AusLink
Project Proposal Report

PERTH - BUNBURY NATIONAL CORRIDOR

NEW PERTH- BUNBURY HIGHWAY
Kwinana Freeway Extension and Peel Deviation
Safety Bay Road, Baldivis to Old Coast Road, Lake Clifton

May 2006

MAIN ROADS
Western Australia
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1 INTRODUCTION

The Perth Bunbury Corridor forms part of the AusLink National Network. The Perth Bunbury Corridor consists of the South West railway from Mundijong to Bunbury and a road route comprising:

- the Kwinana Freeway (from Leach Highway to Safety Bay Road);
- Safety Bay Road (from the end of Kwinana Freeway to Mandurah Road);
- Mandurah Road (from Safety Bay Road to the Perth Bunbury Highway); and
- Perth Bunbury Highway (from Mandurah Road).

The Perth Bunbury Corridor links the Perