradise to Doonan - Yandina-Coolum Road to Walter Hay Drive				●
Total planned investment - $5,538 million					

1. The table identifies planned infrastructure projects to 2031 on the Sunshine Coast.
2. Projects listed in the longer-term planning horizon may change to better reflect the emerging needs of the region.
3. The indicative delivery timeframe outlines the estimated timeframe for completion of the project. However, project planning or commencement may occur before this timeframe.

⚠ Subject to federal funding

Map 8: Sunshine Coast strategic infrastructure



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Part C
Appendixes

Boggo Road Busway

Glossary of terms

Active transport

Non-motorised travel, such as walking and cycling.

Broadhectare

Broadhectare land refers to undeveloped land zoned for residential development on the fringe of the established metropolitan area. These areas are generally used for rural purposes until residential subdivision takes place. This type of land is also referred to as 'greenfield'.

Compact settlement

Consolidating growth in existing areas close to public transport to encourage reduced car use and help manage congestion.

Forward estimates (FE)

Forward Estimates represent the projected annual position for each year of a five-year planning horizon (i.e. current year, next budget year, plus three out years). Forward estimates are produced on a departmental basis.

Greenfield

Greenfield land is undeveloped land in an Urban Footprint that has been identified as being potentially suitable for future urban development. It is generally found on the fringes of existing urban areas.

High occupancy vehicle (HOV)

A vehicle carrying multiple passengers. T2, T3 and bus lanes are examples of HOV-focussed infrastructure.

Infill development

New development that occurs within established urban areas where the site or area is either vacant or has previously been used for another urban purpose. The scale of development can range from the creation of one additional residential lot to a major, mixed-use redevelopment.

Orbital network

The network of roads or motorways around the edges of the urban area designed to allow the movement of traffic

Transport modes

The different types of transport such as walking, cycling, private car and public transport (includes buses, trains and ferries).

Urban Footprint

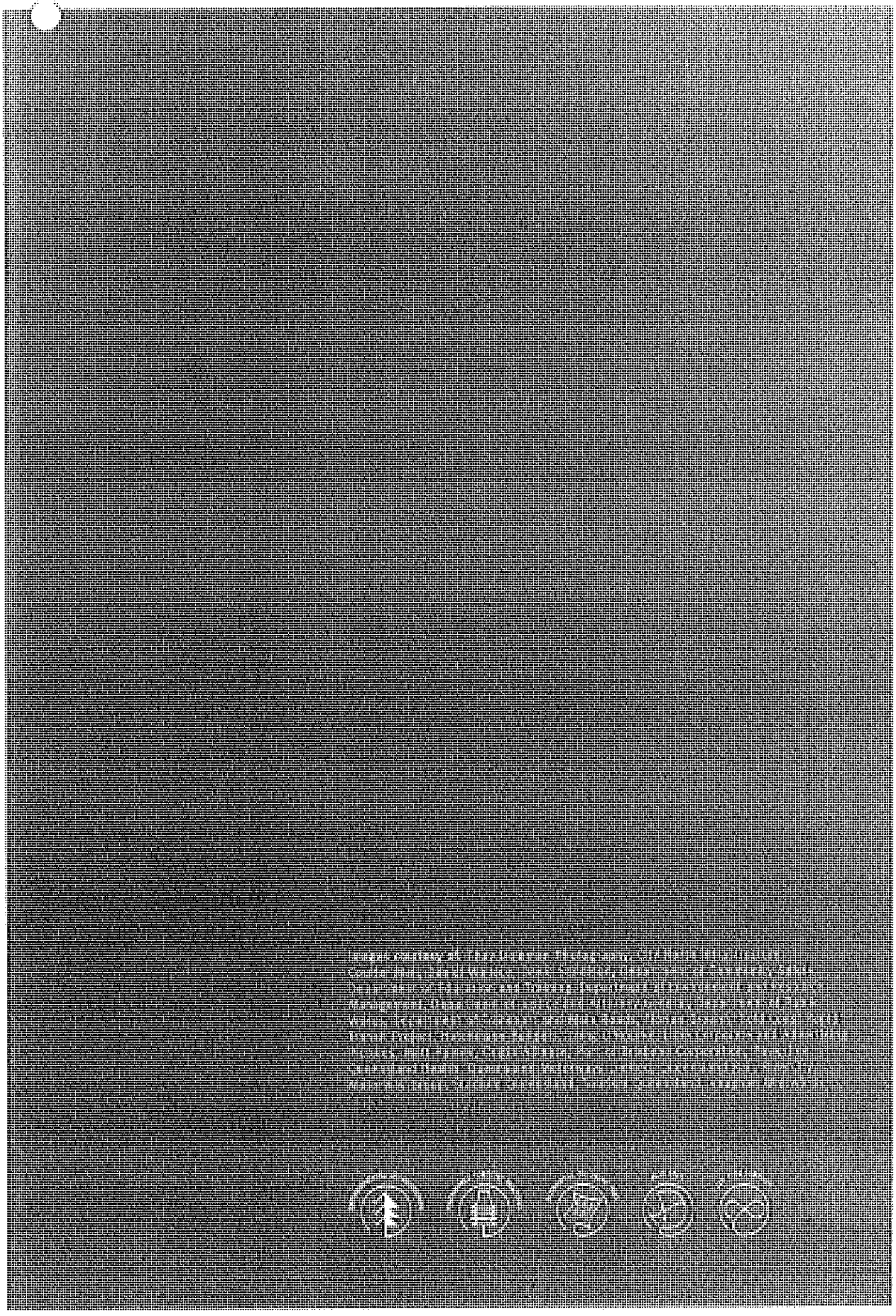
The Urban Footprint includes established urban areas, broadhectare and remnant broadhectare areas that could be suitable for future urban development. It incorporates the full range of urban uses, including housing, industry, business, infrastructure, community facilities and urban open space.

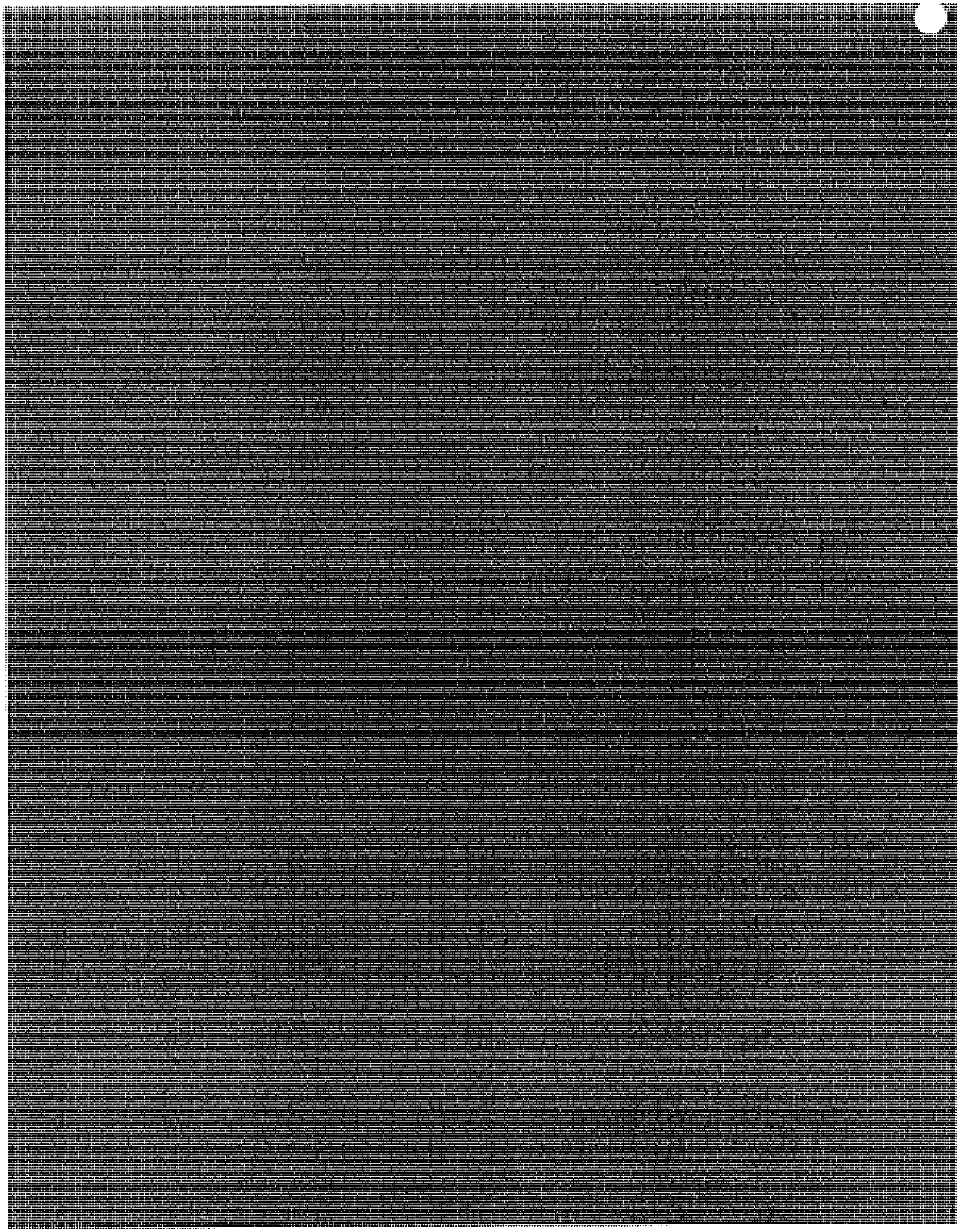
Useful websites

Project	Website
Regional planning and infrastructure projects	
SEQ Regional Plan	www.dip.qld.gov.au/regional-planning
Major projects and infrastructure	www.dip.qld.gov.au
Transport	
Transport and Main Roads	www.tmr.qld.gov.au
Gateway Upgrade Project	www.gatewayupgradeproject.com.au
Bus and busway projects	www.translink.com.au
Airport Link	www.airportlink.com.au
Gold Coast Rapid Transit	www.tmr.qld.gov.au
Cross River Rail	www.crossriverrail.qld.gov.au
Rail projects	www.qr.com.au/seqip
Water	
Queensland Water Commission	www.qwc.qld.gov.au
South East Queensland Water Grid	www.dip.qld.gov.au/seqwatergrid
Energy	
Department of Employment, Economic Development and Innovation (mines and energy)	www.dme.qld.gov.au
CS Energy	www.csenergy.com.au
ENERGEX	www.energex.com.au
Ergon Energy	www.ergon.com.au
National Electricity Market Management Company (NEMMCO)	www.nemmco.com.au
Origin Energy	www.originenergy.com.au
Powerlink Queensland	www.powerlink.com.au
Tarong Energy	www.tarongenergy.com.au
Information and communication technology	
Queensland Telecommunications Strategic Framework	www.qgcio.qld.gov.au

Project	Website
Health	
Queensland Health	www.health.qld.gov.au
Queensland Children's Hospital	www.health.qld.gov.au/buildinghealth
Gold Coast University Hospital	www.health.qld.gov.au/buildinghealth
Sunshine Coast Hospital	www.health.qld.gov.au/buildinghealth
Health Action Plan	www.health.qld.gov.au/publications/corporate/action_plan.asp
Health Precincts	www.health.qld.gov.au/publications
Smart State Medical Research Centre	www.smartstate.qld.gov.au/resources/publications/ss_strategy/building.shtm
Education and training	
Department of Education and Training	www.education.qld.gov.au
Queensland Smart State Academies	www.qldacademies.eq.edu.au
South East Queensland Schools Project	www.education.qld.gov.au/seqschoolsproject/
Brisbane Convention and Exhibition Centre Expansion	www.bcec.com.au
Queensland Skills Plan	www.trainandemploy.qld.gov.au
Community safety and justice	
Department of Community Safety	www.emergency.qld.gov.au
Queensland Police Service	www.police.qld.gov.au
Courthouse upgrades	www.justice.qld.gov.au
South Queensland Correctional Precinct	www.correctiveservices.qld.gov.au
Sport and recreation	
Sport and recreation funding programs	www.sportrec.qld.gov.au
Trails and great walks	www.epa.qld.gov.au/parks_and_forests
South East Queensland Regional Outdoor Recreation Strategy	www.dip.qld.gov.au
Robina–Gold Coast Football Stadium (Skilled Park)	www.msfa.qld.gov.au
Infrastructure for rural development	
South East Queensland Rural Futures Strategy	www.dip.qld.gov.au/regional-planning/rural-futures.html

Notes





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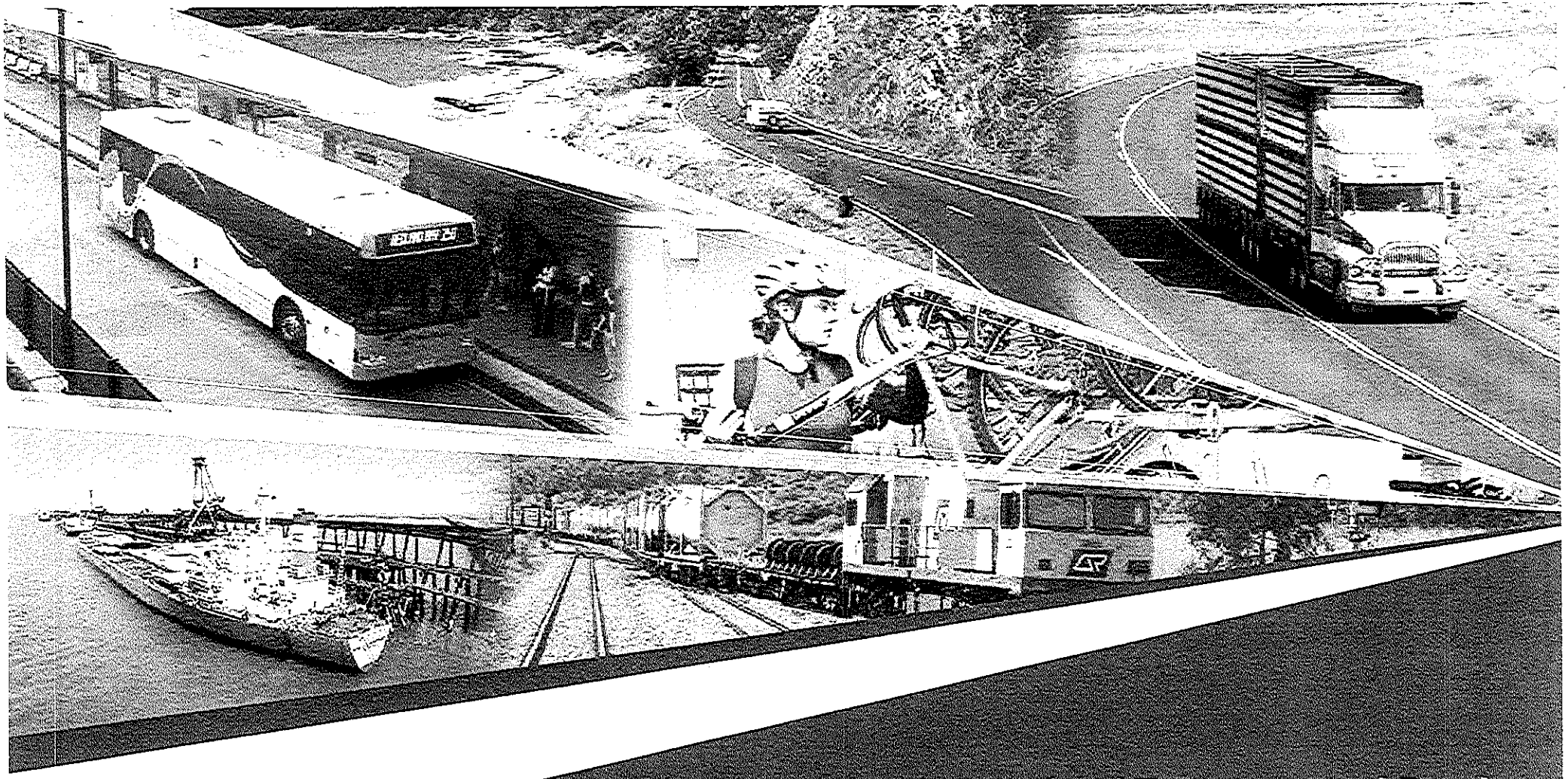
Annexure D

Queensland Transport and Road Investment Program (QTRIP)



Queensland Transport and Roads Investment Program

2010-11 to 2013-14

Toward Tomorrow's Queensland

Queensland Government

Toward Q2: Tomorrow's Queensland

Connecting Queensland

The *Queensland Transport and Roads Investment Program 2010-11 to 2013-14 (QTRIP)* is an Australian first. It sets out the Queensland Government's plan to deliver transport and road projects to meet the infrastructure needs of our rapidly-growing state in line with the goals of *Toward Q2: Tomorrow's Queensland*.

No other state in Australia has a program of works that looks four years ahead to meet the future road and transport needs of a growing state.

QTRIP outlines a significant investment in transport and road projects in Queensland at a time when the country's economy is still recovering from the impacts of the global financial crisis.

QTRIP is a blueprint for the Queensland Government and the Australian Government to invest $17 billion over the next four years into Queensland's transport and road network. For 2010-11, $6 billion has already been committed to further strengthen the economy and sustain jobs for around 55,000 workers in transport and road infrastructure industries.

Following the recent Federal Election, and as part of the Australian Government's A Tax Plan for our Future, a $6 billion, ten-year Regional Infrastructure Fund has been set up to tackle transport capacity restraints, with $2 billion of this funding earmarked for Queensland.

Some of this funding will be made available from 2010-11, and details of allocations and management will be finalised with the new government.

QTRIP includes election commitments for projects under the Regional Infrastructure Fund across northern, central and southern Queensland, for 2010-11 to 2013-14.

Additional election commitments under the Nation Building Program 2, including the Moreton Bay rail link, are listed in QTRIP. Future Australian Government commitments are currently beyond the four-year planning horizon of this document.

QTRIP builds on a record ongoing investment in transport and road projects in Queensland, with more than $25.2 billion invested in the past ten years alone.

Improving safety for Queenslanders

There are few things more important than the safety of Queenslanders on our transport and road network.

That's why $30 million has been provided in 2010-11 for our Regional Safety and Development Program. It will deliver key regional transport infrastructure that targets safety issues on the network and supports economic growth, particularly in the mining regions. These funds will be used to maintain our vast network and that means more jobs for local workers on maintenance and safety projects throughout the state.

Transport and Main Roads (TMR) will deliver a record number of new projects in 2010-11 through our Safer Roads Sooner (SRS) initiative. $66 million will be spent on road safety projects where they are needed most of all. It's all about road safety.

Several federally-funded initiatives will also target road safety. The Black Spot Program will address trouble spots on the state's transport and road network – that's $12.078 million to Queensland annually.

$11.55 million has been set aside to boost safety across Queensland's school bus fleet.

Queenslanders will also be safer on the water, with $3.56 million invested in 2010-11 through Maritime Safety Queensland to boost safety for shipping and small craft. This includes providing pilotage for regional ports and aids to navigation.

Managing growth

With more than 2,000 people moving to Queensland each week, it is important to plan for and manage our future growth.

The recent Queensland Growth Management Summit was all about getting Queenslanders involved in shaping the state's future and, as a government, we are rising to the challenge. We want to encourage more people to settle in regional Queensland to strengthen regional economies and ease the pressure on south east Queensland. That's why we are developing a Queensland Regionalisation Strategy.

This strategy will identify our regions capacity to grow, and any infrastructure investment needed to make this happen. In doing so, the strategy will provide a state-wide blueprint for the Queensland Infrastructure Plan to program the provision of infrastructure. It will provide cues for regional plans and help determine where the new areas for development should be. TMR will play a key role in developing strategies to encourage regional growth and meet the growing transport demands in south east Queensland.

2010 is shaping up to be one of the most significant years in the delivery of key infrastructure to manage future growth and to deliver a better, brighter future for all Queenslanders. The infrastructure that is being signed, sealed and delivered across Queensland will make a big difference to people's lives. We are rolling out an ambitious transport and road building program and generating jobs for workers at a time when jobs and job security are more important than ever.

The country's biggest road and bridge project – the $2.5 billion Gateway Corridor upgrade – will go a long way towards tackling congestion and slashing travel times for busy motorists. The twin bridges across the Brisbane River are much more than a landmark. They are at the forefront in our fight to tackle congestion. By the end of the year motorists will have six lanes northbound and six lanes southbound, delivered six months ahead of schedule.

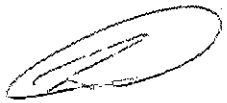
The combined $4.8 billion Airport Link, Northern Busway extension and Airport Roundabout Upgrade projects are currently being delivered through a public-private partnership by BrisConnections. The three projects, scheduled for completion by mid-2012, will be built together to achieve better value for Queenslanders. The Northern Busway (Windsor to Kedron) and the Airport Roundabout Upgrade projects are directly funded by the Queensland Government and are included in QTRIP.

Our cycling infrastructure is second to none. Cyclists too have reason to celebrate with a state-of-the art bikeway and pedestrian path across the Brisbane River. Cyclists and pedestrians within the eastern suburbs of Brisbane are now able to travel across the Brisbane River for the first time. The Sir Leo Hielscher Bridge cycle facility will connect the local cycle network in Nudgee, Nundah and Eagle Farm to the pedestrian and cycle paths in suburbs south of the Brisbane River – complete with stunning views, well-planned facilities and rest areas.

It's about being healthy, being active and best of all, it's free.

We congratulate everyone involved in the delivery of QTRIP initiatives and thank the community for their patience while work is going on around you. You are the ultimate beneficiaries of a first class road and transport network.

The Honourable Anna Bligh
Premier of Queensland
November 2010



The Honourable Craig Wallace MP
Minister for Main Roads
November 2010

The Honourable Rachel Nolan MP
Minister for Transport
November 2010

Connecting Queensland

This is the inaugural release of the Transport and Main Roads (TMR) *Queensland Transport and Roads Investment Program* (QTRIP), which highlights the department's commitment to Queensland's transport and road infrastructure needs.

TMR's role, under its vision of *Connecting Queensland*, is to plan, manage and deliver a safe, efficient and integrated transport system. QTRIP demonstrates the department's commitment to delivering the best solutions for the transport task, whether by rail, bus, road, boat, air, cycling or walking.

QTRIP details the upcoming four-year program of transport and road works together in the same publication for the first time. Projects detailed in the QTRIP comprise a major proportion of the Queensland Government's infrastructure construction program to meet the needs of this rapidly-developing state.

By delivering the key transport and road initiatives listed in QTRIP, TMR will be well on the way to achieving its vision of *Connecting Queensland,* meeting our corporate objectives, and making a strong contribution to the Queensland Government's *Toward Q2: Tomorrow's Queensland.*

QTRIP 2010-11 to 2013-14

Over the four years from 2010-11 to 2013-14, funding of $17 billion has been provided for Queensland's transport and road network. In 2010-11, Queensland Government and Australian Government funded projects totalling $6 billion will commence, continue, or be completed, helping sustain the jobs of 55,000 people throughout Queensland. In addition, $1.3 billion in commercial infrastructure funding will be delivered by Queensland Rail and Queensland Motorways Limited in 2010-11.

The Australian Government is committed to continuing the current Nation Building Program for 2009-10 to 2013-14, and to providing additional funding towards transport and road infrastructure in Queensland.

QTRIP reflects current Nation Building Program funding for Queensland, as outlined in the 2010-11 Federal Budget, but excludes some election commitments for the Nation Building Program and the Regional Infrastructure Fund.

Committed Queensland Government funding for the Blacksoil Interchange is shown in QTRIP, but Australian Government funding for this project, as well as several others, is not included in this publication.

This publication includes initiatives to improve traffic safety; enable greater use of public transport, cycling and walking; manage urban congestion and traffic growth more effectively; and preserve, manage and operate transport and road assets.

Highlights for the upcoming years include:

- continuing detailed feasibility planning for the Cross River Rail capacity upgrade
- extending the Northern Busway to Kedron, and the Eastern Busway to Coorparoo
- strategic planning and community consultation for the Sunshine Coast multi-modal corridor
- stage one of the Darra-Springfield Corridor, including a new railway connection from Darra to Richlands and duplication of the Centenary Highway from the Ipswich Motorway to the Logan Motorway at Carole Park
- developing a preferred option for future upgrades of Cairns' southern approaches, including bus, motor vehicle, rail corridor, and pedestrian and cycle access
- continuing design for a high-standard, four-lane southern approach to Townsville on the Bruce Highway. The first section will extend 7.5km to Cluden, and planning is underway on further sections to the south
- beginning the next stage of a $148 million project to replace the Forgan Bridge across the Pioneer River. Stage two involves replacing the existing bridge with a new two-lane bridge to provide pedestrian and cycle facilities
- constructing the $613 million new alignment of the Bruce Highway south of Gympie between Sankeys Road and Traveston Crossing Road, as part of the planned Cooroy to Curra project
- constructing a $158 million project to upgrade the Pacific Motorway between Nerang and Worongary, part of the $420 million commitment to upgrade the motorway between Nerang and Tugun, jointly funded by the Queensland Government and Australian Government.

A safe system is vital

Ensuring Queensland's transport and roads are safe is integral to the works undertaken by TMR. The department addresses safety through a range of initiatives.

QTRIP includes $66 million for priority projects identified under Safer Roads Sooner (SRS) in 2010-11, and $234 million for SRS projects over the four years from 2010-11 to 2013-14.

SRS aims to help reduce road trauma by providing funding for cost effective, high-benefit projects that address known and potential crash sites on state-controlled roads. Projects include improving line marking and traffic lane separation, providing better signage, removing road side hazards, providing protected turning lanes at intersections, and using intelligent transport signage to advise drivers and influence driver behaviour.

Several mass action programs are also provided as part of SRS. These provide a range of specific treatments to reduce road trauma.

The Australian Government-funded Black Spot Program contributes to the commitment to reduce crashes on Queensland roads. In 2010-11, a total of $12.078 million has been provided for 38 projects to reduce the risk of accidents at known crash sites across the state.

The safety of children travelling to school is a priority, and QTRIP includes $71.2 million in grants from 2010-11 to 2013-14 for safe school bus routes, safe school travel, seatbelts in school bus fleets and ensuring school buses are safety compliant in the event of a rollover type crash.

Maritime safety will also be improved through the allocation of $13 million from 2010-11 to 2013-14 for a range of works, including upgrading and replacing navigational aids across Queensland and establishing a port vessel tracking service in Townsville.

Managing the impacts of urban growth

Encouraging the use of public transport, cycling and walking is an essential component of TMR's approach to managing the impacts of urban growth. The department is developing cycling and walking facilities across Queensland, providing new bus and rail services, integrating passenger transport services, and giving priority access to high-occupancy vehicles where appropriate, to support sustainable transport choices.

Key public transport initiatives include the Gold Coast Rapid Transit Project, jointly funded by the Queensland Government, Australian Government and Gold Coast City Council, and the Northern Busway (Windsor-Kedron) in Brisbane, which is funded by the Queensland Government and being built together with the Airport Link.

Both projects are included in the *South East Queensland Infrastructure Plan and Program* (SEQIPP), which emphasises the need for road, transport and other infrastructure projects to meet the rapidly developing region's growth needs.

Between 2010-11 and 2013-14, major projects to reduce traffic congestion and improve safety on key arterial roads are continuing, including the Ipswich Motorway upgrade (Dinmore-Goodna), funded by the Australian Government; and the Pacific Motorway Upgrade, jointly funded by the Queensland Government and Australian Government.

Intelligent transport systems are being incorporated into the existing road network to improve efficiency. This includes road signs that provide real-time information to road users about driver speed and behaviour and traffic conditions; and improving traffic monitoring and incident management to enable quick responses and limit the impact of incidents on the network.

Preserving transport and road assets

TMR is Queensland's leading manager of public assets, including 33,337km of roads, more than 6,500 bridges and major culverts, 24.6km of busways, approximately 10,000km of rail, and 886 maritime infrastructure assets. This vast network has to be preserved, maintained and operated with the most effective and efficient use of available funding.

QTRIP outlines a four-year program of maintenance and enhancement works set against the demands of an ageing network. Many road pavements around the state are 40 years old or more, having been constructed in the 1960s and 1970s during a major expansion of sealed roads.

QTRIP also includes funding for the maintenance and enhancement of rail lines, busways, airports, and maritime and cycle infrastructure.

Extreme weather caused major flooding in 2009 and 2010, resulting in significant damage to roads, rail lines, airports, bridges and culverts, and maritime infrastructure across Queensland. This posed further challenges for TMR.

During 2009-10, significant road rehabilitation works have been undertaken in various areas across the state, under the Natural Disaster Relief and Recovery Arrangements. A concerted effort was made during 2009-10 to undertake as much restoration work as possible prior to the onset of the wet season, to minimise the impact of further monsoonal activity on the already-damaged road assets. Almost $300 million of restoration works were delivered by the department during the year.

Conclusion

Since the machinery of government changes in March 2009, I have been proud to lead TMR to bring together two strong organisations to create a single entity to cater for all the state's transport and road needs.

The QTRIP is one of the successes of this integration.

This program is the culmination of countless hours of hard work by our people, who have worked to plan and build better and safer roads and expand the public transport network for all Queenslanders.

Together we really can achieve our goal of *Connecting Queensland*.

David Stewart
Director-General
Transport and Main Roads
November 2010

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Fitzroy

Central West

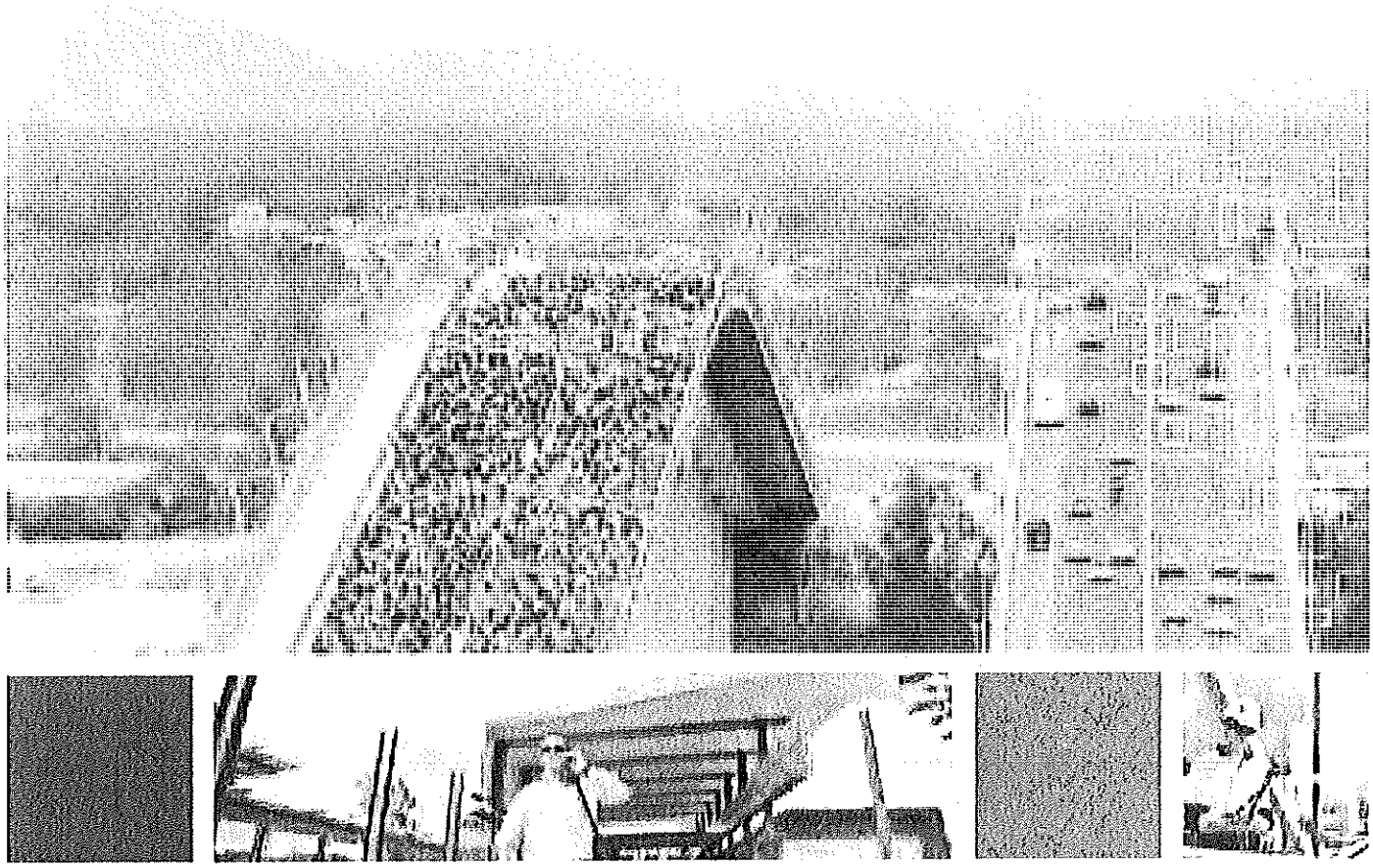
Mackay/Whitsunday

Northern

North West

Far North

Appendices



South East Queensland

Infrastructure Plan and Program

2010–2031

Toward Q

The Department of Infrastructure and Planning brings together planning, local government and infrastructure responsibilities into one department enabling government to deliver integrated solutions, face the state's population and economic challenges and secure a sustainable future for Queensland.

Published by the Queensland Government, July 2010, 100 George Street, Brisbane Qld 4000.

The Queensland Government is committed to providing accessible services to Queenslanders from all culturally and linguistically diverse backgrounds. If you have difficulty understanding this document and need an interpreter, please call the Translating and Interpreting Service (TIS National) on 131 450 and ask them to telephone the Queensland Department of Infrastructure and Planning on 07 3227 8548.

IPN_0257_10_Pb

Front cover—Official opening of the Go Between Bridge, 5 July 2010 [illegible]
This page—Kurilpa Bridge

Annexure E

State Government's Project Assessment Framework (PAF)

Queensland Government

Queensland Treasury

Project assurance framework

The Project Assurance Framework sets the foundation for ensuring that project management is undertaken effectively across the Queensland Public Sector, and that the Government achieves value for money from its significant investment in project activity.

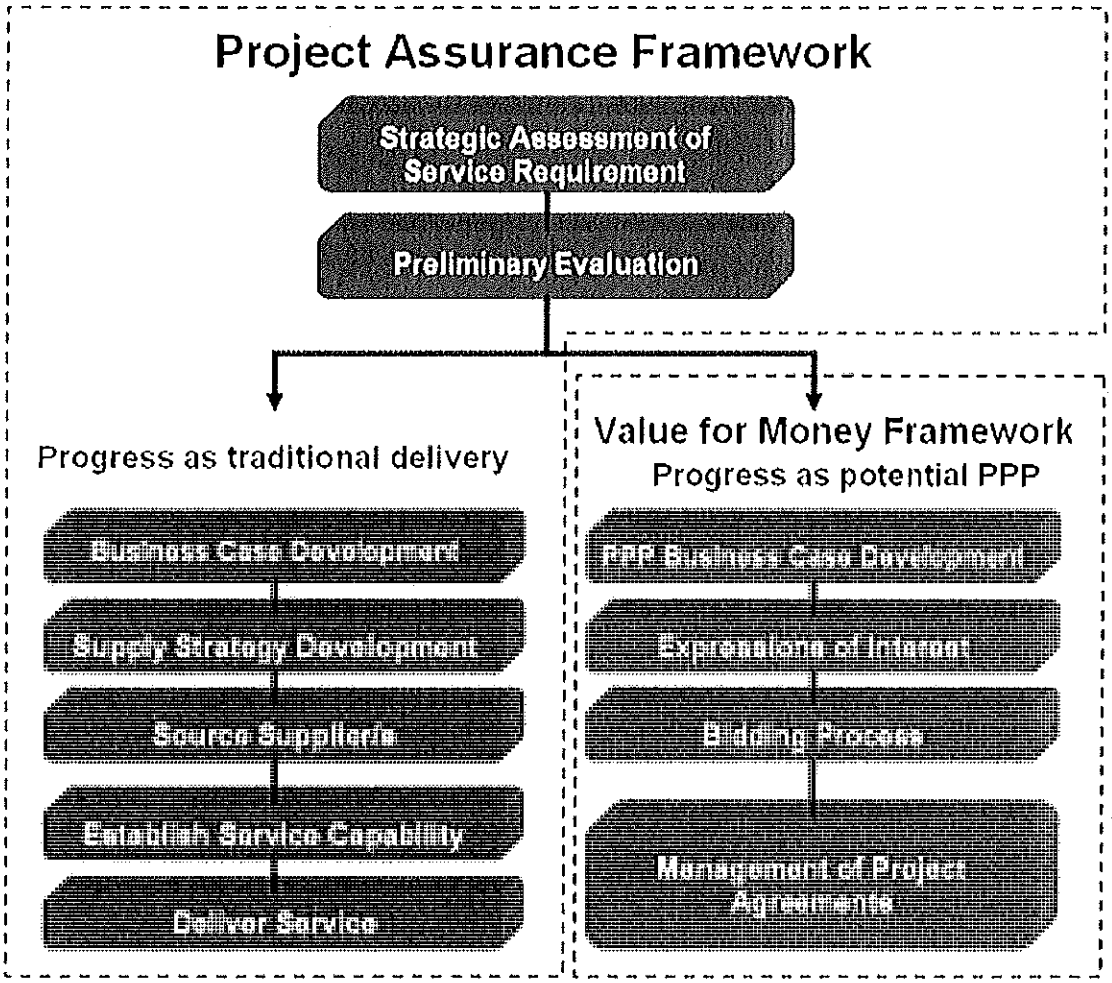
The Department of Infrastructure and Planning is now responsible for the implementation of the Project Assurance Framework, and can provide advice on the application of the Project Assurance Framework, the Value for Money Framework and other policy frameworks and guidance to projects. The Project Assurance Framework Guidance Material is available from the Department of Infrastructure and Planning website.

The Project Assurance Framework and its associated guidance material provide broad-based general guidance on project management and set the high-level parameters that may be evaluated in Gateway Reviews and other project management quality assurance processes.

The Project Assurance and Value for Money Frameworks, complemented by any existing departmental project management processes, represent the minimum standards for project management and assurance across the Queensland Public Sector.

For more information, visit the Project Assurance Framework section of the Department of Infrastructure and Planning website.

Illustration of the key project stages under the Project Assurance Framework



Did you find this information useful?

◯ Yes ◯ No ◯ Somewhat

Your comments:

Submit

Last reviewed 9 March 2010

Annexure F

Infrastructure Investment Committee Charter

DEPARTMENT OF TRANSPORT AND MAIN ROADS

INFRASTRUCTURE INVESTMENT COMMITTEE CHARTER

Version 1.2

Queensland Government

Table of Contents

INTRODUCTION

The Infrastructure Investment Committee (the Committee) is a committee of the Department of Transport and Main Roads Board of Management (the Board). The Committee provides oversight and endorsement of the development, prioritisation and approval of the department's investment strategy enabling the delivery of an integrated transport system.

Context

The Committee aims at improving infrastructure investment governance using an investment prioritisation framework. This ensures consistent delivery of programs aligned with strategic priorities, clear responsibility and decision-making processes to enable investment choices, improved performance, risk management and delivery within budget parameters.

ROLES and RESPONSIBILITIES of the COMMITTEE

The Committee is responsible for the department's infrastructure investment portfolio and the owner of capital investment control and governance providing:

- Strategic alignment through –
  - provision of strategic direction and high-level policy guidance
  - determination of investment priorities overseeing the development of DTMR's investment strategy
  - assessment of the strategic fit of proposals
  - performance of portfolio reviews, monitoring and adjusting the infrastructure portfolio of investments in line with government priorities
- Resource management through –
  - approval of the department's Strategic Investment Plan, to prioritise programs and projects within the portfolio, for delivery of value to DTMR
  - assessing return on investment
  - performing portfolio reviews for cost optimisation
  - reviewing, approving at the various investment decision gates and funding of infrastructure initiatives
- Investment management through -
  - provision of high-level direction for sourcing and use of resources
  - overseeing the aggregate funding of investments to ensure affordability of the portfolio
  - balancing competing demands of infrastructure investments

- Risk management through –
    - monitoring and confirming that critical risks to the department's infrastructure portfolio, including major project specific risks that may adversely impact a program or the portfolio, have been appropriately managed
    - ownership of the capital investment control, risk and governance framework
- Performance management through –
    - verification of outcomes and the achievement of strategic objectives
    - reviewing the measurement of delivery performance and benefits realisation
    - approval of program (or major project) owners and program/project success measures
    - monitoring of progress on major initiatives
    - monitoring and directing key governance processes
    - monitoring of end-to-end benefits realisation management process.

MEMBERSHIP

Membership comprises:

- Director-General
- Deputy Director-General (Policy and Planning)
- Deputy Director-General (Investment and Program) (Chair)
- Chief Operations Officer
- Deputy Director-General (Corporate)
- The General Manager (Program Development and Management)
- General Manager (Portfolio Investment)
- Chief Finance Officer

Members of the Board have an open invitation to attend Committee meetings.

Other representatives from the department or external guests may be invited to attend meetings from to time to report on issues relevant to their particular areas.

INDUCTION

Induction material will be provided to new members before attendance at their first meeting by the General Manager (Portfolio Investment). This will outline the role, structure, agreed behaviours and matters for consideration and a briefing on the capital investment control, risk and governance framework.

Information provided in the induction material will include:

- copy of the Charter
- full listing of members

- copies of previous minutes of the Committee and timing for future meetings
- other documents that will be of assistance, as agreed by the Chair.

STAKEHOLDER RELATIONSHIPS

The Committee provides input in to the Resources and Finance Committee.

The Committee liaises with the Information and Systems Investment Committee and the Audit and Risk Committee to enable its deliberations.

The Portfolio Management Office, Portfolio Investment Division, is the conduit through which information is provided to the Infrastructure Investment Committee.

Reporting on program delivery and performance is provided to the Committee by the General Manager (Program Development & Management).

Reporting Arrangements

The Committee informs and advises the Board on infrastructure investments and delivery to maximise value for money and realisation of benefits. It provides reports as identified in the Board's governance calendar.

MEETING PRINCIPLES

General Principles

Emphasis is on the achievement of outcomes through effective portfolio management.

Meetings are not to be used for the distribution of information or debate on operational issues.

All necessary investigation and consultation must be undertaken before being tabled to the Committee.

Members of the Committee conduct themselves in accordance with the principles stated in the *Public Sector Ethics Act 1994* and the department's code of conduct.

Decision Making

The Committee will use a consensus model of decision-making. Where a decision cannot be agreed by majority, the Chair, shall decide.

All decisions will be recorded.

A list of all actions arising from the meeting will be maintained and circulated with the minutes of each meeting.

The Committee support staff will be tasked with monitoring the actions and providing an update on progress to the meeting.

Quorum

It is expected that all members will attend.

A quorum is constituted when more than 60% (that is, 5) of the membership attend.

Use of proxies

The use of proxies is discouraged.

Proxies may be approved by the Chair prior to the meeting, where the proxy is at a similar level and breadth of knowledge as the full member, regarding Committee matters. The proxy must have the full delegated responsibility of the full member.

Staff acting in a full member's position will be granted temporary membership of the Committee for the duration of the acting role.

Meeting Frequency

The Committee meets monthly or more frequently as determined by the Chair.

Support to the Committee

The General Manager (Portfolio Investment) performs the role of Secretariat to the Committee and arranges secretarial support and is responsible for preparation of the agenda, recording of minutes, maintenance of the action list and decisions made.

All reports and papers to the Committee are coordinated through the Secretariat.

Agenda

The agenda is shaped by the Committee's governance calendar. The governance calendar and agenda items are informed by Board considerations and decisions.

Other agenda items will be canvassed prior to distribution of the agenda.

Minutes

Draft minutes of the previous meeting, endorsed by the Chair, will be circulated one week prior to the meeting.

Alterations and comments are to be provided out of session or at the next meeting prior to the minutes being confirmed.

The minutes unless indicated otherwise are not confidential. However, circulation will be defined and controlled.

ANNUAL EVALUATION OF THE COMMITTEE AND REVIEW OF THE CHARTER

In accordance with best practice governance the Board requires an annual review of its committees and will specify the process for such reviews.

The Committee will annually review the currency of its charter which will be reviewed by the Board for approval by the Director-General.

APPROVAL OF CHARTER

The Director-General approved this Charter:

[redacted]

David Stewart
Director-General
Department of Transport and Main Roads
16/12/2009

Annexure G

Reports and briefings – Colleges Crossing

Moggill Ferry/Colleges Crossing

RECOMMENDED RESPONSE:

- The state-controlled Moggill Ferry on Moggill Road and Colleges Crossing on Mount Crosby Road provide important links for the communities north and south of the Brisbane River with access to Ipswich and surrounds.
- Since October 2010, Colleges Crossing has been closed on three occasions due to the timed releases of water from Wivenhoe Dam and the major South East Queensland flood event.
- The Moggill Ferry survived the recent floods and road approaches were repaired and re-opened to traffic on 2 February 2011.
- Prior to each closure the department provided bridge and ferry users and local residents with as much notice as possible via Variable Message Signs (VMS), 'fold down' metal signage, and up-to-date information via the 131940 traffic and travel information hotline and website and local media.
- The department is undertaking a flood study to determine the feasibility of an improved crossing over the Brisbane River in the vicinity of Colleges Crossing or the Moggill Ferry site.
- Commencing by mid-2011 and concluding in late 2012 the study will investigate possible options to improve the access for the communities to the north and south of the Brisbane River in the vicinity of Moggill and Mount Crosby.
- The study is based on providing a more efficient transport system and will explore crossing options, costs, access improvements and possible flood immunity.

Contact **Telephone**	*Ron Michel* *07 3137 8344*	**Business group** **GM/RD/DD**	*Assets and Operations* *Shane Doran*
Version date	25 March 2011	**Prepared for**	*Minister for Main Roads, Fisheries and Marine Infrastructure*
		Endorsement	*Deputy Director-General/Chief Operations Officer*

- A new bridge across the Brisbane River at Colleges Crossing or the Moggill Ferry site would cost approximately $110 million each.
- This is a decision for the Department of Infrastructure and Planning through the South East Queensland Infrastructure Plan and Program as it would be a significant infrastructure project.

BACKGROUND

- Since October 2010, Colleges Crossing has been closed on three occasions. First on the 15 October 2010, again from the 15 December 2010 through to 24 January 2011 and finally from 21 February for 10 days.
- Alternative arterial routes to Colleges Crossing include the Moggill Ferry via Moggill Road and the Centenary Motorway and Ipswich Motorway link.
- Mount Crosby Road and Moggill Road are both closed during major dam releases and/or flood events. This creates access issues for suburbs north of the river during major flood events, particularly if Moggill Road and Mount Crosby Road are cut-off inbound towards Brisbane.
- On average, there are 1000 cars using the Moggill Ferry each day. The department will assess future operational aspects of the ferry in light of this major flood event, including the potential extension of operating hours.
- The flood study will look at the current infrastructure including Colleges Crossing and the Moggill Ferry. There is currently no funding available for the construction of an additional access or the upgrade of the current accesses.

Consultation with South East Queensland Water:

- The department is currently in consultation with South East Queensland Water to determine the possibility of having smaller more frequent water releases from the Wivenhoe Dam.
- Additionally, the department is also liaising with SEQ Water to establish the possibility of SEQ Water providing more notification to the department, local communities and stakeholders before timed releases of water from Wivenhoe occur.
- Planned water releases from Wivenhoe Dam:
  - As of 14 February 2011, South East Queensland Water was planning a number of 400 cubic metres water releases to commence 20 February 2011. The releases are expected to continue for nine days.
  - Colleges Crossing is expected to be closed for the duration of these releases. Twin Bridges (the lowest of the crossings and the closest to Wivenhoe Dam) and Savages Crossing are also expected to be closed during this time.
  - All affected crossings will be continually monitored over this time.
  - As soon as the water falls below the crossing, the region will ensure the crossing is safe and open as soon as possible.
  - South East Queensland Water has advised Ipswich City Council and Brisbane City Council of these water releases.
  - A process to improve advice to other stakeholders, such as Transport and Main Roads, is yet to be developed.
  - The impact on Moggill Ferry services over the nine day release is unable to be determined. Operation of the ferry will depend on the risk of damage and safety to the vessel, operators

and community. There is an existing Standard Operating Procedure for events such as this to ensure safe operation of the ferry service.

- The region will monitor the water heights at Colleges Crossing as a result of these water releases to ensure more accurate information for future reference, as these releases are the first without the river being in a state of flood.

Contact officer	Mark Wilson
Telephone	[redacted]
Approved by	A/Manager PD, Andrew Nguyen & Manager RO, Mike Carter
Endorsed by	General Manager, Assets and Operations
Date of endorsement	17 March 2011

Our ref: MC55418

Your ref: TF 11/6638

Ms Michele Rice
Manager
Ministerial Correspondence Unit
Office of the Premier and Cabinet
thepremier@premiers.qld.gov.au

Dear Ms Rice

Thank you for your request for advice of 24 February 2011, regarding correspondence to the Honourable Anna Bligh MP, Premier and Minister for Reconstruction, from Mr Wayne McCullough about Colleges Crossing.

The Department of Transport and Main Roads provides the following advice:

The Honourable Craig Wallace, MP, Minister for Main Roads, Fisheries and Marine Infrastructure, has recently commissioned a study to investigate possible options to improve access during periods of increased flows in the Brisbane River, for the communities to the north and south of the Brisbane River in the vicinity of Moggill and Mount Crosby. The study is expected to commence in mid-2011 and conclude in late 2012.

A new bridge across the Brisbane River at Colleges Crossing or the Moggill Ferry site would cost approximately $110 million each. This is a decision for the Department of Infrastructure and Planning through the South East Queensland Infrastructure Plan and Program as it would be a significant infrastructure project.

Since October 2010, Colleges Crossing has been closed on three occasions. First on 15 October 2010, again from 15 December 2010 through to 24 January and finally from 21 February for 10 days. All closures can be attributed to the timed releases of water from Wivenhoe Dam and the major South East Queensland flood event.

Prior to each closure of Colleges Crossing, the Department of Transport and Main Roads provides bridge users and local residents with as much notice as possible of the impending closure. This is achieved via permanent and temporary Variable Message Signs (VMS) and 'fold down' metal signage on the road approaches to the crossings with traffic diversions to the Ipswich Motorway, Warrego Highway and Mount Crosby Road.

During closures the department continually monitors the crossing and is fully prepared to open the crossing once it is safe to do so. The most recent release of water, which commenced in late February 2011, has not impacted upon the operation of the Moggill Ferry, thereby allowing the ferry to continue to provide a viable alternative to Colleges Crossing in this area. The ferry's operations will continue to be monitored to ensure the safety of all users.

In regards to Mr McCullough's concerns about Allawah Road and the Mount Crosby Weir, I am advised that these matters fall under the jurisdiction of Brisbane City and Ipswich City Councils. I note Mr McCullough's letter has been sent to both councils and trust they will provide a suitable response.

The department will endeavour to continue to provide commuters and communities surrounding Colleges Crossing with advanced notice of impending closures. The department also provides up-to-date information via the 13 19 40 Traffic and Travel Information hotline and its website at www.131940.qld.gov.au.

I trust this information is of assistance.

Yours sincerely

Carmen Meshios
Principal Advisor

Annexure H

Reports and briefings – Haigslea-Amberley Road crossing of the Bremer River

OnQ Project Management

Queensland Government
Department of Main Roads

Haigslea-Amberley Road
Five Mile Bridge Bypass

Type 1
Transport Infrastructure Projects
Business Case

R1003

Project Details

Region/District:	Metropolitan	**Local Government:**	Ipswich City Council
Road Name:	Haigslea-Amberley Road (3041)		
Location:	Haigslea-Amberley Road (Chainage 5020 - 6600)		
Project Number:	148/3041/901		
Program:	OSCR		
Project Description:	Five Mile Bridge Bypass – New RC bridge and road bypass along Haigslea-Amberley Road.		

NOTE: This Business Case must be read in conjunction with the previously approved Project Proposal R1001 and Options Analysis R1002 for this project.

Document control sheet

Contact for enquiries and proposed changes

If you have any questions regarding this document or if you have a suggestion for improvements, please contact:

Contact Officer Michael Taylor, Project Manager

Phone [redacted]

File/DOC/DMS No 810 / 02809 [1]

Version history

Version no.	Date	Changed by	Nature of amendment
1	15/09/2009	Samuel Eng / David Lau	Initial draft.
2	30/10/2009	Samuel Eng	Final draft

Contents

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1 Executive summary

This project covers a section of Haigslea-Amberley Road (3041) in Amberley and Walloon suburbs (Ch 5020 – Ch 6600), west of Amberley RAAF Base. The following highlights the need for a new bypass road alignment to replace the existing Five Mile Bridge (FMB) section; due to the poor alignment and safety issues. The new bypass to the FMB will continue to provide a service road function between Haigslea and Amberley, except with improved road alignment and safety to the road users. It will also form part of the proposed Western Ipswich Bypass (WIB) in future, linking Warrego Highway to Cunningham Highway.

The road safety along Haigslea-Amberley Road has been poor from the supporting information available and the comment in general has indicated major concern from both the communities in Amberley and Walloon area. They have requested for Department of Transport and Main Roads (DTMR) to address this issue for a period of time. Improvement works carried out have included the installation of new guardrails and advisory signage at the FMB section. The road section between FMB and Hansen Road was recently reconstructed to 3.5 m lanes and nominal 1.5 m shoulders. A short term business case recently prepared by Road Operations has recommended further improvement work including raising the Curve Chevron Markers to ensure adequate sight distance, installation of rumble strips at the bridge approaches and extension of the existing guardrails.

This business case has examined a number of different options and recommended the construction of a 160 m new reinforced concrete bridge upstream of the existing timber bridge. The reconstruction of the bridge approaches will offer an improved road alignment. The new bridge will provide 28 year flood immunity, an improvement from the existing 1 year immunity. It will also provide a 2 m shared bike and pedestrian path on either side of the bridge, in anticipation of its increased future use.

The current FMB should be replaced as it is sub-standard in load bearing capacity. In addition the existing bridge is located within a dip and tight reverse curve where fatal and severe accidents have occurred at this site. Besides being cost ineffective to upgrade the bridge to current standards, it also does not fit well into a safe road alignment.

Recommendations from the environmental and cultural heritage study have included provision for safe movement of fauna at the Bremer River Bridge crossing, negotiation for koala offsets with the Department of Environment and Resource Management and cultural heritage survey by Jagera Daran Pty Ltd for the development of a Cultural Heritage Management Plan.

The FMB project, which should be included in staging of the proposed Western Ipswich Bypass in future, is an ideal solution to correct the current road and bridge safety issues.

This Business Case proposes a $16.3M solution for the FMB. The South East Queensland Infrastructure Plan and Program (SEQIPP) lists an estimated investment of $55M for the FMB based on the Departments original planning alignment (2003) through the Department of Defence, with no funding available for many years. This proposed infrastructure will provide the road user a safer road for bridge much sooner, as well as a large financial saving.

The WIB when completed will provide a more efficient travelling route between Warrego and Cunningham Highways. Current freight services have to pass through River Road in Dinmore to enable them to travel between the two highways. Besides offering time savings, shorter and safer route, it will also help to divert much of the general and heavy traffic from the existing urban areas onto this bypass; hence allowing more privacy for the local residents who are staying along the existing route.

With RAAF Amberley expanding under Federal government plan to create "super bases" and the expanding industrial development around the region, it will be crucial to have this transport corridor (WIB) to handle the future increase in traffic flow. Most importantly, executing this project will help to provide a long term solution to the road safety issues along Haigslea-Amberley Road.

2 Introduction

2.1 Purpose of this document

The purpose of this Business Case is to:

- Confirm the need for the project and its link to strategic planning requirements;
- Document the available options investigated and the basis for selecting the preferred option;
- Develop an outline preliminary plan and budget for completing the project;
- Present the cost, benefits and risks associated with the project; and
- Obtain approval to implement the project.

2.2 Key project roles

The proposed project management structure during the Concept Phase is:

Project Customer	Paul Peters, acting District Director (Ipswich)
Project Sponsor	Robert Tutticci, acting Manager (Major Projects)
Program Manager	David Hubner, Manager (Network Planning)
Project Director	Wayne Leong, Principal Engineer (Major Projects)
Project Manager	Michael Taylor, Senior Engineer (Major Projects)
Project Engineer	Samuel Eng, Principal Engineer (Core Technology Services)
Project Support Officer	Fiona Patchett, Program Support Coordinator (Major Projects)

3 Project definition

Please identify if any of the following details have changed in the respective sections of Project Proposal and Options Analysis.	Yes	No
Project definition		
Project location	X	
Project background	X	
Current situation	X	
Project outcomes	X	
Project objectives	X	
Project benefits	X	
Links to Department's strategic plan and objectives		X
Links to Whole of Government priorities		X

Stakeholders		
Stakeholders	X	
Project scope		
In scope	X	
Out of scope	X	
Constraints	X	
Assumptions	X	
Related projects		X
Urgency		X
Impacts of the project		
Internal impacts	X	
External impacts	X	
Project risk		
Project risk	X	

3.1 Project Definition

Haigslea-Amberley Road was constructed about 100 years ago with the FMB built in 1953. It has a poor geometry alignment and is sub-standard in loading capacity; in the long run the traffic mix with substantial heavy vehicle content (14% heavy) would significantly increase the maintenance costs and reduce the remaining service life of the timber bridge. The road is currently used by semi-trailers, stock transporters, and local and tourist traffic. Infrequent passage of heavy loads under permit requires individual structural assessment and may only be possible with temporary propping of girders.

The road along the bridge segment contains one 90° intersection with Hansens Road and one approximately 90° curves prior to the bridge entrance in both directions (Figure 1). Currently there are no street lights along the road making visibility poor for road users at night. Meanwhile the community was also concerned with the number of accidents occurring along Haigslea-Amberley Road (shown in Table 1).

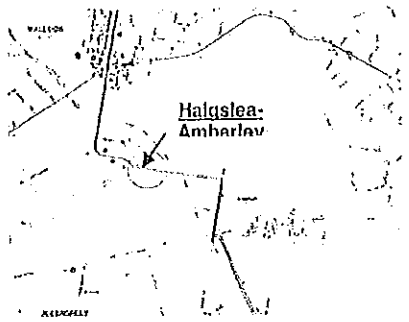


Figure 1: Map of Haigslea-Amberley Road

	Fatal	Hospitalisation	Medical Treatment	Minor Injury	Property Damage only	Total Crashes
1st July 2001 – Sept 2009	1	4	1	0	2	8
Jan 1980 – June 2001	0	1	6	0	3	10

Table 1: Total crash history along Haigslea-Amberley Road (Chainage 5020 – 6600)

Majority of these accidents are caused by single vehicle unable to negotiate properly around the sharp curves in both directions prior to FMB approaches. Fatality incidents had occurred near the FMB section (Figure 2 on the right), which the latest incident happened in early May 2006 killing two teenagers. At the time of the event, the vehicle was travelling northbound on the curve section along the carriageway. When the vehicle was approaching the bridge, the driver lost control of the vehicle and collided onto a large tree bursting into flame. Both the driver and passenger were incinerated. A month later, another accident took place near the same location. This time the vehicle (travelling on the opposite bridge approaches) plunged over the side of the bridge and landed on its roof three metres below. The driver was trapped in the overturned vehicle for more than five hours before the accident scene was discovered.

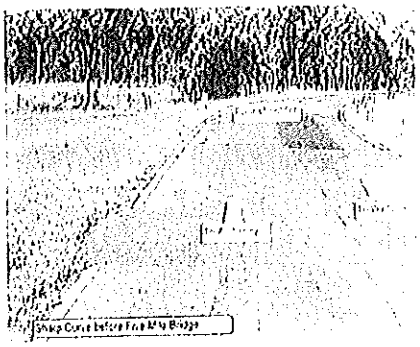


Figure 2: Approaching Five Mile Bridge

These accidents (contributed by the existing poor alignment, posted speed limit and poor visibility condition during evening and night time) have strongly demonstrated how dangerous the current road conditions are within the FMB section. To make things worst, a news article (dated 08/06/2006 from Queensland Times, Ipswich) had posted this; "*It's the worst MR Bridge in the area and only one word describes it – 'neglect'*". Hence it called for a safer quality road to eliminate this hazard.

Recent improvement works carried out have included a full rehabilitation of the bridge in 2006, the installation of new guardrails and advisory signage at the FMB section. The road section between FMB and Hansen Road was recently reconstructed to 3.5 m lanes and nominal 1.5 m shoulders. A short term business case recently prepared by Road Operations has recommended further improvement work including raising the Curve Chevron Markers to ensure adequate sight distance, installation of rumble strips at the bridge approaches and extension of the existing guardrails.

The existing FMB is situated within floodplains with a flood immunity of approximately 1.25 years ARI (Annual Rain Intensity); this means the bridge will be inundated at least once every year or in some worse cases, several times in some years. The current Haigslea-Amberley Road (south of Walloon Township and east of FMB) is also affected by this floodway condition. Therefore measures have to be taken to prevent the occurrence of frequent road closure.

Concern on a heritage and cultural site, "Babies of Walloon", within the project area was highlighted in the Impact Assessment Studies (IAS). The history behind this site was the drowning incident involving two young local girls, which was later immortalised into a poem by Henry Lawson. And in recent years, the local community's interest in the event had increased with a local park remodelled to a "Babies of Walloon" theme; hence indicate the cultural significance of the site to the local community.

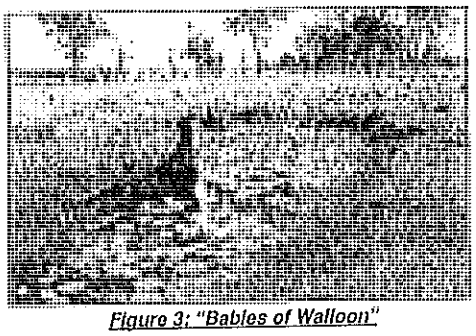


Figure 3: "Babies of Walloon"

RAAF Amberley Base, located within the project area, had an arrangement to set aside eastern portion of their land for commercial and aerospace industrial purposes. Plans were also prepared for military expansion on the western section of the base; due to a possible

redeployment of RAAF's Air Lift Group from Richmond to the base between 2005 and 2020. Other than this expansion taking place, they also required a buffer zone for their noise and explosives training. In 2001, DoD had principally agreed with DTMR on the preferred road alignment corridor (Option 1 as shown in Appendix Q) in the region. However since that initial consultation, RAAF had built a security and dog training facility at Hansens Road / Haigslea-Amberley Road intersection. As this facility is close to the preferred road corridor, DoD is concerned on the impacts that may cause to their training facility with the implementation of this project. DoD's concerns include the impact on their working dogs from excessive noise, ground vibration, dust and pollutants, and the decreased security due to increased exposure. DoD also has expressed concerns over the alignment through the Hanson's Farm Conservation Area (HFCA). Therefore they requested to have the project constructed at least 1 km away from their facility.

In the South East Queensland Regional Plan (commencing between 2005-2026), arrangements have been made to develop Ebenezer and Karrabin district for industrial purposes while Rosewood and Walloon region are set for residential development (Appendix G). With the future rising population and other job opportunities gathered within the development, this bypass will be capable to handle the future traffic capacity with an improved safety and road alignment. For the preparation of this bypass project, six options, Option 1 to 6 were considered.

Out of the six option alignments, Option 6 (as described below) is selected as the preferred option for this project. Discussion of the other five options can be found in Appendix Q.

The alignment in Option 6 is designed as a service road option where it maximised the re-use of existing road pavement and requires the construction of a new road bypass to correct the tight geometry alignment constraint of current Haigslea-Amberley Road (located in the west of current FMB). A new elevated reinforced concrete bridge will replace the sub-standard timber bridge. The rise in the bridge height not only helps to solve the frequent flooding issue occurring at current FMB section, it also proved to be a cost effective choice as the bridge may be used to link up to the WIB; hence minimise the cost and construction work to be carried out in later stages. With the bridge designed for 28 years flood immunity and the least amount of road to be constructed (out of all the 6 options), this option will fit perfectly into the budget of the project cost.

Given that Option 6 is maximising the re-use the current road pavement, the impact caused to RAAF's training facility will be negligible. The property impact created by this option is the lowest when compared to the rest of the options; only one rural residential lot and one Council property will be affected while it avoids using RAAF's land.

In summary, implementing this option not only fulfils all four of the key strategic priorities (*"Improve safety of the road environment", "Achieve reliable delivery of the roads program", "Preserve the increasing road asset" and "Manage the impact of urban traffic growth"*) in DTMR, it also helps to regain back communities' confidence, tackle and improve the initial safety record along Haigslea-Amberley Road.

3.2 Project Scope

The project scope will include the option appraisal, preparation of a Business Case, and design and construction of a new two lanes bypass road to the existing Haigslea-Amberley Road between Ch 5020 - 6600 and replacement of the existing Five Mile Bridge (FMB). The followings are included in the scope of work for the option appraisal:

- Hydrologic/hydraulic assessment on the proposed new bridge and the assessment on the level of impact caused by the nearby mining bunds;
- Preliminary geotechnical investigation on the proposed alignment;
- Assessment on the flooding impact on the surrounding properties; to fulfil the requirements from Ipswich City Council;
- Assessment on the pavement requirements;
- Environment and cultural impact study within the project site region;
- Flora and fauna studies to identify suitable fauna crossing points; hence minimise road kills along this chainage section;
- Assessment on the level of impact due to the loss of koala habitat in the new road corridor;
- Review construction methodologies and sequences which are crucial to avoid impact on existing traffic flow;
- Assessment on the impact of public utility services hence the feasibility of option;
- Provision of pedestrian and bike facilities;
- Provision of street lighting along the bridge section where required to increase visibility and improve the road safety record within the region;
- Maintenance of the property access affected by the new road alignment;
- Assessment on the impact of land resumption;
- Assessment of major risks; and
- Preparation of Ball Park cost estimate for comparison between options, and P90 estimate for the preferred option.

3.3 PROJECT FINDINGS

The details of the project findings have been included in the Appendices.

3.3.1 Environment (Appendix H)

The proposed upgrade of the Five Mile Bridge (Haigslea–Amberley Road) has the potential to cause an impact to the ecological, social, and cultural values in the area. The project is located within the Ipswich City Council (ICC) and is surrounded by a primarily rural area with the RAAF Amberley base to the east.

Parts of the site are flood prone and the proposed alignment crosses the Bremer River. The proposed road traverses areas previously disturbed by farming, however areas of the remaining vegetation are of 'Regional Ecosystem' status. The project area is situated within a Koala

Conservation Area which will create additional significance to the fauna aspect of this project. This will require active community consultation with the local community, environmental groups, and the Ipswich City Council.

The project triggers the *Koala Conservation Plan 2006.* Under this plan the DTMR will be required to prepare a Koala Impact Assessment and negotiate with the Department of Environment and Resource Management regarding Koala offsets.

A Flora and Fauna survey will also need to be undertaken.

3.3.2 Cultural Heritage (Appendix H)

There is one Aboriginal Party for the project area – Jagera Daran Pty Ltd; a search was conducted of the Aboriginal Cultural Heritage Database and Register – there are no sites located within the project area, however there are several sites within close proximity.

There is a medium to high potential for Aboriginal cultural heritage to remain within the project area.

Consultation is required to be undertaken with Jagera Daran Pty Ltd. This consultation most likely will result in a request by Jagera Daran Pty Ltd to undertake a cultural heritage survey and subsequent development of a Cultural Heritage Management Plan or Agreement.

3.3.3 Red Imported Fire Ant (RIFA) (Appendix H)

The entire project area is located inside the RIFA control zone.

3.3.4 Hydraulic Study (Appendix I)

DTMR has commissioned Sinclair Knight Merz (SKM) to conduct a hydraulic investigation study within the project site. The existing FMB has a flood immunity of approximately 1.25 years ARI; this means the bridge will be inundated at least once every year or in some cases, several times a year. The study has included a flood impact assessment on the bridge lengths between 60 – 160 m located on various heights and the following recommendations are made for the bridge design:

a) 130 m bridge span; and

b) 160 m bridge span.

The 130 m bridge span (30.55m AHD) is based on the optimal bridge configuration for construction cost chart with a 7 years ARI flood immunity event and an AATOC of approximately 3 hours.

For a bridge span of 160 m (31.05m AHD), 28 years ARI flood immunity is achieved with a 50 year trafficability and maximum afflux level of 300mm. With this higher afflux level, an additional area of 1600 m^2 will be inundated to the affected property, Lot 79 C15596; thus a minor compensation to the property owner is envisaged (Appendix I-.3).

The proposed project alignment will require a drainage structure of 10 x 4800 x 2400 RCBC at the existing low point east of the proposed bridge and has an approximately 1 year flood immunity (Refer Figure 4). However, it is desirable to provide this culvert together with the WIB in future, as the affected road section is to be modified to fit into the potential WIB alignment. This approach makes sense in view of the existing flood way south of Walloon town, which also has approximately 1 year flood immunity. There are alternative routes to bypass this section during flood. Please refer to section 5.2 for further details.

3.3.5 Geotechnical Investigation (Appendix J)

Embankment Area

Laboratory test results indicate that most of the alluvium samples along Option Six route have 'High to Very High' (WPI >2200) potential for expansion when subjected to change in moisture content.

Sub-grade with high potential for expansion, if not properly treated, may result in pavement cracking and distortion. Removal and replacement of expansive soils coupled with current design embankments butter slope of 1(V): 4(H) is considered effective and is a simple solution to this problem. Further investigation is recommended to check the extent of the expansive materials.

Bridge Foundation

The draft geological profile shows that the site has a layer of alluvial soils (less than 20 m thick across the site) overlying sandstone bedrock.

Both Cast-in-Place (CIP) piles and prestressed driven piles are possible foundation options for the bridge site. Prestressed driven pile is a better option. Estimated refusal level indicates a requirement for 25 m pile length. Shorter length is expected within the creek. Additional boreholes will be required to determine final design refusal levels.

Temporary access road, working platform or temporary bridge will be needed to construct the pile foundation. The choice is dependent on the water level in the creek and environmental protection requirements.

Preliminary assessment has indicated that stability and settlement may not be an issue for approach embankment up to 2.5 m. Due to minimum drilling and test carried out for present preliminary study, additional investigation is recommended for detail design.

3.3.6 Bridge (Appendix K)

FMB, constructed in 1953, is currently used by road users to travel along Haigslea-Amberley Road. The bridge structure is built out of timber material and is deemed fit to handle the road requirements at that period. As time passes by, the traffic demand and loading capacity increases and the timber bridge started to show signs of decay, splitting and cracking which results in a reduction of the bridge serviceability. The structure underwent a full rehabilitation in 2006. However, due to over-snipping of a number of girders and corbels, the structure was recorded as being in Condition State 4 at an inspection conducted in 2007. These issues were addressed in the maintenance works undertaken in 2008 so the structure has no significant defects, however snipping greater than 10% in girders and corbels has been recorded in 2008 inspection. For this reason the bridge is currently placed in Condition State 3. Minor correction work would bring it to Condition State 2.

The bridge is a "A" Class bridge therefore able to carry as-of-right legally loaded vehicles without restriction. B-Doubles and Semi-Trailers routinely cross this class of structure. Infrequent passage of heavy loads under permit requires individual structural assessment and may only be possible with temporary propping of girders. FMB is deemed as sub-standard in load bearing capacity based on the current Australian Standards. The current SM1600 design loads are substantially greater than the loads timber bridges were designed for. In the long run, the traffic mix with substantial heavy vehicle content would significantly increase the maintenance costs and reduce the remaining service life of a timber bridge.

Deterioration of the timber bridge will amount to about 40% of the replacement cost every 15 years (2.7% per annum) compared with about 0.6% per annum for a good concrete structure that is well maintained. Furthermore inspection and servicing costs are considerably higher for a timber structure.

It is not possible to upgrade the bridge to the current code requirements without rebuilding the bridge in concrete.

3.3.7 Traffic (Appendix L)

DTMR has commissioned SKM to conduct an Impact Assessment Study (IAS) on the WIB corridor, where the FMB project forms part of the bypass. Traffic forecast for 2011, 2021 and 2031 have been prepared with the consideration of "No Bypass" and "Bypass" option in the traffic analysis. The traffic estimations of WIB corridor by SKM can be found in Appendix **L-1**.

The SKM traffic projection for 2011 and 2031 are used to derive the AADT for 40 years design traffic. These traffic figures were then used in the design of pavement and checking of roadway capacity. Following table is the summary of the AADT for the FMB section obtained by SKM and DTMR.

Year	SKM
2011	5400
2031	9300
2051	15539

Table 2: AADT calculated by SKM and DTMR

This study has validated that the proposed dual-lane FMB project is well able to handle the peak AADT within the 20 years design period. A record of this study is in Appendix L-2.

3.3.8 Pavement Design (Appendix M)

The pavement design was carried out in accordance with the guidelines and design charts from the DTMR Pavement Design Manual, Austroads Pavement Design Guide, Austroads Guide to Pavement Technology, DMR Standard Specifications and with the aid of the Circly program for the ESA loading response analysis of the pavement.

From the analysis, it is recommended that Option 1 & 2 – Asphalt (DG14) over Granular and Full Depth Asphalt Pavement with a DG14 Surfacing and DG20 (C600) Base Layer be adopted as the most economically viable and constructible option for different sections of the project (Refer Table 3 below).

Full Depth Asphalt (Option 2) will be suitable for overlay onto the existing pavement west of FMB, for joining into existing road at either end of the project and as new pavement near the bridge approaches. This is because of the weak foundation to be found in cuts and near grade sections. This pavement type is selected based on the shortest construction time, low traffic control and minimum side track work during construction. In comparison with other pavement types, it has the thinnest pavement and the least amount of scarifying that is needed to be done on the existing pavement. An additional working platform will be required if this pavement type is to be used in the new bypass section west of FMB.

Asphalt (DG14) over Granular (Option 1) will be the cheaper option compared to the heavy duty asphalt pavement. It is suitable for the new road section west of the bridge, within a "green field" site. Moreover, the thicker pavement will save in the embankment costs as this particular section is to be constructed mainly in fill and near grade sections.

Pavement	Pavement Layer	Thickness in Cut (mm)	Thickness in Fill (mm)
Option 1 - Asphalt Over Granular,	Asphalt Surfacing Layer DG14	45	45
	Polymer modified Sprayed Seal 14mm aggregate	10	10
	Asphalt Base Layer 1 DG14	45	45
	Asphalt Base Layer 2 DG20	50	70
	High Density Granular Base Type 2.1	150	150
	Granular Lower Base Type 2.3	150	150
	Granular Sub-Base 1 Type 2.3	150	
	Granular Sub-Base 2 Type 2.3	150	
	Assumed Subgrade CBR	3	15
	Total Depth (mm)	750	470
	Cost / m^2	**$125.40**	**$112.70**
Option 2 - Full Depth Asphalt	Asphalt Surfacing Layer DG14	45	45
	Polymer modified Sprayed Seal 14mm aggregate	10	10
	Asphalt Base Layer 1	60	45
	Asphalt Base Layer 2	60	45
	Asphalt Base Layer 3	70	55
	Assumed Subgrade CBR	3	15
	Total Depth (mm)	245	200
	Cost / m^2	***$117.96****	***$95.73****

Table 3: Recommended Pavement Options

Note * costs of working platform have not been included in these unit rates.

3.3.9 Utility Services (Appendix N)

From the preliminary findings and discussion with the services authorities, the following utility services will be affected by the project and require relocation / protection:

Telstra

- Relocation of 1 small size manholes for optic cables
- Relocation of an existing telecommunication cable

Energex

- Relocation of 1 power pole.

These services relocation / protection works will need to be carried out prior to construction of this project.

4 Options appraisal

A total of six option alignments were planned for this project with Option 6 being the preferred selection. Discussion of the other five options (Option 1 to 5) can be found in Appendix Q.

Option 6 requires an estimated 1.2 km of new pavement to be constructed while the remaining 0.4 km of the project alignment will be maximising the re-using of existing Haigslea-Amberley Road. Therefore this option alignment contributes to the lowest project cost among all the options that are being considered and it fits into the budget constraint of this job. The construction of this new bypass will address the tight geometry road configuration along current FMB approaches; hence fulfilling DTMR strategic priority of providing safer road for the local communities and road users as well as improving the safety record along Haigslea-Amberley Road.

The existing poor alignment and poor visibility have contributed to the dangerous road conditions within the FMB section. The option to upgrade the existing timber bridge will not address this critical issue.

A new reinforced concrete bridge (situated south of FMB) is proposed to replace the current timber bridge. As there is a possibility of this project alignment being used in the future WIB, this is seen as a strategic advantage to provide a new reinforce concrete bridge in this early stage of the project.

The current FMB is located within floodplains, given it's dipped in elevation (26.96m AHD) and has a flood immunity of approximately 1.25 years ARI. It means that the bridge is subjected to floods at least once every year or in worse case scenario, flooded several times a year. To overcome this issue, an elevated bridge has been proposed.

Since this option alignment is re-using a section of existing Haigslea-Amberley Road, only one rural residential lot and a land parcel belonging to Ipswich City Council are required for land resumption; unlike other options which causes more property impacts.

Four different scenarios, 6A to 6D are generated from Option 6. This is to facilitate the different types of environment this project can be planned and designed. Details of various options are shown in Figures 4 to 9 and their benefits and outcomes in Table 4 to 9.

Option 6A purely looks at the upgrading of the current timber bridge, which also includes 2 m shoulders for pedestrian and bike use. It is deemed infeasible as the safety problems in the project area are not resolved.

Option 6B has minor road realignment along the bridge approaches and it involves the construction of a new 60 m reinforced concrete bridge to replace the existing FMB. While there is an improvement in the bridge bearing capacity to current standards, the planned alignment is still insufficient to permit a higher travel speed due to the geometric constraints from the existing site conditions and the use a short reverse curve with short section of straights.

In both Options 6C and 6D, the horizontal alignment has major modification which promotes safer road alignment. This also boosts up the travel speed from 40 km/h to 80 km/h. The new reinforced concrete bridge in Option 6C and 6D will replace the current FMB, where the bridge span of the two options is 130 m and 160 m respectively. This also improves the flood immunity to 7 years ARI for Option 6C and 28 years ARI for Option 6D. Hence with an improved bridge bearing capacity to the current standards and improved flood immunity, Option 6D has the potential to be part of the future WIB alignment. The following comparison tables and figures will illustrate the outcomes and benefits of each option and at the same time displaying the area of unresolved issues.

It must be noted that the adoption of Option 6D with an improved flood immunity of 28 years will result in approximately 300 mm afflux for a 100 yr ARI. A minor compensation to the property owner of Lot 79 C15596 for the 1600 m^2 land additionally inundated (Appendix I - 3) is required.

Figure 4: Haigslea Amberley Road - Existing Condition

Table 4: Outcomes and Benefits Required – Improvement to the existing Haigslea Amberley Road

Requirement	✓	Typical Description of the Need/Problem
Bridge	✓	1. To upgrade the bridge to meet current design standards. Bridge has superseded design standards (from 1953).
Environmental	✓	1. Fauna crossings for safe passage across the road to minimise road kills. 2. Minimise impact on the ecological, social, and cultural values.
Asset Preservation	✓	1. To provide a long term road facility that will support RAAF airbase expansion and surrounding industrial development.
Safety Issue	✓	1. To improve bridge bearing capacity for a heavy vehicle route. 2. To improve the poor road and bridge geometry which cause severe and fatal accidents at this site.
Operational Functionality	✓	1. To upgrade flood immunity from the current low 1 yr ARI. 2. New pavement to provide increased future traffic loading.
Network Functionality	✓	1. To maintain service road function between Haigslea and Amberley.
Unresolved Issues		1. The floodway south of Walloon and low point east of the bridge have 1 year ARI. The road to be raised with the future WIB. There are alternate routes to bypass Haigslea-Amberley Rd during flood.

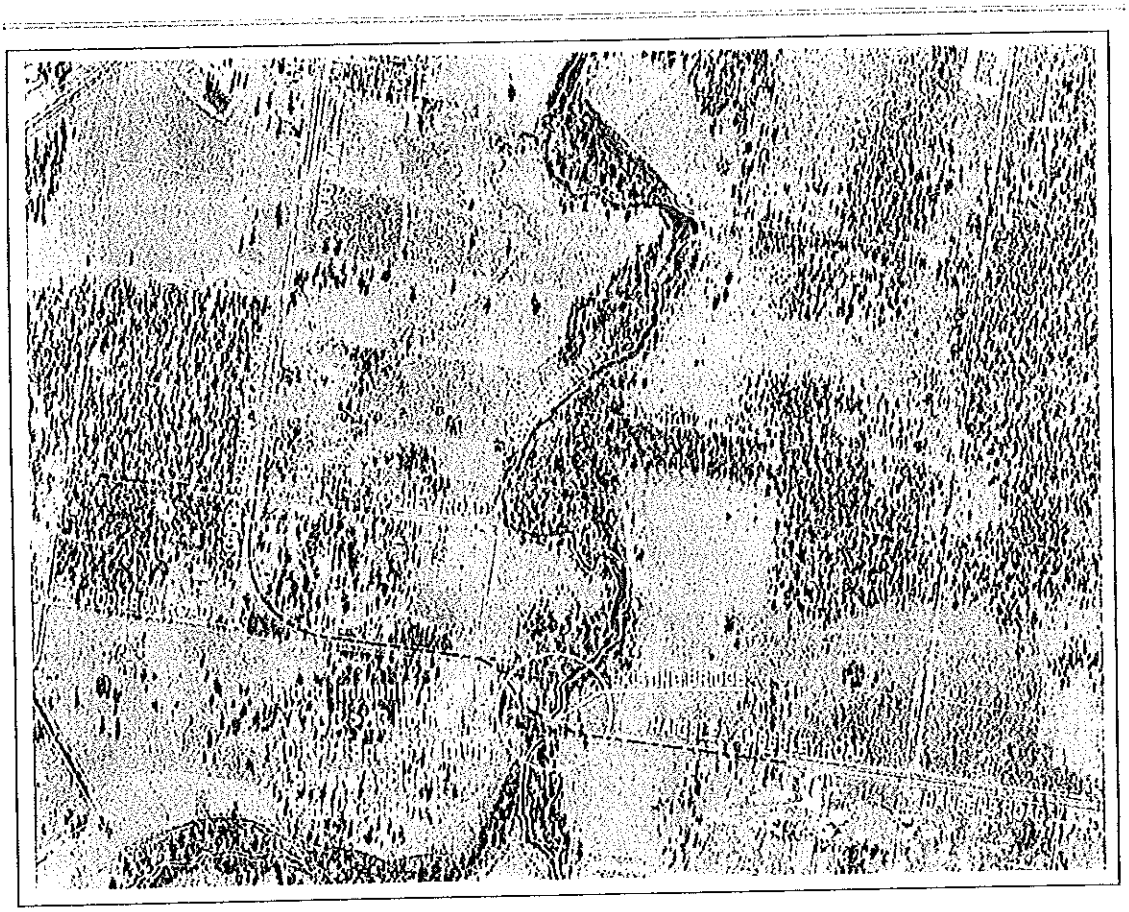


Figure 5: Option 6A- Existing Bridge upgrade

Table 5: Outcomes and Benefits Required – Option 6A Existing Bridge upgrade

Requirement	✓	Typical Description of the Need/Problem
Bridge	✓	1. Strengthen and widen bridge to 11 m to provide for pedestrian and bike use.
Environmental	✓	1. Fauna crossings for safe passage across the road to minimise road kills. 2. Minimise impact on the ecological, social, and cultural values.
Asset Preservation	✓	1. Preserve majority road section east of bridge which has been resealed recently.
Safety Issue	✓	1. Improve bridge bearing capacity for a heavy vehicle route.
Operational Functionality	✓	1. Retain current flood immunity of approx 1 yr ARI.
Network Functionality	✓	1. Maintain service road function between Haigslea and Amberley.
Unresolved Issues		1. Safety issues with poor road and bridge geometry. The bridge is located in a dip. There were severe and fatal accidents at this site. 2. Upgraded bridge has reduced service life, reduced durability and frequent maintenance. Substandard to current code requirements. 3. Low flood immunity about 1 yr ARI.

Figure 6: Option 6B – New 60 m Bridge with minor road realignment.

Table 6: Outcomes and Benefits Required – Option 6B New Bridge with minor road realignment.

Requirement	✓	Typical Description of the Need/Problem
Bridge	✓	1. New 60 m RC bridge designed to current standards.
Environmental	✓	1. Fauna crossings are essential to help local animals to move across the carriageway safely; hence minimise road kills. 2. Minimise land take: 1 rural + 1 council lots affected.
Asset Preservation	✓	1. To provide a long term road facility that will support RAAF airbase expansion and surrounding industrial development.
Safety Issue	✓	1. Improve bridge bearing capacity for a heavy vehicle route.
Operational Functionality	✓	1. Retain current flood immunity of approx 1 yr ARI.
Network Functionality	✓	1. Maintain service road function between Haigslea and Amberley.
Unresolved Issues		1. Safety issues with poor road and bridge geometry. The bridge is located in a dip. There were severe and fatal accidents at this site. 2. To use alternative routes to bypass road during flood.

Figure 7: Option 6C – New 130 m Bridge with improved road alignment.

Table 7: Outcomes and Benefits Required – Option 6C New 130 m bridge with improved road alignment.

Requirement	✓	Typical Description of the Need/Problem
Bridge	✓	1. New 130 m RC bridge designed to current standards.
Environmental	✓	1. Fauna crossings are essential to help local animals to move across the carriageway safely; hence minimise road kills. 2. Minimise land take: 1 rural + 1 council lots affected.
Asset Preservation	✓	1. Preserve majority road section east of bridge which has been resealed recently. 2. To provide a long term road facility that will support RAAF airbase expansion and surrounding industrial development.
Safety Issue	✓	1. Improve bridge bearing capacity for a heavy vehicle route. 2. Improve road and bridge geometry.
Operational Functionality	✓	1. Upgrade bridge flood immunity to 7 yr ARI. 2. Provide new pavement for increased traffic loading in future.
Network Functionality	✓	1. Maintain service road function between Haigslea and Amberley.
Unresolved Issues		1. To use alternative routes to bypass road during flood. To raise low point of road east of the bridge with the future WIB will require 10x4800x1200 RCBC – (refer Fig 9). 2. Approx 140 mm afflux for a 100 yr ARI (minor compensation to property owner of Lot 79 C15596 for the additional land inundated < 1600 m^2). 3. 3 hr AATOC (10 yr trafficability).

Figure 8: Option 6D – New 160 m bridge with improved road alignment **(Preferred Option).**

Table 8: Outcomes and Benefits Required – Option 6D New 160 m bridge with improved road alignment.

Requirement	✓	Typical Description of the Need/Problem
Bridge	✓	1. New 160 m RC bridge designed to current standards.
Environmental	✓	1. Fauna crossings are essential to help local animals to move across the carriageway safely; hence minimise road kills. 2. Minimise land take: 1 rural + 1 council lots affected.
Asset Preservation	✓	1. Preserve majority road section east of bridge which has been resealed recently. 2. To provide a long term road facility that will support RAAF airbase expansion and surrounding industrial development.
Safety Issue	✓	1. Improve bridge bearing capacity for a heavy vehicle route. 2. Improve road and bridge geometry.
Operational Functionality	✓	1. Upgrade bridge immunity to 28 yr ARI (50 yr trafficability). 2. The new service road may potentially become part of the future WIB shown in Figure 9.
Network Functionality	✓	1. Maintain service road function between Haigslea and Amberley.
Unresolved Issues		1. To use alternative routes to bypass road during flood. To raise low point of road east of the bridge with the future WIB will require 10x4800x1200 RCBC- (refer Fig 9). 2. Approx 300 mm afflux for a 100 yr ARI (Requires minor compensation to the property owner of Lot 79 C15596 for the 1600 m^2 land additionally inundated).

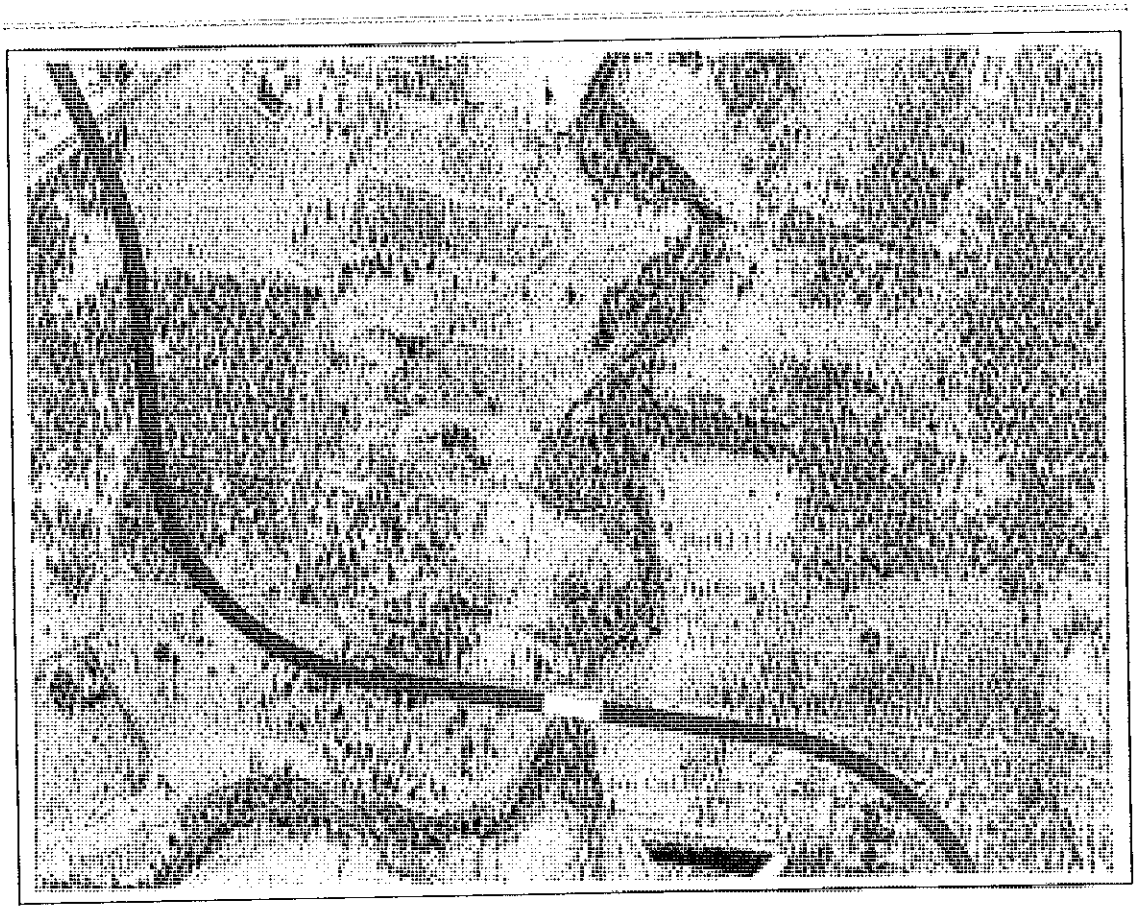


Figure 9: Option 6D and Potential WIB.

Cost Comparison

The cost estimate to the various options is shown in Table 9 below.

OPTION	EXISTING BRIDGE UPGRADE (OPTION 6A)	SERVICE RD (OPTION 6B)	SERVICE RD (OPTION 6C)	SERVICE RD (OPTION 6D) RECOMMENDED OPTION
DESCRIPTION	EXISTING HAIGSLEA AMBERLEY ROAD 11 m Timber Bridge with 1 yr ARI Not possible to upgrade to current code	NEW RC BRIDGE + MINOR ROAD REALIGNMENT 60 m x 11 m Bridge with 2 yr ARI	NEW RC BRIDGE + SUITABLE ROAD REALIGNMENT 130 m x 11 m Bridge with 7 yr ARI	NEW RC BRIDGE + SUITABLE ROAD REALIGNMENT 160 m x 11 m Bridge with 28 yr ARI
BRIDGE $ M	1.2	2.6	5.7	7.0
ROAD $ M	0.5	2.1	2.4	2.7
TOTAL $ M	1.7*	Approx 5*	Approx 8*	Approx 10*

Table 9: Cost Comparison table

*Note: These costs do not include the preconstruction costs and risk adjusted costs for P90 estimate. Total cost for Option 6D is about $16.3 million including preconstruction costs, risk and contingency. The final cost has been prepared in consultation with DTMR Major Project Office.

Recommended Option

The 160 m RC bridge option is recommended for detailed design and construction. It will provide the service road function and offer more beneficial solution than other options while fulfilling the project requirements.

The proposed bridge replacement and road realignment will result in major safety improvement. The improved bridge approach geometry will correct the previous dip and tight reverse curve located at the current FMB section and facilitate an 80 kph travelling speed. It will improve the safety record along this section of the road. The trade off for the improved safety is land resumption from one rural and one ICC properties.

The inclusion of this elevated new RC bridge will replace the sub-standard timber bridge. It will improve both the load bearing capacity and flood immunity from 1 to 28 years ARI allowing 50 years trafficability. The new service road has the potential to form part of the future WIB; hence generate a saving in future construction costs and proves to be a more logical and cost effective option. In comparison the timber bridge upgrade option will not address the safety problem, thus prone to more accidents at this site. Moreover the upgraded timber bridge has reduced service life, reduced durability and requires frequent maintenance. It will be substandard to the current code requirements and has low 1 year flood immunity.

The 60 m bridge option has similarly failed to address the safety problem, low 40 kph travelling speed and low flood immunity of 1 year ARI.

The 130 m bridge option has addressed the safety and speed issues. However as it will only provide a 7 year flood immunity and 10 year trafficability, it does not have the prospect to form part of the WIB in future. Therefore it makes sense to go for a 160 m bridge for a small increase in cost.

5 Scope of preferred option

5.1 In scope

The scope of work for the preferred option is outlined below:

- Prepare the P90 project cost;
- Targeted Community engagement;
- Noise assessment to be conducted near the RAAF fire and security training facilities, to determine the degree of noise impact due to construction works;
- Conduct detailed survey;
- Conduct detailed geotechnical investigation;
- Detailed road and bridge design;
- Conduct investigation and the imposed impact on the cultural heritage along Bremer River (near existing FMB) and within the project area;
- Develop strategies to manage environmental and cultural heritage issues;
- Location of offset for koala's conservation area;
- Provision of fauna crossings;
- Public utility services relocation / protection in consultation with the services providers and determine the cost of service relocation / protection;
- Provision of bridge lighting to improve visibility at night;
- Maintenance of property accesses;
- Stage 2 Safety Audit;
- Carry out a project risk assessment and mitigating measures to reduce the impact of these risks;
- Preparation of the land resumption plans and documents;
- Prepare the staged construction plan; and
- Prepare tender documents.

5.2 Out of scope

The following works have been excluded from the project:

- Correction of low point in the road section east of the bridge. The road section will provide only 1 year flood immunity. This low point is to be raised with the future WIB, including the construction of 10 x 4800 x 2400 RCBC, as the existing alignment will require modification to suit the WIB alignment. There are alternative routes to bypass the flood section.
- The floodway south of Walloon has 1 year flood immunity. 9 x 2100 RCP is required to raise the road section to 50 year flood immunity. This is not carried out for the same reason stated above and tight budget constraints. There are alternative routes to bypass the flood section

5.3 Constraints

The constraints that must be considered for this project includes:

- Trial mines, adits and shafts identified in the project area require geotechnical studies to ensure project alignment avoids any subsidence risk areas;
- Division of native vegetations due to the amount of clearing needed to accommodate the project;
- Splitting of good quality agricultural land;
- Levels of impact inflicted onto the koala's habitat and the location of the offset area required for this lost;
- Possible location points for fauna crossing to aid local animals to travel across the carriageway safely;
- Impact caused on recognised areas of cultural significance along the Bremer River. Issues on the unknown quantity of significant artefacts along the water courses;
- Impact from flood level of Bremer River and appropriate flood immunity level for the bypass;
- Potential high level of afflux due to the natural terrain and existing mining bunds;
- Minimise property impact;
- Property access maintenance;
- Impact on traffic condition upon existing local road;
- Utility services, for example optic fibres and power poles;
- Options for upgrading of the existing timber bridge or construction of new concrete bridge; and
- Availability of funding and resources competing with other high priority projects in the region.

5.4 Assumptions

The following assumptions have been applied to this project:

- The community accepts the proposed 160 m concrete bridge and road realignment (Option 6D);
- Successful land resumption from the rural property owner of Lot 2 CC1473 within the required timeframe;
- Successful negotiation and minor compensation to the property owner of Lot 79 C15596 on the 1600 m^2 land additionally inundated (150 -300 mm from 100 yr flood);
- Ipswich City Council will support and promote the project; and
- Availability of funding.

5.5 Review of preferred option

The project involves the re-alignment of (3041) Haigslea-Amberley Road (chainage 5020 - 6600) and the replacement of existing FMB with a 160 m reinforced concrete bridge. The project scope has been significantly reduced from the initial major project (design of highway bypass) to a service road option. This is due to the constraints from RAAF Military Dog Training Centre and the tight budget that is available to complete this project.

The project, identified as Western Ipswich Bypass: Five-mile Bridge in the 2009 – 2026 SEQIPP Program has an indicative total cost of $55 million. The project timing is subjected to federal contributions. The cost estimate for the service road Option 6 is approximately $16.3 million (Refer Appendix B)

This project will provide the service road function between Warrego and Cunningham Highways, with a major safety improvement on the Five Mile Bridge area, which is the reason and focus of this project. This allows an increased in the travelling speed from the current 40 kph to 80 kph, and improved flood immunity of the bridge from the current 1 year to 28 year ARI with 50 year trafficability. Moreover, the improved road alignment has the potential to form part of the future WIB; thus generate a saving on future construction costs.

The approval of this Business Case will allow the project to proceed to community engagement, detailed design and construction.

5.6 Related projects

The following table shows other projects in the area that will have an impact on this project.

Document Source	Project No. / Road or Location / Work Description	Indicative Total Cost $ '000
Road Implementation Program 2008/09 to 2012/13	Ipswich - Boonah Road 148/211/5 Purga, Level crossing improvement.	$740
	Ipswich - Boonah Road 148/211/6 Purga, Hazards close to roads.	$1,200
	Ipswich – Cunningham Highway Connection 148/301/26 Warwick Road / Carr Street, Improve traffic signals.	$470
	Rosewood – Laidley Road 148/304/705 Ebenezer Rail underpass to Mill Street, Asphalt resurfacing (<75mm).	$600
	Rosewood – Laidley Road 148/308/703 Chainage: 7.81 – 18.90km, Asphalt resurfacing (<75mm).	$1,000

5.7 Urgency

The importance of this project has been driven by the road user safety issues caused by the poor road alignment, posted speed limit and poor visibility condition. There were fatal and severe accidents (1 fatality and 4 hospitalisations) in recent years at the FMB site and the 90° bend west of the bridge. These accidents have strongly demonstrated the dangerous road conditions within the FMB section. Recent criticism from the media has labelled it as the worst MR Bridge due negligence and has placed it on the political hot spot. It has caused a public outrage and called for a safer quality road to eliminate this hazard.

6 Benefits

The benefits from the implementation of this project are listed below:

- Improving overall safety record of Haigslea-Amberley Road through better road alignment and appropriate travelling speed thereby reducing accidents rate;
- Improved relationships with the local communities by addressing the safety issues from a positive and permanent approach;
- Paves the way for the staged construction of WIB, which will offer an efficient travel route between Warrego and Cunningham Highways, by reducing vehicle operating costs and travel time;
- Offers a safe facility for the pedestrians and cyclists. At the same time providing a sustainable recreation and travel solutions; and
- Supports the proposed commercial and industrial development in and around RAAF Air Base, Ebenezer and Karrabin districts, and residential development in Rosewood and Walloon region.

7 Benefit Cost Ratio (BCR)

7.1 Project Benefits

The main economic benefits of FMB project are:

- Reduced number of accidents or crashes, especially at the FMB site;
- Travel savings and reduced vehicle operating costs due to improved road and bridge;
- Travel savings and reduced vehicle operating costs due to improved flood immunity of bridge and future road;
- Reduced maintenance and rehabilitations requirements which translates to less traffic disruptions and thus less cost to road users and DTMR;
- Other intangible benefits include better driver comfort, safety for pedestrians, cyclists and fauna residing in the area; and
- Potential and major cost saving when FMB section is used as part of the future WIB.

7.2 Benefit Cost Ratio (BCR)

Economic evaluation of the project was undertaken using Project Concept Benefit Ratio analysis (NA01F04).

The crash data between 2004 and 2009, as shown in Appendix E, is utilised in this analysis, to determine the savings that will be achieved per year when this project is completed. Travel savings by commuters was done based on average AADT between 2011 and 2021, with the assumption that there is only one passenger per vehicle.

The project cost adopted is $13,000,000 which is representative of a P50 estimate. This is considered to be consistent with the derivation and accuracy of the project benefits.

The results are as follows (cost and benefit rounded to nearest $1,000,000):

Project Cost: $ 13,000,000 Project Benefits: $ 22,000,000 BCR: 1.7

Contingency: $ 3,000,000

When future benefits including improved flood immunity and potential WIB alignment are considered, the results are as follows:

Project Cost: $ 13,000,000 Project Benefits: $ 78,000,000 Total BCR: 5.8

Details of this analysis can be found in Appendix C.

8 Project risk

The following details some of the risks associated with this project, as outlined in the plan:

- Delay in funding due to uncertainty of the current economy and over expenditure of other high profile projects already in construction. The risk of delaying this project will result in more accidents and local communities' discontent with DTMR / government.
- Opposition from the community, Council and the politicians, on the project scope work below their expectation.
- The degree of impact caused upon koala conservation area due to the project. The location of the offset area required to replace the lost of koala habitat.
- Strategic location of fauna crossing has to be planned to minimise road kills as the road alignment is situated within an ecosystem area.
- The afflux upstream (approximately 300mm) in the proposed service road Option 6D has resulted in an additional inundated area of 1600 m^2 within the property, Lot 79 C15596 (Refer Appendix I – 3). It is envisaged that the compensation cost due to this flooding nuisance will be small based on the land valuation from the Property Section ($4.50 per sq meter for land acquisition).
- Construction methodology for the new bridge has to be planned. Prevention measures have to be in placed to ensure the local watercourse will not be impacted in any way due to the construction.
- Formal land acquisition from RAAF for the southern section of WIB around Cunningham Highway and Ipswich Rosewood Road. Objection from RAAF will not only jeopardise the provision the section of WIB, it will also has a significant impact on the WIB alignment in the middle section, in particular the Five Mile Bridge Bypass.

Risk Register

A copy of the Risk Register is included in the Appendix D.

9 Preliminary project plan

The preliminary project plan is contained in Appendix A

10 Recommendations

The 160 m RC bridge option is recommended for consultation with the public, detailed design and construction. It will provide the service road function while fulfilling the project requirements.

The proposed bridge replacement and road realignment will result in major safety improvement. The improved bridge approach geometry will correct the previous dip and tight reverse curve located at the current FMB section and facilitate a higher 80 kph travelling speed. It will improve the safety record along this section of the road. The trade off for the improved safety are:

- The land resumption from one rural and one ICC properties.
- Minor compensation to property owner of Lot 79 C15596 for the 1600 m^2 land additionally inundated (Appendix I - 3).

The inclusion of this elevated new RC bridge will replace the sub-standard timber bridge. It will improve both the load bearing capacity and flood immunity from 1 to 28 years ARI allowing 50 years trafficability. The new service road has the potential to form part of the future WIB hence saving in future construction costs. It is a more logical and cost effective option. In comparison the timber bridge upgrade option will not address the safety problem hence prone to more accidents at this site. Moreover the upgraded timber bridge has reduced service life, reduced durability and frequent maintenance. It will be substandard to current code requirements and has a low 1 year flood immunity.

11 Appendices

A. Preliminary Project Plan
B. Cost Estimate
C. Benefits Cost Ratio Analysis
D. Risk Register
E. Crash History between 1980 to Jun 2001 and Jul 2001 to Present
F. Project Location W.R.T. WIB, Warrego and Cunningham Highway
G. Residential and Industrial Development Area
H. Environmental Approval Report
I. Hydraulic Study
  I-1 Hydraulic Report
  I-2 100 years ARI Flood Map
  I-3 1600 m^2 Land additionally inundated –Property: Lot 79 C15596
J. Geotechnical Report
K. Bridge
L. Traffic Estimation
  L-1 SKM Projected Traffic Figures
  L-2 Lane Capacity Verification using DTMR calculations
M. Pavement Design Report
N. Utility Services Investigation
O. Preliminary Drawings - Option 6
P. Option Comparison between Existing Bridge Upgrade and Service Road Option
Q. Description of Option 1 to 5 and Option Comparison Plan
R. Project Schedule

12 Approvals

In signing this approval:

- I agree that the document meets the standard required for the Business Case Deliverable (requirements above)
- I understand the financial and other impacts associated with progressing to the Project Plan stage
- I authorise progression to the Project Plan stage.

CUSTOMER

Name: Paul Peters

Position: A/Director (Ipswich District)

Signature: [redacted]

Date: 5/12/10

Comments: Funding to come from WIB $90m.

SPONSOR

Name: Robert Tutticci

Position: A/Manager (Major Projects)

Signature: [redacted]

Date: 23 Dec 09

Comments:

The following officers have **endorsed** this document:

Name: David Hubner

Position: Manager (Network Planning)

Signature:

Date:

Comments:

The following officers have **endorsed** this document:

Name: Wayne Leong Position: Project Director (Major Projects)

Signature: [redacted] Date: 11/12/09

Comments:

Name: Michael Taylor Position: Project Manager

Signature: [redacted] Date: 11/12/2009

Comments:

Project Scope Identification
Five Mile Bridge

Queensland Government

Source of funds: *(Program, line item in RIP)*	**OSCR**		
Region / District:	**Metropolitan**	**Local Government:**	**Ipswich City Council**
Road Name (Section):	**3041- Haigslea- Amberley Road**		
Project Location: *(T. Dist, GIS coordinates, where applicable)*	**Ch 5020-6600**		
Project Number:	**148/3041/901**		

Existing conditions:	The road safety along Haigslea-Amberley Road has poor alignment and raises safety issues- comment in general has indicated major concern for both the communities in Amberley and Walloon area.
• **Crash history:** *(over last 5 years)*	Fatal- 1 Hospitalisation- 4 Medical Treatment- 1 Minor Injuries- 0 Property damage- 2 Total crashes- 8
• **AADT (% of heavy vehicles) (date):**	5400 (14% heavy) (2011)
• **Deficiencies:** *(Why is this project required, the need, the issue)*	Haigslea-Amberley has poor geometry alignment and is sub-standard in loading capacity. In the long run the traffic mix with substantial heavy vehicle content (14% heavy) would significantly increase the maintenance costs and reduce the remaining service life of the timber bridge. Currently there are no street lights along the road making visibility poor for road users at night. The recent accidents contributed by the poor alignment, posted speed limit and poor visibility condition during night time have strongly demonstrated how dangerous the current road conditions are within the five Mile Bridge section (FMB). The existing FMB is situated within floodplains with a flood immunity of approximately 1.25 years ARI (Annual Rain Intensity); meaning the bridge is inundated at least once every year of in some worse cases, several times in some years.
• **Political and community issues:**	The Amberley and Walloon communities have requested that DTMR address the safety issues of the FMB. During inundation closure of the highway causes significant community disruption and generates significant political and media interest and comments.

• **Any associated works / projects:** • **Other:** *(provide photos where applicable):*	Purga, Level crossing improvement- Ipswich- Boonah Road Purga , Hazards close to roads- Ipswich – Boonah Road Warwick Rd/ Carr St- Improve traffic signals- Ipswich – Cunningham Hwy connection Ebenezer Rail underpass to Mill St- Asphalt resurfacing- Rosewood- Laidley Rd Rosewood- Laidley Road- Asphalt resurfacing
Benefits/outcomes of proposed works: • *Driver safety (road carriageway)* • *Driver safety (intersection)* • *Pedestrian safety* • *Freight efficiency and heavy vehicle management*	• Improve overall safety record of Haigslea-Amberley Rd • Improve relationships with local communities • Paves the way for the staged construction of WIB • Offers a safe facility for the pedestrians and cyclists • Supports the commercial and industrial development in and around RAAF Air Base, Ebenezer and Karrabin districts, and residential development in Rosewood and Walloon region.

Scope of proposed project: **In Scope:** *(incl. proposed delivery method & documentation)* **Out of Scope:**	• Improving flood immunity of FMB to 1 in 28. • Improve road alignment on approach to FMB • Minor resumptions • Ultimate alignment of WIB
Perform a safety assessment of future operational performance based on proposed work/treatment:	Does the proposed work make any aspect of the road less safe? (e.g. *traffic moved closer to hazards, or approach speed to a tight curve increased)* *No,* ☐ - *proceed with the design* *Yes,* ☐- *do further mitigation work to achieve the appropriate level of safety.* No
Significant risks identified: *(Public consultation, geotechnical, flooding, traffic management, PUP, safety, materials)*	• Delay in funding due to uncertainty of the current economy • Opposition from the community, council and politicians, on the project scope work below their expectations • The degree of impact caused upon koala conservation area • Strategic location of fauna crossing has to be planned to minimise road kills as the road alignment is situated within an ecosystem area' • The afflux upstream
Native Title / Environmental / Cultural Heritage concerns:	Although there are no sites located within the project area, there are several sites that are within close proximity. Consultation will continue with the Jagara Daran Pty Ltd

Project Estimate: *(note contingency allowance)*	Project Cost: $20,000,000 Contingency: $2,000,000

Source Fund $'000	**Proposed expenditure flows**				
	Prior Expenditure $'000	**2008-09 $'000**	**2009-10 $'000**	**2010-11 $'000**	**Total $'000**
	-	-	-	-	

Submitted (Project Manager)

Name Michael Taylor

Position Senior Engineer (Civil)

Signature _____Date___/____/____

Recommended (M PD&D / Principal Engineer / PreConstruction Coordinator)

Name Matt Smith

Position Principal Engineer

Signature _____Date___/____/____

Comments:

Approved (RD / DD / or Delegate)

Name Ron Michel

Position A/ Regional Director

Signature _____Date___/____/____

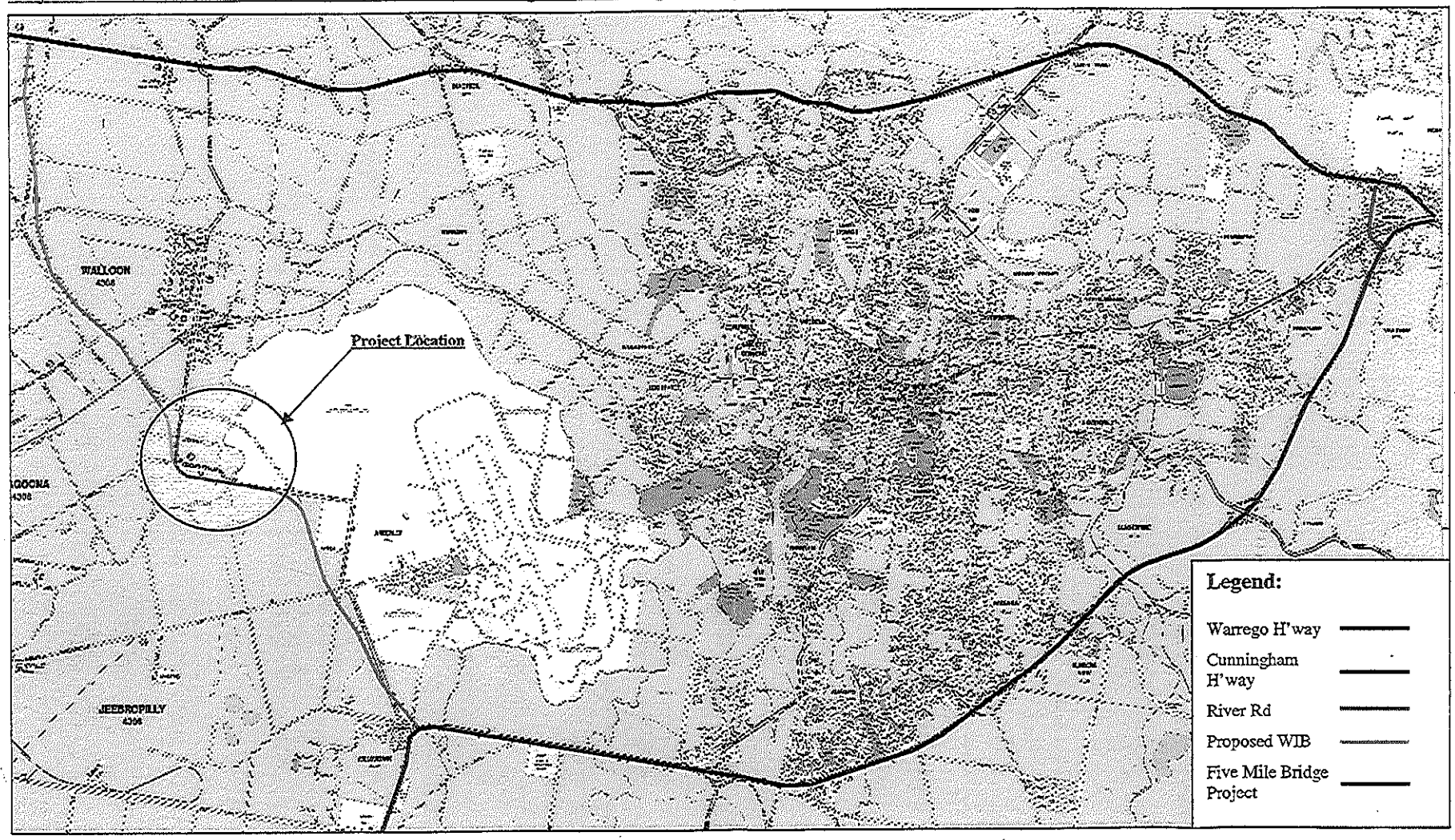
(When not approved by RD, obtain an endorsing signature from RD on this page)

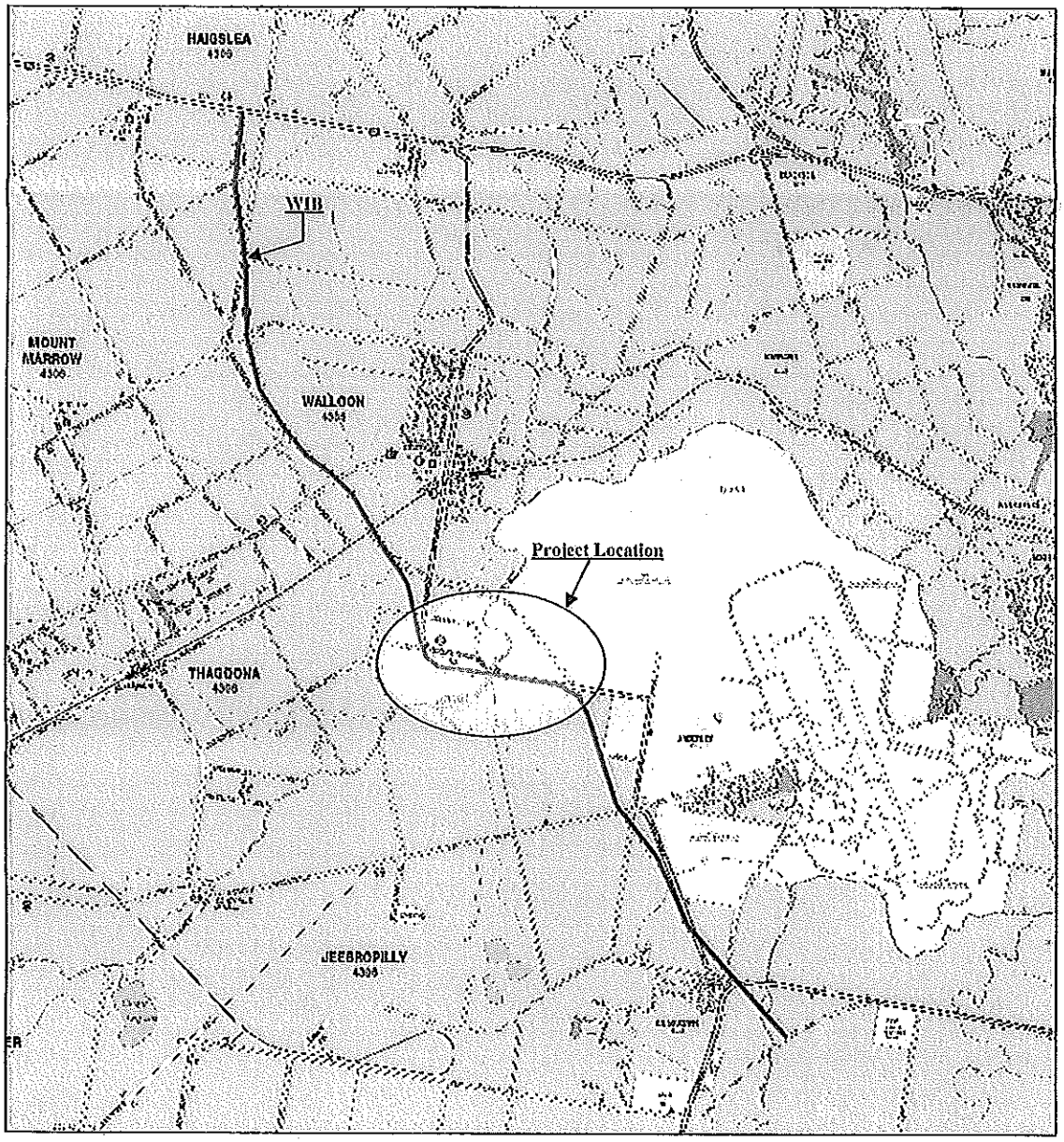
Comments:

Attachments

A. Locality Drawing / Sketch

Project Location W.R.T. WIB, River Rd (Dinmore), Warrego and Cunningham Highway




HAIGSLEA
4309
WB
MOUNT
NARROW
4306
WALLOON
4304
Project Location
THAGOONA
4306
JEEBROPILLY
4306

Annexure I

AJ Wyllie Bridge Structural Repairs Report dated 9 March 2011

Queensland Government

A J Wyllie Bridge Structural Repairs Report

Flood Damage Assessment after January 2011 flooding

Gympie Road, North Coast Region

Prepared by	Jolyon Kenward
Title	Assistant Director Bridge Design
Branch	Bridge Design Branch
Division	Structures
Department	Department of Transport and Main Roads
Location	Floor 7, 477 Boundary Street, Spring Hill Queensland 4108
Version no.	0.3
Version date	09 March 2011
Status	Final Draft
DMS ref. no.	

Document control sheet

Contact for enquiries and proposed changes

If you have any questions regarding this document or if you have a suggestion for improvements, please contact:

Contact officer Katherine Heron

Title Engineer

Phone [redacted]

Version history

Version no.	Date	Changed by	Nature of amendment
0.1		Jolyon Kenward	Initial draft.
0.2		Katherine Heron	Minor format edits
0.3		Jolyon Kenward	Edits based on feedback ref inspection allowances, maintenance costs and inclusion of Recommendations section 9

Document sign off

The following officers have approved this document.

Customer

Name _____

Position _____

Signature _____ Date _____

Sponsor

Name _____

Position _____

Signature _____ Date _____

The following officer has endorsed this document.

Name _____

Position _____

Signature _____ Date _____

Contents

1 Executive Summary

During the floods between 11th and 20th January 20011, severe scouring of the abutments and piers occurred, affecting the two bridges that form the 110m long, four lane AJ Wyllie crossing.

Following inspections as soon as the flood waters subsided, emergency repairs were immediately designed and installed at the abutments to make the Southbound Bridge safe for use. On 25/1/2011 it was agreed it could safely reopen to traffic. The scouring had less effect on the piers of this structure as it is founded on deeper piles.

The Northbound Bridge was found to have severe scour at the abutments and piers 3, 4 and 5. The pile embedment was reduced from 5-6m to as little as 0.7m into gravels that may have been disturbed during the flooding and scouring action. The original design drawings indicate that the piles required a minimum 15' (4.57m) embedment into the dense gravels to provide the necessary resistance.

The scour problems are caused by a significant constriction of the flow area resulting from a difference in deck levels of the two bridges. This is because the deck level of the north bound bridge is just below the soffit level of the south bound bridge, thereby restricting the waterway area significantly for a range of flood levels.

The most certain method of reducing the risk of scour would be to raise the deck level of the north bound bridge to match the south bound bridge so that the blockage of the flow path is reduced. The scour at the bridge can be managed using best practice scour protection methods. The scour protection required at this site to manage the risk of scour is extensive and costly.

Load tests and structural assessments were undertaken to assess the capacity for carrying highway loads. The load test confirmed movements of up to 4.8mm at pier 3.

The bridge was deemed acceptable to allow pedestrian loading and use of the walkway, but the analysis and load tests concluded that further validation of ground conditions and remedial works to reinstate structural capacity would need to be completed before even one lane of the bridge could be reopened without the risk of needing to close it again under flood conditions.

Initial assessment of the embedded lengths and likely ground conditions following the scour event confirmed the possibility of a very wide range of parameters. Further SPT testing has been proposed to allow confirmation of the residual stability of the pile bearing under full live loading and the vibration effects from traffic loading.

To reinstate the structural capacity will require works to the pile and to re-provide the lateral restraint by infilling the scour holes in the bed adjacent to the piling.

The anticipated costs of the flood repairs are in the range of $ 11–15 m which includes $3m allowance for possible additional works should the integrity of piling and ground conditions be unable to be confirmed as satisfactory.

Additional maintenance costs and risks of further works associated with retaining the current arrangement are assessed as being in the range of $ 4 - 7m over the next 20years

The level of costs for remedial works is considerable and to provide a benchmark an option considering typical costs for a replacement structure option were prepared. Based on an initial assessment the cost of replacement of the northbound bridge is assessed as being in the range $26 – 32m

The marginal differences between costs of replacement against repair and future maintenance and eventual replacement costs if the existing bridge is left in place require consideration in selecting the most appropriate option to progress. Whilst a repair program would be shorter to implement, this is costly and provides little long term improvement or benefit. Replacing the existing bridge would provide significant benefits of reduced upstream afflux effects, increased flood immunity and reduced future maintenance.

Based on the levels of cost involved in effecting a repair and the benefits to future scour and hydraulic performance, it is recommended that the existing Northbound Bridge is replaced using a structure with similar span arrangements and deck levels as the existing Southbound bridge. This would allow the benefits of reduced afflux, improved hydraulic performance, higher flood immunity and reduced maintenance costs and risks to be realised in the period until the existing bridge would be programmed to be replaced in any event.

It is recommended that a more detailed assessment is completed to confirm the costs, program, community impact and benefits and level of funding that would be necessary for a new crossing,

2 Introduction

The river crossing consists of two bridges that cross a tidal section of the river. Tidal levels range between HAT = RL 1.58m and LAT = RL -1.26m. These levels are increased by tidal surges, storm flows, and releases from upstream catchments. The Southbound bridge deck is approximately at ARI Q_{50} flood level. The northbound bridge 1.4m below the southbound bridge deck level. The differences in deck levels results in a significant afflux, during a 100year ARI event. For a Q100 event an approximate drop in water levels of 0.5 – 1m between upstream and downstream water levels has been assessed in previous models.

The older, 8 span, Northbound Bridge was originally constructed in 1934 and modified by the addition of a pedestrian walkway in 1987. The newer, 4 span, Southbound Bridge was built in 1987, downstream of the Northbound Bridge. The deck is at a higher level, has 4 longer spans and piers that are at a 15^0 skew to the deck, matching the general channel direction at that time. The general layout and positions of the two bridges forming the crossing are indicated on preliminary drawing in Appendix A.

During the flood events between 11th and 20th January 2011 severe scour damage at the abutments occurred and became immediately obvious as the flood waters subsided. The flood events undermined the approach embankments, abutments and also severely damaged utilities attached to the bridge. Later investigations also confirmed major scour around piers as discussed below.

Initial visits were undertaken to assess conditions as the floods subsided and reviews were undertaken by Bridge Asset Management (BAM) and the Bridge Design Director. As part of this process an emergency response team was formed, with repair work assessments being led by the Project manager in the Hydraulics team as the main concerns related to scour issues.

This report covers the main tasks and activities that have been required and undertaken by the bridge design team in consultation with the hydraulic, geotechnical and bridge asset management teams.

3 Existing Structures

For ease of reference the principal structural aspects of the bridges are included below

3.1.1 Northbound bridge

The bridge is formed by 8 No. 45' (13.72m) simply supported spans, without a skew. The original two lane section was built in 1934. The superstructure is formed by 6 simply supported steel beams per span supporting a nominally 155m thick reinforced concrete deck. The finished deck level is at approx RL 4.5 m with beam soffit levels at approximately RL 3.5m

The original bridge was widened in 1987 to accommodate an additional 2m wide walkway. Overall the deck is now approximately 13m wide.

The bridge supports a 700mm diameter sewer positioned on the downstream (eastern) side and adjacent to the Southbound Bridge. This is supported on steel cantilever brackets which are fixed to the headstocks of the Northbound Bridge.

The substructure consists of a 2.95m deep profiled concrete headstocks beneath the girders that span 9.95m across the heads of 6 raking piles. At RL 61.54' (18.75m), the underside of the headstock is approximately at Mean Sea Level. (The raking piles are 450mm square and raked at 1:10 in the direction of the river flows. The piers and headstocks are square to the main spans and at each pier there is a single line of piles which are not raked in the direction of the braking forces.

Articulation of each span consists of a fixed end at one pier with a sliding joint at the next pier. If the bearings still work as originally designed, the braking forces would be transferred into individual spans. Severe corrosion is present at a number of bearings which suggest they may in reality act as partially fixed joints and this has been the subject of ongoing maintenance inspections and repairs over the years.

The existing bridge had previously been assessed as having no operational load restrictions. However, the structure does not meet current requirements for new bridges in respect of transverse impact load requirements. The age of the bridge suggests that in the next 20years it would be expected to be replaced.

3.1.2 Southbound bridge

The Southbound Bridge was constructed in 1987. The superstructure consists of 4 skew spans (2 x 27.18m and 2 x 27.43m, 15° skew), formed by 4 prestressed I beams per span that support a 180mm thick, reinforced concrete deck. The deck is approximately 9.4m wide and has a higher deck level than the Northbound Bridge at RL5.9m and a minimum soffit level of approximately RL 4.2m. The Southbound bridge is located downstream of the older Northbound Bridge

The substructure consists of

- two abutments, supported on a 1.2m deep headstock sitting on four 500mm octagonal piles
- Three piers, formed by 3.88m deep "I" section headstocks supported on six, 550mm octagonal piles

All piles are vertical and driven significantly further into the substrata than for the older northbound bridge with designed toe levels between RI-11.5 and RL-13.5.

The bridge also supports a water main on brackets supported by two of the downstand I beams. These beams and the brackets were damaged during the flooding and have required repairs and development of a new support system to allow reinstatement of the services

4 Summary of Structures Division Actions

Inputs by the Hydraulics team, Bridge Asset Management and Bridge Design groups were undertaken. The following tasks and actions were required to support the response team in developing both immediate repairs and appropriate design solutions for the various issues caused by the floods

1) Initial inspections, assessment of structural risks and possible remedial works

- Development of emergency repairs aimed at securing the abutments and reducing the risk of further erosion.
- Assessment of existing structures and load capability

2) Assessment of the works proposed by Unity Water to stabilise their mains,

- Review and advice on options presented to protect TMR asset.

3) Works required to piers on northbound bridge

- Review of scouring at piers following receipt of survey data and effects on structural capacity
- Assessment of residual load capacity of scoured structure and strengthening options
- Assessment of the stability and structural capacity of the scoured piling
- Development of repair and structural improvement options
- Assessment of loading requirements for piles in service
- Assessment and design of measures to regain stability of the piling

4) Liaison and support to project team

- Liaison by the hydraulics team to confirm scour extent and input into remedial works proposals
- Liaison by BAM to obtain clarification of the condition survey results and conclusions and also assessing conclusions resulting from the output of load testing
- Liaison with the geotechnical team to confirm design parameters, the residual capacity of ground support and measures needed to confirm performance and reinstatement of previous capacity.
- Provision of drafting to confirm scour protection works, interfaces with Unity water works, proposed abutment protection and pier works

5) Preparation of a structural options report

- To summarise the activities and conclusions arising from the above tasks

4.1 Initial actions following flooding

Immediate visits to site and structural reviews were undertaken as soon as flood waters subsided. The following principal actions were completed

1) An initial visit to the site was undertaken on 14/1/2011 followed by provision of advice to assist in structural stability assessments and to allow development of rapid repairs to reinstate pipeline connections by Unity Water.
2) Reviews of remedial work proposals and confirmation of constraints for Unity design and need to prevent undermining of abutments.
3) Assessment of repair brackets and proposals from unity water to reinstate their critical utility connections using new brackets and supports from the existing bridges.
4) Assessment of stability of abutments and appropriate measures for gabion support in conjunction with hydraulics team

4.2 Hydraulic Assessments

Hydraulic assessments were undertaken and are summarised in the report in Appendix F. This led to development of the abutment protection proposals using gabion mattresses.

4.3 Structural Assessments

This section details the structural assessments and issues considered for the main works areas based on the progressive receipt of data on bed levels, the general condition of the bridge and results from inspections and load testing completed between 31/1/2011 and 16/2/2011.

4.3.1 Abutments Protection Works (both bridges)

1) Assessment of scour effects and extent of damage to abutments required confirmation of works to provide interim scour protection to the abutments of bridges. Short term repairs are required to mitigate the further damage arising from future dam flow releases or flood events.
2) A solution was developed with the hydraulics team to allow immediate repairs using gabions. Sketches were issued for comment and pricing. Modifications to these works were undertaken to reflect changes arising from access tracks and works necessary for Unity Water repairs.
3) Works were undertaken to review the repair works by Unity Water to reinstate and stabilise their two sewers. This included reviews of proposals to
    - Repair damage caused to the existing concrete beams by failure of the support systems,
    - Provide new brackets and new connections between the existing bridge beams to allow reinstatement of services, and
    - Provide an acceptable piling arrangement to support the bends and thrust block areas adjacent to the abutments.

Detailed surveys of final levels were provided on 3/2/2011 for the North Abutment and 16/2/2011 for the South Abutment. The designs were developed to confirm an arrangement for gabion supports to allow backfilling behind the abutment and provision of scour mattresses to mitigate exposure to future scour events. (See Appendix C).

4.3.2 Piers

4.3.2.1 Southbound bridge

The southbound bridge is a more modern structure and has piles driven much deeper than the northbound bridge. As soon as water levels receded the bridges were inspected and assessed by BAM. Emergency works were undertaken based on details issued on 15/1/2011. On 21/1/2011 it was confirmed that the Southbound Bridge was considered to be in suitable condition to allow reopening to traffic as soon as emergency repairs could be completed on the Southern abutment approach. The Southbound Bridge was reopened to two way traffic on 25/1/2011.

4.3.2.2 Northbound bridge

The main focus is the Northbound Bridge, which has remained closed to traffic.

Hydrographic survey details were confirmed on 31/1/2011 and confirmed the scouring had removed most of the embedment of the piles at piers 3 and 4. Initial advice was provided on 4/2/2011 which included indicative arrangements for repairs to stabilise the abutments and a possible methodology for pile stabilisation. This advice also included requirements for further assessments to be completed prior to considering opening the Northbound Bridge for traffic, due to the depth of scour found at piers 3 and 4.

Load testing was undertaken on 16/2/2011 and confirmed differential movements and deflections under live loading at pier 3 in particular.

Structural design assessment tasks were completed as data became available and the following conclusions were reached:-

1) Scour at piers was reported and confirmed through diving inspections. Details of the extent were confirmed by hydrographic survey data received on 31/1/2011 for the piers and followed up on 3/2/2011 and 16/2/2011 for the South and North Abutments respectively. This data confirmed the size and depth of residual scour holes and bed profiles at the piers and that the bed above the toe of the piles on the northbound bridge had reduced by over 6m and left as little a 0.7m cover to the toe level of the piles at piers 3 and 4

2) The historic drawings for the design contain a note that a minimum embedment of 15' (4.57m) is required for the piling.

3) A structural model was developed to allow analysis of structural sections for piers 3-5 on the Northbound Bridge. (see example in **Appendix B**) These checks allowed review of the stress likely in the piles and assessment of the maximum length of undamaged pile that would be needed to accommodate current highway loading requirements. The analysis confirmed requirements for ultimate toe bearing of up to 797kN on the outermost piles under full highway loading conditions. The analysis also confirmed that as the scour had removed support to the piles, they would be overstressed under normal loading. Unsupported piles lengths exceeding 6m would

need remedial works or reinstatement of the ground support to prevent overstress under combined axial and bending forces prior to allowing traffic loads. The assessment confirmed that the older piles can only accommodate a maximum transverse impact load of 200kN, compared to the current AS5100 requirement for new bridges of 500kN.

4) Initial advice was provided which recommended further inspections and supporting that physical load testing is undertaken to assess stability. Load tests were undertaken and test results were received on 16/2/2011 and noted that residual movements of pier had occurred under tests.

5) The assessment and load tests confirmed stability in service is highly dependent on maintaining and demonstrating continued load capacity of piling.

6) Analysis of loading to AS5100 confirmed the required ultimate load case axial pile loading and resistance under traffic should be 797 kN for the most heavily loaded pile. This approximately equates to a serviceablility load of 547kN/pile. By comparison the load test undertaken has been assessed as applying an axial load of 343kN in the most heavily loaded pile. Whilst the load test confirms at serviceability levels the live load capacity exists, the residual load factors and effects of repeated cycles of loading cannot be assessed without further data.

7) Initial assessment of the embedded lengths and likely ground conditions following the scour event confirmed the possibility of a very wide range of parameters. Further SPT/CPT testing has been proposed to allow confirmation of data to allow the residual stability of the pile bearing under full live loading and the vibration effects from traffic loading to be addressed.

8) The depth of scour at piers 3 and 4 has removed all effective lateral restraint capacity against braking forces along the bridge. This would now rely on the movement of the decks to the limit of movement joints to mobilise adjacent spans down the deck and can only be transferred through the deck units after translation of the bearings to their movement limits.

9) To reinstate the structural capacity will require works to the pile and to re-provide the lateral restraint by infilling the scour holes in the bed adjacent to the piling

5 Option 1 – Remedial Works

5.1 Abutments (both bridges)

The proposed extent of gabion replacement and scour protection works to stabilise the abutments are shown on sketches in Appendix C. Initial sketches were prepared and issued on 15/1/2011 to allow repairs to the southbound bridge abutments and this allowed emergency works and backfilling to progress. These works were developed to be implemented rapidly and also had to accommodate the works to reinstate key utility connections and pipe supports proposed by Unity Water. The works by Unity Water required replacement of pipe supports with piled foundations and these have to be completed prior to installation of the final gabions. Unity Water presented initial design proposals for their remedial works and a conditional acceptance letter was issued by BD on 25/1/2011. Further details were provided and clarified between 25 and 31/1/2011. Piling works commenced in early February. The works to reinstate the mains were still in progress as of 4/3/2011. Until the works by Unity Water are completed the final gabion remedial works cannot be completed.

Northbound Bridge Piers 3-5

Following confirmation of the depth of scour and receipt of survey data on 31/1/2011, the following assessments were made and actions taken

1) Assessment of the structural capacity of the piles as columns following removal of materials providing support during the flood event. This has increased the unsupported length of the pile from 5m to 9.6m
2) Assessment of pile capacity in combined bending and compression for pier 3 (worst case) in the revised scenario with 5-6m scour.
3) Contact with geotechnical group to arrange assessment of piling capacity from geotechnical perspective.
4) Assessment of piling loads, uplift and deck loading in service conditions.

The repair options have to address the two following two issues

- Scour causing an increased effective length and
- End bearing and pile restraint issues reducing capacity for support from the ground

5.1.1 Issue 1 – Improving structural resistance of piles

Should level 3 inspections confirm significant damage to the piles (or alternatively visibility is so poor that diving inspections and integrity testing cannot conclusively confirm they have not been damaged), strengthening will be necessary. Early consideration of works was given to options of works to improve structural capacity of the piles. This included proposals for casing the piles to improve their resistance and performance.

The existing structural pile capacity at pier 3 after removal of ground support by scour has been checked. This confirmed the existing piles have insufficient capacity to resist the combined axial loads and bending loads that occur under normal service conditions. To reinstate the original design capacity would require either

1) reinstatement of the bed levels and lateral support conditions
2) increasing the section capacity

To increase the section capacity a proposal has been developed that would provide a new reinforced concrete sleeve around the existing pile. This proposal utilises techniques previously used at the Barron River bridge repairs to form a 950 diameter reinforced concrete column around existing piles. This is indicated on the diagrams in **Appendix D.**

The process of cleaning the piles, fixing reinforcement and setting up shuttering would all need to be undertaken by divers as all the piles are all below the Mean Water Level. This repair process is complicated as special measures would be needed to allow placement of concrete using tremmie techniques to ensure there was no possibility of leakage or environmental impacts during the works.

To guarantee transfer of bending forces and loads from the headstock would also require shear connections into the piles, complicating the works and temporarily decreasing the capacity. The casing technique is considered appropriate providing load transfer paths can be guaranteed to the toe scour repairs.

5.1.2 Issue 2 – End bearing and residual capacity of piles

The encasement of the piles, whilst appropriate to address the bending issues, does not result in generation of the larger bearing pressures as the casing and in-situ concrete surround cannot be driven into the ground. Accordingly the assessment of the pile toe and works to prevent failure of the toe are of prime importance.

The pile bearing capacity is highly dependent upon the geotechnical bed conditions that exist following the scour event. The scouring has disturbed a large mass of ground and may have affected the remaining bed and upper layers of material. The lateral restraint required to the piers to resist braking and transverse forces on the deck depends on reactions with backfill and the level of compaction adjacent to the piling. The original design drawings indicate that the piles required a minimum 15' (4.57m) embedment into the dense gravels to provide the necessary resistance. The current piles at piers 3 and 4 have embedment of as little as 0.7m into gravels that may have been disturbed during the flooding and scouring action.

Structural analysis of the bridge has indicated that ultimate pile loads of up to 797kN are required for full HLP320 traffic loading, self weight and effects of flood events. This includes load and dynamic factors. On a 450 square pile ($0.2m^2$) this equates to an ultimate bearing pressure of 4.0MPa. The load test confirms only serviceability levels and a capacity of around 1.9MPa may still be present. The coincident settlement, whilst not large, could be indicative that this is at the limit of load capacity in the current situation. Notwithstanding this, the current scoured profile provides little lateral restraint to the raked piles.

Geotechnical investigations of the bed and assessment of residual capacities and parameters applicable for the existing piles is essential. Preparations for these investigations are progressing. Initial assessments confirm that the ground bearing capacity is highly sensitive to the amount of disturbance that occurred in the scour event. The required toe bearing pressure to resist the ultimate loading is at least 4.6MPa. The original dense gravels would typically be expected to provide a resistance of 9-12MPa, which would be sufficient for long term service conditions, providing lateral stability can be reinstated. However, the disturbance of the gravels during the scouring will have reduced their capacity.

If the equivalent of a medium density gravel condition exists at the toe, the typical bearing capacity of the order of 4 MPa would be exceeded and further ground remedial works would be required to meet the normal long term design criteria. Geotechnical assessment of the data from investigations will allow confirmation of the minimum height required to assist in reducing the volumes of fill required.

To ensure satisfactory pile performance in the long term requires confirmation of works to ensure the original density of gravel exists or is achieved. Site investigations will be necessary to confirm the performance and state of the gravels. It is proposed that SPT tests are undertaken to confirm the residual density of gravels adjacent to the toe of the piles.

The observations of the levels across the bridge and results from the load tests suggest that a significant proportion of the original bearing capacity has been retained, but these tests alone cannot confirm whether the increased loading and vibration effects will continue to affect the bridge or the suitability for continued operation for the remainder of the bridges life. At the very least, continuous monitoring would be required and there would still be a real risk of needing to reclose the bridge if unacceptable movements were detected until such time as repairs can be effected.

The proposed SPT/CPT tests will allow proper consideration of this effect to design a solution. If the gravels at the toe levels have been disturbed and cannot be confined by simple addition of backfilling in the scour holes, further measures to underpin and grout around the pile toes would be necessary. In the tidal conditions that exist this would be difficult to achieve without major disruption and risk of environmental concerns.

Assuming the SPT tests confirm the required density of the gravel at the toe level has been retained, a satisfactory pile condition to prevent failure and provide lateral resistance can be achieved by local support in conjunction with reinstatement of overburden by filling the scour hole.

The local support to the piles could be rapidly provided by using concrete filled grout bags, filling around the piling back up to the original bed levels as part of the remedial works. Use of ELCORock containers filled with grout could be considered to provide the necessary support. The original bed levels provided a surcharge of at least 5m of submerged soil above the toe which equates to a 50kPa confinement pressure. This is equivalent to 3.5m of submerged concrete or grout bags.

This option is illustrated on the attached sketches in **Appendix D**. The steepness of the grout bags reduces the total volume required saving costs, but is dependent on follow up backfilling with the self compacting hydraulic fill. The grout bags will also act as a spread footing and thus increase the effective size of the pile group, reducing the lateral pressures the fill material needs to generate to provide stability.

The following table summarises and compares the repair Options considered

Table 1 – comparison of Structural repair methods and Options

	Advantages	Issues	Comments	Order of cost
Jacket piling to bed	Can be used to address structural instability of piles if damaged Can be installed above bed using divers Highly effective in improving the axial and bending capacity of the pile Known technology	Difficult to install as all below water levels Environmental concerns Bearing onto bed only marginally improves pile resistance Quality of final works harder to verify and control Increased flow obstruction by piles	Will slightly improve the end bearing but not significantly as cannot be driven into the bed materials	Min $ 10,000 / pile plus set up shuttering, reinforcement and placing underwater / tremmie. - based on repairs to Rooneys Bridge in 2000
Strip footing approach	Simple methodology Lower ground bearing pressure possible	Extensive area required in conjunction with casing method to transfer loads	Complex load path, very difficult to form reinforced footing at depth, load transfer issues. Bearing pressure under footing low and could still be prone to scour effects	Assumed 2m wide x 13m long x 1.5m deep concrete = 49m^3 placed by divers
Form a fin pier by Encasing within a cofferdam or continuous shutter around pier piles	Works would be in controlled environment Better quality of final works	Cannot drive piles beneath existing bridge, achieving cut off unlikely Tremmie works complicated and greater volumes of concrete to pump and control	Not considered feasible to drive under existing bridge and obtain cut off. Risk of disturbing ground to Southbound bridge	Not considered feasible due to headroom constraints Very expensive (Minimum $800k plus per pier for cofferdam plus permanent works, plus access)

Reinstate support around piles using grout bags	Simple technology and can be undertaken by divers Provides restraint to resolve lateral stability providing piles can be demonstrated to be undamaged. Could be used with the casing of piles if required.	Relies on existing end bearing of piles being proven Significant volume of grout bags required	Simple and capable of being undertaken as part of the scour repair works Provides immediate end bearing and lateral stability improvement. If piles can be shown to be undamaged, casing may not be required	Grout bags provides shuttering, placing simple, no reinforcement but need stitching together. Pumped concrete / grout Cost related to speed of divers placing Approx 140m3 each $1,200,000/ pier

5.2 Remedial Works and Further Data Requirements

To mitigate the potential for further scour to both the North and Southbound bridges it would be necessary to implement the following works

1) reinstate the abutment protection
2) backfilling and repair to the bed levels beneath both bridges

Prior to considering reopening the Northbound Bridge it is considered essential that the following works are undertaken to allow confirmation of the structural capacity and longevity of operation

1) Completion of Geotechnical investigations sand interpretation to confirm the density of existing ground adjacent to the pile toe
2) Analysis of stability and applicable design parameters to allow confirmation of the piling capacity and whether further underpinning works will be required
3) Inspection works to confirm the structural integrity of the piles exposed by the scour. This will allow a decision on whether the cost of casing the piles is required.
4) Agreement of the principle methodology to be adopted and confirmation of initial extent of works (in parallel to geotechnical investigations) to allow reduce lead in time in procurement of suitable Grout bags. This will allow the earliest reinstatement of lateral capacity, improve the end bearing capacity and reduction of risk of further scour damage by future events

5.3 Remedial Works Cost estimates

The immediate structural remedial works are anticipated as having the following costs with risks of requiring further works

Works scope	Budget estimate / order of Cost $	Comments
Scour repair works	$ 2.0m	Sub Total A
Structural Repair Works	$ 3.3m	Sub total B
Sub total – Scour repair and pile stabilisation	**$ 5.3m**	Sub Total A + B
Possible Additional structural works		
Encasement of piles - pier 3	$0.2m	Assumed 18 piles encased if they cannot be demonstrated as intact
Underpinning & Repairs to headstocks	$3.0m	If ground conditions are not proved suitable founding
Total additional works items	**$ 3.3m**	
Anticipated Capital Cost range	**$ 5.3– 8.6m**	
Other costs	$ 5.9 – 6.7 m	Design consents, site preparations , contingencies * (* 40% applied to upper range, 70% to lower)
Budget cost range	**$11– 15m**	

The basis of the above figures are included in Appendix E.

These are considered as budgetary figures for options comparison and based on projects with similar types of works but in different localities. The costs estimated will need to be confirmed by more detailed assessment and pricing to reflect the particular site constraints and difficulties of access caused by the existing bridges that limit working space for cranes and support vessels. It is anticipated the majority of works will need to be undertaken by divers using air bags and in poor visibility and flow conditions which will add significantly to the risks of changes to the program requirements for these works.

To put the above costs into context and allow a best value decision to be made, the following section provides an assessment of replacement costs as a benchmark.

6 Option 2 – Bridge Replacement

In view of the level of costs of remedial works and residual maintenance and repair works that would be required, a benchmarking exercise was also undertaken to compare these costs with and assessment of the range of costs for replacement.

The structural condition of the Northbound bridge and the remaining 20years operational life before planned replacement is anticipated draws into questions the real value of undertaking the extensive works required to reinstate structural stability and prevent future scour damage to this bridge when compared to the security from a new build.

The scour hole formed in the main channel appears consistent with the effects of water being confined in the channel between the two bridges and the northbound bridge effectively creating a weir effect, prior to flows being forced to change direction and run beneath the Southbound bridge. It is also noted that the Northbound bridge has more piers which are not aligned with the main channel or the southbound bridge piers, creating further turbulence in the hydraulic flow which would promote scour.

The existing bridges and channel geometry creates significant afflux upstream when high flows occur and especially when levels exceed the Northbound deck level. This could be significantly reduced, with associated benefits to flooding risks, if the existing bridge were replaced with a new, 4 span structure set at the same level and skew as the Southbound structure.

Removal of the northbound bridge and replacement with a higher level structure of similar construction to the southbound bridge would immediately improve the hydraulics of this section and help mitigate the likelihood of future scour events undermining the bridges and reduce afflux levels upstream. A new structure could also be installed on deeper piles and designed to provide the full load capacity and greater flood immunity

If the existing bridge is to be removed and a new bridge constructed, allowance will need to be made to provide a temporary crossing for pedestrians and cyclists as the existing Southbound Bridge has no provisions for this traffic and there are no local alternative routes.

Base on similar projects and an estimate of the works required at this site, the cost for demolition and replacement of the Northbound Bridge at the higher level have been estimated as between $26 and 32m. (see **Appendix E**).

A new structure would also result in savings of maintenance and inspections of the old structure which over 20 years are estimated as $ 4- 7 m (see **Appendix E**) and reduce the possibility of further damage to the Southbound Bridge.

7 Benefit Cost Review

The expenditure of between $ 11 and $15 m is anticipated as being necessary to effect immediate repairs to address the flood damage. These works would still leave the Northbound bridge

- exposed to flooding and scour issues from similar events
- requiring increased levels of maintenance as it approaches the end of it's useful life
- needing careful works during maintenance due to presence of lead based paints
- maintaining existing afflux levels in high flow situations.
- Providing conditions that could lead to future scour damage at the piers of the Southbound Bridge.

In addition a budget allowances for extra maintenance works to the aging existing bridge when compared to normal allowances for a new bridge, have been assessed as between $3m and $5m over the next 20years.

The cost of replacement is assessed as between $26 and $32m.

A new bridge would

- be expected to have low maintenance costs in the first 20 year period
- improve hydraulic performance
- reduce head loss across the crossing
- improve flood immunity

If allowance is also made for reductions in maintenance alone, let alone the benefits of reduced afflux and increased flood immunity for the crossing, it appears a ease could be made that suggests replacement of the bridge is as economic as undertaking the major repairs. A benefit cost assessment and analysis should be undertaken to confirm the net present value of replacement options.

Even assuming availability of marine plant, the repairs needed are estimated as requiring procurement and lead in times of at least 6 weeks followed by at least 8-12 weeks to undertake. The difficulties of access and tidal and river flow conditions pose a real risk that this program would extend further. The public perception of works needs to be considered as the scour repairs and reinstatement of bed levels are largely not visible operations and could give the impression of no works being undertaken. The bridge would remain closed to traffic during most of this period

Anticipated timescales for design of a new bridge are approximately 6 months. It is anticipated that a 9 -12 month construction program would be required. Sequential demolition could be used as an alternative to providing a new temporary footbridge, but this would add to project costs and program. The removal of the bridge and subsequent reconstruction would give more visible indications that major works were needed, planned and progressing.

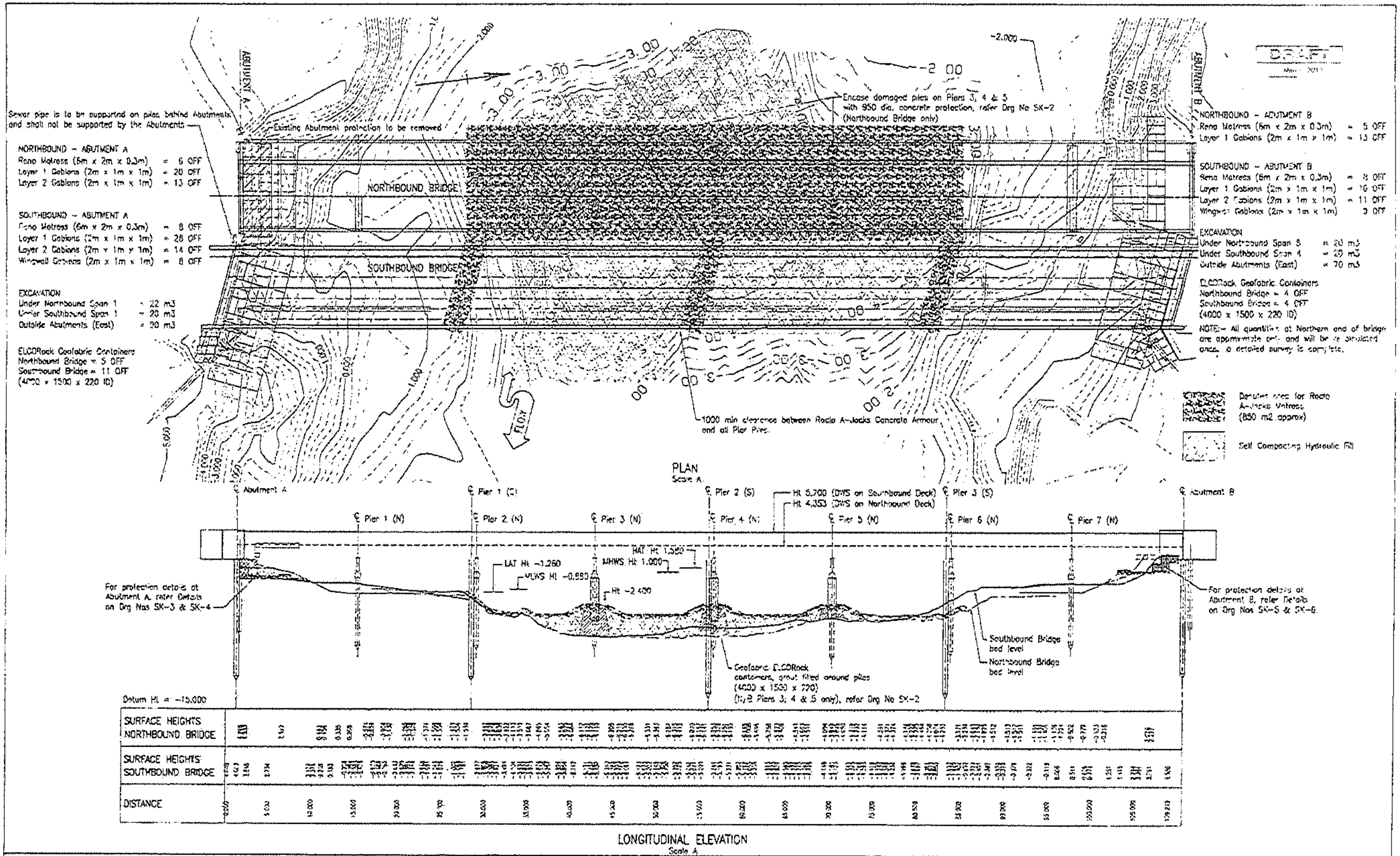
8 Conclusions

- The repair and reinstatement of structural integrity of the bridge requires significant backfilling and works around the exposed piles to re-establish stability and required structural performance for full highway loading.
- The short age of supply following the floods, costs and difficulty of placing conventional rock armouring under the bridge led to consideration of alternative methods of scour protection using A-Jack blocks and grout bags.
- The grout bag option combined with the A-jack scour protection and hydraulic fill provides a method for reinstatement that is appropriate to access constraints and works by divers.
- A level 3 inspection and assessment of condition is considered essential to confirm whether the piles require casing.
- The anticipated minimum costs of the flood repairs are in the range of $11 – 15 m which includes a $3m allowance for possible additional works should the integrity of piling and ground conditions be unable to be confirmed as satisfactory.
- Based on an initial assessment the cost of replacement of the northbound bridge would be expected to be in the range $26 – 32m
- The increased maintenance costs associated with the existing structure, compared to a new structure are assessed as being in the range of $ 4 – 7 m over the next 20 years.
- The extra cost of replacement is within the bounds of possible outturns for the repair costs. The repairs will still leave the existing bridge in place. This would be anticipated as needing replacement in the next 20 years in any event with associated increased traffic disruption and costs as traffic volumes increase. This should be considered in selecting the appropriate option to progress at this time.
- Replacing the existing bridge would provide significant benefits of increased flood immunity, reduced afflux upstream and reduced future maintenance.
- Maintaining the existing arrangement by implementing only scour repairs still leaves the possibility of further damage in extreme events not only to the Northbound Bridge but also around the Southbound bridge piers.

9 Recommendations

- To improve the wider community, engineering and security of service issues and mitigate the probability of repeated scour issues, it is recommended that the existing Northbound Bridge is replaced.
- To improve hydraulic performance, it is recommended that a replacement bridge has a similar span arrangement and has the deck at approximately the same level as the Southbound Bridge.

Appendix A – General Layout & Extent of Scour Repairs



BRIDGE DESIGN CRITERIA: DESIGN CODE: AS 5100-2004 | DESIGN LOADING: SM1600 and HLP400 | DESIGN SPEED: 100 km/h | EARTHQUAKE ZONE: BEDC-1 | BARRIER PERFORMANCE LEVEL: Regular | BRIDGE TYPE: PSC Deck Units | BIS No: 1...

Revisions | Certified | Date | Associated Job Nos | Auxiliary Drg Nos | Survey Data | Horiz. Datum | Height Datum | Survey Books | GDA | Scales A 0 2 4 6 8 10m

A Original Issue A1/A3

Reference Points: Preceding RP | Dist. to start of job (km) | From start to end of job | From end to Following RP | Following RP

Through Chainage From | District

AJ WYLLIE BRIDGE SCOUR PROTECTION

GENERAL ARRANGEMENT

Drawing | Design | Design Review | Engineering Certification | For scheme approval status refer Drg. No

Checked | Verified

Queensland Government

Department of Transport and Main Roads

Job No.

Contract No.

Drawing No. SK-1 A

Series Number BR01– 01 of 06

Appendix B – Structural Analysis Model & Assessment

The following is a summary of the transverse 2D SPACEGASS models created to assess transverse loads in the line of river flows. Because of the depth and stiffness of the headstock it was assumed that vehicle loads would be carried uniformly across all piles. The applied values were subsequently verified by approximate hand calculations and by using RAPT to analyse the column.

For end bearing, all of the models produce a maximum of approximately 797kN per pile.

Model in Current Condition (with Springs):

Assumes 700mm of soil at toe

Springs values are assumed as 100,000 N/mm in the vertical and only placed at toe of each pile. 10 nodes were provided between toe and top of soil each with a 3,000 N/mm spring stiffness. These are based on using the load test and subsequent deflection to work backwards and approximate springs. Using these springs our model calculates 3.4mm deflection at toe of piles which is between the 1.8mm and 4.5mm that the load test produced. The SLS Axial Load in the piles under the test load was 343 kN.

ULS Traffic (HLP320 Factored) + 1.2 Dead Load

No piles in tension.

M* = 4 kNm

N* = 797 kN

Max Deflection = 8mm at toe

Lateral Restraint (500kN) + 0.85 Dead Load

1 Pile in Tension. N* = -110 kN.

M* = 423 kNm

N* = 700 kN

Max Deflection = 80mm horizontal at top of piles with concurrent 6mm vertical deflection.

Max Deflection = 7mm at pile toe.

Model in Repaired Condition (with Springs):

This model assumes some form of bed rectification works to produce an effective unrestrained height of 6m, i.e. similar to the original case before scour.

Springs are 100,000 N/mm in the vertical. Only placed at toe of each pile. 10 nodes between toe and top of soil each with 1,000 N/mm spring stiffness.

ULS Traffic (HLP320 Factored) + 1.2 Dead Load

No piles in tension.

M* = 2.5 kNm

N* = 812 kN

Max Deflection = 8 mm at pile toe, 11mm at headstock.

Lateral Restraint (500kN) + 0.85 Dead Load

1 Pile in Tension. N* = -110 kN.

M* = 364 kNm

N* = 595 kN

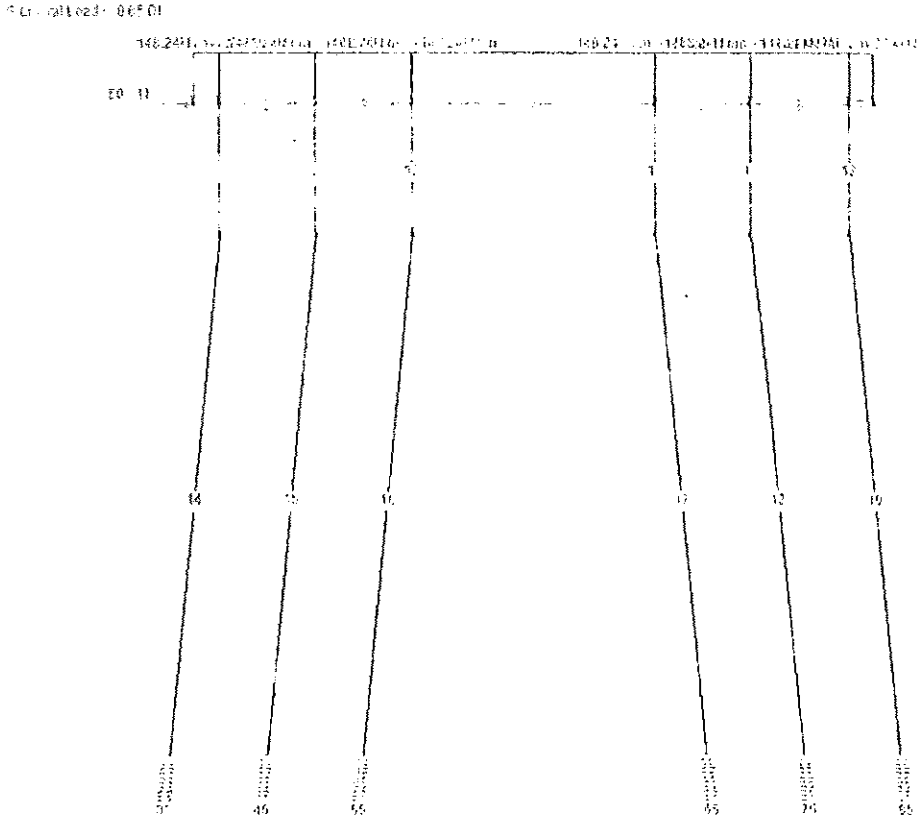
Max Deflection = 60mm horizontal at top of piles with concurrent 6mm vertical deflection.

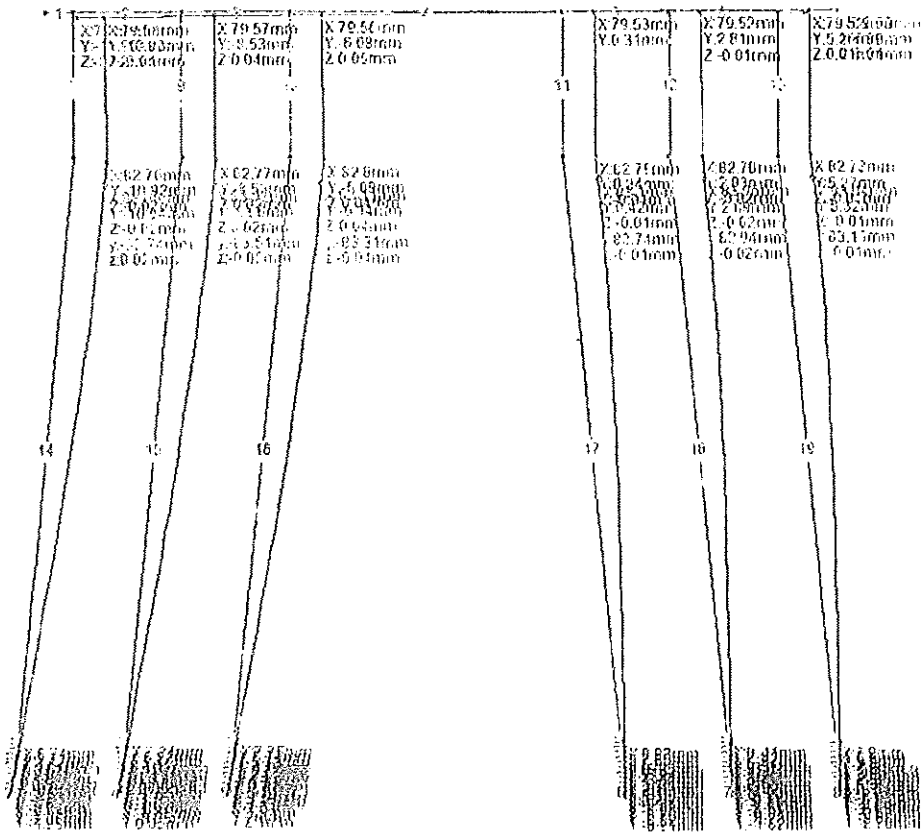
Max Deflection = 10mm at pile toe.

Analysis Conclusions

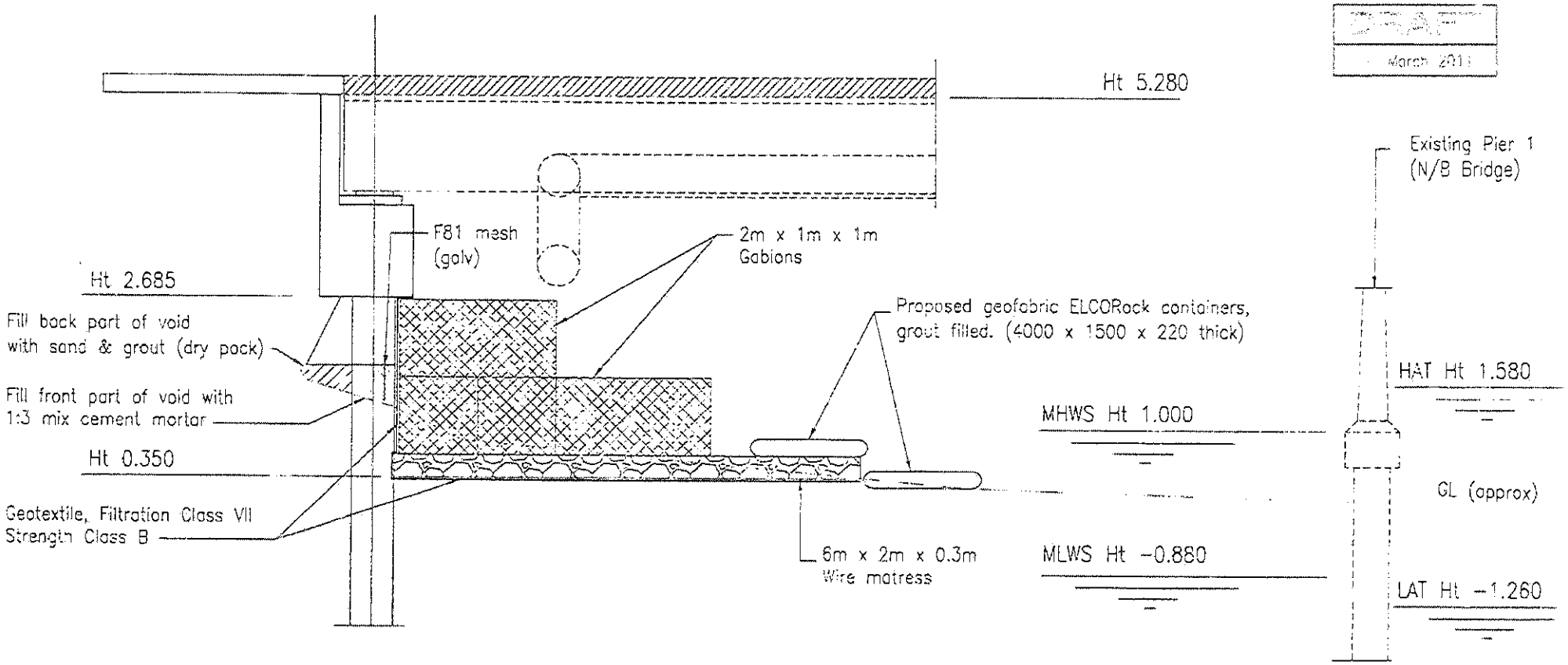
- The piles do not have sufficient capacity to resist full AS5100 transverse moments and the calculated applied moment, even after the effective length is reduced to 6m
- The maximum lateral load that the piles can resist is assessed as 200kN, not the AS5100 requirement of 500kN even with 6m effective length and 25 MPa Concrete.

Simplified frame and deflection models





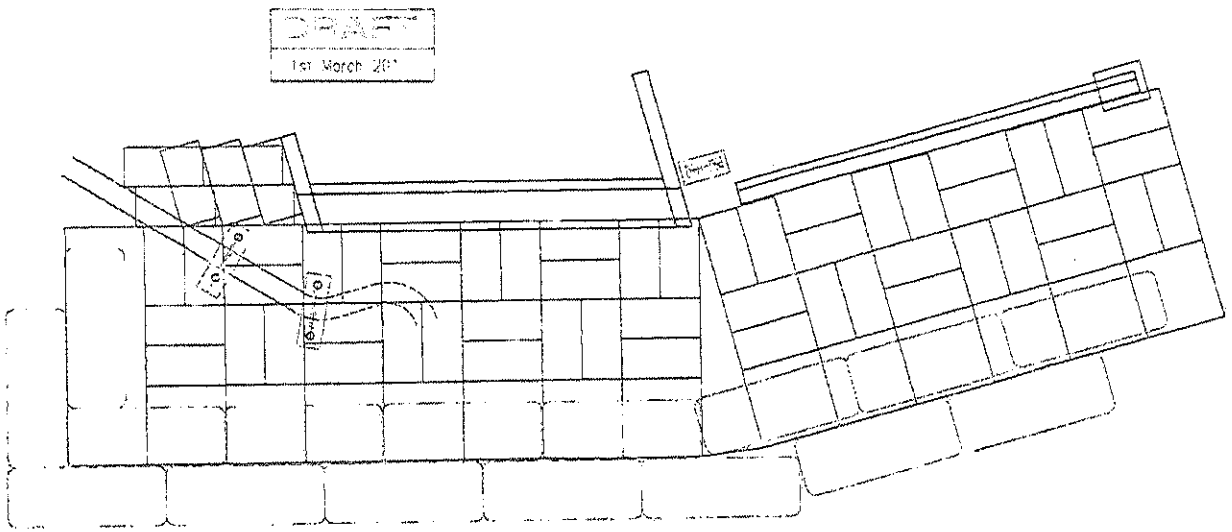
Appendix C – Proposed remedial works to abutments



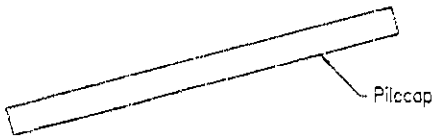
SECTION – ABUTMENT A
(SOUTHBOUND BRIDGE SHOWN)
(NORTHBOUND BRIDGE SIMILAR)

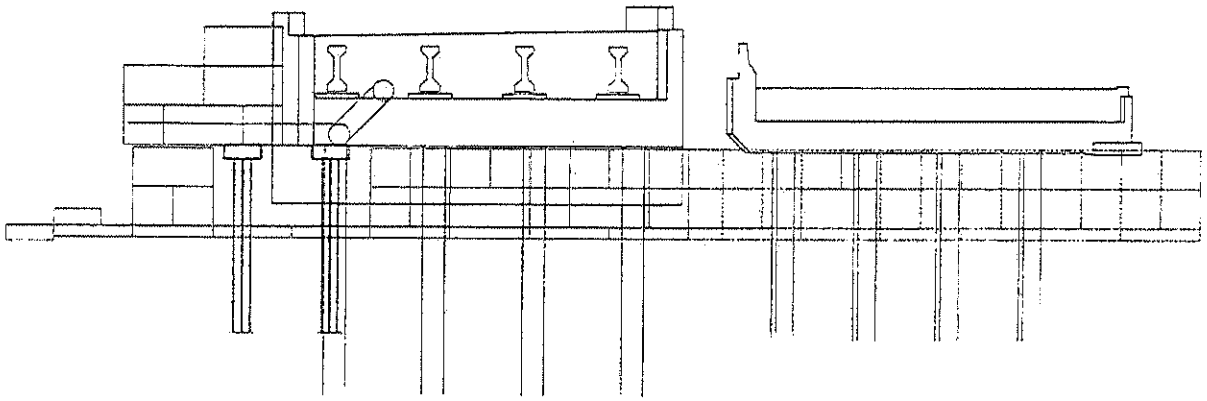
0 1000 2000mm

Drawing No :– SK–3
Series No :– 03 of 06



PLAN ABUTMENT A

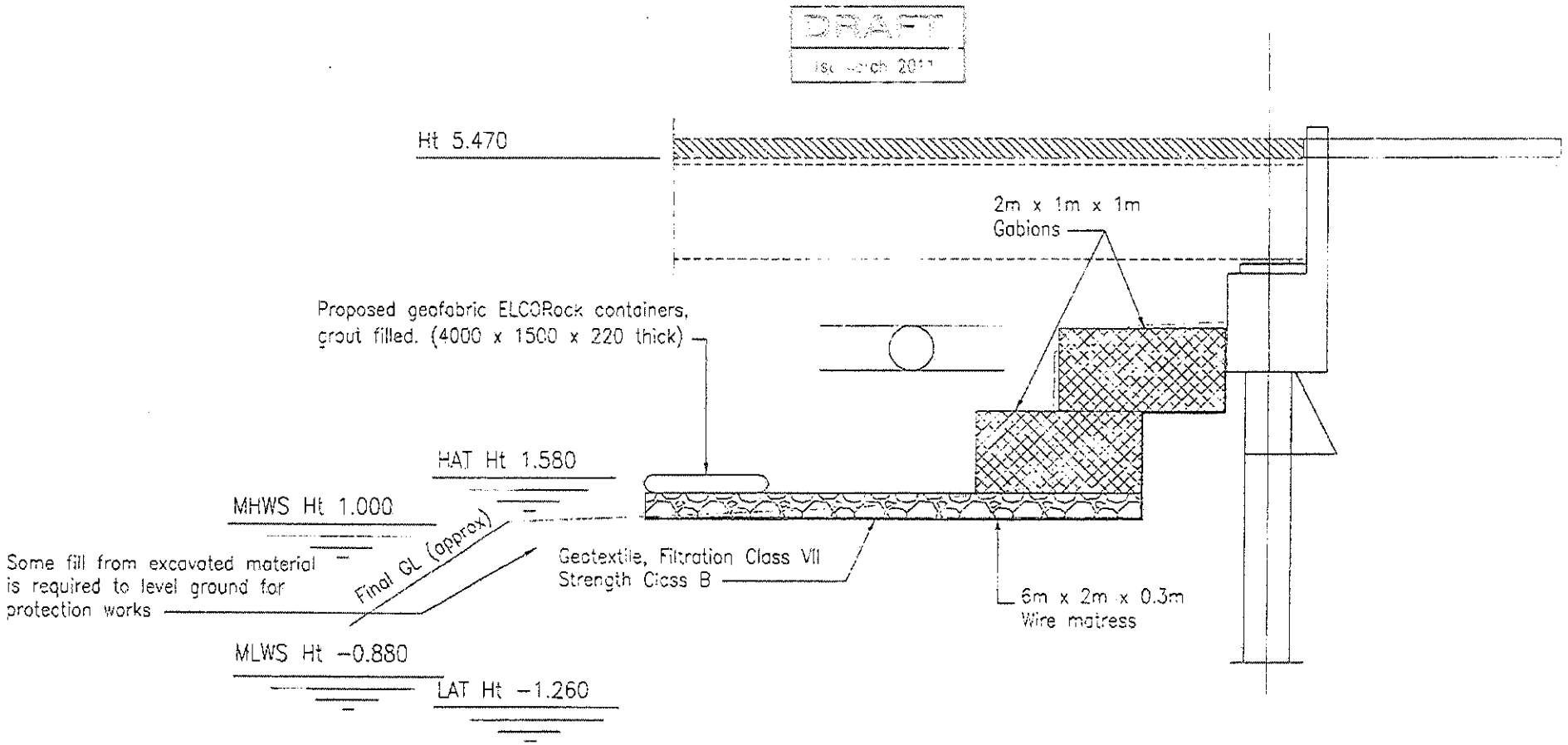




ELEVATION ABUTMENT A

Drawing No :- SK-4
Series No :- 04 of 06

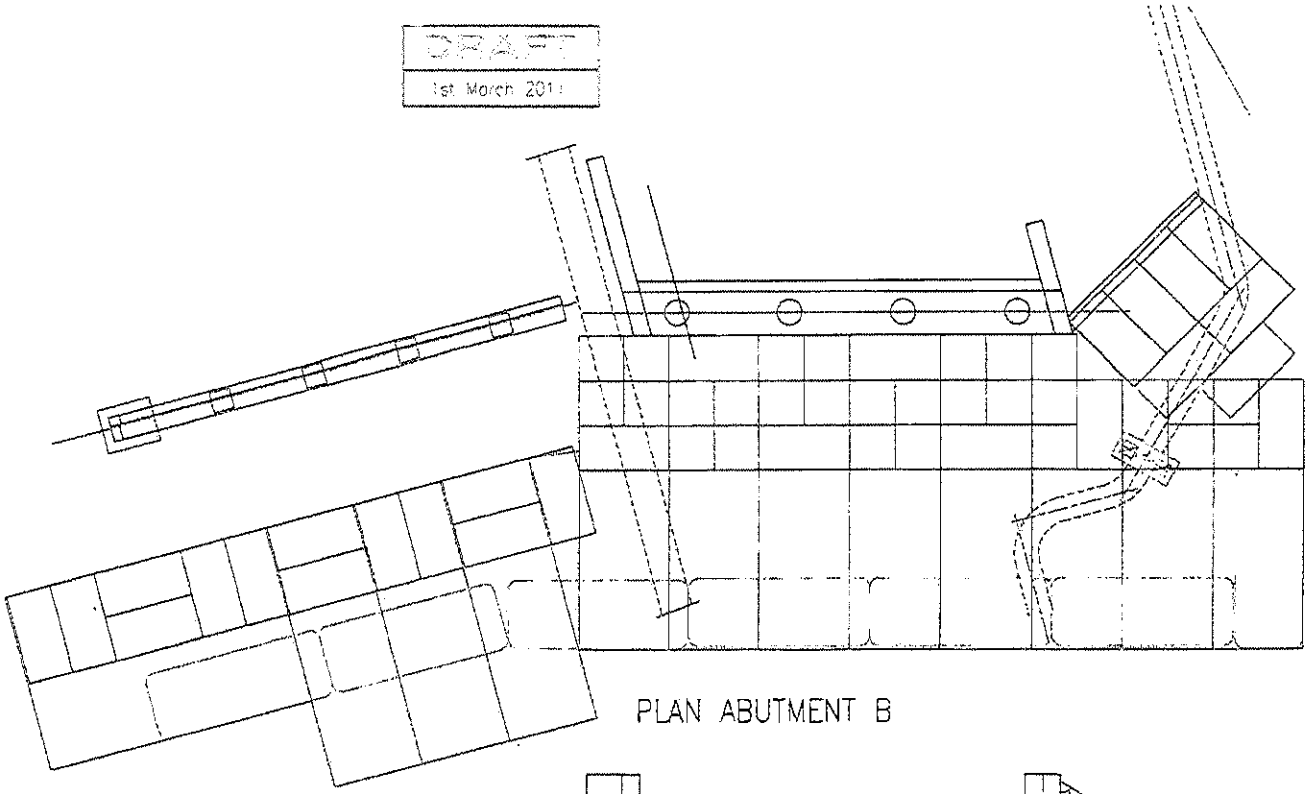
DRAFT
1st March 2011



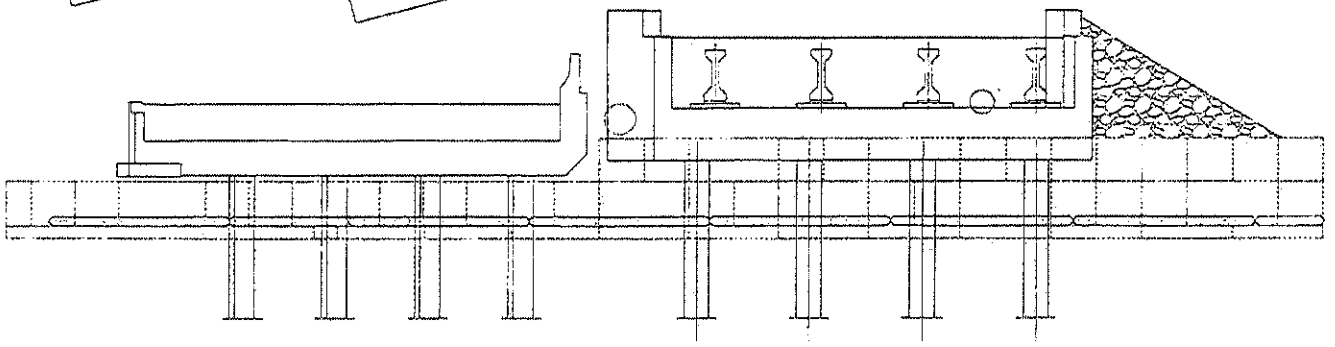
SECTION – ABUTMENT B
(SOUTHBOUND BRIDGE SHOWN)
(NORTHBOUND BRIDGE SIMILAR)

Drawing No :- SK-5
Series No :- 05 of 06

DRAFT
1st March 201



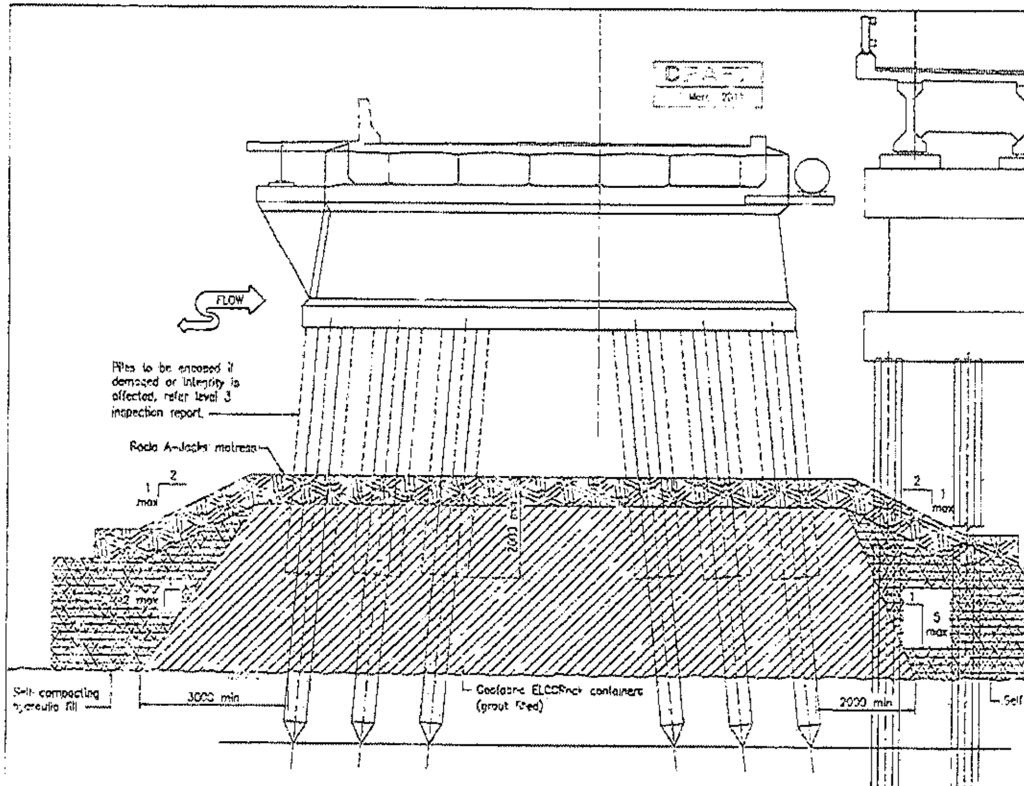
PLAN ABUTMENT B



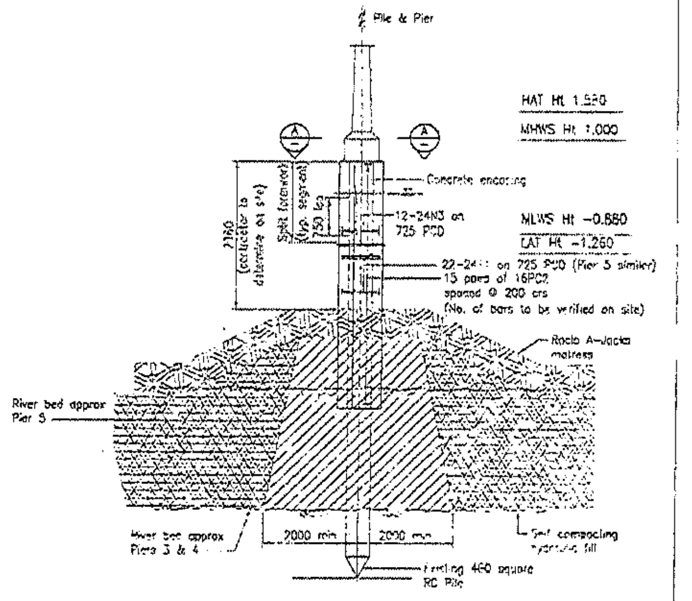
ELEVATION ABUTMENT B

Drawing No :- SK-6
Series No :- 06 of 06

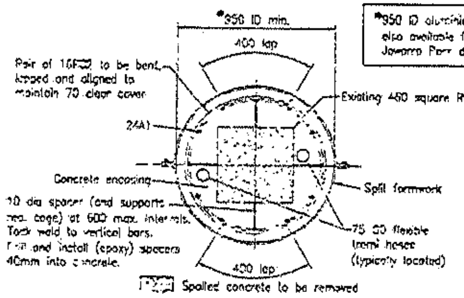
Appendix D – Proposed remedial and scour protection works at piers



ELEVATION – PIERS 3, 4 & 5 PILE REPAIRS
NORTHBOUND BRIDGE
Scale A

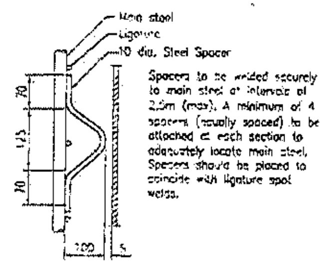


END VIEW



*950 ID aluminium split formwork also available from RTCS (SE) Jawarra Parr depot.

VIEW (A)
Scale B



SPACER DETAIL
NTS

CONCRETE MIX DESIGN:

The following details are supplied for the concrete encasement mix design:

1. Grade 50MPa/10mm
2. Slump 125mm dry condition, 150 – 200 mm for concrete placed in wet.
3. Minimum 20% fly ash by mass of total cementitious
4. Maximum shrinkage 600 microstrain at 56 days
5. Must be pumpable mix
6. Use anti-washout chemical admixtures only if required. However trial first without admixtures and measure performance before deciding.
7. Maximum w/c = 0.40

SEQUENCE OF REPAIR TO PILES

1. Scrape to remove all marine growth and loose material. Remove spalling concrete from existing piles to ensure 20mm clear behind reinforcing bars.
2. Place the formwork to firmly bed into the river bed.
3. Pump concrete using a flexible tremi hose.

NOTES

1. Concrete class to be S50/20.
2. Cover to reinforcing steel to be 70mm unless shown otherwise. Exposure classification C.
3. Steel reinforcement to be read in conjunction with Drgs No 1043 and 1044.
4. All welds to be SP category.
   Welding symbols conform to AS 1101.3.
   Welding of bar splices to conform to AS/NZS 1554.3.
   Tack welding for location purposes to conform to AS/NZS 1554.3 Clauses 3.3.1 and 3.3.2.
   Welding consumables to be E4816, E4818 or W50X.
   Welding shall not be carried out within 75mm of any bent portion of the bar.

BRIDGE DESIGN CRITERIA DESIGN CODE: AS 5100:2004 | DESIGN LOADING: SM1600 and HLP400 | DESIGN SPEED: 100 km/h | EARTHQUAKE ZONE: BEDC-1 | BARRIER PERFORMANCE LEVEL: Regular | BRIDGE TYPE: PSC Deck Units | BIS No: 1....

Revisions	Certified	Date	Microfilmed	Associated Job Nos	Survey Data	
				Auxiliary Drg Nos	Horiz. Datum	
					Height Datum	
	RPEQ				Survey Book	
A Original issue A1/A3					District	

Scales: A 0 1000 2000mm; B 0 250 500mm

Reference Points: Preceding RP | Dist. to start of job (km) | From start to end of job | From end to Following RP | Following RP

AJ WYLLIE BRIDGE SCOUR PROTECTION
PROPOSED PILE PROTECTION (PIERS 3, 4 & 5 Nth/Bnd Bridge)

Drawing x Checked x | Design x Verified x | Design Review C Swefling | Engineering Certification RPEQ No. 1/3/11 | For scheme approval status refer Drg. No.

Queensland Government
Department of Transport and Main Roads

Job No.	
Contract No.	
Drawing No.	SK-2 A
Series Number	02 of 05

Appendix E - Budget Estimates

E.1 Option 1 – Remedial Works Estimates

Works scope	Budget estimate / order of Cost $	Comments
Scour repair works		
A-Jack Mattress	$ 1,550,000	900 square metres @ $ 1,500/ m2 plus 200k set up (A Jack supply only approx $0.5m = $20.35 x 25,000 units)
Hydraulic Fill	$ 550,000	3,500 cubic metres @ $100/m3 plus set up of $200k
Sub total – scour repair works	$ 2.1m	Sub total A
Structural Repair Works		
Remedial works to Abutment A	$ 110,000	Based on gabion replacement and mattress
Remedial works to Abutment B	$ 110,000	Based on gabion replacement and mattress
Remedial works to stabilise pier 3	$ 1,200,000	Assuming toe bearing capacity can be demonstrated from Geotechnical tests approx 275 bags
Remedial works to stabilise piers 4	$ 1,200,000	Assuming toe bearing capacity can be demonstrated from Geotechnical tests approx 275 bags
Remedial works to stabilise pier 5	$ 650,000	Assuming toe bearing capacity can be demonstrated from Geotechnical tests approx 150 bags (shallower scour)
Sub total – minimum works for structure	$ 3.27 m	Sub total B
Sub total – Scour repair and pile stabilisation	**$ 5.3 m**	Sub Total C = A + B
Additional structural works	Budget $	Comments
Encasement of piles - pier 3	$ 95,000	Assumed 6 piles encased over 7m depth @ $ pile, average $15,000 /pile based on Rooney's Bridge refurb + set up & difficult access
Encasement of piles - pier 4	$ 95,000	Assumed 6 piles encased over 7m depth @ $ pile, average $15,000 /pile based on Rooney's Bridge refurb + set up & difficult access

Works scope	Budget estimate / order of Cost $	Comments
Encasement of piles - pier 5	$ 75,000	Assumed 6 piles encased over 7m depth @ $ pile, average $15,000 /pile based on Rooney's Bridge refurb + set up & difficult access
Underpinning of pier 3	$ 1,000,000	Assessment of underpinning in dry conditions resulted in $500k/pier. Assume min additional 100% for underwater with difficult access
Underpinning of pier 4	$ 1,000,000	Assessment of underpinning in dry conditions resulted in $500k/pier. Assume min additional 100% for underwater with difficult aceess
Underpinning of pier 5	$ 1,000,000	Assessment of underpinning in dry conditions resulted in $500k/pier. Assume min additional 100% for underwater with difficult access
Additional repair works to headstocks arising from Level 3 inspection	$ 10,000	Inspections in February 2011 mapped cracking but noted little new cracking. Provisional allowance for sealing works and painting repairs
Total additional works items	**$ 3.3m**	Sub total D
Anticipated Capital Cost range	**$ 5.3 – 8.6m**	Sub total E , Range = Subtotal C to (C+D)
Consents and design	$ 0.8 – 1.4 m	Allow 15% of item E
Site preparations and works compounds	$ 0.5 – 0.9 m	Allow 10% of item E
Sub total	**$6.6 – 10.9m**	
Risk and Contingencies	$ 4.6 – 4.4m	As estimating manual range 40% - 70%. To avoid over conservatism it is assumed 70% applied to lower bound and 40% to upper
Total cost range	**$ 11 – 15 m**	

E.2.1 Option 2 - Works to replace bridge at higher level

Main element	Budget cost range*[1]	Comments
Temporary footbridge *[2]	$1.5 m	Assume $3,500/m2 x 110 x 3.8m
Diversion of utilities	$ 1 m	Provisional - Assume support of one main maintained under Southbound bridge
Demolition of existing bridge	$ 1.4 m	Assumed costs of $1000 / m2 Area = 1430m2 (110 x 13m)
Construction of new bridge	$ 10.1m	Assumed rate $7,000/m2 Area = 110m long x 13m min = 1430m2 wide to accommodate full cycleway provisions and two lanes of traffic
New approach embankments, road works and drainage to change alignment and raise levels by 1.55m at the bridge	$ 0.5 m	Assume 5% max approach slopes for DDA and pedestrians, average length = 1.55 / (5%/2) = 62 m either side. Total earthworks volume = 1250m3 @ $50/m3, Road construction, area = 1600m2 @ 48/m2, Drainage modifications – allow $ 300/m2 x 125x 12 m
Retaining structures on approaches	$ 0.1 m	Retaining structures say 4x10 x av 1m high dwarf concrete walls & misc works
Scour protection works at piers	$ 0.5 m	Assumed reduced area around piers as piling designed for existing scour allow 100m2 per pier = 300m2
Budget Capital cost - replacement bridge	**$ 15.1 m**	Total A
Other costs		
Consents and design	$ 2.2 m	Allow 15% of item A
Site preparations	$ 1.5 m	Allow 10% of item A
Sub total	**$ 18.8m**	
Risk and Contingencies	$ 7.5 – 13.2 m	Estimating manual range = 40 -70%
Range	**$26 – 32m**	

Notes *[1] Budgets provided use generic costs from similar projects and will require testing against the current market rates. *[2] The permanent facility will require a pedestrian and cycleway. If a new permanent cycleway bridge can be located remotely from the main bridge, the need for a temporary bridge could be removed. Costs for the permanent works are included in the estimate of the new bridge. Maintenance costs are assessed at 0.6% of capital/year = $78,000

E.2.2 Option 2 - Potential savings if bridge replaced

Item	Budget cost range	Comments
Future Level 3 inspections & remedial works arising from inspections	$0.1 – 0.2m	Assuming one every 5 years @ $50 - 100,000 / inspection with reporting, assume two not required for new bridge
Increased level of maintenance and repair of aging structure v new bridge.	30% of 0.6% x 13m = 23,400/yr x 20 yrs = $0.47 m	Assume 30% increase required of new bridge allowance of 0.6% of capital value / year due to repainting and maintenance of existing steel beams, replacement of bearings etc and environmental issues for removing lead based paints and over painting
Scour Repairs	$1 - 2m	Reduced scour protection area and volumes of backfill fill possible if foundations designed for lower level. Allowance for continuing risk of further scour repairs and structural damage from flooding events due to complex hydraulic path and turbulence through existing bridge geometry
Road closure & disruption costs	$1- 2 m	Traffic diversions and management costs 1- 2wks / yr due to lower flood immunity @ $50,000/ week x 20yrs
Sub total Range	**$ 2.6– 4.7 m**	Sub total A
Contingency range	**$ 1.8 – 1.9m**	Estimating manual - if assumed as strategic estimate level – range of 40% to 70% To provide a consistent approach whilst seeking to avoid over conservative figures, it has been assumed the 70% contingency is applied to the lower bound and 40% on the upper bound of the range
Budget Range	**$ 4 – 7m**	

Appendix F – Hydraulic Report

Scour report

Executive Summary

This report has been prepared to review the scour damage at the A.J. Wyllie Bridge and to recommend remediation measures both in the short term and long term. There are two parallel bridges across the North Pine River at this location and significant scour damage has occurred at both of these. Scour has occurred at these bridges in the past, and repairs have been needed previously.

The north bound bridge (upstream on the river) was built in the 1930s and the south bound bridge in the 1980s. The north bound bridge has a lower deck level than the south bound bridge.

There are several reasons for this damage, as discussed in this report, and the mechanism for scour is complex. It is expected that scour will continue to occur in this section of the North Pine River, but scour protection can be installed at the bridges to manage this scour risk.

Scour in a river can be caused by one or a number of different mechanisms. In this case, constriction scour, local scour, bend scour and bank failure due to slumping all seem to be present at this bridge site on the North Pine River.

There is evidence that slumping of the river bank has been occurring for a long time, and possibly since even before the construction of the north bound bridge in the

1930s. The bridge is located on a natural bend in the river so bend scour would probably have also been occurring for a long period of time.

The two types of scour that have been caused directly by the construction of the bridges are local scour and constriction scour. Of these two effects, constriction scour has had the greatest impact. This scour has resulted from the significant reduction in the width of flow in the river from the construction of the bridges. Both bridges have the same length (though the span sizes are different) and this is shorter than the floodplain width. The railway bridge located upstream of Old Gympie Road is significantly longer than the road bridges and this bridge extends over the whole floodplain width.

In addition to the constriction in the flow width in the river, the difference in deck levels and the approach embankments between the two bridges also results in significant restriction of the natural waterway area. This is because the deck level of the north bound bridge is just below the soffit level of the south bound bridge, thereby restricting the waterway area significantly for flood levels between the soffit of the north bound bridge and the top of the safety barrier on the south bound bridge.

The scour problems therefore are caused by the constriction to the flow width and the constriction to the flow from the levels of the two bridge decks which block flow over a significant range of flood levels. The most certain method of reducing the risk of scour would be to provide a new longer bridge that reduces the flow constriction or to provide additional waterway area on the approach embankments. Raising the deck level of the north bound bridge to match the south bound bridge so that the blockage of the flow path was reduced would also be of value. While this approach would be the best method, the North Coast Region has indicated that there is no funding available to replace the north bound bridge.

Therefore the scour at the bridge must be managed using best practice scour protection methods. This report provides a recommended approach to this work.

To manage the scour in the short term it is recommended that gabions be installed at the bridge abutments of both bridges. Gabions are acceptable at the abutments as they are above MHWS tide level. Gabions in salt water or in a gravel bed river would not be recommended because of the risk of corrosion. The details of the gabions required are shown in Appendix A.

The long term scour management works shall include providing protection to the piers from scour and monitoring of the channel bed in addition to the abutment protection.

The high velocities estimated at the A. J. Wyllie Bridges would require significant rock sizes to provide scour protection. This velocity needs the equivalent of a 2 m layer of 2 tonne (1.15 m diameter) rocks so it is recommended to use A-Jacks, a precast product from Rocla to restore bed levels in the channel.

Monitoring of the river bed shall take place after every significant rainfall event where the north bound bridge is overtopped. Sounding dips will indicate if any damage has occurred to the scour protection. Inspection of the abutment protection is also required.

1 Introduction

This report has been prepared as part of a scour investigation at the A. J. Wyllie Bridges for the North Coast Region of Transport and Main Roads.

Scour in the North Pine River has been occurring since before the first bridge was constructed in 1937. The site is located on a bend in a gravel bed river with unstable bank slopes and there are also tidal flows at the bridge site. After the construction of the south bound bridge in the 1980s there has been at least two major scour events.

2 Background

There are two parallel bridges across the North Pine River at this location and significant scour damage has occurred at both of these. Scour has occurred at these bridges in the past, and repairs have been needed previously.

The north bound bridge (upstream on the river) was built in 1936 and the south bound bridge in the 1987. The north bound bridge has a lower deck level than the south bound bridge. The bridges are parallel and very close to each other.

The deck level of the south bound bridge is at 5.9 m AHD, while the deck level of the north bound bridge is approximately 4.27 m AHD. These deck levels mean that the two decks combine to provide a significant blockage to the flow from the soffit of the north bound bridge to the top of the safety barrier of the south bound bridge.

There are records of previous scour damage at the bridges on a number of occasions. There was significant scour damage during a major flood in 1989, where the damage appeared similar to that which occurred during the 2011 flood.

The tidal range at the bridge is of the order of 2 m.

3 Survey

Survey data is important in hydraulic investigations, and the survey was very limited for this project.

The survey data used in this hydraulic investigation was obtained from bridge drawings dated 1934 and 1984. After the flooding in 2011, hydrographical survey with some ground survey was taken. No other survey was available so there was no indication of any changes to the stream bed and channel for the long period of time between the previous surveys.

To determine if there was any movement of the bridge caused by the flood, survey of the bridge deck was conducted after the recent flooding.

Comparison of the survey on the bridge drawings shows that there has been a slight difference in bed level over 50 years from 1934 to 1984, but there has been significant scour under the north bound bridge since 1984. Details of the changes in scour and sediment deposition over the years are not available.

4 Hydrology and Hydraulics

There are stream gauges on the North Pine River located at the North Pine Dam and at Young's Crossing.

The North Pine Dam is located approximately 6 km upstream of the A. J. Wyllie Bridge with Young's Crossing approximately 2 km downstream of the dam. The catchment area of the North Pine River at Young's Crossing is approximately 403 km^2. The catchment area of the North Pine River at A. J. Wyllie Bridge is approximately 431km^2. The difference in the catchment area of the Young's Crossing and the A. J. Wyllie bridge (431km2) is small so the runoff from this part of the catchment is minor. Flood information at Young's Crossing may be used to approximate the conditions at the A. J. Wyllie Bridge.

Flood information from 1/12/10 to 14/01/11 has been obtained from SEQ Water. Flow data from SEQ Water has been obtained to approximate the flows in the North Pine River during the 2011 floods in Petrie. Figure 1 shows a plot of the flows released from the North Pine Dam between 7/01/11 and the 14/01/11. This data does not include discharge from regulators or river release valves during non-operational periods. Discharges from regulators or river release valves may be included in the discharge for operational periods. The peak flow on the 11/01/11 was 2800 m^3/s.

An accurate sizing of the flood that occurred on 11/01/11 is difficult to determine without the North Pine Dam's operational guidelines and further analysis. Based on the information available the flood event that occurred on 11/01/11 is likely to be greater than 100 years ARI.

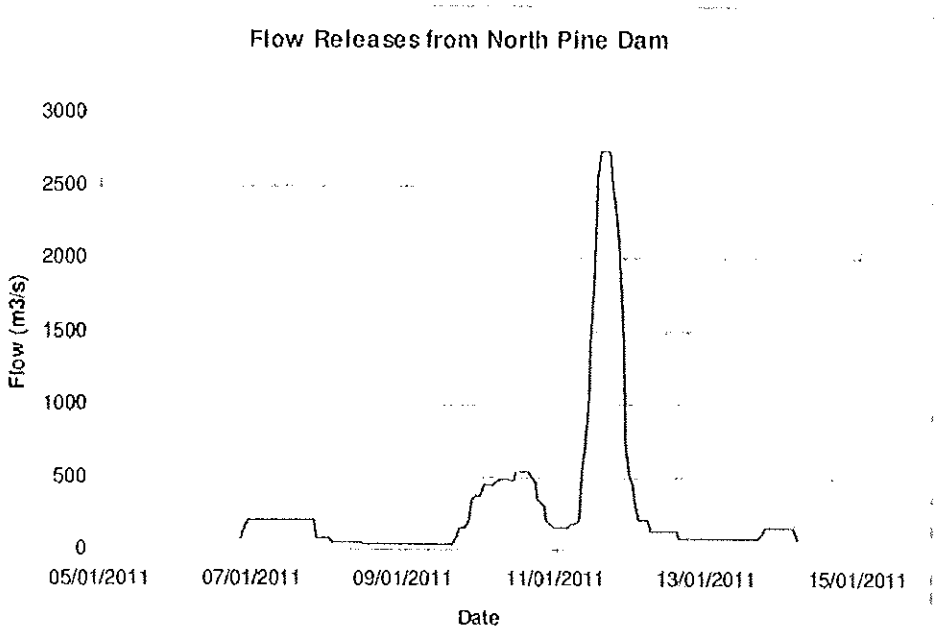


Figure 1: North Pine River Dam flow releases

Flood data has also been obtained from stream gauges operated by the Bureau of Meteorology. Figure 2 shows the approximate locations of the Bureau of Meteorology stream gauges on the North Pine River at Petrie.

Figure 3 shows the water levels in the North Pine River from 20/01/11 to 25/01/11 following a minor release of water from North Pine Dam.

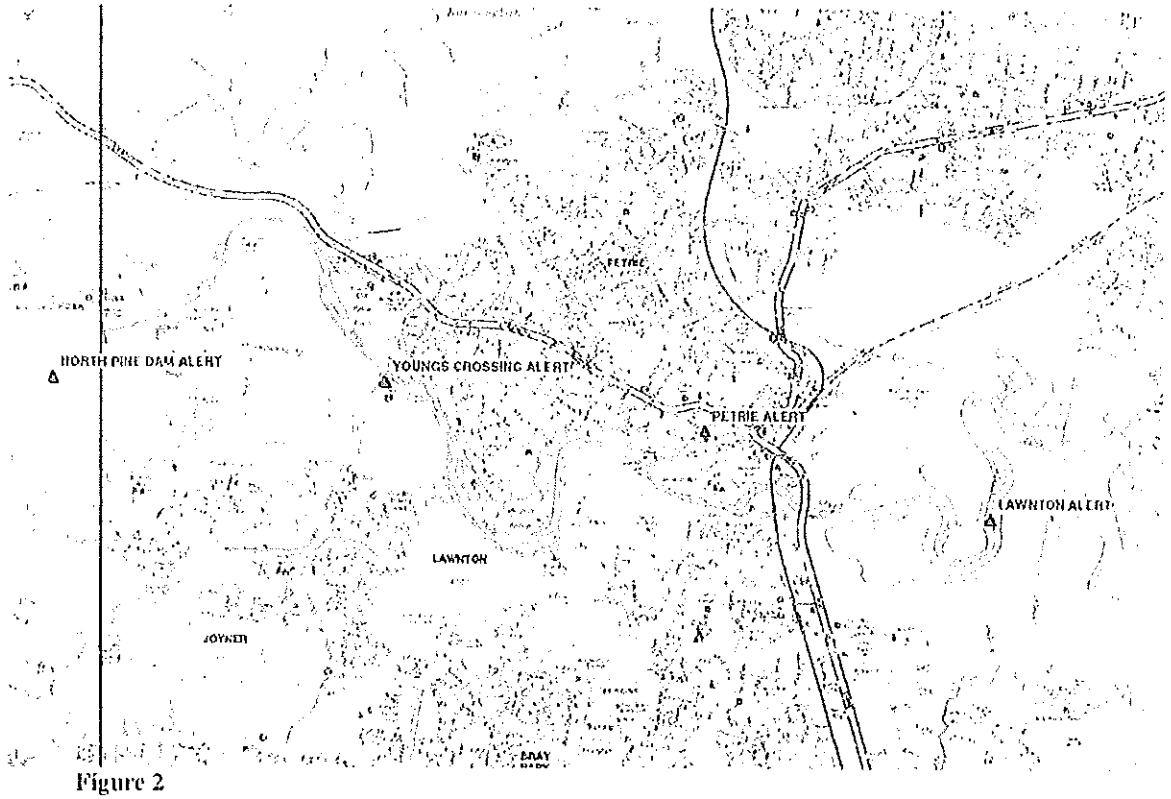


Figure 2

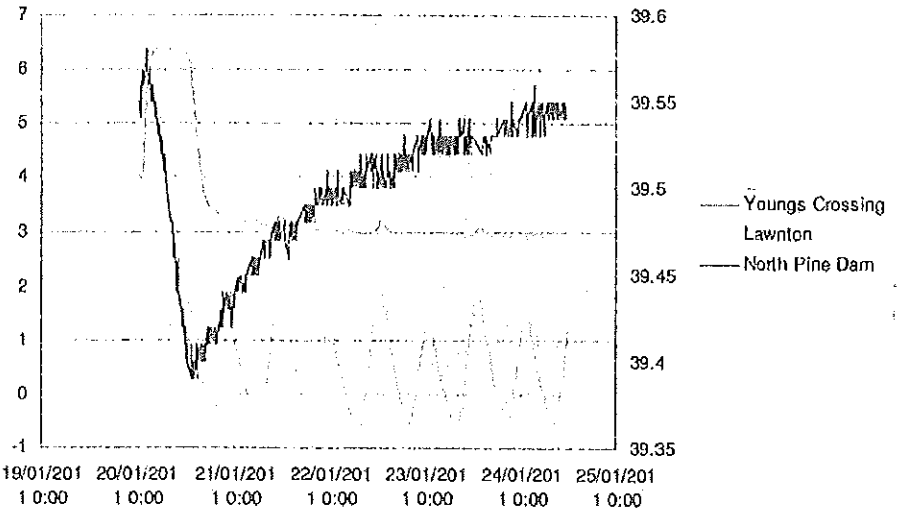


Figure 3: Water level records from BoM gauges on the North Pine River.

Young's Crossing is a low level crossing of the North Pine River and has a low flood immunity. From topographical information the crossing height of Young's Crossing is assumed to be approximately 3 m.

Based on traffic reports (www.snarl.com.au) it is known that Young's Crossing was closed on 04/12/10. This coincides with a water release from the Dam. The peak flow released from the dam on 04/12/10 is approximately 150 m^3/s. It is assumed that the crossing will be closed when ever water is released from the Dam.

On the 20/01/11 the water level at Young's Crossing was approximately 6.4 m. This water level is above the BoM minor flood level of 6.0 m for the Young's Crossing river station. It is assumed that the flows released on 20/01/11 would have an ARI of more than 2 years.

During the release of water from North Pine Dam on 20/01/11 Young's Crossing was overtopped. On a site visit to the A. J. Wyllie Bridge on the 20/01/11 high flow velocities at the A. J. Wyllie Bridges were observed.

The limited survey data was used to assess the flow velocity through the bridges. The maximum flow velocity through the bridge will occur when the water level at the north bound bridge is just before the point of overtopping. At this flood level, the blockage of the river channel is at a maximum and therefore the velocity of the flow through the bridge is also at a maximum.

While this hydraulic assessment was approximate and based on limited data, the flow velocity through the bridge was calculated as 5.5 m/s. This is an extremely high velocity and is a serious risk of scour for most river bed materials. Based on observations and the scour damage observed, this calculated flow velocity seems likely.

4.1 Previous Flood Studies

A previous flood study has been conducted in the North Pine River at Petrie. The TMR Hydraulics Branch has a report from Cardno Lawson and Treloar for the BMD Group in January 2006 for a development assessment referred to TMR. The assessment used a SOBEK model as supplied by the Pine Rivers Council.

This model shows that Gympie Road has a major impact on flooding in the North Pine River. Figure 4 shows the flood levels and velocities in the North Pine River for an ARI 10 year flood event. Figure 5 shows the ARI 100 year flood levels and velocity vectors. There is approximately 0.5 to 1 m drop in water level over the A. J. Wyllie Bridges for a 100 year ARI event. The bridge is not overtopped for the ARI 10 year flood.

Gympie Road at North Pine River has a major influence on velocities at the bridges. The bridge approaches appear to cause a major restriction of the flood plain for floods over 10 years ARI.

The velocities in North Pine River are naturally high due to a natural constriction upstream of the bridges. Reports indicated that natural stream velocities in the North Pine River are up to 4 m/s. Further constriction of the flood plain from the A. J. Wyllie Bridge will cause further increases in velocities.

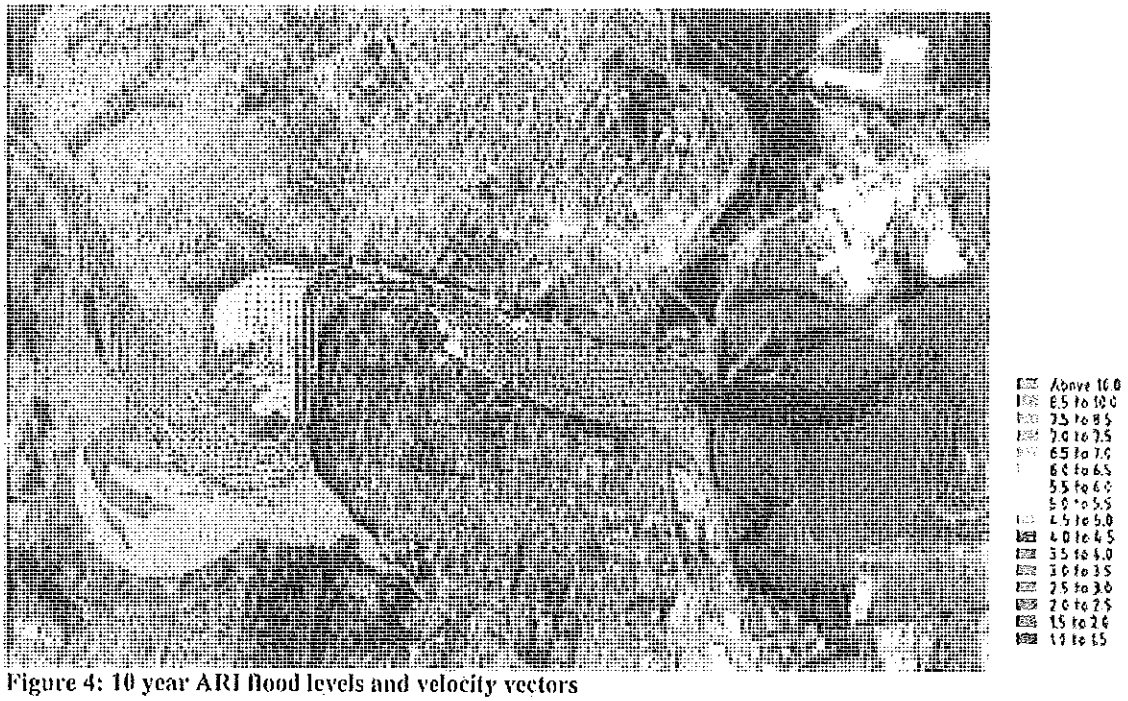


Figure 4: 10 year ARI flood levels and velocity vectors

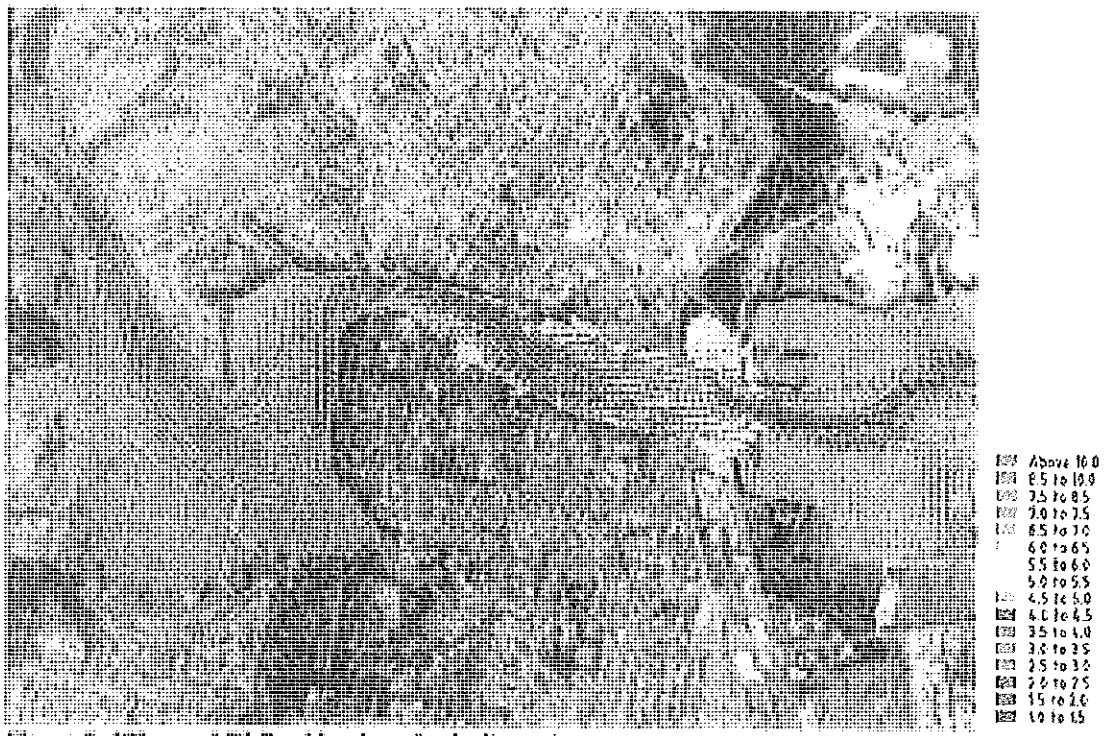


Figure 5: 100 year ARI flood levels and velocity vectors

Design flows from Lower Pine River Flood Study (June 2009).

5 Geotechnical Information

A bridge site foundation investigation for the North Pine River was conducted in October 1986. The foundation investigation indicated a subsurface profile of deep alluvium over a bedrock of extremely weathered to slightly weathered sandstone. The alluvium layer consists of a sand / gravel mixture with some cobbles present. The report found there was a general increase in material size and consistency with depth. The bed rock layer consists of a material of low to medium strength.

As the sand and gravel layer increases with size and consistency with depth it is likely that long term scour has occurred. After a flood peak larger sized bed material will settle before the finer material, thus explaining the increasing size and consistency in material with depth.

The geotechnical information clearly shows that the bed material in the river at the bridge site is erodible, especially considering the high velocities encountered here. Scour depths have not been calculated as part of the bridge design process, but these depths are expected to be high.

6 Site Investigation by Hydraulics Branch

6.1 Introduction

As part of the investigations into the scour damage and planning for repairs, staff from the Hydraulics Branch inspected the bridge on 20 and 25 January 2011.

6.2 North Bound Bridge

6.2.1 Introduction

The north bound bridge was designed in 1934. The deck level of this bridge is at approximately 4.27 m AHD and the bridge is approximately 100 m in length.

At the southern approach of the north hound bridge there was scour at the abutment face causing voiding behind the abutment. Stabilised sand had been pumped under the relieving slab as an interim measure to allow trafficking.

There were no defects reported or evident on the northern approach.

6.2.2 Abutment scour

Scour at the southern abutment (Abutment A) has resulted in damage to a sewer thrust block. The sewer pipe runs between the two bridges.

At the northern Abutment B face, there was some scour. Based on sounding information the scour is not yet serious, but there is a risk that future scour will cause problems at this site.

The outside of the channel curve in North Pine River is to the south (Abutment A) so this bend in the river explains why there has been more scour at the southern abutments.

Upstream of span 1 (Figure 8) and span 8 (Figure 7) of the north bound bridge the banks of the North Pine River intrude into the flow area of the channel. The flow capacity of the bridge is therefore reduced to only 6 of the 8 spans working effectively. This encroachment effectively reduces the length of the bridge and therefore increases the flow velocity through the bridge. The encroachment of the banks is clearly natural because of the large trees that are growing on the section of bank that encroaches into the stream channel. This reduction exacerbates the blockage caused by the higher level of the downstream bridge deck.

The encroachment of the upstream banks into the end spans of the north bound bridge will affect the average flow velocities in the main channel of the North Pine River. The average velocities at the end spans of the bridge will be lower than the average velocities through spans 2 to 7. This is supported by the fact that the scour protection at the southern abutment of the north bound bridge has stayed mostly intact. While the average velocity through the end spans is less than that through the middle spans, this encroachment does change the distribution of flow and cause turbulence in the end spans thereby causing damage to the abutment. Based on observations, it appears that the end spans were previously blocked significantly and the local scour on the abutments has eroded back the bank and therefore caused the risk to the abutments. The area of the bank that encroaches onto the river has remained as it was originally. This is shown in Figure 2, the bridge plans from when the bridge was constructed in the 1930s. This scour has resulted from the concentration of flow under the bridge and the location on the outside of the bend. The removal of the encroachment of the banks upstream could be considered because this would open up the end spans, but would provide an area of increased scour risk where the earthworks were carried out.

A comparison of a photograph of the northern abutment (Abutment B) of the north bound bridge from 2000, Figure 9, with recent flood damage, Figure 10, indicates that there was no significant damage at this abutment during the 2011 flood.

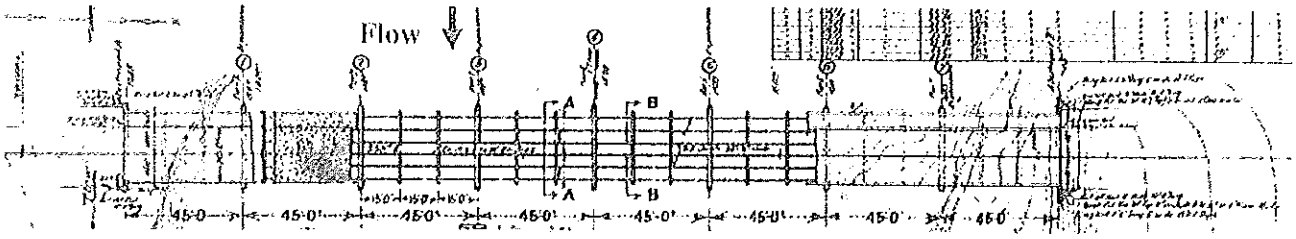


Figure 6: Southern Abutment from bridge plans (1934). The banks upstream of spans 1 and 8 naturally encroach into the flow area of the bridge.

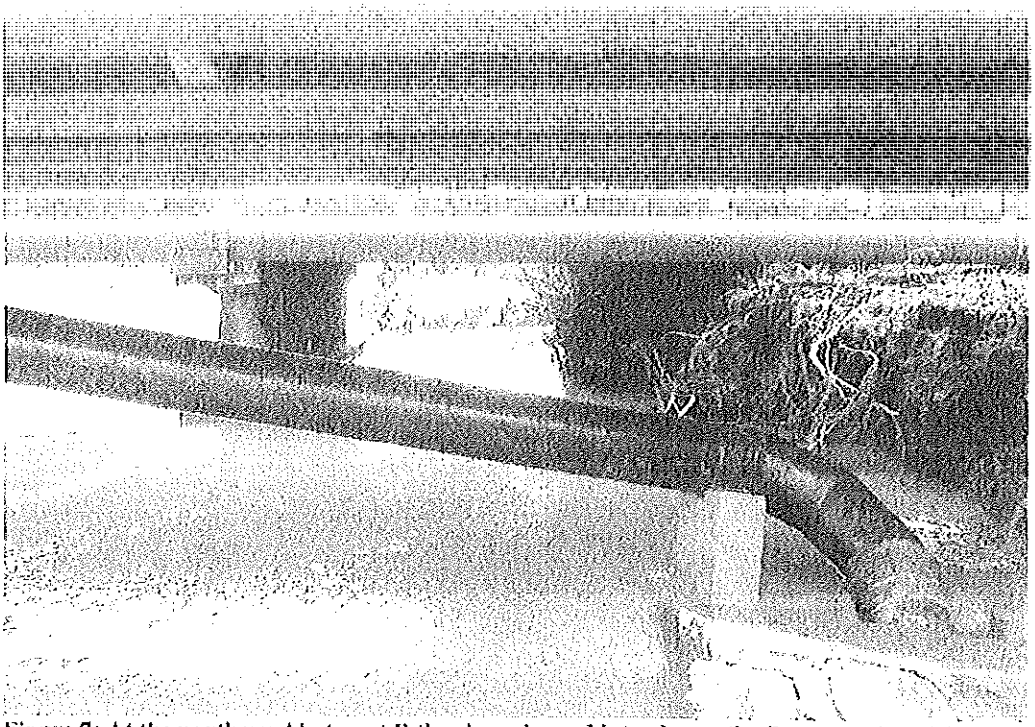


Figure 7: At the northern Abutment B the river channel intrudes on the flow capacity of the A. J. Wylie Bridges. (Looking upstream)

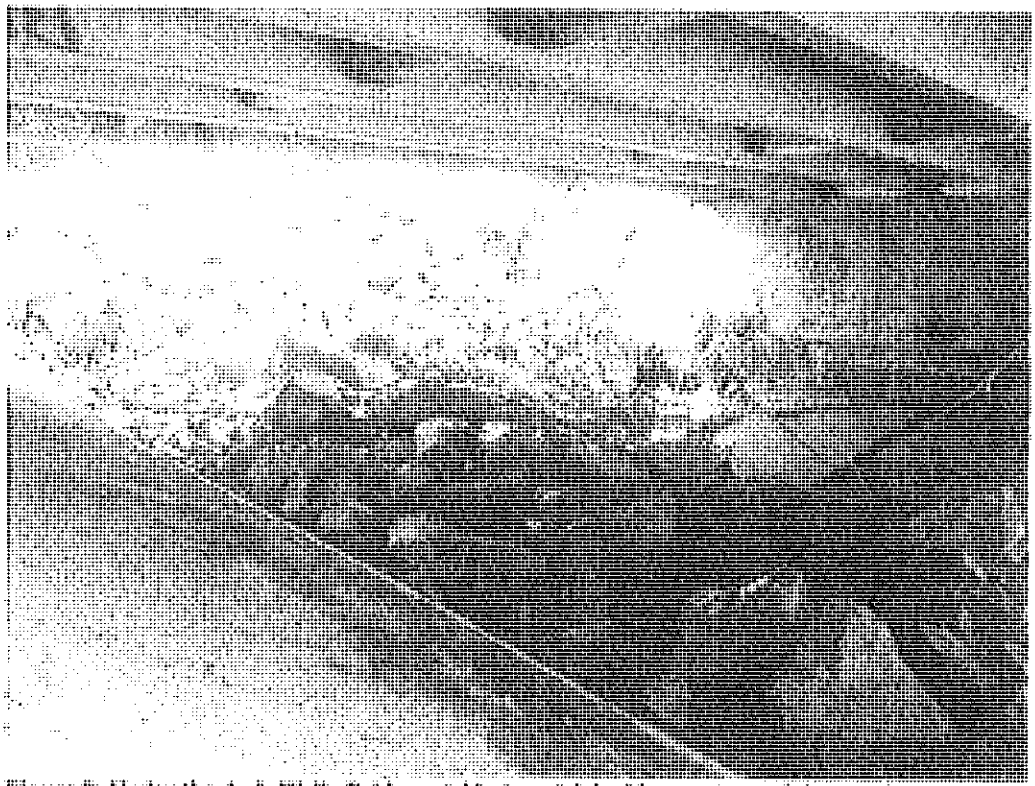
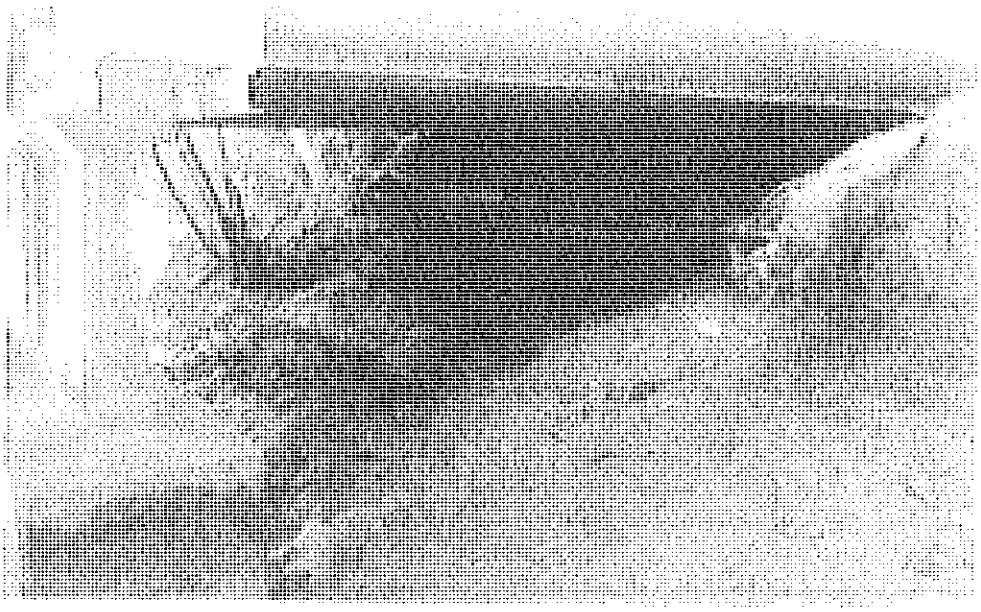


Figure 8: Under the A. J. Wylie Bridges at Abutment A looking upstream it is seen that flow through span 1 of the north bound structure is blocked by the upstream channel geometry.



Severe scouring of natural bank under bridge @ abutment [2]
Date image captured: 04/12/2000

Figure 9: Abutment B of the Northbound bridge in December 2000.

Figure 10: Photo taken 26/01/2011 of Abutment B of the North Bound Bridge.

6.2.3 Pier Scour

After the flood event in 2011, bed level measurements were carried out revealing a significant loss of bed material. There was no indication of when this scour had occurred since there was no previous additional survey since the time of the bridge construction in the 1930s. There was a reduction of the bed level of the river of up to 5 m since the 1930s.

There is less than 4 m of material over pile at piers 3 and 4 with a minimum of 0.7 m at pier 3. The scour has resulted in a potential threat to the structural integrity of the bridge.

It is noted that pier 3 has been repaired previously. The reason for the repairs is unknown, but the repairs may have been related to previous scour problems that were not reported.

Repeated sounding dips indicate that the gravel bed of the North Pine River has been relatively stable since the scour was first noted immediately after the flood. There may be some movement in the bed caused by the high water level variation from tidal flows.

This scour across the width of the river is a serious risk to the bridge, though it is not known whether the scour occurred in the 2011 flood, in an earlier flood or over a period of time.

6.3 South Bound Bridge

6.3.1 Introduction

The deck level of the south bound bridge is 5.9 m AHD and the bridge is on a 15° skew. This deck level is higher than the deck level of the upstream north bound bridge so the combination of the two bridges causes a significant blockage of the flow when the flood level is above the soffit level of the north bound bridge. The narrow section between the two bridges means that only minor flows can flow over the north bound bridge and then under the south bound bridge.

The raised approaches on the northern side of the bridge suffered significant scour damage during the 2011 flood. A longer duration of overtopping of the approach embankments may have resulted in the approaches being totally washed out.

Prior to the overtopping of the bridge there would have been high water pressure differences on the relieving slab road surfaces behind the relieving slab. Lifting or cracking of the pavement surface or relieving slab would have allowed scouring action of the material behind the abutment to occur resulting in the eventual failure of the approach embankment. A build up of flood debris on the guard rail may have exacerbated this effect.

A likely entry point for the water to enter behind the approach embankment would have been where the sewer main passes behind the abutment.

The settlement of the material behind the abutment and sewer pipe headstock may have occurred. Voids in the fill material would have allowed for piping effects assisting in the eventual failure of the approach embankment.

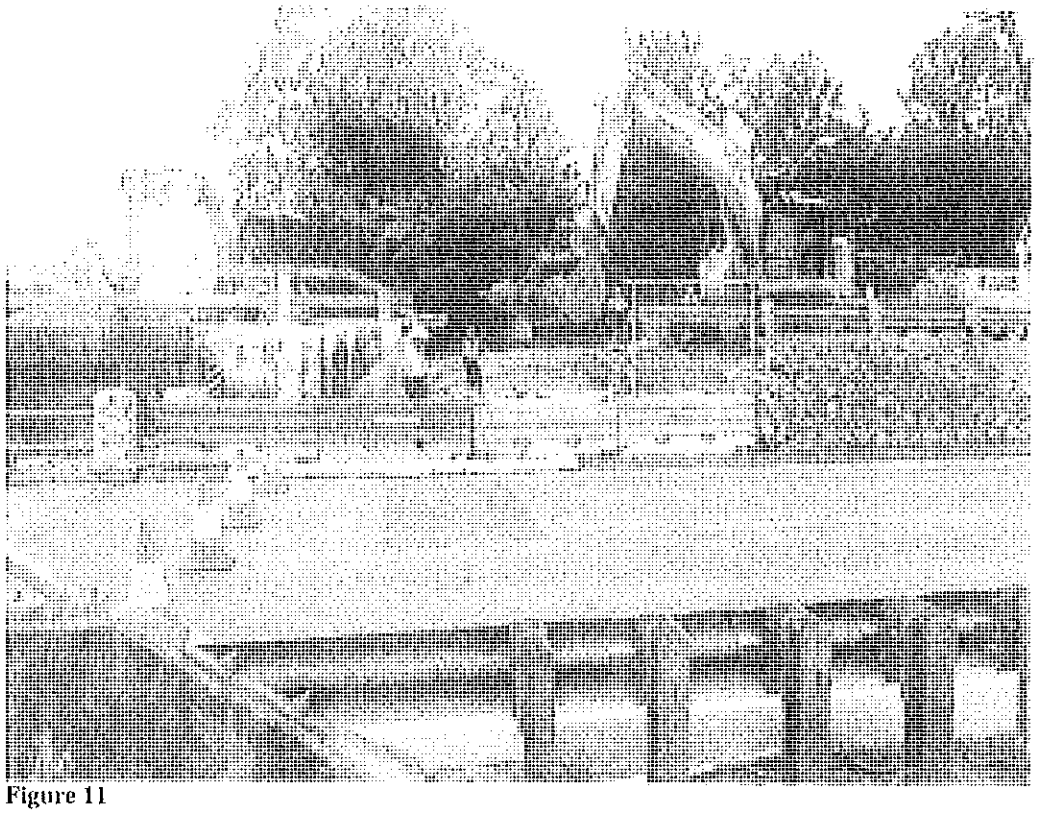


Figure 11

6.3.2 Abutments

Based on observations of the river banks, the bank material and the material at the abutments are prone to slumping failures. If the water levels were to recede relatively quickly after the flood, which based on Figure 3 seems to have been the case, then slumping may have contributed to the cause of scour at Abutment B of the south bound bridge. This is the probable cause of bank failure as Abutment B of the south bound bridge does not seem to have had further scour after 2000.

The scour at Abutment A appears to have been caused by the failure of the approach embankment behind the abutment. Relatively high flow velocities through the bridge may have contributed to the scour at the abutment.

6.3.3 Piers

The piers of the south bound bridge are founded deeper that the piles of the north bound bridge due to advances in construction abilities since 1937. The piles are founded on rock and have more than 4 m of material from the toe of the piles.

While there has also been scour under this bridge, the deeper piles means that the risk to this bridge from failure at the piles is not significant.

7 Recommended Scour Repairs

7.1 Immediate scour management

To manage the scour in the short term it is recommended that gabions be installed at the bridge abutments of both the south and north bound bridges. Gabions are acceptable at the abutments as they are above MHWS so the risk from salt water is reduced. The details of the gabions required are shown in Appendix A.

These gabions will provide immediate protection to the bridge, but will also be adequate for the protection of the abutments in the longer term.

7.2 Long term scour management

The long term scour management works shall include providing protection to the piers from scour and monitoring of the channel bed.

The high velocities estimated at the A. J. Wyllie Bridge would require significant rock sizes to provide scour protection. An estimated velocity of 5.5 m/s under the bridges requires the equivalent of a 2 m layer of 2 tonne (1.15 m diameter) rocks.

A number of options have been investigated for the long term scour management in the river bed. These options are described in Table 2.

The scour protection measures recommended for the river bed to protect the bridge piers are shown in Appendix A.

Monitoring of the river bed shall take place after every significant rainfall event where the north bound bridge is overtopped. Sounding dips will indicate if any damage has occurred to the scour protection. Inspection of the abutment protection is also required.

Table 2: Scour protection options

	A-Jacks PREFERRED OPTION	Dumped Rock	Eclorock (grout mattress/bag)	Articulated Blocks	Gabions
Pros	◦ Normally used as coastal scour protection ◦ Precast segments used ◦ Finer material can fill in gaps between Jacks ◦ Smaller jacks can be tied to larger jacks – helps to fill ◦ Previously used at bridge piers	◦ Commonly Used ◦ Natural product ◦ Finer material can fill in gaps between rocks ◦	◦ Normally used as coastal scour protection ◦ Already used at the bridge abutments	◦ Flexible ◦ Easy to install (roll out layer)	◦ Familiar with use/construction ◦ Finer material can fill in gaps between gabions ◦
Cons	◦ Large products required ◦ Will need to be placed from a barge/crane ◦ may need to be tied together. ◦ Large size may damage piers ◦ May be costly ◦ Will need to be manufactured before placement.	◦ Will need to be placed from a barge/crane ◦ Difficult to source the large rocks required ◦ Large size may damage piers	◦ Difficult to Place/fill underwater ◦ May result in environmental problems during construction if the concrete/grout is spilt. ◦ Will need to be placed from a barge/crane	◦ Product not available in Australia. ◦ Not certain about the flow velocities that this product is suitable for. ◦ May not be heavy enough ◦ Will need to be placed from a barge/crane ◦ Cables not durable	◦ Not suitable in gravel bed streams/ saline environments/ in permanent water ◦ Difficult to place in water ◦ Will need to be placed from a barge/crane ◦

8 Conclusion

This report has discussed the issues related to the scour damage for the bridge that occurred in the flood in January 2011 and provided details of options for the protection of the bridges and management of the scour risk.

There are several possible causes of scour damage to bridges and the A. J. Wyllie Bridge shows several of these possibilities.

The most significant cause is the constriction of the river channel, where the approach embankments of the bridge block a significant portion of the floodplain. This blockage is exacerbated by the levels of the two bridges, where the flow is blocked by the decks of the two bridges from the soffit of the north bound bridge to the top of the safety barrier of the south bound bridge.

Based on observations, the length of the bridge should be longer or there should be additional waterway area on the approach embankments to reduce the constriction in flow across the floodplain. As well, if the two bridges were at the same level, this would also reduce the blockage of the flow path, and the velocity through the bridges. These options are not possible so protection of the river bed and the bridge abutments must be provided.

This report provides the basis for the development of the recommended scour protection measures.

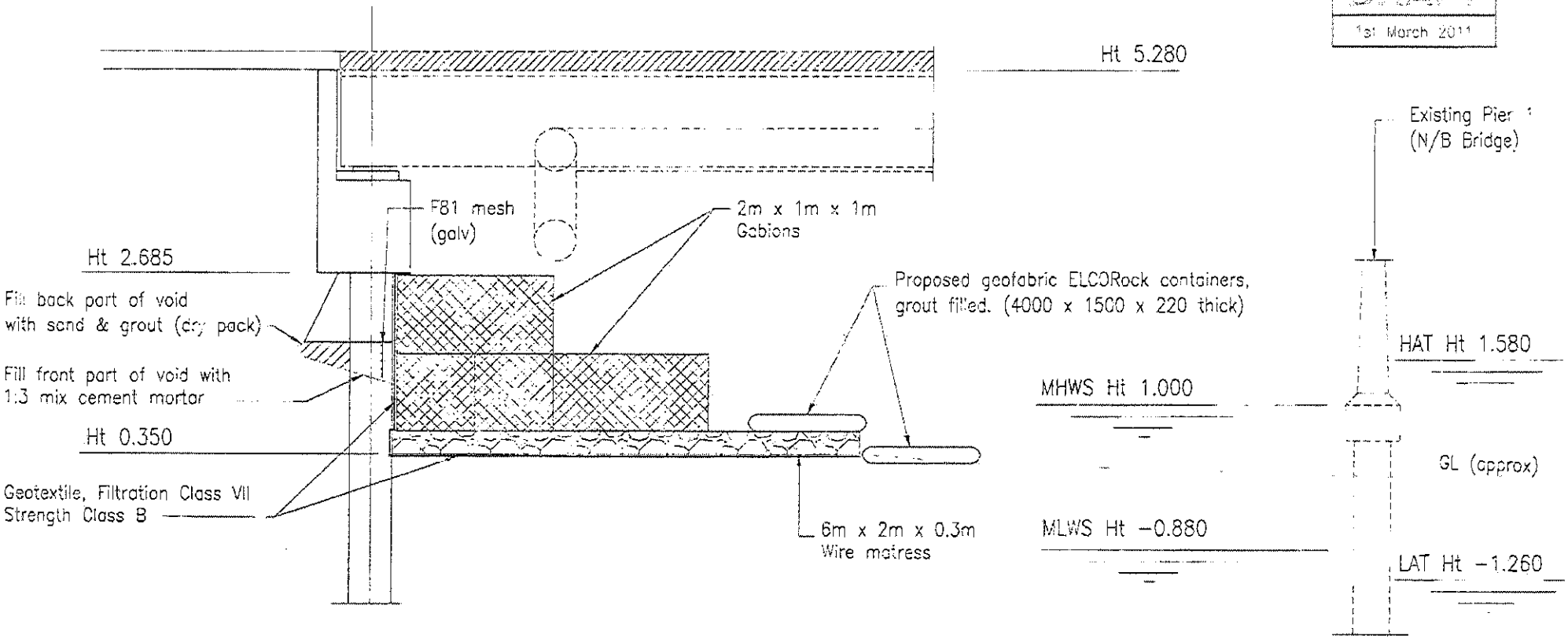
9 References

- Cardno Lawson Treloar, "Master Plan Stormwater Management Strategy", 2010
- Cardno Lawson Treloar, "BMD/ Boral North Pine Lakes Lawnton", 2006
- Lawson and Treloar Pty Ltd, "Lawnton Quarry Redevelopment Stages 1 and 2 Stormwater Management Strategy", 2004
- Worely Parsons, "Lower Pine River Flood Study", 2009

Appendix A

Proposed Scour Protection Design

DRAFT
1st March 2011

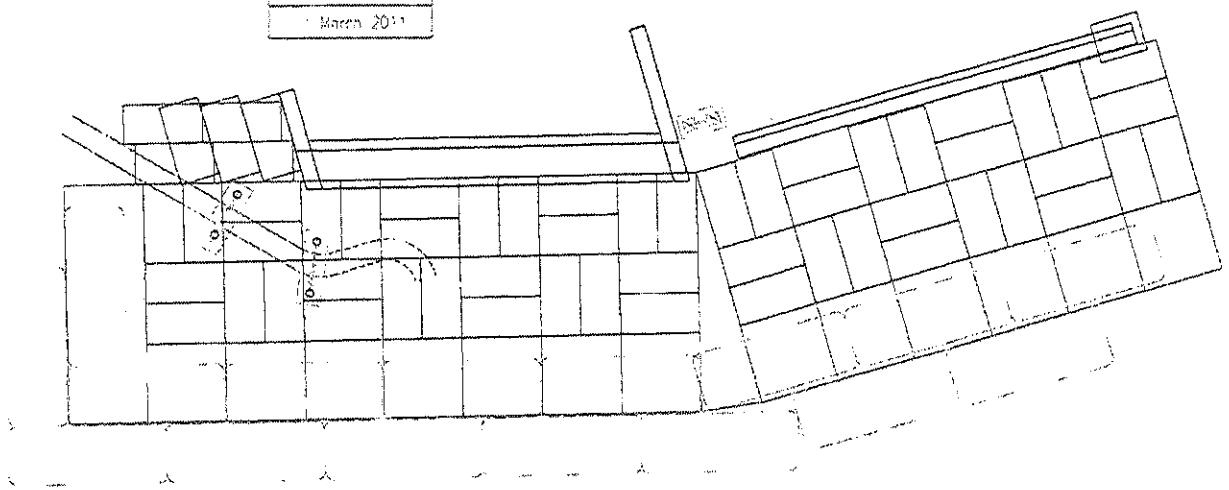


SECTION – ABUTMENT A
(SOUTHBOUND BRIDGE SHOWN)
(NORTHBOUND BRIDGE SIMILAR)

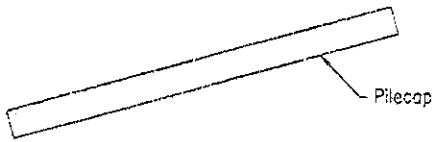
0 1000 2000mm

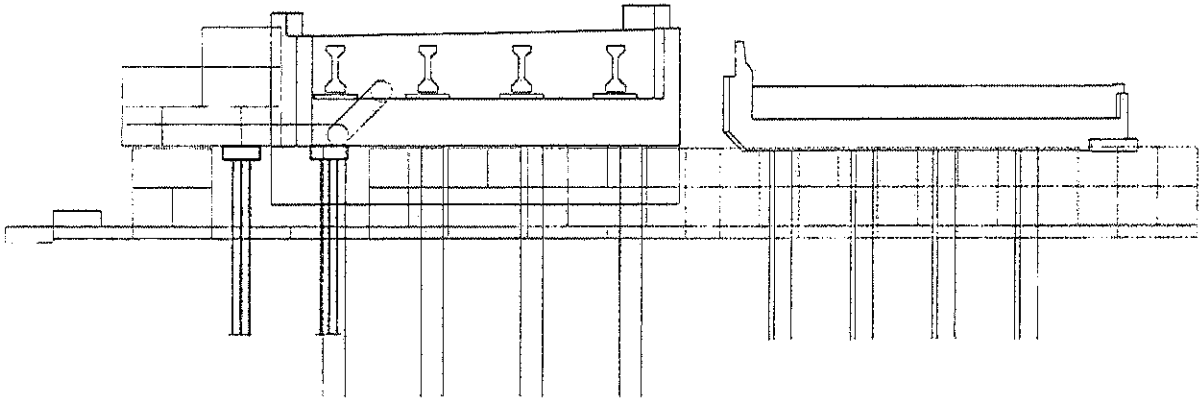
Drawing No :- SK-3
Series No :- 03 of 06

DRAFT
March 2011



PLAN ABUTMENT A





ELEVATION ABUTMENT A

Drawing No :- SK-4
Series No :- 04 of 06

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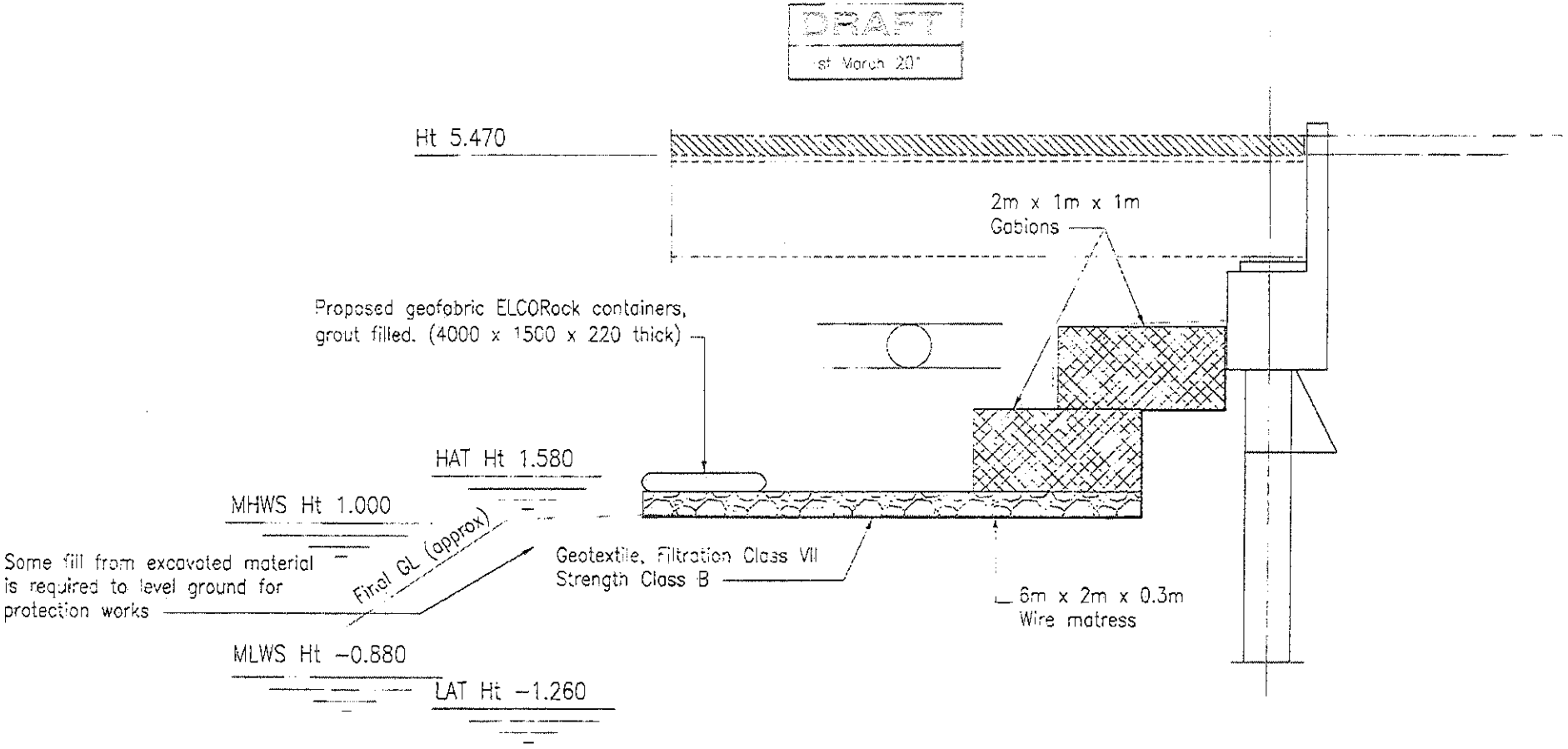
st March 20"

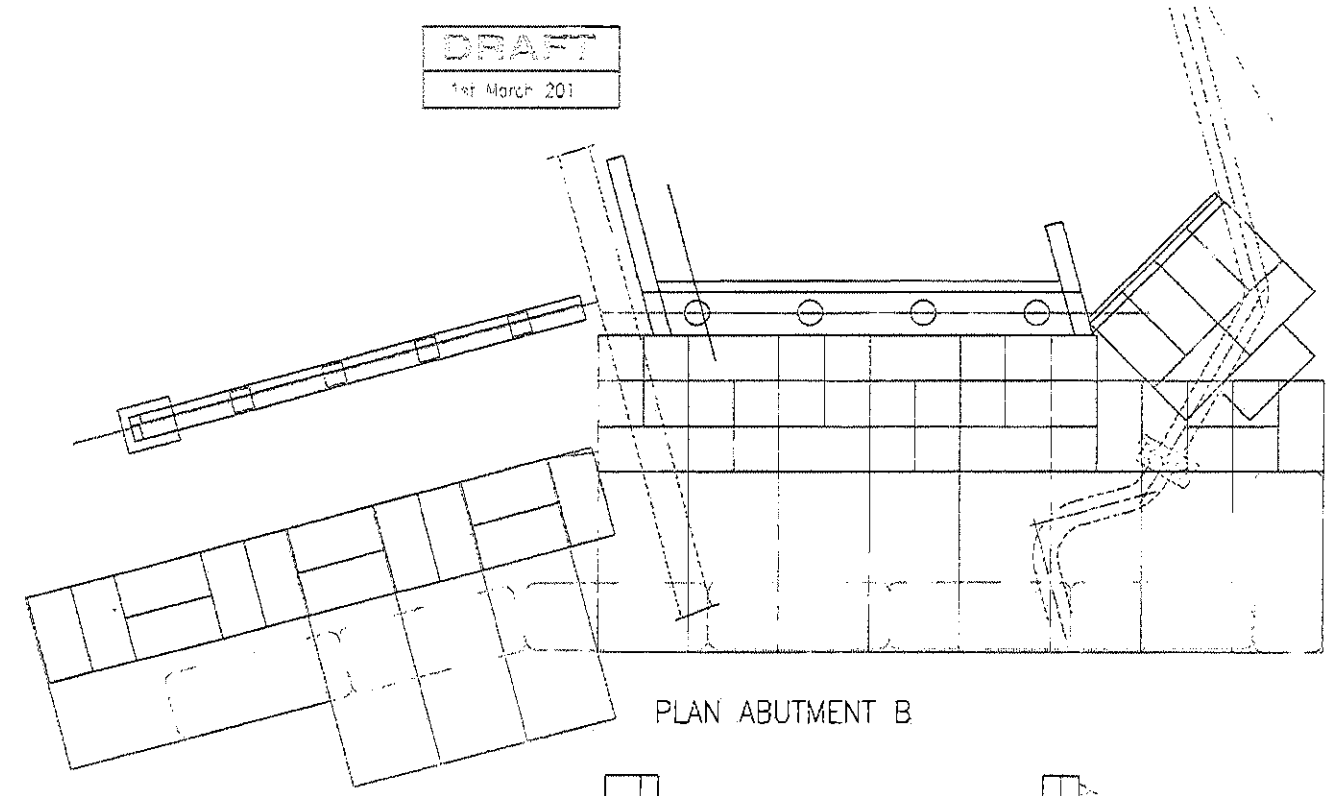


SECTION – ABUTMENT B
(SOUTHBOUND BRIDGE SHOWN)
(NORTHBOUND BRIDGE SIMILAR)

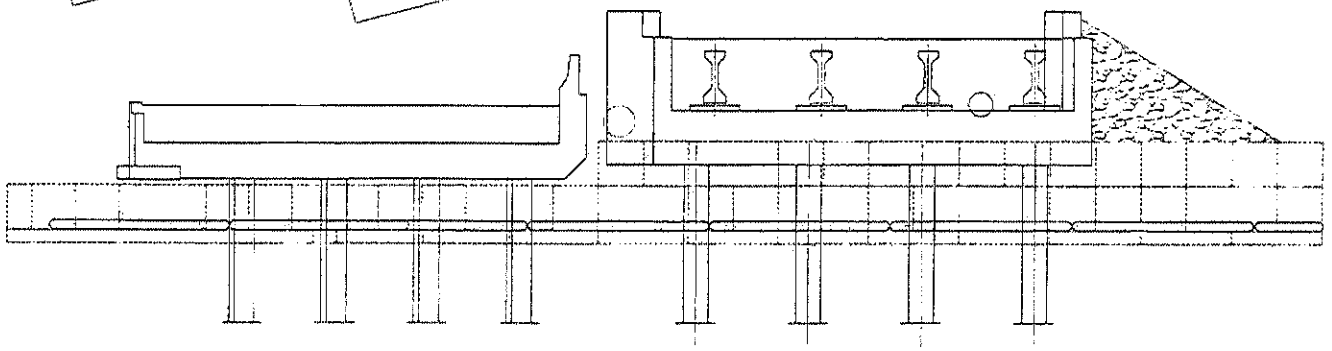
0 1000 2000mm

Drawing No :- SK-5
Series No :- 05 of 06

DRAFT
1st March 201

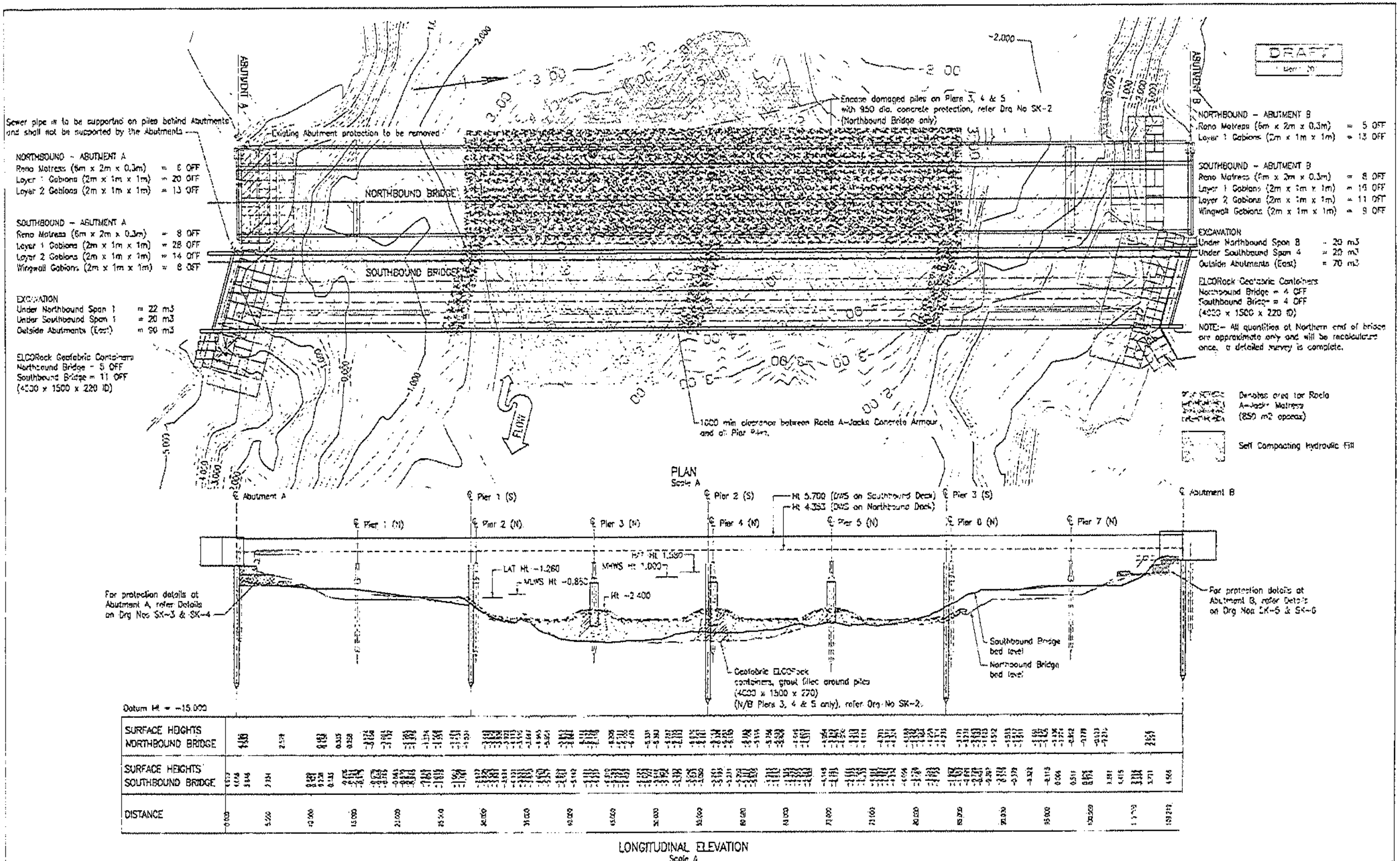


PLAN ABUTMENT B



ELEVATION ABUTMENT B

Drawing No :- SK-6
Series No :- 06 of 06



BRIDGE DESIGN CRITERIA: DESIGN CODE: AS 5100-2004 | DESIGN LOADING: SM1600 and HLP400 | DESIGN SPEED: 100 km/h | EARTHQUAKE ZONE: BEDC-1 | BARRIER PERFORMANCE LEVEL: Regular | BRIDGE TYPE: PSC Deck Units | BIS No: 1...

Revisions | Certified | Date | Microfilm | Associated Job Nos | Auxiliary Drg Nos | Survey Data: Horiz. Datum, Height Datum, Survey, Photo | GDA

Scales: A 0 2 4 6 8 10m

AJ WYLLIE BRIDGE SCOUR PROTECTION

GENERAL ARRANGEMENT

Reference Points: Preceding RP | Dist. to start of job (km) | From start to end of job | From end to Following RP | Following RP

Drawing | Design | Design Review | Engineering Certification | For scheme approval status refer Drg. No.

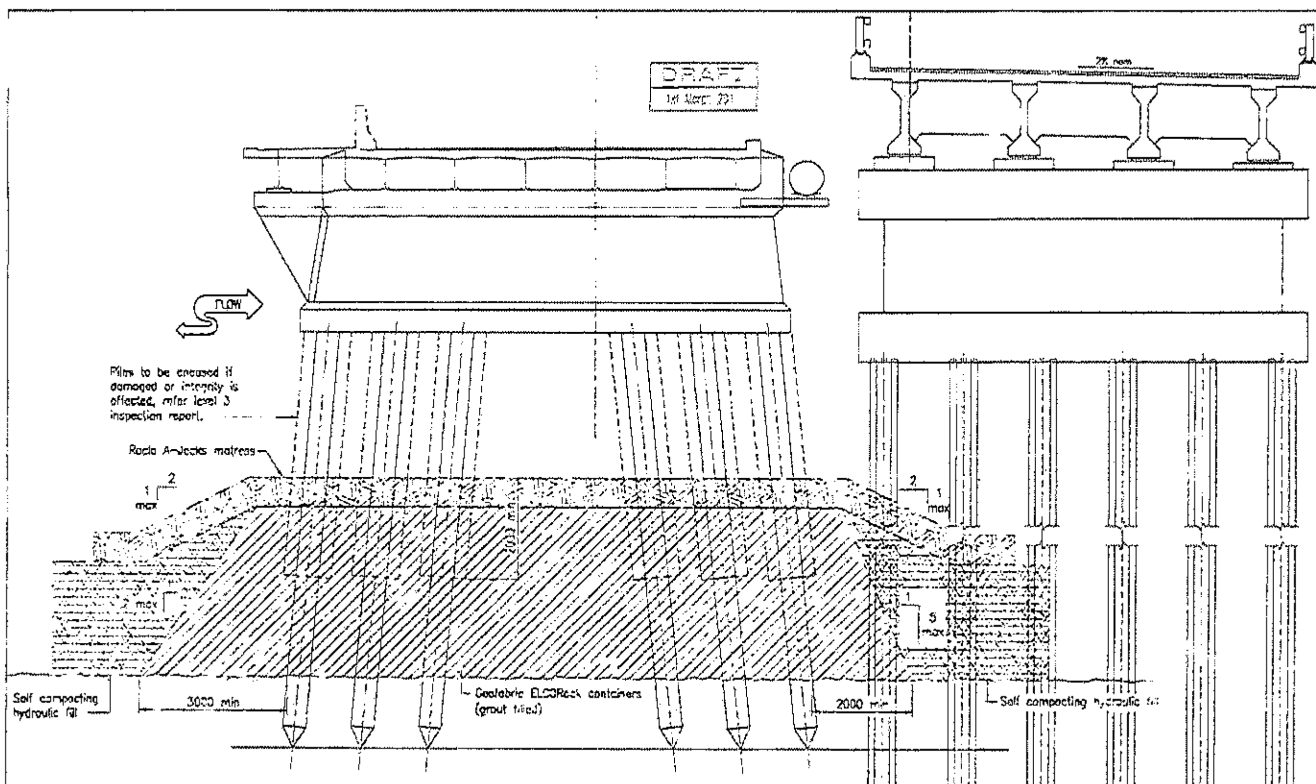
RPEQ No.

Queensland Government
Department of Transport and Main Roads

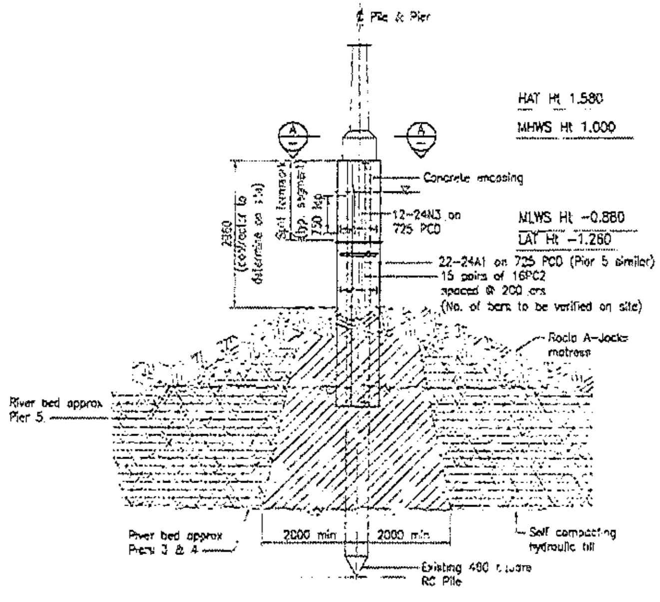
Job No.
Contract No.
Drawing No. SK-1 A
Series Number BR01- 01 of 25

A Original Issue A1/A3

DRAFT
1st March 2011

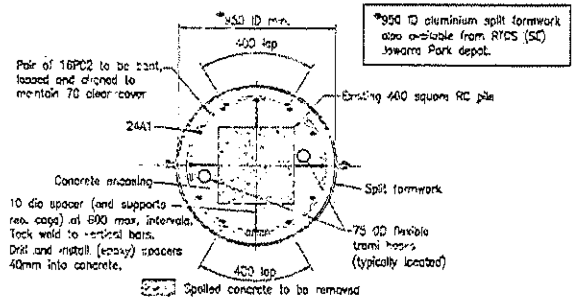


ELEVATION – PIERS 3, 4 & 5 PILE REPAIRS
NORTHBOUND BRIDGE
Scale A

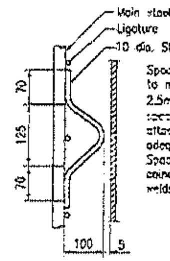


END VIEW

*950 ID aluminium split formwork also available from RTCS (SC) Jowarra Park depot.



VIEW A
Scale B



SPACER DETAIL
NTS

CONCRETE MIX DESIGN:

The following details are supplied for the concrete encasement mix design:

1. Grade 50MPa/10mm
2. Slump 125mm dry condition, 150 – 200 mm for concrete placed in wet.
3. Minimum 20% fly ash by mass of total cementitious
4. Maximum shrinkage 600 microstrain at 56 days
5. Must be pumpable mix
6. Use anti-washout chemical admixtures only if required. However trial first without admixtures and measure performance before deciding.
7. Maximum w/c = 0.40

SEQUENCE OF REPAIR TO PILES

1. Scrape to remove all marine growth and loose material. Remove spalling concrete from existing piles to ensure 20mm clear behind reinforcing bars.
2. Place the formwork to firmly bed into the river bed.
3. Pump concrete using a flexible tremi hose.

NOTES

1. Concrete class to be S50/20.
2. Cover to reinforcing steel to be 70mm unless shown otherwise. Exposure classification C.
3. Steel reinforcement to be read in conjunction with Drgs No 1043 and 1044.
4. All welds to be SP category.
   Welding symbols conform to AS 1101.3.
   Welding of bar splices to conform to AS/NZS 1554.3.
   Tack welding for location purposes to conform to AS/NZS 1554.3 Clauses 3.3.1 and 3.3.2.
   Welding consumables to be E4816, E4818 or W50X.
   Welding shall not be carried out within 75mm of any bent portion of the bar.

BRIDGE DESIGN CRITERIA: DESIGN CODE: AS 5100-2004 | DESIGN LOADING: SM1600 and HLP400 | DESIGN SPEED: 100 km/h | EARTHQUAKE ZONE: BEDC-1 | BARRIER PERFORMANCE LEVEL: Regular | BRIDGE TYPE: PSC Deck Units | BIS No:

Revisions | Certified | Date | Microfilmed | Associated Job Nos | Survey Data: Horiz. Datum, Height Datum, Survey Books | Auxiliary Drg Nos

A | Original issue A1/A3 | RPEQ

GDA

Scales: A 0 1000 2000mm; B 0 250 500mm

Reference Points: Preceding RP | Cnt. to start of job (km) | From start to end of job | From end to following RP | Following RP

AJ WYLLIE BRIDGE SCOUR PROTECTION
PROPOSED PILE PROTECTION (PIERS 3, 4 & 5 Nth/Bnd Bridge)

Drawing x Checked x | Design x Verified x | Design Review | Engineering Certification | For scheme approval status refer Drg. No.

C Sweeting | 1/3/11

Queensland Government
Department of Transport and Main Roads

Job No.
Contract No.
Drawing No. SK-2 A
Series Number BR01– 02 of 05

Annexure J

Ministerial briefing AJ Wyllie Bridge dated 14 February 2011

Department of Transport and Main Roads
Meeting Brief
MBN14474

To: Minister for Main Roads

Date: 14 February 2011

SUBJECT: The meeting will take place at 2.30pm on 17 February 2011 at Parliament House Room A36.	
REQUESTED BY: JESSICA PUGH	**Due date** 11 February 2011

Minister ....
Date ...../...../.....

Details of the Meeting

- You are meeting with Ms Mary-Anne O'Neill MP, Member for Kallangur.
- The meeting will take place at 2.30pm on 17 February 2011 at Parliament House Room A36.
- Departmental representative to attend the meeting with you is Mr Derek Deane, District Director (Moreton), phone [redacted]
- The primary purpose of the meeting is to discuss the recovery process for the flood-damaged A J Wyllie Bridge, on Gympie Road, Petrie, and also discuss the Kallangur Bypass.

Background:

A J Wyllie Bridge

- The A J Wyllie Bridge on Gympie Road at Petrie suffered significant damage as a result of recent flooding and was initially closed to all traffic.
- The bridge consists of two northbound lanes (low bridge) and two southbound lanes (high bridge). Both of these were closed following storm and flooding events and traffic was diverted via the Bruce Highway or Youngs Crossing Road. On one occasion Youngs Crossing Road was also closed due to release of water from the Pine River Dam.

Action Officer:	**Endorsed by:**	**Endorsed by:**
Derek Deane	Shane Doran	Emma Thomas
District Director (Moreton)	A/General Manager (Assets &Operations)	Chief Operations Officer
Tel: [redacted]	Tel: [redacted]	Tel: [redacted]
Date: 11 February 2011	Date: 11 February 2011	Date: 14 February 2011

- Transport and Main Roads gave high priority to restoring connectivity on the bridge. Emergency repairs were undertaken which enabled the re-opening of the southbound lanes to one lane of traffic in each direction on 25 January 2011.
- Damage to the southbound bridge included scouring around the abutments at both ends of the bridge, damage to the embankment shoulders at the northern approach and damage to lighting ducts and cables.
- Design is underway for the replacement of abutment protectors on both the northern and southern ends of the bridge.
- Damage to the northbound bridge includes major scouring around the piles on two of the piers and minor scouring at the southern abutment. The northbound bridge remains closed.
- It is still safe for pedestrians and cyclists to use the low bridge to cross Pine River.

Kallangur Bypass

- In October 2010, Ms O'Neill requested information from Transport and Main Roads on behalf of a constituent about Kallangur Bypass. Ms O'Neill was informed that a proposal exists for a bypass of Kallangur that would form part of a transport corridor from Petrie to the Bruce Highway.
- The transport corridor contains the Moreton Bay Rail Link with the Kallangur Bypass alongside (Attachment 1).
- Ms O'Neill was informed that the proposed Kallangur Bypass has not been adopted at this stage and has no funding allocated to it. She was told that the bypass is being further considered as part of a transport study covering the Moreton Bay Regional Council area.
- Also in October, the department provided similar information for the minister in MBN14003 about the East Petrie Bypass, which is the first leg of the Kallangur Bypass, from Gympie Road to Dohles Rocks Road.

Issues and suggested approach

A J Wyllie Bridge

- High priority is now being given to works to enable the re-opening of the northbound bridge.
- Design to repair damage on the A J Wyllie Bridge was completed 9 February, 2011 and now a program of works will be finalised.
- Bridge load testing and detailed inspections are currently being undertaken to assess whether the northbound bridge can be opened ahead of the full repair works being completed.

- A timeframe for re-opening the bridge has not yet been determined. The factors influencing the re-opening are complex and also include possible future wet-weather events which could require release of more water from Pine River Dam.

Kallangur Bypass

- The proposed Kallangur Bypass is not currently funded but it is being considered as part of the Moreton Integrated Transport Study (MITS). This is a significant study being undertaken by Transport and Main Roads and the Moreton Bay Regional Council of all transport issues in the Moreton region.
- MITS will address transport needs up to 2031 and beyond. It is due for completion mid-2011 and will form a sound basis for transport planning for future years.
- The Moreton Bay Rail Link is expected to significantly improve public transport usage in the region and reduce high levels of reliance on private vehicles. The Kallangur Bypass proposal will also be guided by outcomes of the Moreton Bay Rail Link completion.
- In the short term, the department continues to look for ways to improve the efficiency of the Petrie Roundabout.

Consultation with Stakeholders

- Quest community newspapers in the Pine Rivers area have had strong interest in the A J Wyllie Bridge and also moderate interest in the Kallangur Bypass.

Financial Implications

- N/A.

Employment impacts

- N/A.

Political Representatives

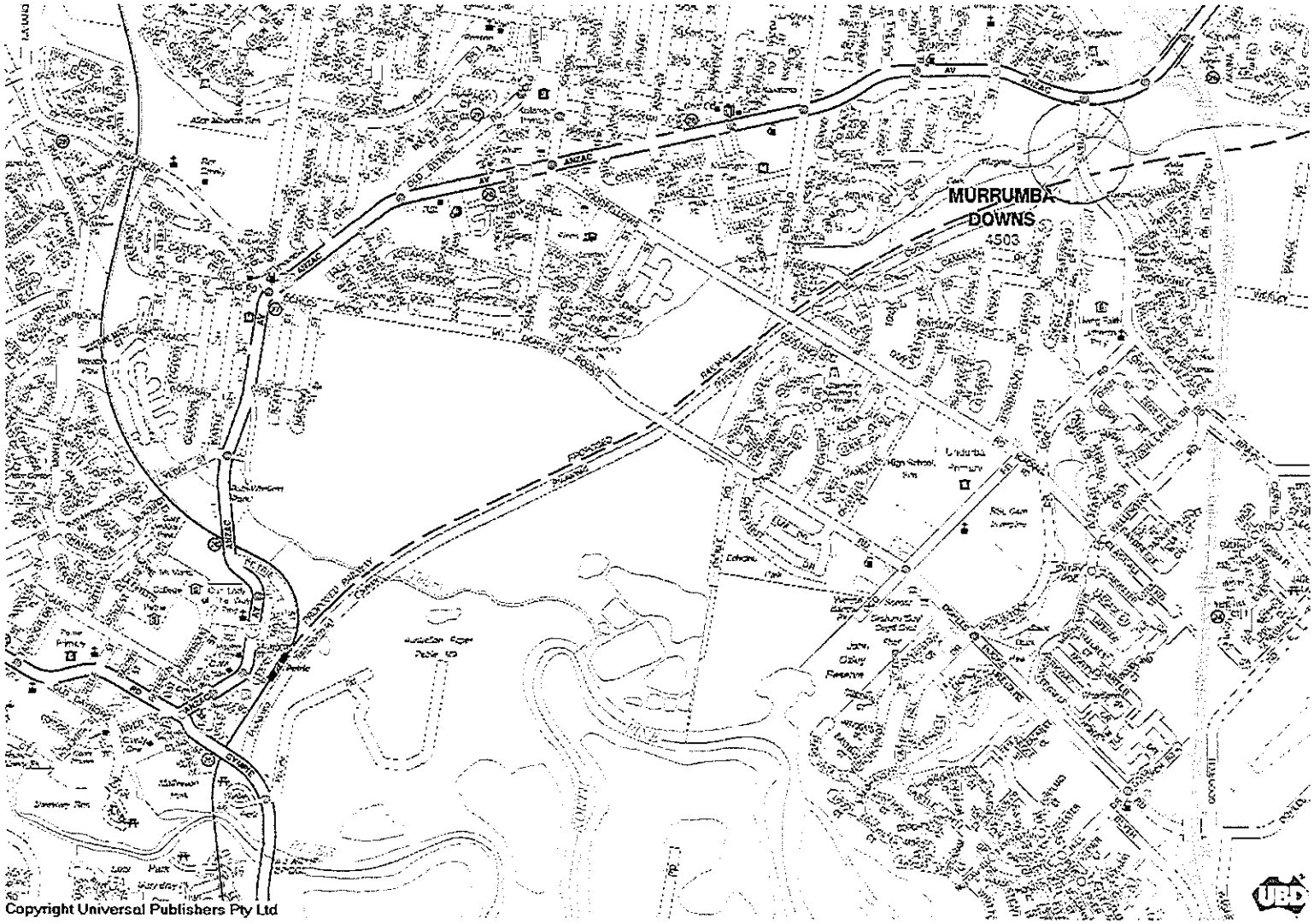
Local Government

Moreton Bay Regional Council:
Division 7 councillor David Dwyer

State Government
Member for Kallangur Mary-Anne O'Neill MP
Member for Pine Rivers Carolyn Male MP

Federal Government
Member for Dickson Peter Dutton
Member for Petrie Yvette D'Ath

Minister's comments: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Annexure K

Reports and briefings – Lockyer Creek Bridge

REF. NO. PS9573

810/734

RECEIVED SOUTHERN DISTRICT
FILE 810/717

OFFICER	ACTION	COPY
DJP		

Queensland Government

Memorandum

Department of Main Roads

Our ref 810/163
Your ref E32433 810/717
Date 23 February 2006

To District Director (Southern)

Attn. David Prout

Subject **Approval of Project Concept**
Forest Hill - Fernvale Road
Lockyer Creek bridge and approaches
Job No. 52/412/12

[redacted] 17/3/06

I am approving the concept of a new bridge over Lockyer Creek on the Forest Hill – Fernvale Road to be on a minor realignment to the east, with an improved vertical alignment that smooths the obvious "dip".

I don't consider flood immunity to be a criterion that drives this project. But I acknowledge that the existing bridge is situated within a low level sag, and it does overtop. To lift the bridge (approximately 5 metres) to span from high bank to high bank as your propose, I'm sure will incur considerable additional cost to the project.

The extent to which the bridge needs to be lifted for improved immunity needs to be balanced against the requirements for an improved vertical geometry that satisfies sight distance, riding comfort and visual standards. The result should be a "fit for purpose" solution.

This can be explored by the alliance project team during the planning phase.

I am attaching photocopied extracts from the business case report as evidence of my approval. Contrary to normal practice, the ARRP project team will hold the original report for the duration of the ARRP project. It will be returned to your district records when the project is completed.

[redacted]

Bruce Ollason
Executive Director (Southern Queensland)

Enc (1)

Southern Queensland Region
Regional Office
Floor 1 Toowoomba Main Roads Building
1-5 Phillip Street Toowoomba Queensland 4350
PO Box 645 Toowoomba Queensland 4350

Enquiries Geoff Crozier
Telephone [redacted]
Facsimile

1

Calculation/Sketch Sheet

Queensland Government
Queensland Transport and Main Roads

Job Title: Lockyer Creek   Job/File No. 52/412/12

Subject: Business Case Review

District Recommendation: Option 2. new bridge / new alignment

Estimate Comparisons:

- appears balanced towards option 2.
  opt 2 would require small side tracks at both ends to accommodate joining back on – $200000
  opt 1 would require permanent signs diverting onto shire roads. ~~$30,000~~ ?
  + $35,000 maintenance of local roads

- [illegible] for ~~the~~ option 2 look light for 600 m of approaches

Forecast [illegible]: $2.8 M Programmed: $2.7M

Comment: I know from discussions with Dave Prout & R[illegible] B[illegible] that the site is not particularly conducive for bridg[e] replacement. I would ask [illegible] for specialist advice [illegible]

→ Roni view?

[redacted]

1/ ~~APM~~ BOI to sign
2/ S[illegible] to update
3/ Letter
4/ File

PM Comments

Likely to be dropped from ARRP – is ~~this~~ current comment?

no DG countered steering c'ttee decision.

[redacted] original list of 31 bridges to be adhered to 12/12/06.

Designed by and Date / /   Verified by and Date / /   Page no.   Next Page no.

Corporate Forms Form M1208 May 1997

Road Infrastructure

Abridged Business Case

Queensland Government
Department of Main Roads

This form is to be included for submission of Improvement (capital) and Periodic Preservation (reseals, rehabilitation) projects

1. Details of Proposed Project:

Electorates:	State	Lockyer	Local Government:	Esk Shire
	Federal	Blair	Main Roads District:	Southern

Road Name: Forest Hill - Fernvale Road

Section: Lockyer Creek - Lyons Bridge

Project Number: 52/412/12

Project Location: 25.38 km from Forest Hill – just west of Lowood township.

Project Name: Replacement of existing timber bridge over Lockyer Creek

2. Identified Project Need:

Replacement of existing timber bridge on significant freight routes

3. The Origin of the Need:

Increased maintenance and rehabilitation costs (B.I.S. score = 11289#) (#Rehabilitation of the existing timber bridge has been completed since this assessment) what rehab was done – new plywood deck?

4. Outcomes (a clear statement of requirements and the expected functionality of completed project):

Replacement of existing 6/9.1 spans x 7.3m wide timber bridge with a reinforced concrete bridge (8.6 m between kerbs) what traffic volumes ∴ what width.

The proposal is to reinstate this section of the road to an acceptable standard capable of carrying freight efficient vehicles. This falls within the objectives of the ARRP. ✓

5. Out of Scope (list identified items that will not be delivered as part of this project):

6. Aligns with Investment Strategies / Link Development Plans: Yes ☐ No

Comment if No:

AADT @ 2004 (9-10% HV) – minimal growth. assume 2% / annum
= 1200 vpd. → 1800 vpd
from table 7.18
bridge width (>20m long) : 6.5m + 2x1.0 = 8.5m (between kerbs)

7. Risk Identification - *Major factors which could significantly influence the timing, cost or project scope*

Refer attached Risk Register

8. Option Analysis / Recommended Treatment

Options considered :-

1. Construction of new bridge on existing horizontal and new vertical alignments — deep gully not feasible due to earthwork
2. Construction of new bridge on new horizontal and new vertical alignments (Refer Appendix D)

Recommendation : Option 2 - Improves the horizontal and vertical alignments at no additional cost

9. Preliminary Costing:

$2.5 million - Refer attached Concept Estimate

10. Sensitive Issues / Community Opinion / Commitments, including any made to Developers:

11. Additional Comments:

Bridge to be funded under the ARRP program. Road forms a significant link between the Lockyer Valley and Brisbane Valley areas and carries a significant number of heavy vehicles carrying produce.

12. Attachments:

A. Concept Estimate
B. Risk Register
C. Locality Plan
D. Original construction drawings - showing proposed alignment
E. Original bridge drawings

13. Recommendation

Bridge - 5 x 16m spans X 8.6m between kerbs

Immunity - Local knowledge indicates that the western bank of Lockyer Creek was inundated in the 1974 and 1996 floods (original flood level shown above the existing eastern bank but below the western bank on the working plans dated 1958)

- raise bridge to bank level on the eastern approach
- Cultivation - no anticipated afflux issues — what about erosion on cultivated fields - loss of topsoil?
- Existing sag vertical curve on the eastern approach to the bridge site to remain for larger floods

Road - Length approximately 600m

- 8.0 m formation (Refer Route Assessment guidelines)
- Horizontal curve on the eastern approach to be increased to R300m (will provide a transition between the R600 curves in the cultivation areas on the western side to the R200m curve on the eastern side adjacent to the semi-urban outskirts of Lowood).

14. Actions				
	Submitted	Noted	Recommended	Approved
Comment:				
Signature:	[redacted]			
Date:	19/5/05	19/5/05	19/5/05	6/7/06
Title:	Project Coordinator	Manager (Infrastructure Delivery / Transport Planning)	District Director	Executive Director (Southern Queensland)

A. Concept Estimate

Job Number 52/412/12 - Lockyer Creek - Lyons Bridge

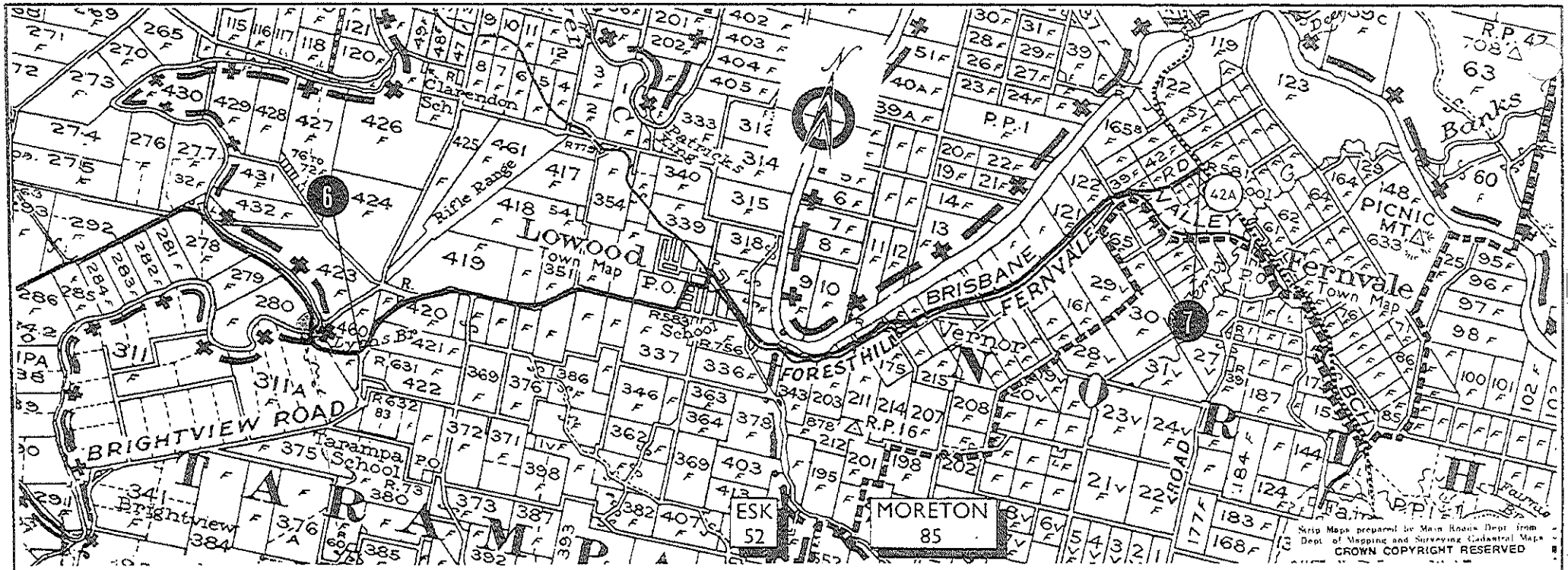
			Off line - at eastern bank level			On line - at eastern bank level		
			Qty	Unit Rate	Amount	Qty	Unit Rate	Amount
	PROVISION FOR TRAFFIC MRS11.02							
1201.01	Provision for traffic	lump sum			20000			30000
1202.01	Preparation of Traffic Management Plan	lump sum			1000			1000
1211.01	Maintenance of existing shire roads used as an alternative route	lump sum			0			85000
	DRAINAGE, RETAINING STRUCTURES AND PROTECTIVE TREATMENTS MRS11.03							
	REMOVAL/DEMOLITION MRS11.03							
2101.01	Removal or demolition of culverts, complete	lump sum						
2102.01	Removal or demolition of culvert end structures	lump sum						
9910	Removal of existing bridge - Incl salvage	lump sum			30000			30000
	SUPPLY AND INSTALLATION OF CULVERTS MRS11.03							
2241.01	Supply and installation of concrete pipe culvert components, complete	m						
	CONCRETE IN CULVERTS AND END STRUCTURES MRS11.03							
2302.01	Concrete bases in culverts	m3						
2308.01	End structures to culverts, reinforced concrete	m3						
2309.01	End structures to culverts, unreinforced concrete	m3						
2313.01	Aprons to culverts, reinforced concrete	m3						
2314.01	Aprons to culverts, unreinforced concrete	m3						
2317.01	Precast concrete end structures to culverts, [size]	each						
	PROTECTIVE TREATMENTS MRS11.03							
2845.01	Steel-wire mattress protection work	m2						
2851.01	Bridge abutment protection Type 1 - rock spillthrough, [location] abutment	each			20000			20000
	EARTHWORKS MRS11.04							
	EARTHWORKS, PREPARATION MRS11.04							
3101.01	Clearing and grubbing	m2			5000			2500
3102.01	Bridge site preparation	m2			5000			5000
3103.01P	Stripping of topsoil (Provisional Quantity)	m3	100	5.00	500	25	5.00	125
3104.01	Ground surface treatment under embankment, standard	m2						
3109.01P	Excavation and disposal of Unsuitable Material under embankment, if ordered (Provisional Quantity)	m3	250	20.00	5000	50	20.00	1000
	EARTHWORKS, EXCAVATION MRS11.04							
3201.01	Road excavation, all materials	m3	1000	7.00	7000	200	7.00	1400
	EARTHWORKS, EMBANKMENT MRS11.04							
3501.01	Road embankment using general fill material from all sources	m3	4500	10.00	45000	500	10.00	5000
	EARTHWORKS, SUBGRADE MRS11.04							
3402.01P	Subgrade in cuttings, subgrade treatment Type A, compact existing, if ordered (Provisional Quantity)	m3	20	7.00	140	20	7.00	140
3421.01	Subgrade in embankment	m3	100	7.00	700	25	7.00	175
	EARTHWORKS, BACKFILL MRS11.04							
3501.01P	Backfill with general backfill material to [description]	m3						
3503.01P	Backfill with free draining granular material to bridge	m3			1000			1000
	EARTHWORKS, TURNOUTS AND ENTRANCES MRS11.04							
3501.01	Turnouts	m						
3502.01	Entrances to private property	m			0			0
	UNBOUND PAVEMENTS MRS11.05							
4101.01	Base, unbound pavement	m3	650	80.00	52000	350	80.00	28000
4102.01	Subbase, unbound pavement	m3	1450	75.00	108750	775	75.00	58125
	SPRAYED BITUMINOUS SURFACING (EXCLUDING EMULSIONS) MRS11.11							
5101.01	Prime	m2	5350	4.00	21400	2700	4.00	10800
5103.01	Seal	m2	5350	5.00	26750	2700	5.00	13500
	ROAD FURNITURE MRS11.14							
	REMOVAL, DEMOLITION AND RE-ERECTION MRS11.14							
6101.01	Demolition of road furniture	lump sum			500			500
	GUIDANCE AND INFORMATION SYSTEMS MRS11.14							
6111.01	Road edge guide posts	each	20	50.00	1000	20	50.00	1000
6121.01	Supply of regulatory, warning and hazard sign faces	lump sum			500			500
6123.01	Supply of direction and information sign faces	lump sum						
6132.01	Installation of regulatory, warning and hazard sign	each			500			500
6133.01	Installation of direction and information signs	lump sum						
6136.01	Erection and removal of project signs	lump sum			2000			2000
	ROADSIDE STRUCTURES MRS11.14							
6161.01	Steel beam guardrail, w beam	m			30000			30000
	LANDSCAPE WORKS MRS11.16							
3862.01	Grass seeding, mix [mix type]	m2			200			200
	CONTRACTOR'S SITE FACILITIES AND CAMP MRS11.28							
1101.01	Contractor's site facilities	lump sum			20000			20000
1102.01	Contractor's camp	lump sum						
5031.01	Construction of stockpile site	lump sum						
	DENSE GRADED ASPHALT PAVEMENTS/PREPARATION MRS11.33							
5405.01	Dense graded asphalt	tonne			40000			40000
	PAVEMENT MARKING MRS11.45							
	LINE MARKING MRS11.45							
6301.01	Spotting only for longitudinal lines	m			500			500
	ENVIRONMENTAL MANAGEMENT MRS11.51							
1311.01	Preparation of the Environmental Management Plan (Construction)	lump sum			1000			1000
1312.01	Implementation and monitoring of the Environmental Management Plan (Construction)	lump sum			1000			1000
1313.01	Erosion and sediment control management plan	lump sum			500			500
1315.01	Water quality monitoring	lump sum			1000			1000
1316.01	Control of erosion and sedimentation	lump sum			2500			2500
	BRIDGE							
	Bridge - 5 x 16m x 8.6m				1376000			1376000
	Miscellaneous	5.0%			91322			88458
	Sub Total				1917782			1658453
	Supply of Project & Recognition Signs				2000			2000
9310.01	Longitudinal linemarking and pavement markings				1000			1000
	Audit Testing				5000			5000
	Contingency Reserve (from Risk Management Register)				155500			185000
	Resumptions				40000			0
	Preconstruction Costs				70000			70000
	Alterations to services				10000			10000
	Sub Total				283500			273000
	LSL Levy & WH&S Fee				4403			4263
	Administration				176453			176558
	2				2382118			2306584
	Plus Inflation - 2 year @ 2%							
		Say			2480000			2400000

B. Risk Register

RISK REGISTER FOR: Lockyer Creek - Lyons Bridge - Offline						PROJECT No. 52/412/12				$645,000	<<TOTALS>>			$69,000	$155,500	$486,500	
General Details			Initial Values				Values after treatment				Probability Range (%)			Contingency Range			Comments
Ref.	Category	Risk	Likelihood	Consequence	Risk Rating	Treatment Strategy	Likelihood	Consequence	Risk Rating	Estimate ($)	Min.	Likely	Max.	Min.	Likely	Max.	
	Political	Accelerated project - increased precon costs	Likely	Moderate	High	Start design early	Unlikely	Minor	Low	$15,000	10%	10%	70%	$1,500	$1,500	$10,500	
	Political	Change to project priority	Possible	Moderate	High	Project completed and put in-the-drawer	Possible	Minor	Medium	$15,000	10%	30%	75%	$1,500	$4,500	$11,250	
	Stakeholders	Potential scope changes - higher flood levels	Possible	Moderate	High	Consultation early in the planning phase	Possible	Minor	Medium	$200,000	10%	30%	75%	$20,000	$60,000	$150,000	
	Financial	Inaccurate estimates	Possible	Moderate	High	Estimate using historical rates	Unlikely	Moderate	Medium	$40,000	10%	30%	75%	$4,000	$12,000	$30,000	
	Financial	Inaccurate estimates	Possible	Moderate	High	Inaccurate quantities	Possible	Minor	Medium	$50,000	10%	30%	75%	$5,000	$15,000	$37,500	
	Native Title	Lockyer Creek	Likely	Moderate	High	Restrict construction works to within existing road boundaries	Unlikely	Moderate	Medium	$15,000	10%	30%	75%	$1,500	$4,500	$11,250	
	Cultural Heritage	Lockyer Creek	Possible	Moderate	High	Carry out survey early in process	Possible	Minor	Medium	$20,000	20%	30%	70%	$4,000	$6,000	$14,000	
	Public Consultation	none identified to date															
	Flooding	Construction interrupted	Possible	Moderate	High	Program works during dry periods	Possible	Minor	Medium	$15,000	10%	30%	80%	$1,500	$4,500	$12,000	
	Flooding	Wet weather	Possible	Moderate	High	Additional rework	Possible	Minor	Medium	$25,000	20%	30%	80%	$5,000	$7,500	$20,000	
	Project Management	RIP slippage	Possible	Moderate	High	Consult with management	Possible	Minor	Medium	$10,000	10%	30%	80%	$1,000	$3,000	$8,000	
	Assumptions	Nil															
	Workforce Considerations	un-availability of skilled personnel	Possible	Insignificant	Low	Contractor to source skilled personnel	Unlikely	Minor	Low	$50,000	10%	10%	80%	$5,000	$5,000	$40,000	
	Workforce Considerations	un-availability of appropriate plant	Unlikely	Moderate	Low	Check plant availability prior to construction	Unlikely	Minor	Low	$30,000	10%	10%	70%	$3,000	$3,000	$21,000	
	Constructability	Difficulty in constructing under traffic	Possible	Moderate	Medium	Traffic management plan signed prior to works	Unlikely	Minor	Low	$0	10%	10%	80%	$0	$0	$0	
	Constructability	Pile driving encountering old bridge foundations	Possible	Major	High	Detailed investigation at old bridge site	Unlikely	Moderate	Medium	$50,000	10%	30%	80%	$5,000	$15,000	$40,000	
	Environment	Erosion occurring during construction	Unlikely	Moderate	Extreme	Erosion and sediment control plan signed off	Unlikely	Minor	Low	$50,000	10%	10%	75%	$5,000	$5,000	$37,500	
	Utilities	none identified to date	Possible	Moderate	Medium	Dial before you dig	Unlikely	Minor	Low	$25,000	10%	10%	70%	$2,500	$2,500	$17,500	
	Geotechnical	Inaccuracy of drillhole data	Possible	Major	High	Sufficient drillholes to predict foundations	Unlikely	Moderate	Medium	$10,000	10%	30%	70%	$1,000	$3,000	$7,000	
	Materials	Available spoil areas within the road reserve	Unlikely	Moderate	Extreme	Locate areas outside road prior to construction	Rare	Minor	Low	$5,000	10%	10%	70%	$500	$500	$3,500	
	Materials	Unsuitable material in cuttings/subgrade	Unlikely	Moderate	Medium	Testing done to determine material properties	Unlikely	Minor	Low	$5,000	10%	10%	75%	$500	$500	$3,750	
	Materials	Availability of construction water close to job site	Possible	Moderate	Medium	Locate sources prior to construction	Possible	Minor	Medium	$5,000	10%	30%	75%	$500	$1,500	$3,750	
	Traffic Management	Traffic sequencing of through traffic	Unlikely	Moderate	High	Traffic management plan in place prior to works	Unlikely	Minor	Low	$10,000	10%	10%	80%	$1,000	$1,000	$8,000	

RISK REGISTER FOR: Lockyer Creek - Lyons Bridge - Online						PROJECT No. 52/412/12				$670,000	<<TOTALS>>			$70,000	$185,000	$516,500	
General Details			Initial Values				Values after treatment				Probability Range (%)			Contingency Range			Comments
Ref.	Category	Risk	Likelihood	Consequence	Risk Rating	Treatment Strategy	Likelihood	Consequence	Risk Rating	Estimate ($)	Min.	Likely	Max.	Min.	Likely	Max.	
	Political	Accelerated project - increased precon costs	Likely	Moderate	High	Start design early	Unlikely	Minor	Low	$15,000	10%	10%	70%	$1,500	$1,500	$10,500	
	Political	Change to project priority	Possible	Moderate	High	Project completed and put in-the-drawer	Possible	Minor	Medium	$15,000	10%	30%	75%	$1,500	$4,500	$11,250	
	Stakeholders	Potential scope changes - higher flood levels	Possible	Moderate	High	Consultation early in the planning phase	Possible	Minor	Medium	$200,000	10%	30%	75%	$20,000	$60,000	$150,000	
	Financial	Inaccurate estimates	Possible	Moderate	High	Estimate using historical rates	Unlikely	Moderate	Medium	$40,000	10%	30%	75%	$4,000	$12,000	$30,000	
	Financial	Inaccurate estimates	Possible	Moderate	High	In-depth assessment	Possible	Minor	Medium	$50,000	10%	30%	75%	$5,000	$15,000	$37,500	
	Native Title	Lockyer Creek	Likely	Moderate	High	Restrict construction works to within existing road boundaries	Unlikely	Moderate	Medium	$15,000	10%	30%	75%	$1,500	$4,500	$11,250	
	Cultural Heritage	Lockyer Creek	Possible	Moderate	High	Carry out survey early in process	Possible	Minor	Medium	$20,000	20%	30%	70%	$4,000	$6,000	$14,000	
	Public Consultation	none identified to date															
	Flooding	Construction interrupted	Possible	Moderate	High	Program works during dry periods	Possible	Minor	Medium	$15,000	10%	30%	80%	$1,500	$4,500	$12,000	
	Wet Weather	Damage to shire roads	Likely	Major	Extreme	Provide additional maintenance	Likely	Moderate	High	$100,000	20%	50%	90%	$20,000	$50,000	$90,000	
	Project Management	RIP slippage	Possible	Moderate	High	Consult with management	Possible	Minor	Medium	$10,000	10%	30%	80%	$1,000	$3,000	$8,000	
	Resumptions	Nil															
	Workforce Considerations	un-availability of skilled personnel	Possible	Insignificant	Low	Contractor to source skilled personnel	Unlikely	Minor	Low	$50,000	10%	10%	80%	$5,000	$5,000	$40,000	
	Workforce Considerations	un-availability of appropriate plant	Unlikely	Moderate	Medium	Check plant availability prior to construction	Unlikely	Minor	Low	$30,000	10%	10%	70%	$3,000	$3,000	$21,000	
	Constructability	Difficulty in constructing under traffic	Possible	Moderate	High	Traffic management plan signed prior to works	Unlikely	Minor	Low	$0	10%	10%	80%	$0	$0	$0	
	Environment	Erosion occurring during construction	Unlikely	Moderate	Medium	Erosion and sediment control plan signed off	Unlikely	Minor	Low	$50,000	10%	10%	75%	$5,000	$5,000	$37,500	
	Utilities	Additional utilities	Possible	Moderate	High	Dial before you dig	Unlikely	Minor	Low	$25,000	10%	10%	70%	$2,500	$2,500	$17,500	
	Geotechnical	Inaccuracy of drillhole data	Possible	Major	Extreme	Sufficient drillholes to predict foundations	Possible	Moderate	High	$10,000	10%	50%	70%	$1,000	$5,000	$7,000	
	Materials	Available spoil areas within the road reserve	Unlikely	Moderate	Medium	Locate areas outside road prior to construction	Unlikely	Minor	Low	$5,000	10%	10%	70%	$500	$500	$3,500	
	Materials	Unsuitable material in cuttings/subgrade	Unlikely	Moderate	Medium	Testing done to determine material properties	Unlikely	Minor	Low	$5,000	10%	10%	75%	$500	$500	$3,750	
	Materials	Availibility of construction water close to job site	Possible	Moderate	High	Locate sources prior to construction	Possible	Minor	Medium	$5,000	10%	30%	75%	$500	$1,500	$3,750	
	Traffic Management	Traffic sequencing of through traffic	Unlikely	Moderate	Medium	Traffic management plan in place prior to works	Unlikely	Minor	Low	$10,000	10%	10%	80%	$1,000	$1,000	$8,000	

C. Locality Plan



PERMANENT REFERENCE POINTS				
Preceding PRP Name	Dist. to Start of Job km	Dist.-Start to End of Job km	Dist. from End to Following PRP km	Following PRP Name

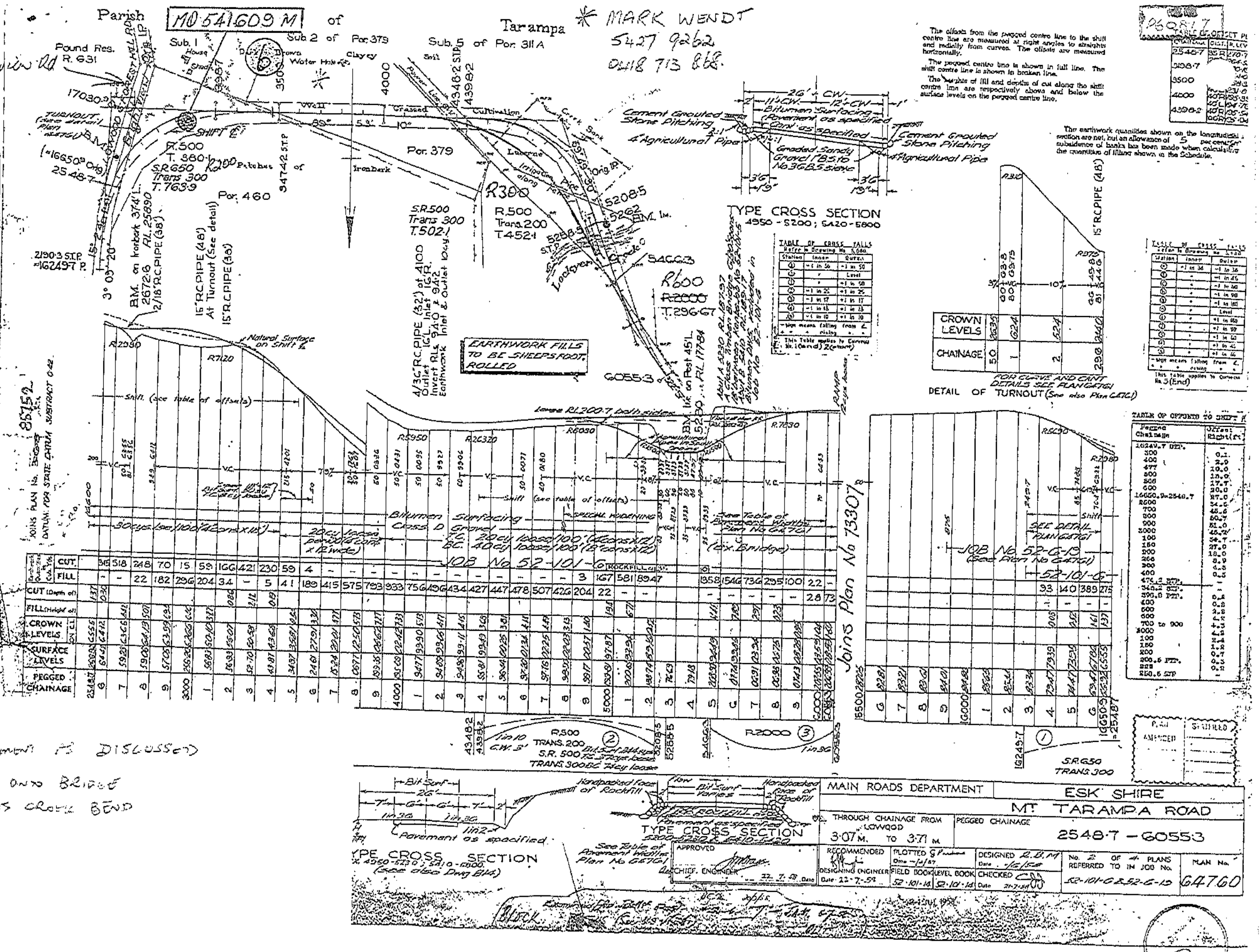
20 JUN 1991

19/7/90

RPC	ASSOC PRP	DESCRIPTION
0412 /6	MQ541609M	Int. 412 with Brightview Road.
0412 /7	MQ646639P	End of Forest Hill-Fernvale Road (412). Int. with 42A Brisbane Valley Highway (Ipswich-Harlin).

km 1 0 1 2 3 4 5 1:50000

QUEENSLAND TRANSPORT	JOB NOS.	DECLARATION	LOCAL AUTHORITIES	DECLARED LENGTHS	CLASSIFICATIONS	FOREST HILL - FERNVALE ROAD
		NEW DECL'N ———	52 ESK	21.92 NEW 21.79 OLD km km	STATE MAIN	
	RESUMPTION PLANS	EXTENSION			C'WLTH RURAL ART	REGISTRATION NO. RD412 - 3 - B
		CANCELLED			NAASRA 3	LENGTH 26.21 km - 38.95 km END
		PRIOR DECL'N				



MKH
- ALIGNMENT AS DISCUSSED
- RIBO ONTO BRIDGE
- MISSES CREEK BEND

ARRP – Timber Bridge Replacement

Bridge: Lockyer Creek

Road: Forest Hill – Fernvale

Road Number: 412

Existing bridge:

Span Layout: 6 @ 9144 mm

Width (between kerbs): 5486 mm

Foundation Type: Headstock on piles

Flood immunity: Deck Level: 57.84

Maximum Flood level: 61.58

Discussion:

The existing Lockyer Creek is a low level crossing of a deep creek with a steep bank on Abutment A. After crossing the creek the road has two tight left curves.

It is considered economically impracticable to sidetrack the road.

It is considered impractical to deviate to the left due to reducing radius to unacceptable level for design speed.

It is considered that deviation to the right will increase the radius of an existing low radius curve, produce a square crossing and minimize deviation.

Planning/preliminary Work

New alignment options: Deviation to right.

Desired flood immunity: Top of bank.

Traffic during construction: Existing bridge

Other:

Proposed bridge layout:

Location: Deviation parallel to existing bridge on alignment to right.

Possible span layout: 4/20m or 5/16m

Skew: Square

Spillthrough type: Wire mattress or rock protection at Abutment A.

Structure types: Headstock on piles at abutments, columns on piles at piers, deck units.

Structure depth assumed in hydraulics: To be determined

Restraints on design/construction: Steep bank.

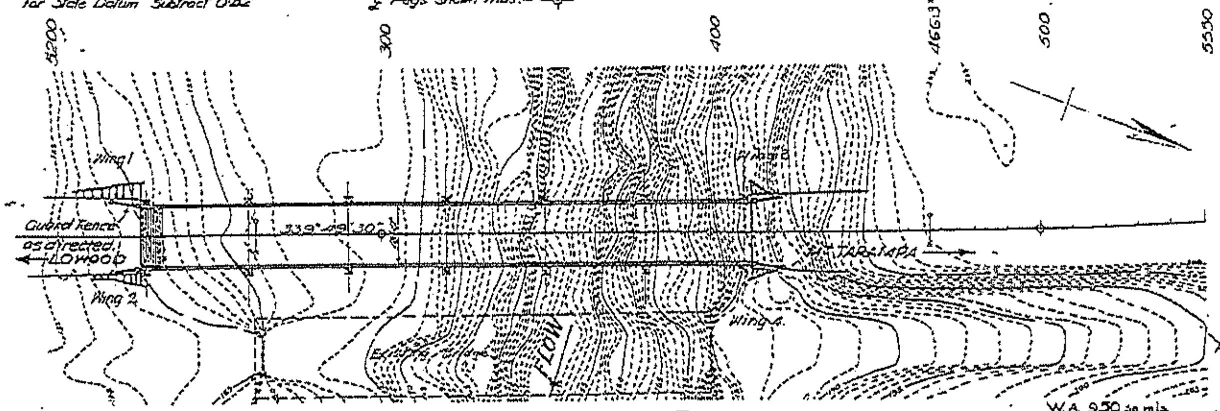
Other:

View of bridge looking to Fernvale

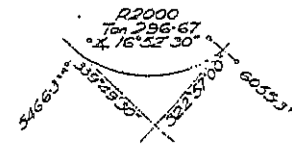
View of creek

F. Type Cross Section – Road Approaches

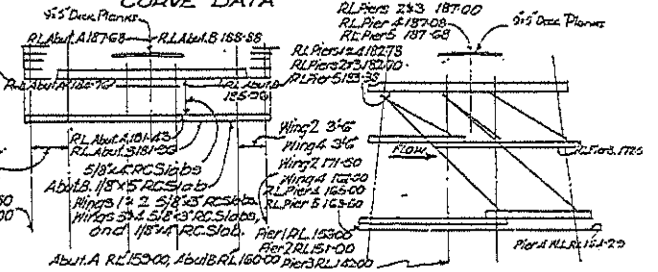
B.M. Nº 1 Tee on Post 46·5L 5279 RL 177·85 GENERAL PLAN & LONGITUDINAL ELEVATION
for State Datum Subtract 0·42
℄ Pegs shown thus:—



GENERAL PLAN



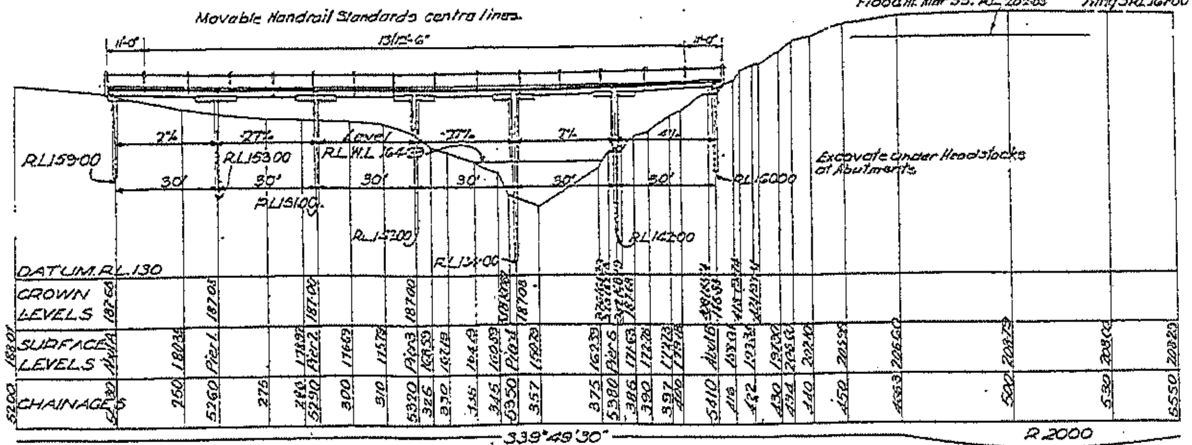
CURVE DATA



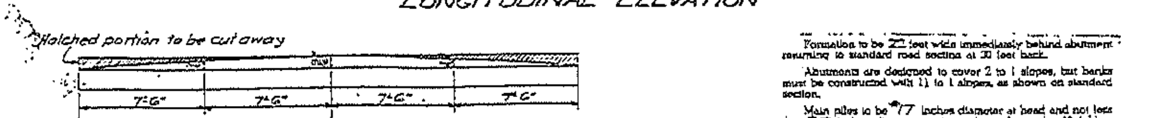
ELEVATION OF ABUTMENTS

ELEVATION OF PIERS

Piles in Pier 4 shall be 18"dia. at the head and not less than 15"dia. at the toe.



LONGITUDINAL ELEVATION



LONGITUDINAL CAMBER DIAGRAM

The finished deck shall have a longitudinal camber of 1" in the centre of each span. This shall be obtained by dressing the tops of the Spiking Planks and inner girders to conform to the diagram, either while the girders are in position or are supported on the ground at 3' from each end. The girder cuts shown on Plan 412 are the dimensions before dressing for the above camber.

Main Piles shall have a penetration in solid ground of not less than 15' and Wing Piles not less than 10'.

Formation to be 22 feet wide immediately behind abutment returning to standard road section at 30 feet back.

Abutments are designed to cover 2 to 1 slopes, but banks must be constructed with 1½ to 1 slopes, as shown on standard section.

Main piles to be *17 inches diameter at head and not less than *12 inches diameter at toe, wing piles to be 12 inches diameter at head and not less than 10 inches diameter at toe.

For general details reference is to be made to standard plan No. 412 and for Girder Bolt spacing details see plan No. 623.

* The main piles in Pier 4 shall be 18"dia. at the head and not less than 15"dia. at the toe.

The scheduled quantities and length of Timber Piles are nett. Proper allowance must be made for cut-off and overdriving.

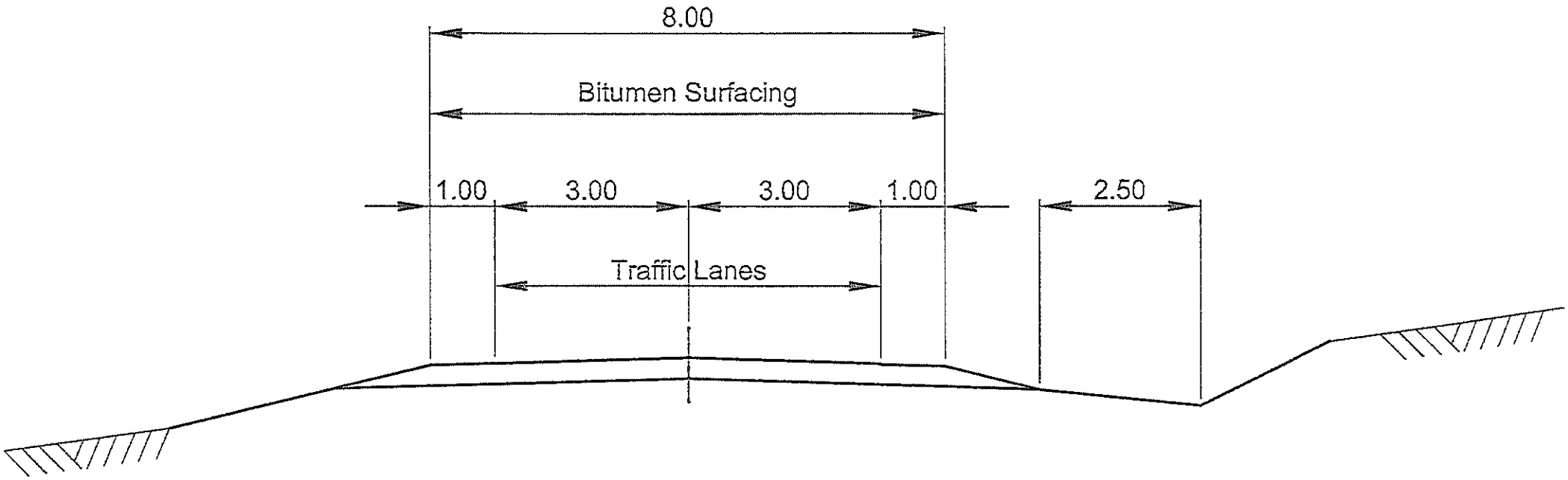
APPROVED TIMBERS (Timber District No. 1).

Girders, Corbels, Kerbs ..	Ironbark, Spotted Gum, Grey Gum.
Logging	Ironbark, Forest Red Gum (Blue Gum), Red Bloodwood, Swamp Box (Swamp Mahogany), Grey Gum.
Sills (above ground) ..	Ironbark, Forest Red Gum (Blue Gum).
Sills	Ironbark, Red Bloodwood, Swamp Box (Swamp Mahogany).
Piles (driven), Fenders, Struts	Ironbark.
Piles (silled or planted) Guard Posts	Ironbark, Red Bloodwood.
Ballast and Cover Boards, Wing Rails	Ironbark, Red Bloodwood, Gympie Messmate (Dead Finish).
Sheet Piles	Ironbark, Tallowwood, White Mahogany (Yellow Stringybark), Grey Gum.
Headstocks..	Ironbark, Tallowwood, White Mahogany (Yellow Stringybark), Grey Gum, Forest Red Gum (Blue Gum), Gympie Messmate (Dead Finish), Blackbutt (free of heartwood).
Wales, Braces, Handrail ..	Ironbark, Tallowwood, White Mahogany (Yellow Stringybark), Grey Gum, Forest Red Gum (Blue Gum), Spotted Gum, Gympie Messmate (Dead Finish), Blackbutt.
Spiking Planks	Ironbark, Forest Red Gum (Blue Gum), White Mahogany (Yellow Stringybark), Grey Gum, Gympie Messmate (Dead Finish).
Deck Planks (square or Hogback)	Ironbark, Tallowwood, White Mahogany (Yellow Stringybark), Grey Gum, Spotted Gum, Gympie Messmate (Dead Finish), Blackbutt, Forest Red Gum (Blue Gum), Lustar (Turpentine), Brush Box (for high level bridges or nearly high level bridges in Dry Areas). For this job brush box is not an approved timber.

NOTE.—Ironbark shall be "Grey" (*E. Paniculata*), "Narrowleafed Red" (*E. Crebra*), or "Broadleafed Red" (*E. Siderophloia*).

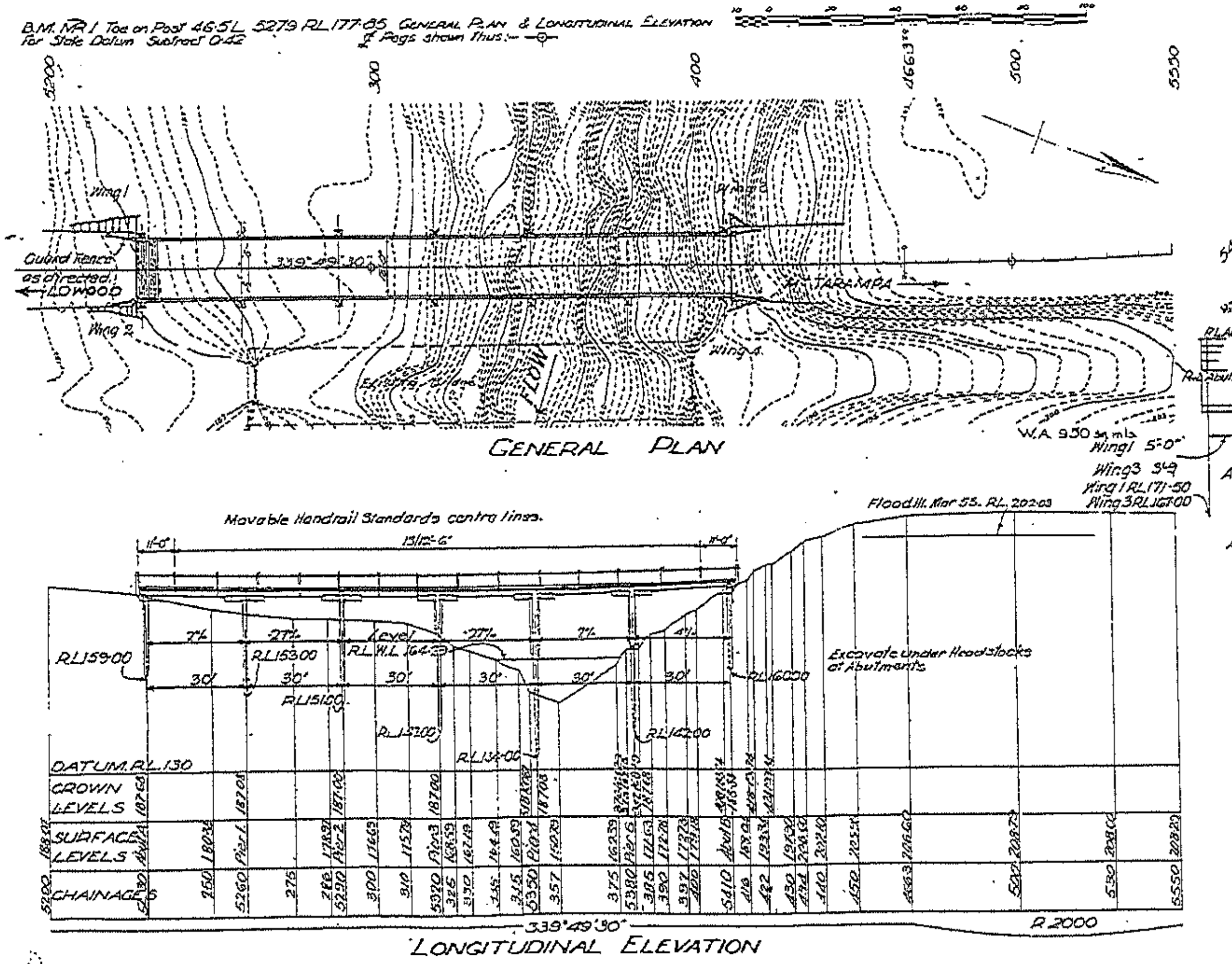
See Plan Nº 64047 for Material and Bolt Lists and Girder and corbel cuts.

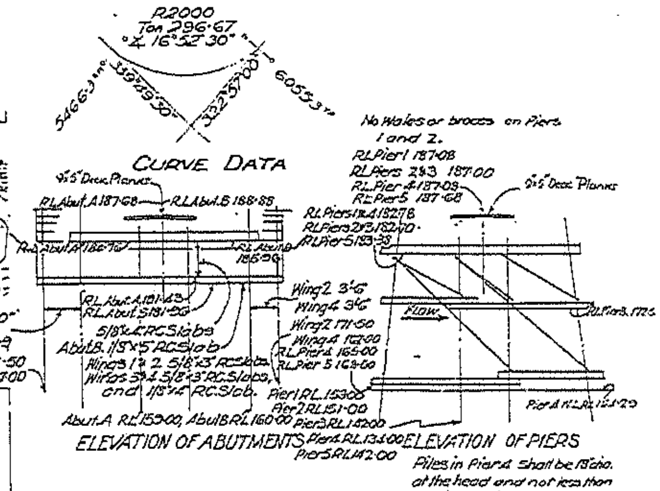
MAIN ROADS DEPARTMENT	— ESK SHIRE			
Mᵀ TARAMPA ROAD				
RECOMMENDED [signature] BRIDGE ENGINEER Date	PEGGED CHAINAGE 5320' OVER LOCKYER CREEK			
	6/30' SPAN TIMBER BRIDGE, 18' WIDE			
APPROVED [signature] CHIEF ENGINEER Date	PLOTTED / CHECKED / DRAWN / CHECKED	FIELD BOOK 52-101-11 LEVEL BOOK 52-101-11,12,13	No 1 OF THE 3 PLANS REFERRED TO IN JOB No. 52 · 101 · 5	PLAN No. 64046

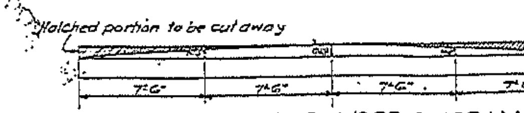


ROADWAY EXCAVATION AND EMBANKMENT

F. Type Cross Section – Road Approaches







LONGITUDINAL CAMBER DIAGRAM

The finished deck shall have a longitudinal camber of ¼" in the centre of each span. This shall be obtained by dressing the tops of the Spiking Planks and lower girders to conform to the diagram, either while the girders are in position or are supported on the ground at 3' from each end. The girder cuts shown on Plan 412 are the dimensions before dressing for the above camber.

Main Piles shall have a penetration in solid ground of not less than 15' and Wing Piles not less than 10'.

Formation to be 22 feet wide immediately behind abutments returning to standard road section at 22 feet back.

Abutments are designed to cover 2 to 1 slopes, but banks must be constructed with 1½ to 1 slopes, as shown on standard section.

Main piles to be *17 inches diameter at head and not less than *12 inches diameter at toe, wing piles to be 12 inches diameter at head and not less than 10 inches diameter at toe.

For general details reference is to be made to standard plan No. 412 and for Girder Bolt spacing details see plan No. 621.

* The main piles in Pier 4 shall be 15" dia. at the head and not less than 15" dia. at the toe.

The scheduled quantities and length of Timber Piles are nett. Proper allowance must be made for cut-off and overdriving.

APPROVED TIMBERS (Timber District No. 1).

Girders, Corbels, Kerbs ..	Ironbark, Spotted Gum, Grey Gum.
Logging	Ironbark, Forest Red Gum (Blue Gum), Red Bloodwood, Swamp Box (Swamp Mahogany), Grey Gum.
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Headstocks..	Ironbark, Tallowwood, White Mahogany (Yellow Stringybark), Grey Gum, Forest Red Gum (Blue Gum), Gympie Messmate (Dead Finish), Blackbutt (free of heartwood).
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Spiking Planks	Ironbark, Forest Red Gum (Blue Gum), White Mahogany (Yellow Stringybark), Grey Gum, Gympie Messmate (Dead Finish).
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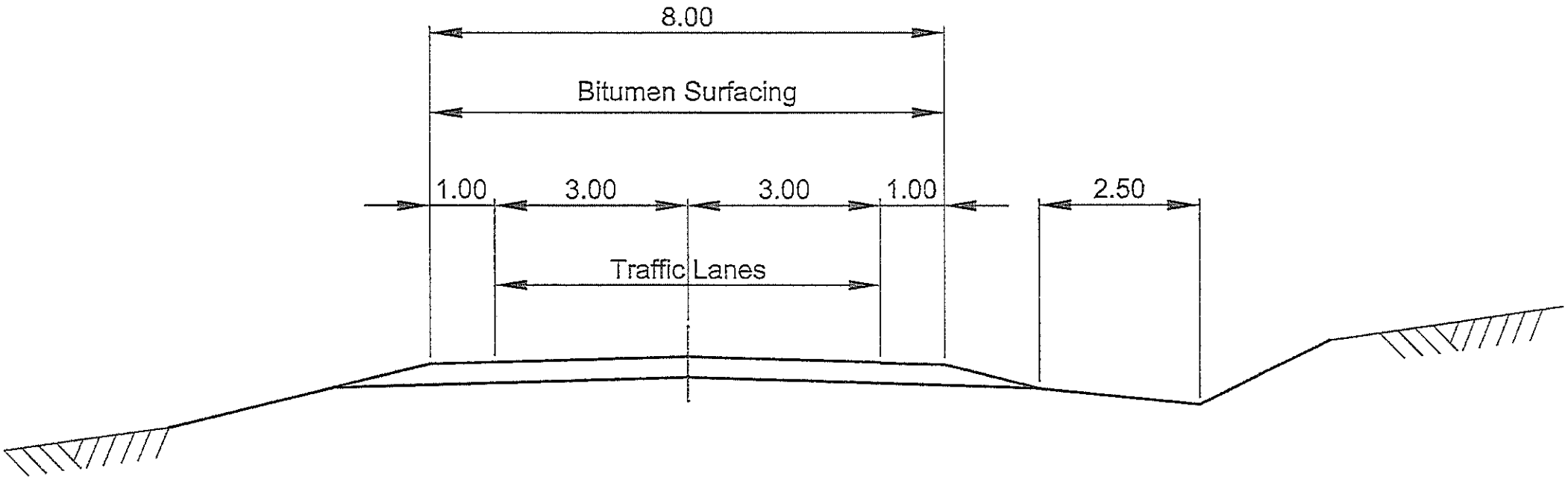
NOTE.—Ironbark shall be "Grey" (E. Paniculata), "Narrowleaved Red" (E. Crebra), or "Broadleaved Red" (E. Siderophloia).

See Plan Nº 64047 for Material and Bolt Lists and Girder and corbel cuts.

MAIN ROADS DEPARTMENT	— ESK SHIRE		
Mt TARAMPA ROAD			
RECOMMENDED [signature] BRIDGE ENGINEER 1/1/0 Date	PEGGED CHAINAGE 5320' OVER LOCKYER CREEK		
	6/30'SPAN TIMBER BRIDGE, 18' WIDE		
APPROVED [signature] CHIEF ENGINEER Date	PLOTTED / CHECKED / DRAWN / CHECKED — FIELD BOOK 52-101-11 LEVEL BOOK 52-101-11,12,13	No. 1 OF THE 3 PLANS REFERRED TO IN JOB No. 52 · 101 · 5	PLAN No. 64046



ROADWAY EXCAVATION AND EMBANKMENT

ARRP Bridge Replacement Project

Site Concept Summary

Location: Lockyer Ck (ID264) @ 25.4km **District:** Southern **Shire:** Esk 52

Road: Forest Hill – Fernvale 412 **Section:** Lowood locality

Link Importance: District. Shortcut for freight across to Brisbane Valley H'way.

AADT: 1,100 $_{2005}$ (9%hv) .. 2% growth **Mass Limit**: "B" doubles–general freight.

Base Case Concept:

- New bridge on minor realignment to north-east with improved vertical alignment that smooths the dip.
- Immunity improvement is not a driver.
- Alignment to be driven by speed environment (ie: consistency of alignment within an already constrained section with tight radii). Suggest environment is currently 80-90 kph.

"TOC-1" Concept:

- New bridge on realignment to north-east with improved vertical alignment.
- Improved horizontal alignment (R.350m).
- Vertical alignment to suit natural surface provides higher bridge than existing.

"TOC-2" Concept:

- As for "TOC-1" above.

Bridge Details: refer "TOC-1" drawings B26 02-03

No. of Spans	Length of Spans	Bridge Length	Bridge Width	Deck RL	Proposed Flood Immunity
5	16m	80m (30^0 skew)	8.5m (krb – krb)	RL 61.65m 0.2% grade (4.4m> exist)	> Q^{10} TOC^{Q50}=60hrs
Options explored: • Review span lengths to standardise deck units. ✓ • Improved geometric alignments (R.350) to suit environment ✓ Refer VM No. 75					

Road Approaches: On new alignment....refer "TOC-1" dwgs LOCK C1-C3

Cross Section	Target Design Speed	Length of Approaches	Intersection Works Involved	Land Resumption Required
8.5m+CW (R=350m) (sealed)	80-90kph	600m	Maintain existing entrances	Yes

Traffic Management Details: Retain existing bridge & highway

Cross Section	Target Speed	Sealing Required	Length of Sidetrack	Temporary Intersection Works Involved	Land Resumption Required
existing	Sign at 60kph	existing	approx 600m	Maintain existing access	N/a

Environmental Issues & Constraints:

Bridge; Approaches & Sidetrack Construction:	
- Try to avoid clearing Qld Blue Gums on north eastern corner - CH monitors requested for construction - New alignment traverses existing smallcrops cultivation - Construction type mitigation applies	
Permits & Approvals req'd: - "Taking Water" permit - "Works within Riverine Area" permit	Required in time for start of construction

Community Consultation:

Consult with:	
- Adjacent land owners - School Bus operators - Local government authorities	During planning & design phase
- Police Dept; SES and RACQ - Transport operators - Road users (general) - Local media	Prior to & during construction

Land Resumption & Native Title:

Resumption req'd	Native Title
- Required	- NT extinguished

Public Utilities Plant Conflicts:

Services Impacted:	Extent of Conflict:
- Telstra ✓	- Alliance to identify possible conflicts - negotiate with service authorities (refer to "Service Conflicts Register")
- Power supply ✓	
- Water supply ✓	
- Gas supply:	

Reviewed: (G Crozier) [redacted] **Date:** 5 March 2007

Annexure L

Lockyer Creek Bridge (Eastbound) Strengthening Options Paper dated April 2011

LOCKYER CREEK BRIDGE (East Bound)

STRENGTHENING

OPTIONS

Prepared by

Bridge Branch

Structures Division

April 2011

CONTENTS

1. Introduction

The existing Lockyer Creek Bridge (east bound) comprises the following.

- 5 span bridge (unequal spans); total length = 85m
- 5 steel girders with concrete deck slab
- 7.32m deck width between kerbs with steel bridge rail

It has been found that the superstructure of the bridge cannot support the anticipated future commercial trucks with heavy loads. In particular, the two edge girders and the central girder are under-strength. Therefore, it is proposed to strengthen the superstructure of the bridge.

Information given in previous geotechnical investigation reports for the existing bridges indicates that the existing foundations can support the future commercial trucks with heavy loads (within 5% acceptability) for the recommended options. For the current design loads specified in AS5100, however the existing foundations have been found to be somewhat under-strength (see Section 5.1.7), but considered still acceptable.

Two proposals have been previously considered. They are:

Option (i) Remove existing steel girders and the concrete deck; then construct a new deck using PSC units with transverse stressing. The carriageway width = 8.6m

Option (ii) Adding a new steel girder at each edge of the deck. This also enables the deck to be widened to a width of 8.6m.

In this option, the existing girders need to be strengthened as follows:

- Add a cover plate to the bottom flange (10m length in mid span - all girders)
- Add a cover plate to the top and bottom flanges (10m length at pier locations –two external girders & central girder)

Both the above options need the pier and abutment headstocks to be extended.

2. Previous substructure proposal re-examined

In both the above options, the headstock extension was supported on a new bored pile built on either side of each pier and abutment. However, it is noted that if the bridge is widened on both sides by equal amounts, the required headstock extensions are not very large. In this case the headstock extension can be cantilevered from existing piers without constructing new piles. This argument is further supported by the fact that the original design has allowed for a future footpath supported on headstock extensions, which was never built.

Also in the previous proposal, the new piles were to be built 500mm away from the existing ones. This clearance is not considered to be adequate. Therefore, for the case where the deck is widened on both sides by equal amounts, cantilevering pier headstock extensions is considered a better option.

3. Previous deck options expanded

Option (ii) (adding a new steel girder on either edge of the deck) was taken to be the preferred option. Project Proposal Report prepared by Metro District Office indicates that the selection was based on the fact that the selected option does not need the closure of the bridge. Hence there is no need to construct a side track and therefore causing less traffic disruption.

It is noted however, that welding of cover plates to the top flange of the central girders requires the removal of concrete over this girder (about 3m in width). The remaining parts of the deck will not be sufficient for traffic during construction (see Sketch-2). Hence bridge closure will be necessary for this option.

For welding cover plates to the top flange of girders it is necessary to remove the concrete deck adjacent to the girders. As seen in Sketch-2, for welding cover plates to three girders it will be necessary to remove and reconstruct almost the entire width of the deck (for a 10m length over each pier). As described later, this will increase the cost significantly. In addition, the removal of red lead paint will be required before welding cover plates to top and bottom flanges of girders. This is a very expensive and time consuming operation due to the environmental concerns. As a result Option (ii), adding two steel girders, will not be the preferred option anymore (see cost estimates in Section 5).

Option (i) in the previous proposal comprised of a deck unit bridge at the same alignment as the existing bridge centreline. This option was not preferred as the existing deck needs to be removed for the construction of the new bridge, requiring closure of the bridge for traffic.

However it is noticed that in the deck unit option, the new bridge can be offset by at about 1600mm to enable the staged construction - Option (i)b. With this modification, the bridge closure and diverting the traffic to the adjacent bridge will not be required. However in this option, the approach roads need to be realigned to match the new bridge centreline.

As an alternative, it is possible to widen the bridge on one side to facilitate staged construction, thereby avoiding bridge closure. The extra width of the bridge can be utilized to provide a pedestrian footpath – Option i(c), or it can be used as a widened shoulder to facilitate merging with the existing left-turn lane – Option (i)d. Another possibility is to provide the minimum extra width required for staged construction – Option (i)e. In these three options the traffic lanes on the bridge will be on the same alignment as the approach roads; hence realignment of approach roads is not required.

4. Previous cost - underestimated

Cost for the preferred option (adding two new steel girders and strengthening three existing girders) was previously estimated to be $3,182,335. A review of this estimate showed that the actual cost would be higher than this estimate, because the costs associated with the following works have not been fully included:

(i) Removal of large parts of the deck for welding cover plates to top flange of girders
(ii) Traffic diversions required for the above work in item (i)
(iii) Additional work required for removal of concrete and shear links over the girders
(iv) Environmental issues relating to the removal of red lead paint in girders

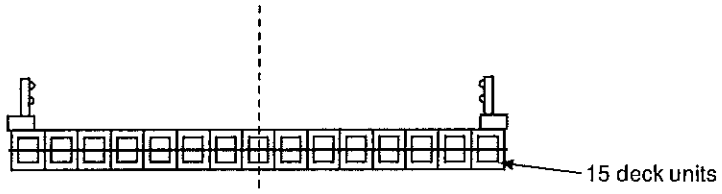
The revised cost of this option is estimated to be $5,500,000.

5. More superstructure options

5.1 Option (i): Demolish existing deck and install new deck units

This option has the following possible designs.

5.1.1 Option (i)a - New deck on the same centreline as the existing deck.



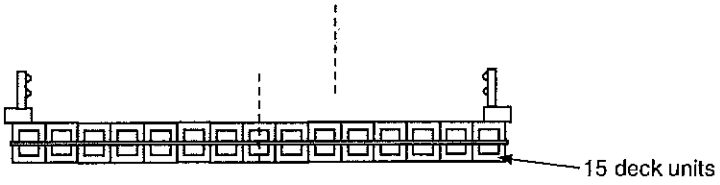
Staged construction not possible; Traffic needs to be diverted to the adjacent bridge.

Small widened parts of deck on either side are supported on cantilevered headstock extensions; new piles are not required. See Sketch 1A for more details.

This design will have a symmetrical pier arrangement with cantilevered headstock extensions on both sides.

Cost estimate for Option (i) a = $4,202,000

5.1.2 Option (i)b - New deck offset by 1600mm



New deck is offset by 1600mm to the existing bridge centreline to enable the staged construction; Approach roads need realignment.

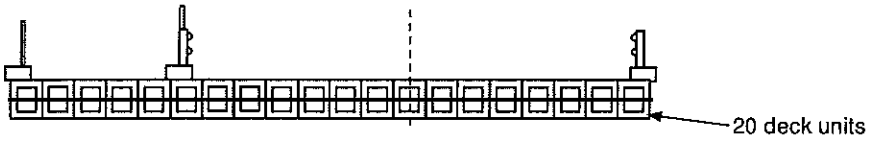
Traffic can use part of the existing deck and part of new deck while deck units are installed.

Deck is widened on one side only. Widened part of deck is supported on a new pile and headstock extension. See Sketch 1B.

Additional costs are required for the realignment of approach roads to match the traffic lanes on the bridge.

Cost estimate for Option (i) b = $4,084,000 (excluding realignment of approach roads)

5.1.3 Option (i)c -New deck having extra width of 3100mm (used for footpath)



One side of the new bridge is widened to enable the staged construction. Traffic lanes in the new bridge will be on the same alignment as the approach road centreline; No work is needed on approach roads.

The widened part of the bridge can be utilized for a pedestrian walkway.

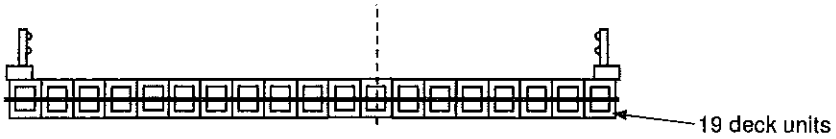
Traffic can use part of the existing deck and part of new deck while deck units are installed.

The width of extra widening will need to match the required footpath width.

One pile is required to support the headstock on the widened side. (see Sketch 1C)

Cost estimate for Option (i) c = $5,240,000

5.1.4 Option (i)d -New deck having extra width of 2500mm (used for widened shoulder)

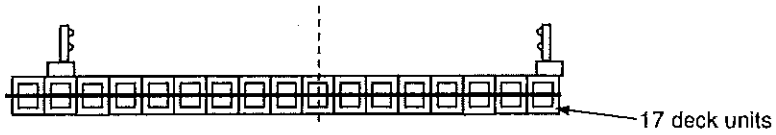


Similar to Option (i)c, but the widened part of the bridge is to be used as an additional shoulder width instead of a footpath.

If a pedestrian walkway is not a requirement, the additional bridge width may be used as an extra shoulder width instead of a walkway. This extra width can be used as a transition to merge with the existing left-turn lane at the departure end of the bridge. As the balustrade and handrail on the bridge barrier are no longer required, there will be some reduction in the cost compared with Option (i)c. Also the required number of deck units will be 19, instead of 20 units used for Option (i)c.

Cost estimate for Option (i) d = $4,839,000

5.1.5 Option (i)e -New deck having extra width of 1200mm



In this option, two extra deck unit will be used in comparison to Options (i)a & (i)b to facilitate the minimum width required for the traffic lane in Stage-2 construction; that is total of 17 deck units. However the trafficable width will be reduced to 9.2m (equivalent to 16 deck units) by having the bridge barrier attached to the second deck unit from the edge. See Sketch 1E. This reduction of the carriageway width is required to limit the number of design lanes to two lanes, thereby ensuring the bearing pressure under the existing foundations does not exceed the allowable limit (see Section 5.1.7).

The traffic lanes in the bridge will be on the same alignment as the road approaches, and there will be additional shoulder width of 600mm on the extra widened side.

A new pile is required to support the headstock extension on the extra widening side.

Cost estimate for Option (i) e = $4,612,000

5.1.6 Traffic control measures during construction

In Options (i)b, (i)c, (i)d & (i)e, where parts of the existing deck as well as part of the new deck are used during construction, strict traffic control measures need to be applied. These would include, but not limited to lower speed limits during staged construction. Suggested speed limit is 60km/h for all vehicles to limit the vibration effects on the deck. The reduced speed limit should be applied in both stages. That is in Stage 1 when the traffic is on part of the existing deck while the first 8 new deck units are installed, and in Stage 2, when the traffic is on part of the new deck while the remaining deck units are installed.

5.1.7 Design Criteria

The design criteria for the deck unit Options (i)a, (i)b, (i)c, (i)d & (i)e are as follows:

Load rating after widening the bridge with new deck units:

(a) Superstructure (deck units): SM1600 & HLP400 as per AS5100

(b) Foundations and substructure (strength limited by existing foundations):

Option (i)a - no new piles: (8.6m wide deck central)	97% Vehicle No:16 (critical future heavy vehicle): acceptable 100% T44; 90% HLP320; 90% SM1600; 85% HLP400
Option (i)b - with new piles: (8.6m wide deck off centre)	100% Vehicle No:16 (critical future heavy vehicle): 100% T44; 90% HLP320; 95% SM1600; 85% HLP400
Option (i)c - with new piles: (8.6m wide deck + footpath)	96% Vehicle No:16 (critical future heavy vehicle): acceptable 100% T44; 85% HLP320; 85% SM1600; 80% HLP400
Option (i)d - with new piles: (11.1m wide deck)	89% Vehicle No:16 (critical future heavy vehicle): NOT acceptable (Wider deck allows 3 design lanes; hence more load on existing piles) 99% T44; 80% HLP320; 80% SM1600; 69% HLP400
Option (i)e - with new piles: (9.2m wide deck)	Identical to Option (i)a Because the critical pile is not the existing one next to the new pile; the opposite side one

The above strength values are governed by the bearing capacity for the existing piles, which was taken as 1.5 MPa in founding rock, as recommended in previous geotechnical report. For Options (i)b, (i)c & (i)d, where a new pile is used, the critical pile is the existing one closer to the new pile for the load case where a truck is placed over the critical pile location. For Option (i)d where the deck is wider, the load on the critical pile is heavier as one more design lane (3 design lanes) needs to used in the analysis in accordance with AS5100; hence two trucks may be placed side by side over the critical pile location.

For Option (i)a, both piles have identical loading, while in Option (i)e, the critical pile is the one on the opposite side of the new pile.

As the capacity of the critical pile in Option (i)d is only 89% for the case of future heavy vehicles, this Option is not recommended.

Load rating during construction

(a) Part of existing bridge: 100% currently permitted vehicles

(b) Part of new bridge: 100% currently permitted vehicles

It may be noted that in Option (i)b & (i)e, only 3 girders in the existing deck may be retained for traffic during Stage-1, whereas for Option (i)c & (i)d, 4 girders may be retained (see Sketches 1B, 1C, 1D & 1E). However, calculations show that there is no significant difference in stresses in the critical girder (edge girder) for the two cases where 3 girders and 4 girders are retained in the deck. This is because the critical load case is when the truck is located at the edge of the deck, in which case most of the load is shared by only the two outer girders; hence the fourth girder has no significant effect.

5.2 Option (ii): Adding steel girders

This design will have a symmetrical pier arrangement with cantilevered headstock extensions (See Sketch 2). Removal of concrete deck over central girder for welding the top cover plate will require the traffic to be diverted to the adjacent bridge.

Cost estimate for Option (i) = $5,500,000

6. Summary of Preliminary Cost Estimates

Option	Description	Cost	Remarks
Option (i) a	Deck unit bridge (Symmetrical)	$4,202,000	Divert Traffic to adjacent bridge ($5,750/m^2); 85m x 8.6m area
Option (i) b	Deck Unit Bridge - 1600mm off centre	$4,084,000	Staged construction possible; Traffic can use part of existing bridge & part of new bridge; Approach roads need realignment ($5,590/m^2); 85m x 8.6m area
Option (i) c	Deck Unit Bridge with 3m extra width used for pedestrian footpath	$5,240,000	Staged construction possible; Traffic can use part of existing bridge & part of new bridge; Traffic lanes on the bridge will be on the same alignment as road approaches; no work on approach roads needed; 2.7m footpath is provided ($5,460/m^2); 85m x 11.3m area
Option (i) d	Deck Unit Bridge with 2.4m extra width used as an additional shoulder width	$4,839,000	Same remarks as in Option (i)c. Additional shoulder width is to be used as a transition to merge with the existing left-turn lane on the departure end of the bridge. ($5130/m^2); 85m x 11.1m area
Option (i) e	Deck Unit Bridge with 1200mm extra width to provide sufficiently wide traffic lane during Stage 2. Bridge barrier is attached to the second unit from the edge to reduce the carriageway width to two design lanes	$4,612,000	Same remarks as in Option (i)c, without footpath. ($5900/m^2); 85m x 9.2m area
Option (ii)	Add 2 new steel girders	$5,503,000	Traffic diversion to adjacent bridge required for strengthening central girder; Additional works include: Removal of part of deck, and replacing that part; Removal of concrete and shear links over external girders, welding of cover plates and removal of red lead paint ($7530/m^2); 85m x 8.6m area Deck cannot support the design loads on the bridge rail; The bridge rail becomes non-compliance

Note: Cost per square metre rate has been calculated based on the usable road width, i.e, excluding the kerb width

7. Conclusion

- Detailed cost analysis showed that previously preferred Option (ii) is in fact more expensive due to the additional works described previously. It is also noticed that bridge closure is necessary for strengthening the central girder. Also, the treatment of red lead paint over the creek, which is an environmental concern, adds to the cost and time of the project. In addition the bridge barrier will become non-compliant as the deck cannot support the current design loads.
- Option (i), the deck unit option, is less expensive and more environmentally friendly than the previously preferred Option (ii).
- Although Option (i)a does not have new piles and headstock extensions, it is more expensive than Option (i)b due to the additional cost involved in traffic control. Also Option (i)a causes more traffic disruption to the public.
- The total cost for Option (i)c is higher than Options (i)a & (i)b, but this option provides a pedestrian footpath. It is also noticed that the unit rate for Option (i)c is marginally lower than Options (i)a & (i)b.
- If a pedestrian footpath is not a requirement, the extra bridge width in Option (i)c may be used as a transition to merge with the existing left-turn lane on the departure side of the bridge – Option (i)d. The cost for Option (i)d is lower than Option (i)c because one less deck unit is being used, and the pedestrian balustrade and handrails on the traffic barrier are no longer required.

  However, for this Option the load rating for future heavy vehicles was found to be only 89%, which is not considered acceptable.

  Option (i)d is not recommended as the load rating for future heavy vehicles is unacceptably low (only 89%) as outlined in Section 5.1.7.
- Option (i)e is a variant of Option (i)d, where the extra deck width in Option (i)d is reduced to the minimum required for staged construction (1240mm). The bridge barrier is attached to the second deck unit from the edge to reduce the deck width to 9200mm. This reduction is required to restrict the number of design lanes on the bridge to two lanes, in order to limit the bearing pressure under the existing foundations. This will make the load rating in Option (i)e higher than in Option (i)d, making Option (i)e acceptable.

8. Recommendation

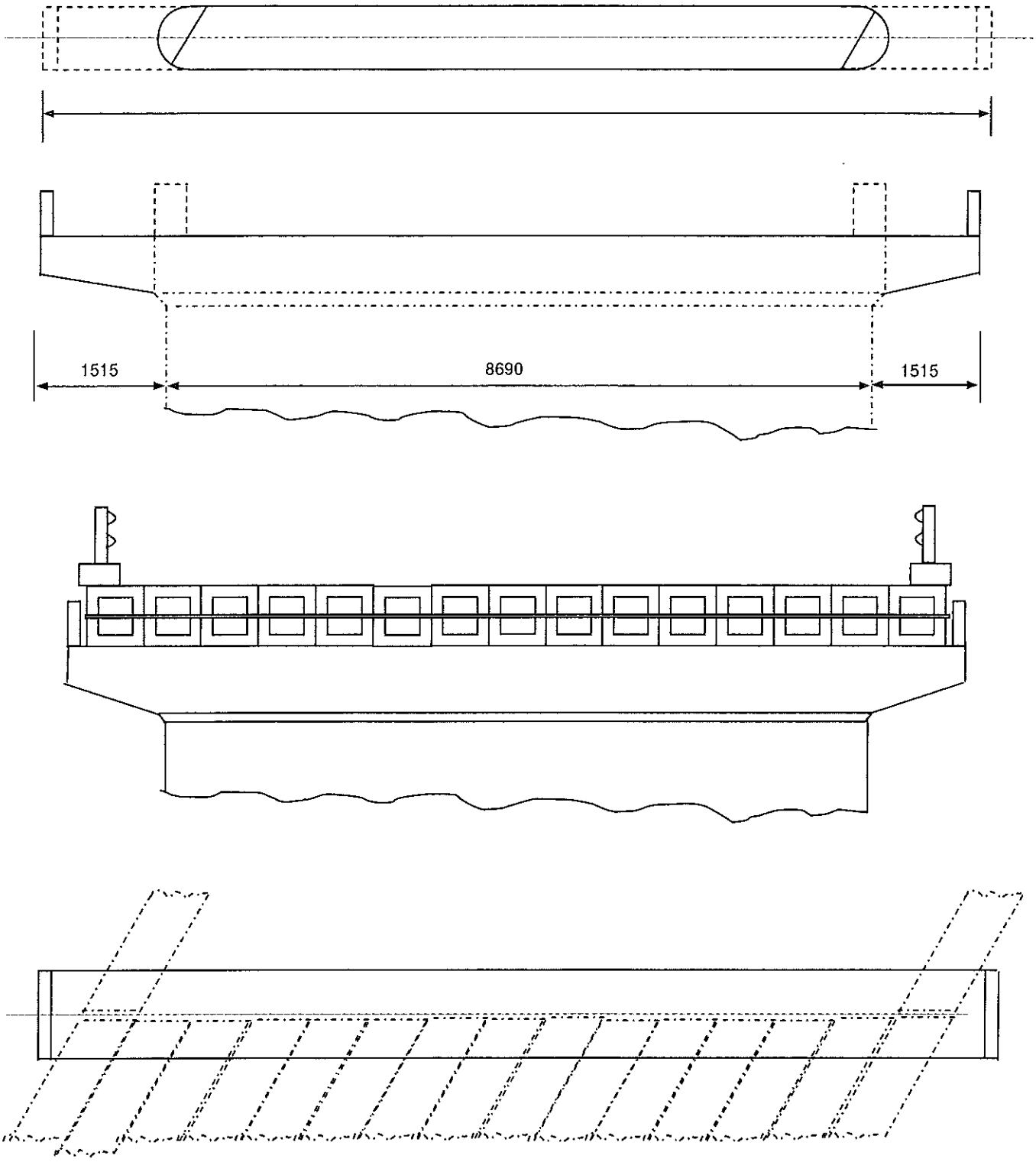
It is recommended to adopt one of the deck unit options, either Option (i)a, (i)b, (i)c or (i)e. The costs for the first two options are similar, but Option (i)b causes less traffic disruption while it needs additional costs for the realignment of approach roads. Option (i)c costs more than the first two options but it provides a pedestrian footpath at nearly the same unit rate. If a pedestrian footpath is also in the agenda, this option may be adopted. The cost for Option (i)e is less than that for Option (i)c because the total deck width is about 1800mm narrower than in Option (i)c.

Option (i)d, where the additional deck width is to be used for merging with left-turn lane, is not recommended as the load rating for future heavy vehicles is unacceptably low.

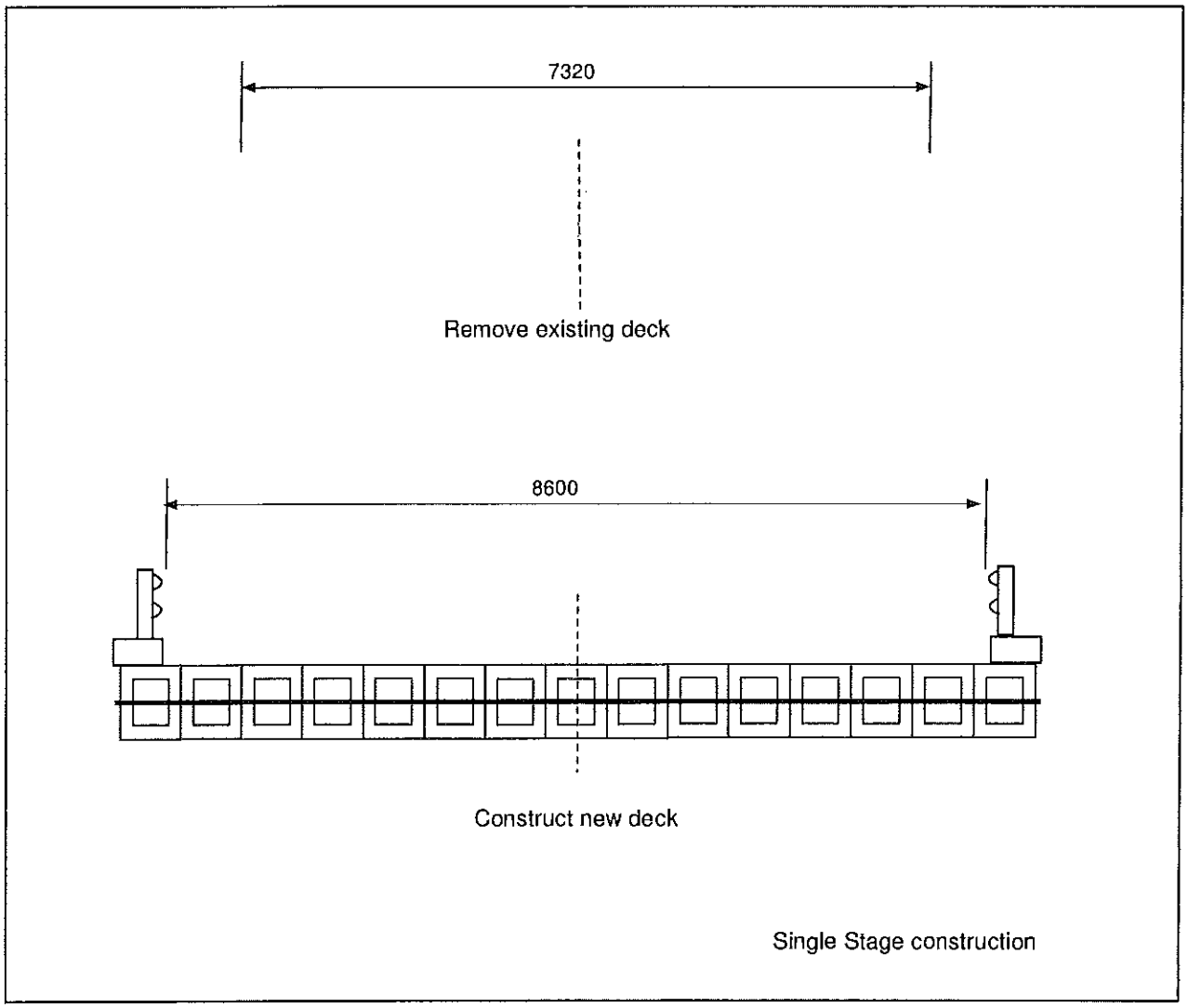
APPENDIX -1

Sketches

SKETCH-1A

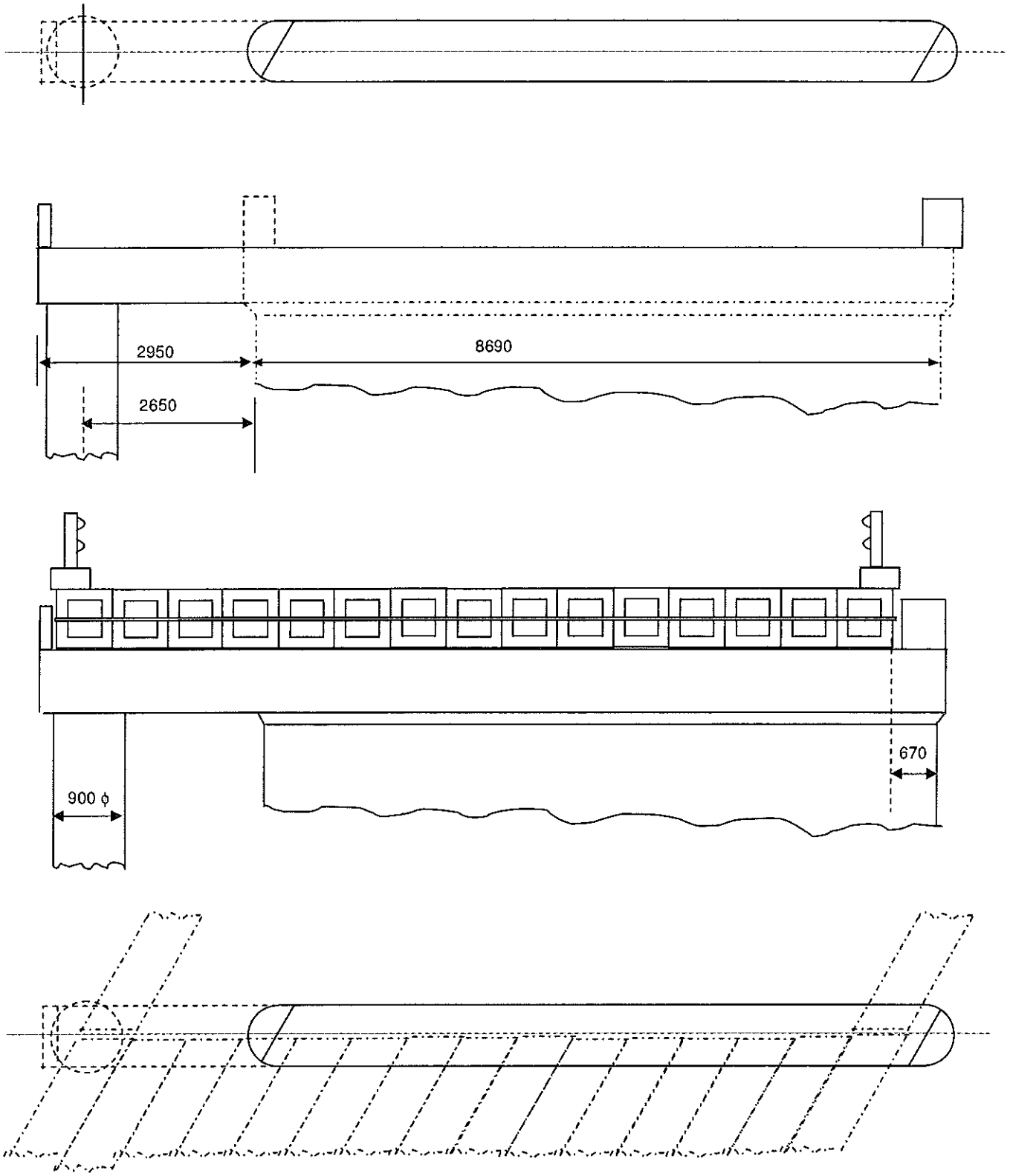


SKETCH-1A

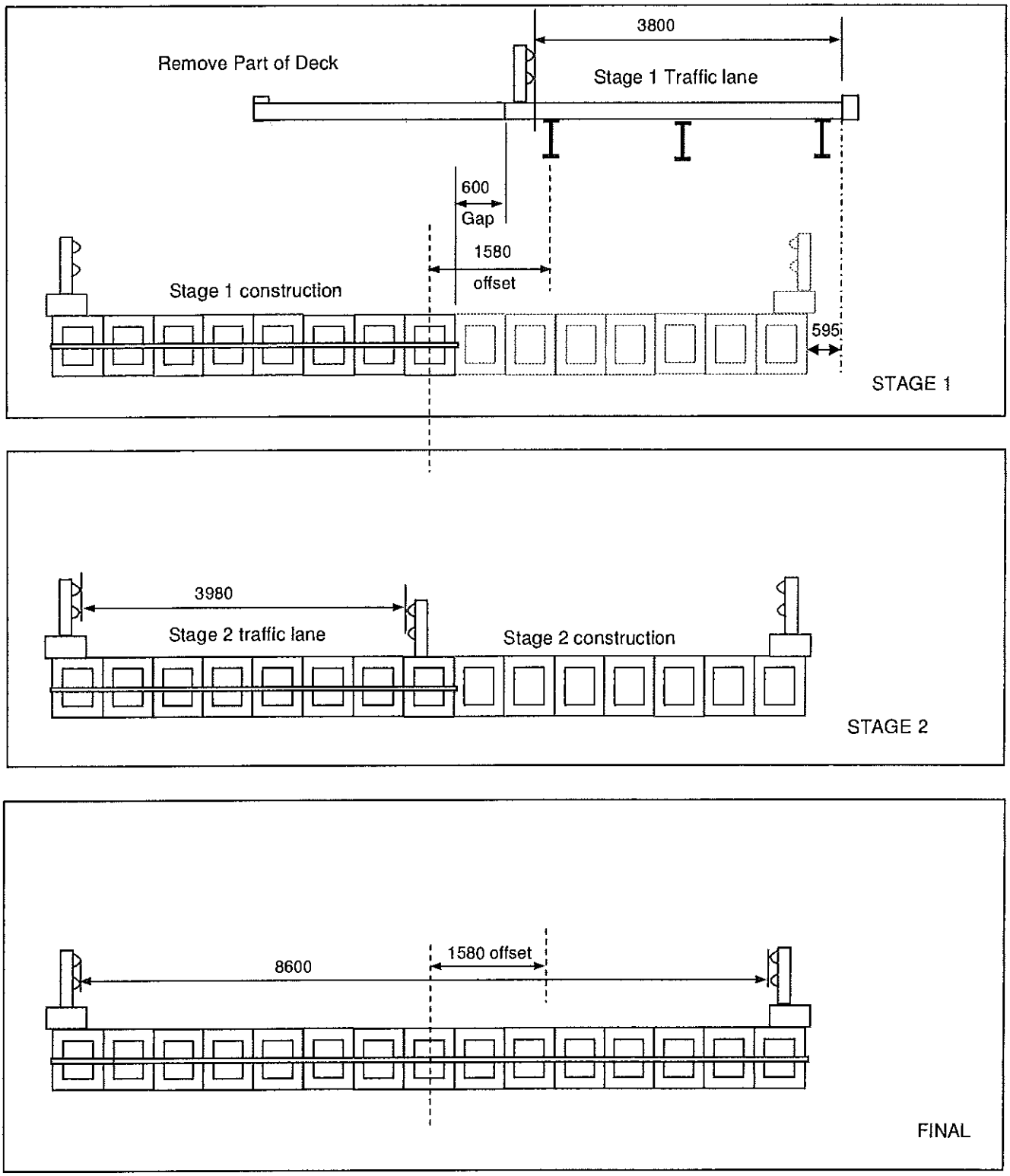


Single Stage construction

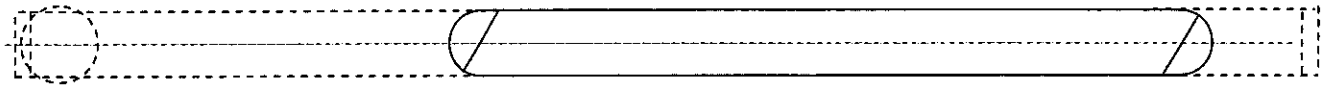
SKETCH-1B

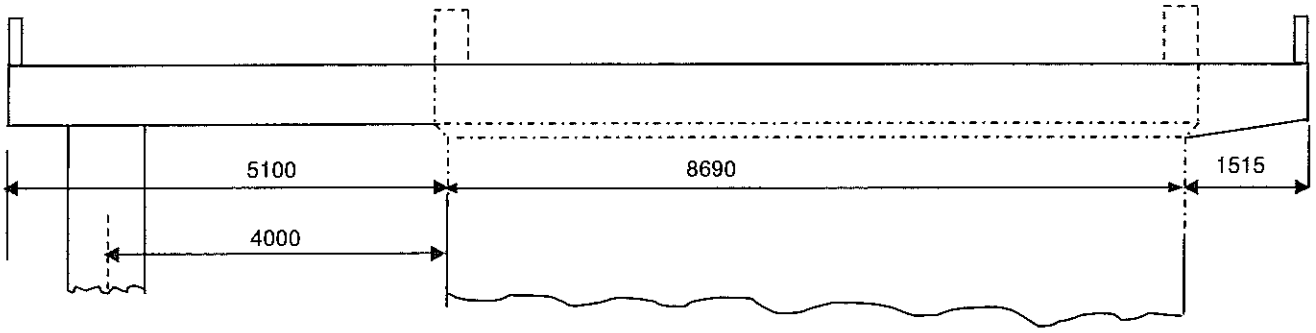


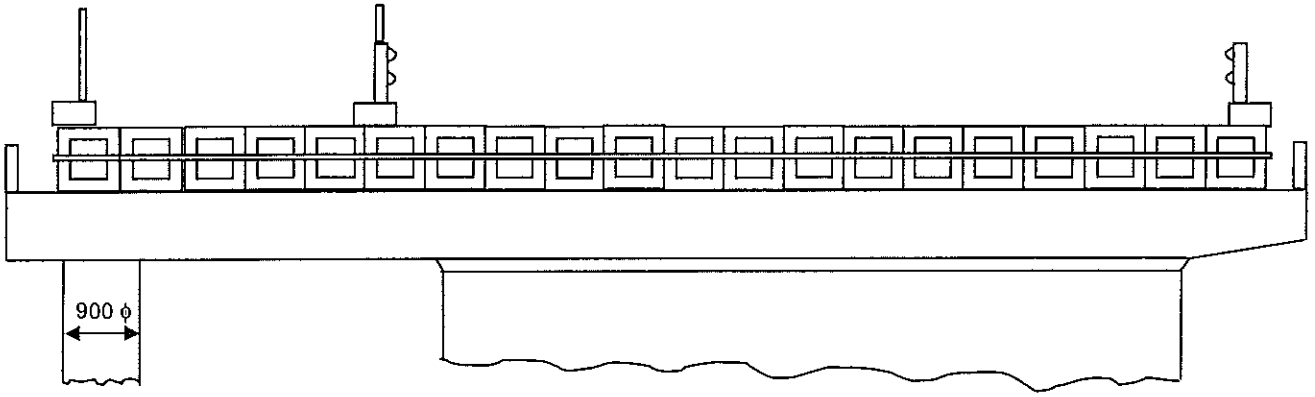
SKETCH-1B

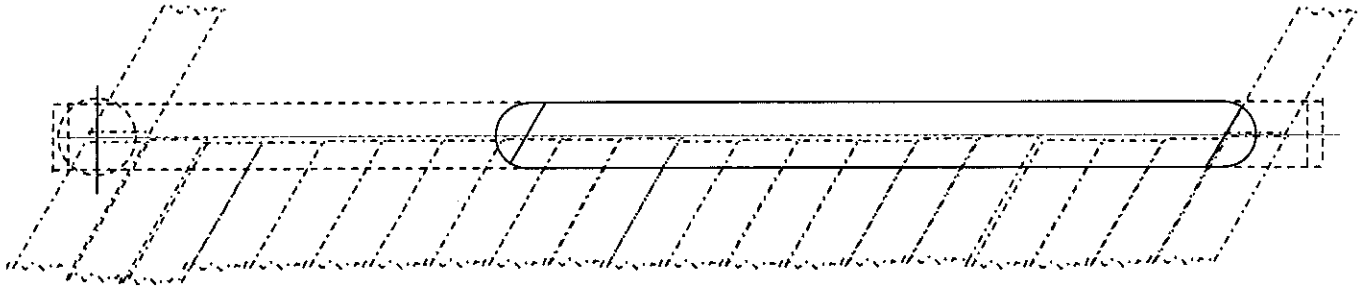

3800
Remove Part of Deck
Stage 1 Traffic lane
600
Gap
1580
offset
Stage 1 construction
595
STAGE 1
3980
Stage 2 traffic lane
Stage 2 construction
STAGE 2
8600
1580 offset
FINAL

SKETCH-1C

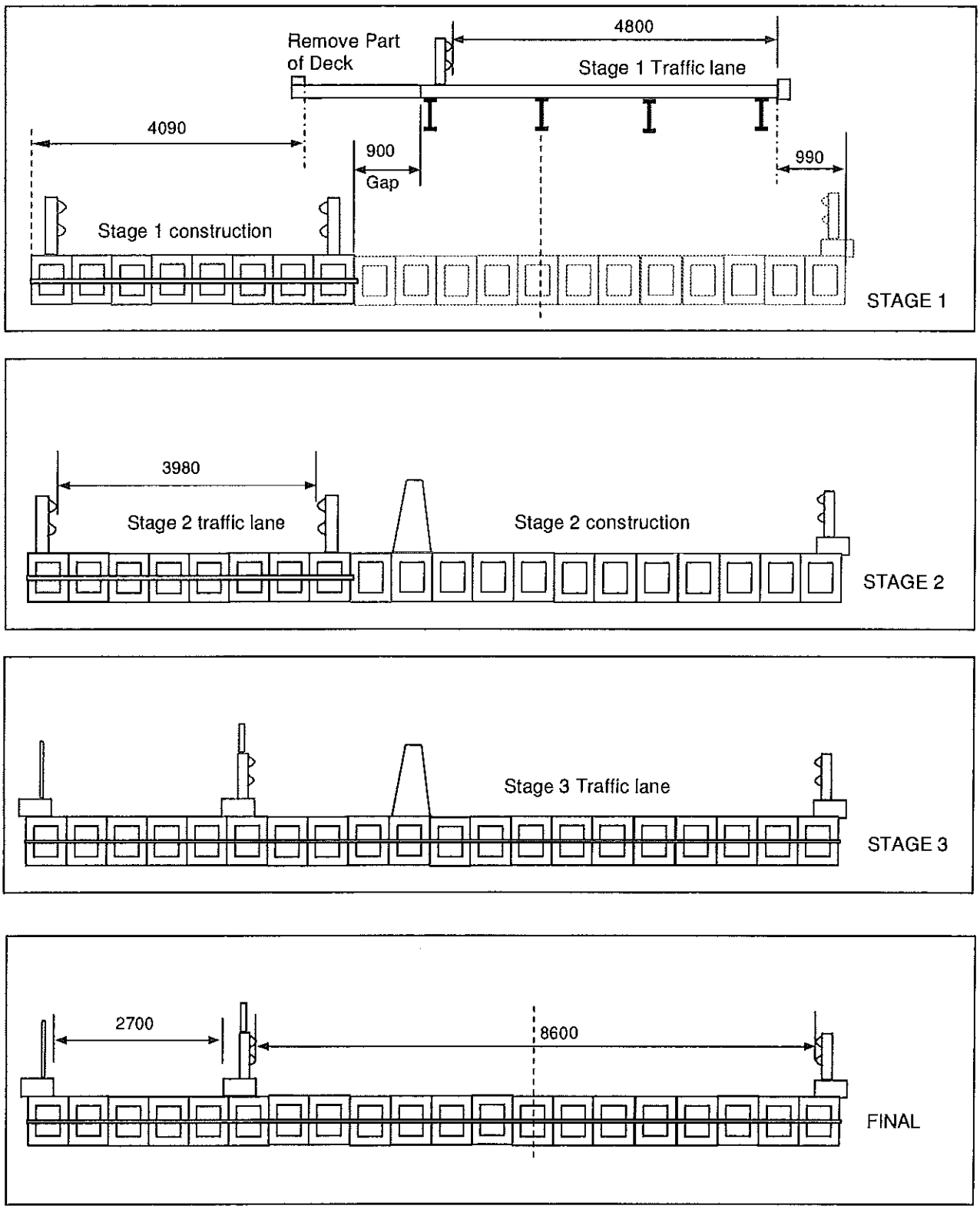




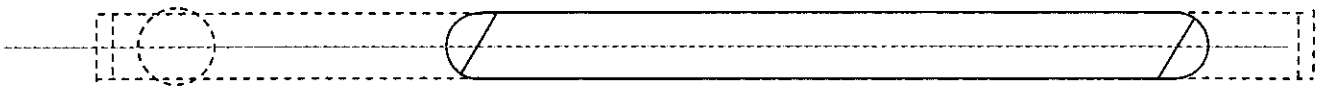


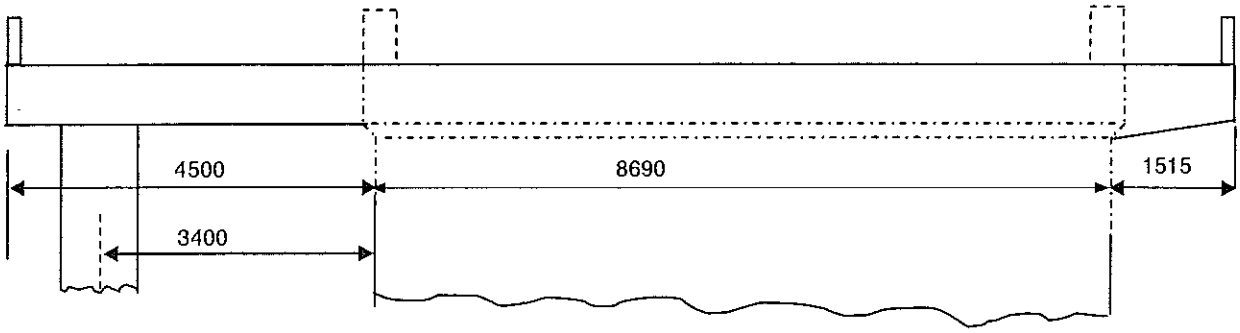


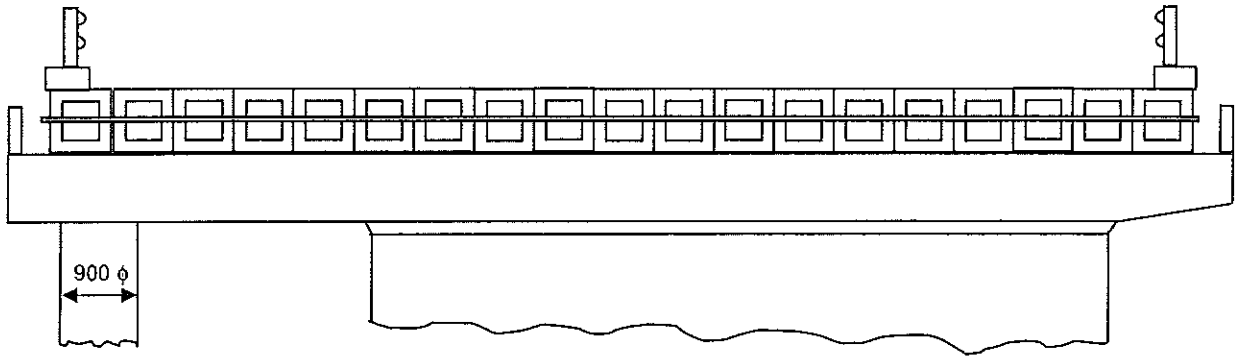
SKETCH-1C

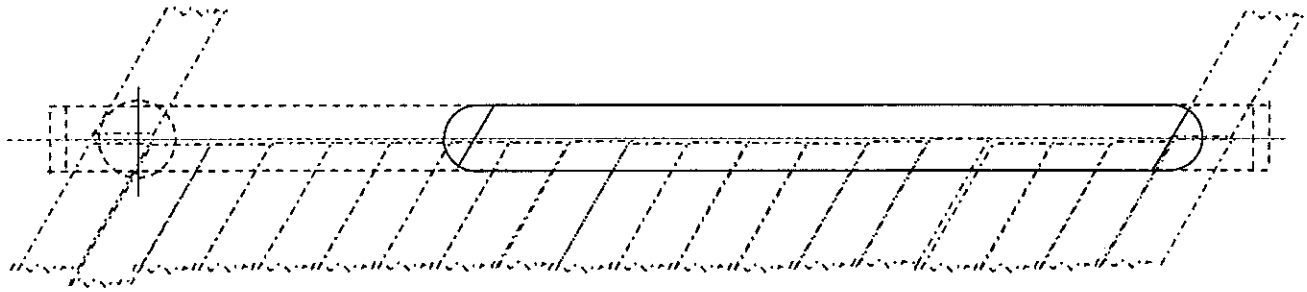

Remove Part of Deck
4800
Stage 1 Traffic lane
4090
900
Gap
990
Stage 1 construction
STAGE 1
3980
Stage 2 traffic lane
Stage 2 construction
STAGE 2
Stage 3 Traffic lane
STAGE 3
2700
8600
FINAL

SKETCH-1D

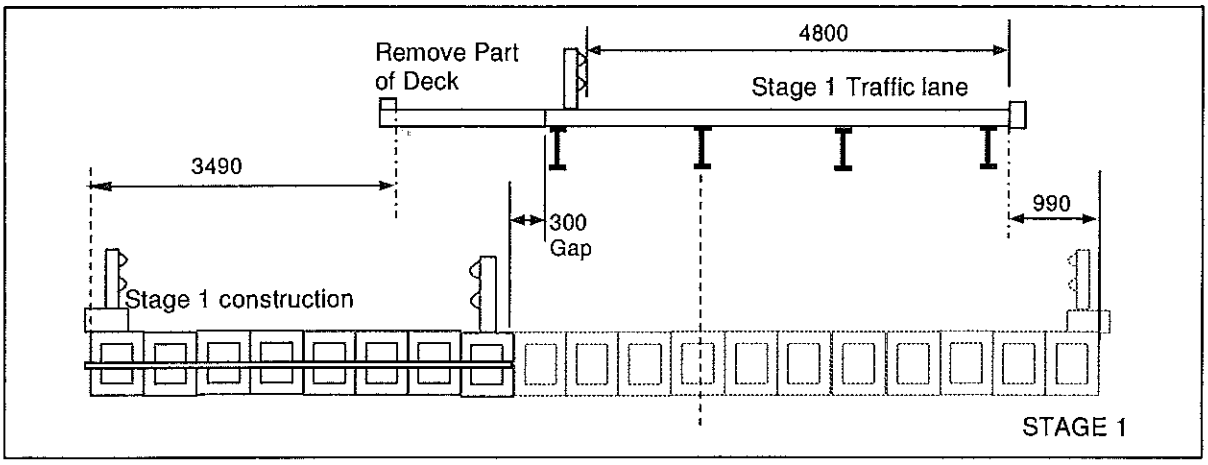


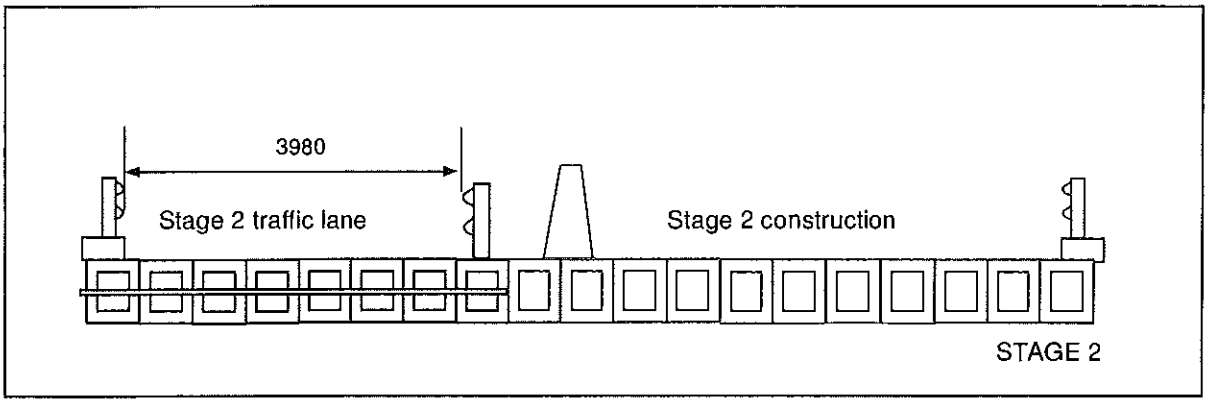


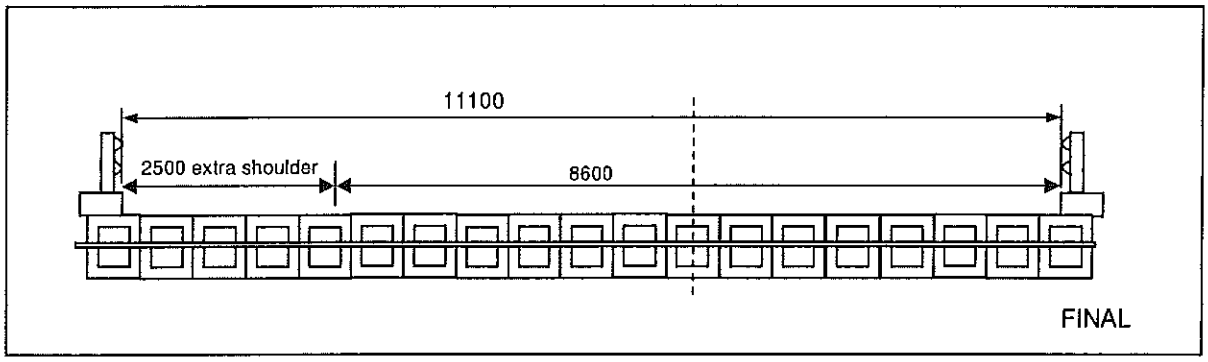




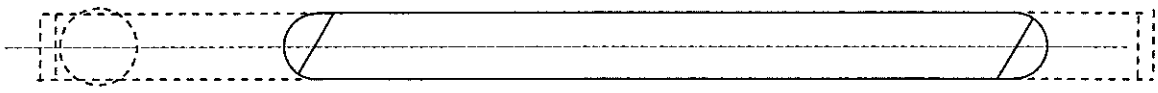
SKETCH-1D

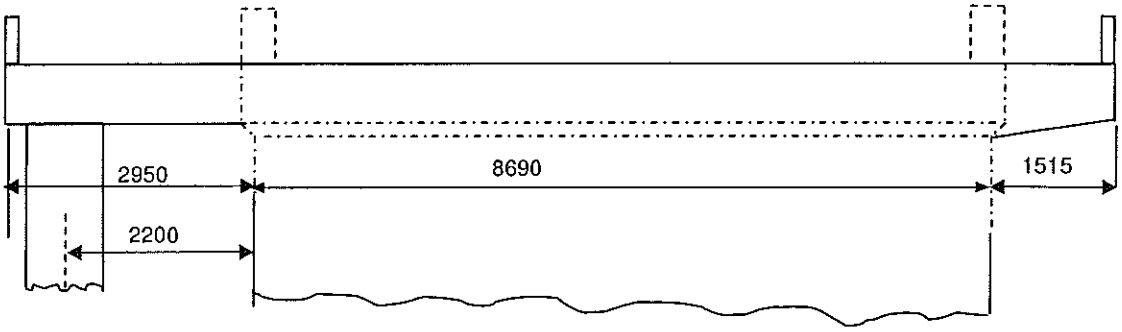

Remove Part
of Deck
4800
Stage 1 Traffic lane
3490
300
Gap
990
Stage 1 construction
STAGE 1

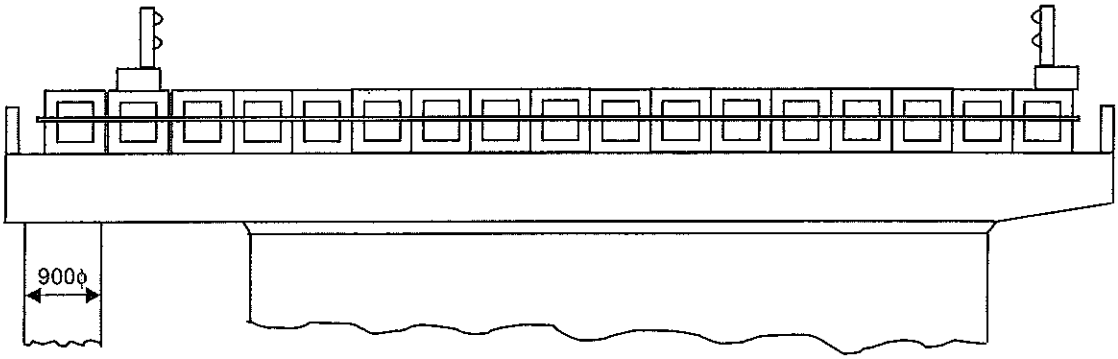

3980
Stage 2 traffic lane
Stage 2 construction
STAGE 2

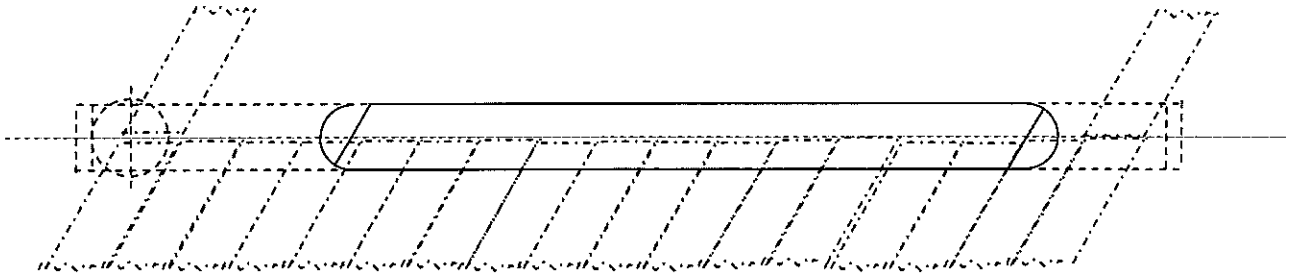

11100
2500 extra shoulder
8600
FINAL

SKETCH-1E

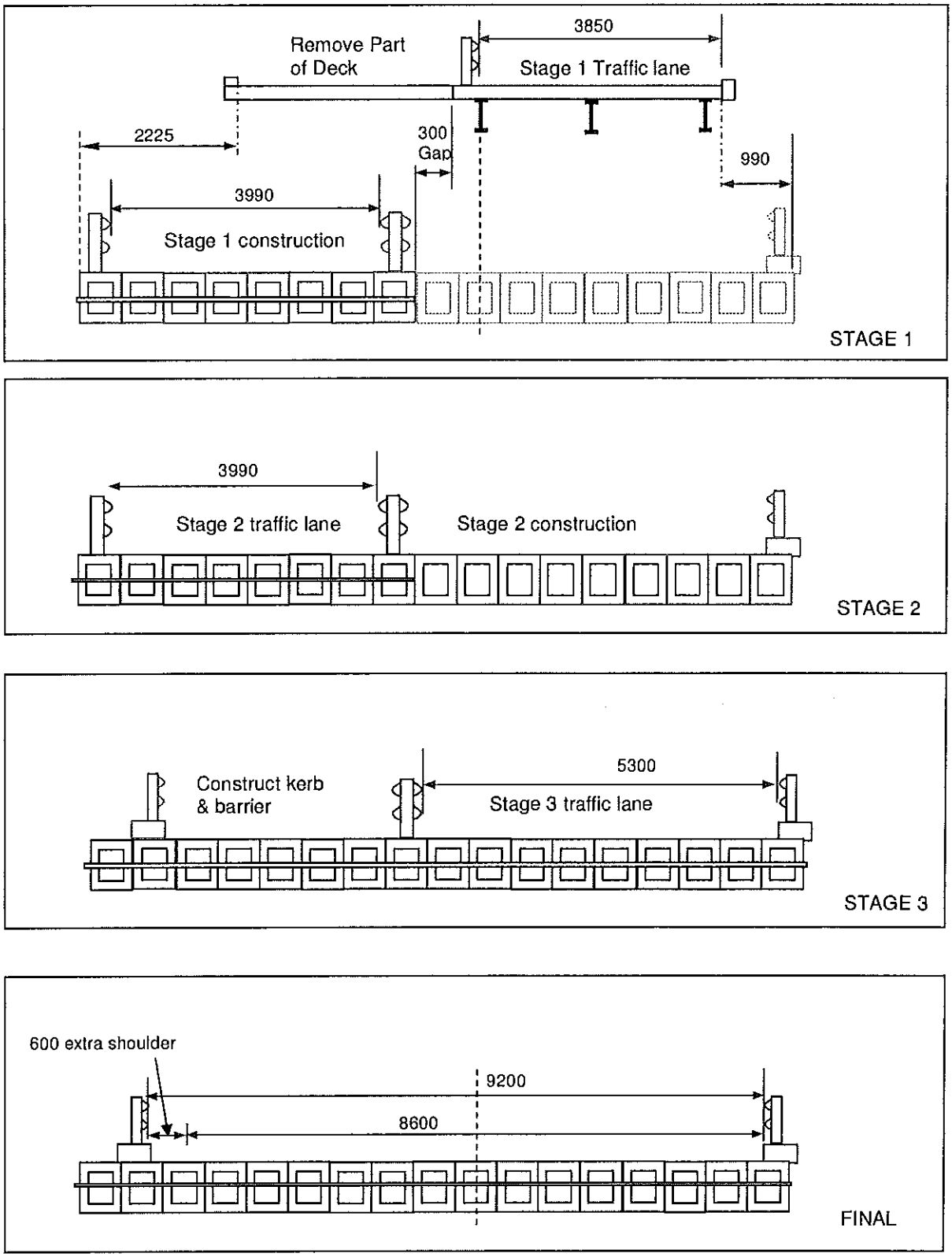




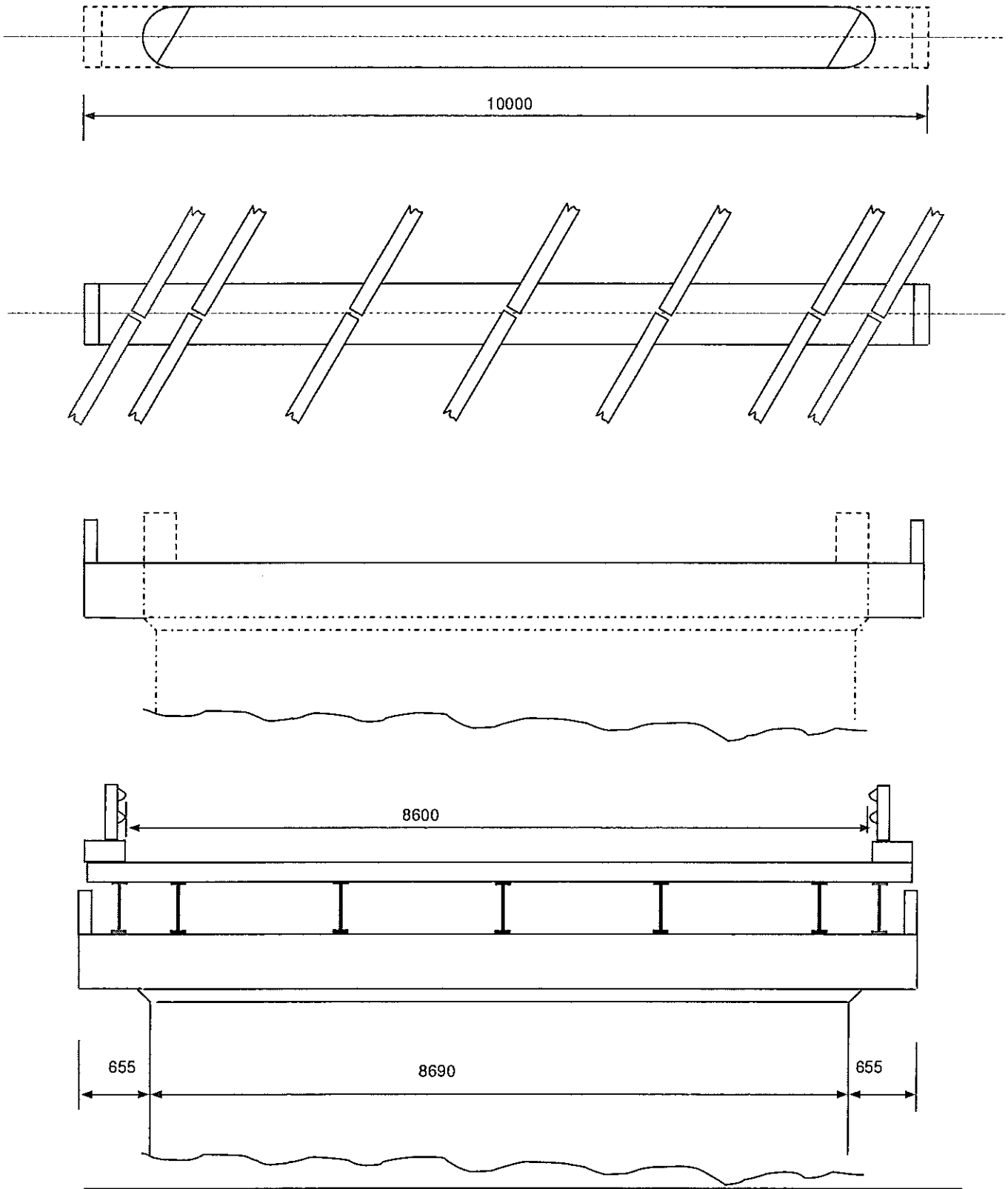




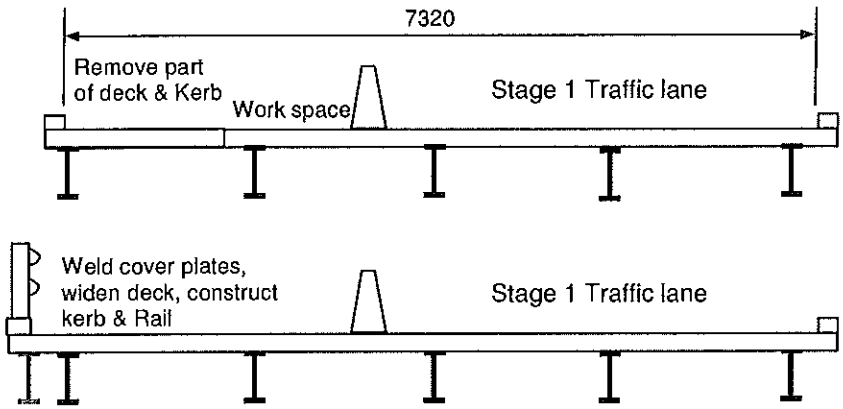
SKETCH-1E


Remove Part
of Deck
3850
Stage 1 Traffic lane
2225
300
Gap
990
3990
Stage 1 construction
STAGE 1
3990
Stage 2 traffic lane
Stage 2 construction
STAGE 2
Construct kerb
& barrier
5300
Stage 3 traffic lane
STAGE 3
600 extra shoulder
9200
8600
FINAL

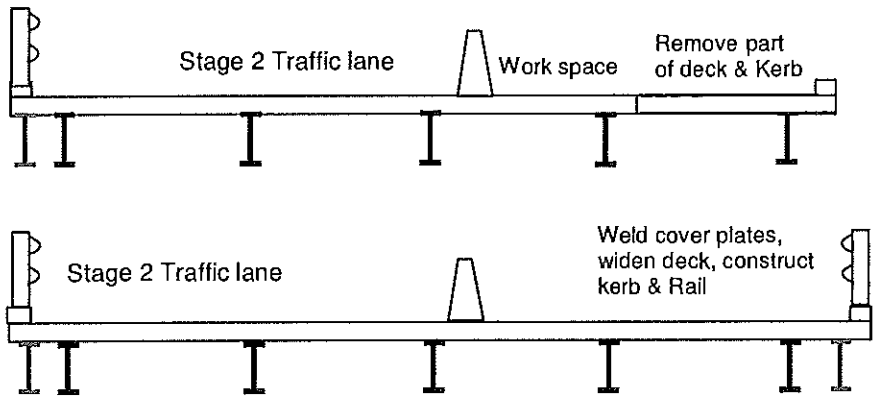
SKETCH-2



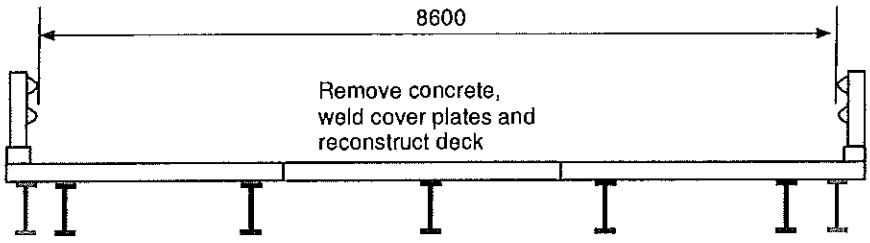
SKETCH-2



STAGE 1



STAGE 2



Bridge closure required

STAGE 3

Annexure M

Regional Bridge Renewal Program List

Regional Bridge Renewal Program

The Regional Bridge Renewal Program is an initiative to replace significantly deteriorated timber bridges and older concrete and steel structures in poor condition in regional Queensland. The Regional Bridge Renewal Program was announced by the Premier on the 9 August 2005 and the Queensland Government allocated $350 million over five years. This funding was allocated to replace 104 bridges and rehabilitate 5 bridges over the five-year program.

Since 1 January 2006 the following projects have been constructed under this program replacing bridges in regional Queensland:

Albert River - Yore Road	Waterford - Tamborine	South Coast	19,000
Kuralboo Creek	Springbrook	South Coast	1,588
Nerang River	Labrador - Carrara	South Coast	7,414
Reynolds Creek	Boonah - Fassifern	South Coast	7,500
Unknown Bridge No. 7	Running Creek	South Coast	3,610
Wallace Creek	Boonah - Rathdowney	South Coast	2,900
Western Creek Tributary	Rosewood - Warrill View	Metropolitan	1,782
Western Creek	Rosewood - Warrill View	Metropolitan	1,498
Harrisville Creek	Warrill View - Peak Crossing	Metropolitan	1,192
Sheep Station Creek	D'Aguilar Highway (Kilcoy - Yarraman)	North Coast	4,030
Six Mile Creek King John Creek	Beerburrum	North Coast	11,110
Booberanna Creek	Talwood - Boonanga	Darling Downs	756
King Creek	Gatton - Clifton	Darling Downs	4,623
Bum Bum Creek	New England Highway (Yarraman - Toowoomba)	Darling Downs	10,000
Redbank Creek No.4 Redbank Creek No 5	Esk - Hampton	North Coast	3,859
Calico Creek	Gympie - Brooloo	Wide Bay/Burnett	2,426
Tuchekoi Bridge	Tuchekoi	Wide Bay/Burnett	7,460
Sandy Creek	D'Aguilar Highway (Yarraman - Kingaroy)	Wide Bay/Burnett	4,000
Burnett River Bridge	Burnett Highway (Gayndah - Monto)	Wide Bay/Burnett	3,588
Fox Creek	Burnett Highway (Gayndah - Monto)	Wide Bay/Burnett	596
Gap Creek	Kilkivan - Tansey	Wide Bay/Burnett	1,032
Harkness Boundary Creek No. 2	Burnett Highway (Gayndah - Monto)	Wide Bay/Burnett	1,105
Langley Creek	Burnett Highway (Gayndah - Monto)	Wide Bay/Burnett	1,345
Little Brooyar Creek	Bauple - Woolooga	Wide Bay/Burnett	1,761
Miva Creek	Bauple - Woolooga	Wide Bay/Burnett	1,613
Clovernook Zamia	Dawson Highway (Banana - Rolleston)	Fitzroy	2,776
Byfield Creek	Yeppoon - Byfield	Fitzroy	
Kianga Creek	Dawson Highway (Banana - Rolleston)	Fitzroy	2,946
Stoney Creek	Yeppoon - Byfield	Fitzroy	6,500
Styx River	Ogmore Connection	Fitzroy	726
Cornish Creek	Aramac - Torrens	Central West	5,275
Sandy Creek	Peak Downs Highway (Nebo - Mackay)	Mackay/Whitsunday	6,267
Belyando River	Clermont - Alpha	Mackay/Whitsunday	10,200
Perrys Creek	Peak Downs Highway (Nebo - Mackay)	Mackay/Whitsunday	4,338
Bushy Creek	Mossman - Mount Molloy	Far North	1,651
East & West Normanby River	Cooktown Developmental	Far North	8,448
Gracey Creek	Innisfail - Japoon	Far North	2,103
Scheu Creek	Innisfail - Japoon	Far North	1,956
Caboolture Creek	Yandina - Bli Bli	North Coast	362
Jiggera Creek	Kilcoy - Murgon	North Coast	67
Kin Kin Creek No 3	Kin Kin	North Coast	611
New Country Creek	Esk - Kilcoy	North Coast	77
Oakey Creek	Inglewood - Texas	Darling Downs	5,064

Dry Creek	Gatton - Clifton	Metropolitan	3,836
Ma Ma Creek	Gatton - Clifton	Metropolitan	4,501
Barambah Creek	Byee	Wide Bay/Burnett	2,091
McCord Creek	Burnett Highway (Gayndah - Monto)	Wide Bay/Burnett	5,586
Three Moon Creek	Burnett Highway (Monto - Biloela)	Wide Bay/Burnett	7,220
Wide Bay Creek	Bauple - Woolooga	Wide Bay/Burnett	10,900
Black Gin Creek	Rockhampton - Ridgelands	Fitzroy	70
David Burgess	Mackay - Eungella	Mackay/Whitsunday	4,577
Running Creek	Sarina - Homebush	Mackay/Whitsunday	1,096
Sandy Creek	Homebush	Mackay/Whitsunday	9,188
Gentle Annie Creek	Halifax - Lucinda Point	Northern	5,905
Gilbert River	Burke Developmental (Normanton - Dimbulah)	North West	10,491
Kogan Creek	Dalby - Kogan	Darling Downs	5,700
Wilkie Creek	Dalby - Kogan	Darling Downs	4,577
Degilbo Creek	Maryborough - Biggenden	Wide Bay/Burnett	6,600
Harkness Boundary Creek No. 1	Burnett Highway (Gayndah - Monto)	Wide Bay/Burnett	5,419
Station Creek	Gayndah - Mount Perry	Wide Bay/Burnett	867
Two Mile Creek	Kalpowar	Wide Bay/Burnett	3,656
Wetheron Creek	Gayndah - Mount Perry	Wide Bay/Burnett	2,679
Lonesome Creek	Leichhardt Highway (Westwood - Taroom)	Fitzroy	1,294
Neville Creek	Dawson Highway (Biloela - Banana)	Fitzroy	1,480
Oaky Creek	Dawson Highway (Gladstone - Biloela)	Fitzroy	4,341
Scrubby Creek	Dawson Highway (Gladstone - Biloela)	Fitzroy	3,129
Native Companion Creek	Clermont - Alpha	Central West	3,367
McGregor Creek No. 2	Mirani - Mount Ossa	Mackay/Whitsunday	3,244
Twelve Mile Creek	Oxford Downs - Sarina	Mackay/Whitsunday	6,416
Endeavour River	Endeavour Valley	Far North	12,559

The following bridges were completed as part of the Southern Queensland Accelerated Road Rehabilitation Program which were delivered as an alliance contract. The SQ ARRP forms part of the RBRP and replaced 31 bridges across Darling Downs and Wide Bay Burrnett regions. The SQ ARRP was completed in December 2009.

Broadwater Creek (6.0km)	Stanthorpe - Texas	Darling Downs	2,220
Bracker Creek (1.4km)	Warwick - Killarney	Darling Downs	1,500
Rosenthal Creek (1.6km)	Warwick - Killarney	Darling Downs	1,715
Wilkie Creek (25.2km)	Moonie Highway (Dalby - St George)	Darling Downs	2,850
Wallaby Creek No.3 (39.4km)	D'Aguilar Highway (Kilcoy - Yarraman)	North Coast	1,292
Wallaby Creek No.2 (36.0km)	D'Aguilar Highway (Kilcoy - Yarraman)	North Coast	4,450
Slip Gully (33.2km)	Forest Hill - Fernvale	North Coast	3,200
Lockyer Creek (25.4km)	Forest Hill - Fernvale	North Coast	6,620
Philpott Creek (30.9km)	Burnett Highway (Gayndah - Monto)	Wide Bay/Burnett	3,780
Woowoonga Creek (41.1km)	Isis Highway (Childers - Biggenden)	Wide Bay/Burnett	2,980
Yandaran Creek (24.3km)	Bundaberg - Lowmead	Wide Bay/Burnett	4,140
Littabella Creek (28.1km)	Bundaberg - Lowmead	Wide Bay/Burnett	3,480
Mullett Creek (35.3km)	Bundaberg - Lowmead	Wide Bay/Burnett	3,930
Cockatoo Creek (24.7km)	Bundaberg - Lowmead	Wide Bay/Burnett	1,750
Gregory River (16.5km)	Goodwood	Wide Bay/Burnett	4,500
Gregory River (32.5km)	Isis Highway (Bundaberg - Childers)	Wide Bay/Burnett	4,590
Sandy Creek (20.3km)	Isis Highway (Childers - Biggenden)	Wide Bay/Burnett	1,490
Nangur Creek No.3 (58.6km)	Burnett Highway (Nanango - Goomeri)	Wide Bay/Burnett	4,431
Nangur Creek No.2 (57.4km)	Burnett Highway (Nanango - Goomeri)	Wide Bay/Burnett	3,230
Boonara Creek No.4 (36.5km)	Burnett Highway (Goomeri - Gayndah)	Wide Bay/Burnett	4,625
Crooked Creek (7.9km)	Burnett Highway (Goomeri - Gayndah)	Wide Bay/Burnett	2,700
Fat Hen Creek (31.9km)	Wide Bay Highway (Gympie - Goomeri)	Wide Bay/Burnett	1,595
Widgee Creek (7.8km)	Wide Bay Highway (Gympie - Goomeri)	Wide Bay/Burnett	5,020
Coppermine Creek (43.4km)	Wide Bay Highway (Gympie - Goomeri)	Wide Bay/Burnett	3,810

Wide Bay Creek (47.0km)	Wide Bay Highway (Gympie - Goomeri)	Wide Bay/Burnett	3,040
Boyne River (70.0km)	Bunya Highway (Dalby - Kingaroy)	Wide Bay/Burnett	2,825
Mannuem Creek (72.6km)	Bunya Highway (Dalby - Kingaroy)	Wide Bay/Burnett	3,370
Wagner's Gully (44.65 km)	Bundaberg - Gin Gin	Wide Bay/Burnett	2,745
Barambah Creek (42.5km)	Burnett Highway (Nanango - Goomeri)	Wide Bay/Burnett	4,575
Un-named Creek (21.5km)	Murgon - Gayndah	Wide Bay/Burnett	2,080
Kratzman's Gully (24.6km)	Murgon - Gayndah	Wide Bay/Burnett	3,145

The following bridges were completed as part of the Central Queensland Accelerated Road Rehabilitation Program and also forms part of the RBRP. The CQ ARRP replaced 5 bridges across Central Queensland and was completed in late 2007.

Branch Creek	Dawson Highway (Gladstone - Biloela)	Fitzroy	2,800
Deep Creek	Dawson Highway (Gladstone - Biloela)	Fitzroy	2,046
Duckholes Creek	Dawson Highway (Gladstone - Biloela)	Fitzroy	2,437
Double Creek	Dawson Highway (Gladstone - Biloela)	Fitzroy	694
Doughboy Creek	Dawson Highway (Gladstone - Biloela)	Fitzroy	935

Accelerating the replacement of ageing and obsolete bridges that are least able to accommodate current and future freight load demands will return financial savings on future maintenance and rehabilitation and also return benefits to road users and industry. An upgraded bridge network will also improve economic performance and regional employment through better road freight efficiency.

Annexure N

Closure and upgrade of A J Wyllie Bridge

Fw: AJ Wyllie - articles on Pine Rivers Press and Northern Times websites.
Derek A Deane to: Emma J Thomas, Shane G Doran 25/03/2011 03:44 PM
Cc: Dennis G Tennant, Pannie Z Mitchell, Garth H Agnew

Hi,

Just drawing your attention to the decision of Minister Wallace to have the A J Wyllie northbound bridge replaced as contained in the media clip below. The clip includes statements by the local MP.

The Minister had called for a media release for the bridge replacement and this was referred to TNRP for advise on wording as it seemed premature without funding being resolved. The wording agreed by John McEvoy to be included in the media statement was "the bridge will be recommended for replacement and funding application will be made to the NDRRA in coming weeks", The media statement was passed up the line as normal based on this. The Minister chose to depart from the media statement provided.

The closure of the bridge has been a significant issue in the community and we propose to move quickly to deal with the matter in the light of the decision taken.

Some points to be noted in this regard:

- a consultant has been appointed to project manage the replacement
- an NDRRA submission is being prepared that will address betterment and highlight sustainability issues for both this bridge and the adjoining bridge. This has a high priority.
- priority is being given to the demolition of the existing bridge to show progress. Issues here are pedestrian pathway alternative and potential environmental concerns
- a communication plan is to be prepared and the Minister is looking to monthly updates to the community
- consideration is being given to how the business community nearby can be assisted
- consideration will be undertaken of improvements to traffic management considering the extended period of the reduced capacity

Please advise if you would like anything further.

Cheers

Derek Deane
District Director (Moreton) | North Coast Region / Moreton Office
Assets and Operations / Regions | Department of Transport and Main Roads

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----- Forwarded by Derek A Deane/SouthEast/QMR/Au on 25/03/2011 02:41 PM -----

Tracy L Bange/SouthEast/QMR/Au
25/03/2011 11:42 AM

To [redacted]

Deane/SouthEast/QMR/Au@qdot

cc

Subject AJ Wyllie - articles on Pine Rivers Press and Northern Times websites.

Please see below, an article posted online on the Pine Rivers Press and Northern Times (sister newspapers) websites.

A.J. Wyllie Bridge to be replaced

- Local News

24 Mar 11 @ 10:23am by Miranda Forster

PETRIE: The State Government will build a new bridge to replace the northbound section of the A.J. Wyllie Bridge, Main Roads Minister Craig Wallace said today.
Mr Wallace did not release a cost or timeframe for the bridge, but State Member for Kallangur Mary-Anne O'Neill said the money would come from the state's disaster rebuilding funds and the project would be given top priority.
``Everyone knows how urgent it is to have this resolved,'' she said.
Mr Wallace said divers found severe damage to the 77-year-old bridge's foundations and cracking on some sections.
"Taking all factors into consideration...a new bridge is the best option," Mr Wallace said.
LNP candidate for Kallangur Trevor Ruthenberg said a new bridge was the right decision but called for more detail from the Minister.
``This is a major infrastructure program that may take months and even years so we want to know what are they going to do for traffic flow in the meantime?'' he said.
``Businesses are already hurting in Lawnton and Petrie.''
Mr Ruthenberg also called for a review of the management of water releases from North Pine Dam to prevent further damage to the bridge.
Mary-Anne O'Neill defended the length of time taken to make a decision on the lower bridge, which has been closed for two months after it was damaged during the January floods.
``You have to be sure the thing is broken to justify the cost, considering all the damage that has been done across the state,'' Ms O'Neill said.
The A.J. Wyllie Bridge is one of just two spots where cars can cross the North Pine River, and commuters have voiced their frustration at its closure in The Northern Times.

Kind regards,

Tracy Bange
Communications Officer | North Coast Region
Assets & Operations / Regions | Department of Transport and Main Roads

21 Carnaby Street, Maroochydore, 4558
PO Box 1600, Sunshine Plaza Post Shop, Maroochydore, Qld, 4558
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Sharyn Durston

From: Jessica Pugh
Sent: Tuesday, 8 February 2011 11:11 AM
To: Sharyn Durston
Cc: Craig Wallace
Subject: 2.30 thursday 17th feb- room a36

Mary Anne

Drop in session- 2.30 to 3pm

AJ Wylie bridge is flood affected Mary Anne would like to talk about reconstruction and maintenance, and a timeframe for reopening.

She also wanted to know if a new bridge a possibility.

She would also like to discuss Kallangur bypass- any movement on this one?

Sharyn can we please order a briefing note on these two and a department rep to attend?

thanks

Jessica Pugh
Assistant Policy Advisor to
Hon Craig Wallace MP
Minister for Main Roads
Member for Thuringowa

Phone: [redacted]

MINISTERIAL REQUEST FORM

Queensland Governmer

Minister for Main Roads

Request date: 09/02

Min Ref: _____

Dept Ref: _____

☐ Urgent ☐ Confidential

REQUIRED BY (Name)	TIME	DUE DATE
Minister	12.00	15/02

TO: [redacted] ☐ Department of Transport and Main Roads

Directorate:

PLEASE PREPARE:

- ☐ Trip Brief/Folder
- ☒ Briefing Note
- ☐ For Information
- ☐ For Appropriate Action
- ☐ Other: _____
- ☐ Speaking Points *
- ☐ Draft Media Release *
- ☐ Function Pro-forma
- ☐ Guest / Invitation List
- ☐ Event Run Sheet
- ☒ Dept Officer to attend

NOTE: Only briefs for signature and trip folders are provided in hard copy.

Departmental officer must confirm attendance ASAP or no later than 48 hours prior to meeting by email to: [redacted]

DETAILS OF MEETING:

DATE: 17/02 TIME:2.30pm

ORGANISATION / FUNCTION: Meeting with Mary Anne O'Neill MP

VENUE: Parl Hse, Room A36

PLEASE NOTE:
* If speech and/or media release has been requested, please ensure liaison/consultation occurs with Media Unit

FOR SIGNATURE BY:

☒ Minister ☐ Policy Advisor ☐ Other ☐

ADDITIONAL INSTRUCTIONS:

** When speech or media releases have been requested, please contact the Media Unit (ph: 3306 7060)

*See attached.

If you require any further information regarding this request please contact:

Departmental Liaison Officer Donna Boswell on [redacted]

Briefing note request: Meeting with Ms Mary-Anne O'Neill on 17 Feb 2011

DLO_Main Roads Minister to: Doctrak Information Services - DTMR, Dennis G Tennant, Derek A Deane 09/02/2011 12:48 PM

Sent by: Donna M Boswell
Cc: Shane G Doran, Emma J Thomas

Joan (IS) - Could you please arrange for a briefing note to be prepared by Moreton office. The briefing note is required by Tuesday, 15 February 2011. Please note Moreton office previously answered the AJ Wylie bridge issue as CE2595.

img-20910306-0001.pdf

Dennis - Please note the request for a departmental representative to attend. Could you please arrange and advise *DLO_Main Roads Minister* by email, accordingly.

Kind regards,

Donna Boswell
Departmental Liaison Officer | Government Services
Corporate Governance Division | Department of Transport and Main Roads

Floor 20 | Mineral House | 41 George Street | Brisbane Qld 4000
GPO Box 2595 | Brisbane Qld 4001
P: [redacted]
E: [redacted]
W: www.tmr.qld.gov.au

Fw: Urgent: SMS updates - A J Wyllie Bridge
Penny J Ford to: Emma J Thomas 25/01/2011 03:03 PM
Cc: Eddie J Peters, Dennis G Tennant
History: This message has been replied to.

Hi Emma and Eddie,

Please see the good news below - the Southbound bridge is now open - one lane in each direction. It was opened at 11am this morning.

The below communication was sent out to all stakeholders at lunchtime today. There is an SMS service established. I have signed off on the media release which I hope gets sent out shortly. I have personally contacted Carolyn Male, Mary-Ann O'Neill's office and Greg Smith from Passenger Transport (school bus routes) to give them the good news. Moreton Bay Regional Council have also been contacted by our Project Manager.

Please feel free to contact me if you would like to me to provide you with more details, particularly about the northbound bridge which is still closed.

Update: Southbound lanes of the A J Wyllie Bridge are now open

The A J Wyllie Bridge on Gympie Road at Petrie has now opened to traffic on the southbound lanes (high bridge).

Transport and Main Roads gave work on the high bridge highest priority so that connectivity could be restored.

This bridge is now open to one lane of traffic in each direction.

It is likely that the northbound bridge will remain closed for a number of months due to ongoing inspections and repair work.

It is still safe for pedestrians and cyclists to use the low bridge to cross Pine River.

Variable Message Signs are in place to keep motorists informed of changed traffic conditions and will remain there while the work is ongoing.

Transport and Main Roads is urging all motorists to be patient while works are being undertaken and to check the 131940 website (www.131940.qld.gov.au) for road conditions and closure updates.

Subscribe for SMS updates – visit www.northpinebridgesms.com.au and follow the prompts. This service will provide regular reports on changing traffic conditions, delays and the progress of these works.

For further information, please contact Lisa Shirley or Tracy Bange at Transport and

Main Roads on 5313 8700 or email moreton.office@tmr.qld.gov.au.

Kind regards,

Penny Ford
A/ District Director (Moreton) | North Coast Region / Moreton Office
Assets & Operations Division | Department of Transport and Main Roads

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----- Forwarded by Penny J Ford/SouthEast/QMR/Au on 25/01/2011 02:54 PM -----

Joan M Campbell/cp1/QMR/Au
25/01/2011 02:50 PM

To Penny J Ford/SouthEast/QMR/Au@qdot
cc Eddie J Peters/SouthEast/QMR/Au@qdot
Subject Fw: Urgent: SMS updates - A J Wyllie Bridge

Hi Penny

Reference the below e-mail trail. Could you please provide an update (direct to Emma Thomas with a cc to Eddie please) on the A J Wyllie Bridge.

Kind regards,

Joan Campbell
Principal Advisor (Assets and Operations) | Office Of The General Manager
Assets & Operations Division | Department of Transport and Main Roads

Floor 9 | 295 Ann Street | Brisbane Qld 4000
PO Box 309 | Spring Hill Qld 4004
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----- Forwarded by Joan M Campbell/cp1/QMR/Au on 25/01/2011 02:48 PM -----

Julie M Salsbury/Central/qdot/au
25/01/2011 01:33 PM

To Joan M Campbell/cp1/QMR/Au@QDOT
cc
Subject Urgent: SMS updates - A J Wyllie Bridge

Hi Joan, Can we can an urgent update please.

Kind regards,

Julie Salsbury
Principal Advisor to Chief Operations Officer | Executive Directorate
Chief Operations Officer | Department of Transport and Main Roads

Floor 17 | Capital Hill | 85 George Street | Brisbane Qld 4000
GPO Box 1549 | Brisbane Qld 4001
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----- Forwarded by Julie M Salsbury/Central/qdot/au on 25/01/2011 01:32 PM -----

Emma J Thomas/cp3/QMR/Au
25/01/2011 01:28 PM

To "Mrs Julie Salsbury" <[redacted]
cc
Subject Fw: Urgent: SMS updates - A J Wyllie Bridge

Could you pls chase response to this?
Thanks
Kind regards,

Emma Thomas
Chief Operation Officer | Executive Directorate
Operations Group | Department of Transport and Main Roads
Floor 17 | Capital Hill | 85 George Street | Brisbane Qld 4000
GPO Box 1549 | Brisbane Qld 4001
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P| Please consider the environment before printing this email
Emma J Thomas

----- Original Message -----
From: Emma J Thomas
Sent: 25/01/2011 09:12 AM ZE10
To: Eddie Peters
Subject: Urgent: SMS updates - A J Wyllie Bridge

Hi Eddie,

Sorry that we have not caught up yet. Could you please urgent;y find out the status of this bridge and our actions?

Kind regards,

Emma Thomas
Chief Operations Officer | Executive Directorate
Chief Operations Officer Division | Department of Transport and Main Roads

Floor 17 | Capital Hill | 85 George Street | Brisbane Qld 4000
GPO Box 1549 | Brisbane Qld 4001
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M: [redacted]
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----- Forwarded by Emma J Thomas/cp3/QMR/Au on 25/01/2011 09:11 AM -----

David M Stewart/cp1/qdot/au
25/01/2011 09:10 AM

To "Emma Thomas" [redacted]
cc
Subject Fw: SMS updates - A J Wyllie Bridge

this is the bridge.

Kind regards,

David Stewart
Director-General (Transport and Main Roads) | Executive Directorate
Office Of The Director-General & Associate | Department of Transport and Main Roads

Floor 13 | Capital Hill | 85 George Street | Brisbane Qld 4000
GPO Box 1549 | Brisbane Qld 4001
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----- Forwarded by David M Stewart/cp1/qdot/au on 25/01/2011 09:10 AM -----

Peter G Brown/cp1/QMR/Au
25/01/2011 08:55 AM

To David M Stewart/cp1/qdot/au@qdot
cc Jack Z Noye/cp1/qdot/au@qdot
Subject Fw: SMS updates - A J Wyllie Bridge

Dave, A J Wyllie Bridge public information is below. Further to this, North Coast, Roadtek and Bridge Branch are meeting at 11am this morning to discuss moving forward. Greg Smith from PT in North Coast has been consulted on a daily basis regarding school buse diversion routes. The schools have been given daily briefings. It has all been handled very well. Penny Ford, A/DD North Coast is hoping to have one lane open each way by tomorrow or even as early as this afternoon depending on meeting outcomes.

Motorists warned work on A J Wyllie Bridge to continue for months

The A J Wyllie Bridge on Gympie Road at Petrie is currently closed to ensure the safety of motorists while crews assess damage caused by the recent unprecedented flooding.

Inspections have identified riverbed erosion issues with the northbound lanes (the low bridge) while on the southbound lanes there has been significant damage to the guardrail, embankments and lighting.

It is likely that the northbound bridge will remain closed for a number of months due to ongoing inspections and repair work.

Work on the high bridge has been prioritised so that connectivity can be restored. It is anticipated that, weather permitting, there will be one lane open in each direction from Wednesday 26 January.

Until the high bridge is reopened, a diversion route along Youngs Crossing Road will also be available.

Variable Message Signs are in place to alert people to the changed traffic conditions and will remain there while the work is ongoing.

Transport and Mains Roads Regional Director Penny Ford said that they wanted to reopen the bridge as soon as possible but will not reopen it until it is safe to do so.

"Our priority right now is making the transport network fully safe and open," she said.

She said the state's biggest piece of infrastructure, the 33,000 kilometre road network, took more damage than any other government asset during the floods.

Transport and Main Roads is urging all motorists to be patient while works are being undertaken and to check the 131940 website (www.131940.qld.gov.au) for road conditions and closure updates.

- Ends

Lisa Shirley
A/Principal Communications Advisor | North Coast Region / Sunshine Coast Office
Assets & Operations | Department of Transport and Main Roads

Floor Gr | Maroochydore - Sunshine Coast Office | 21 Carnaby Street | Maroochydore Qld 4558
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Peter G Brown/cp1/QMR/Au

Peter G Brown/cp1/QMR/Au
25/01/2011 08:42 AM

To Lisa A Shirley/SouthEast/QMR/Au@qdot
cc
Subject Fw: SMS updates - A J Wyllie Bridge

Thanks.....what's the answer

Regards

Peter Brown
Principal Advisor |
Office Of The Director-General and Associate | Department of Transport and Main Roads

Floor 13 | Capital Hill | 85 George Street | Brisbane Qld 4000
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----- Forwarded by Peter G Brown/cp1/QMR/Au on 25/01/2011 08:42 AM -----

moretonDB
Sent by: Lisa A Shirley

25/01/2011 08:37 AM

To

cc

Subject SMS updates - A J Wyllie Bridge

Update: A J Wyllie Bridge, Petrie

The Department of Transport and Main Roads has set up an SMS service to keep the community informed of recovery works on the A J Wyllie Bridge on Gympie Road, Petrie.
This service will provide regular reports on changing traffic conditions, delays and the progress of these works.

To subscribe to this free service, visit www.northpinebridgesms.com.au and follow the prompts.

For further information, please contact Lisa Shirley or Tracy Bange at Transport and Main Roads on 5313 8700 or email moreton.office@tmr.qld.gov.au.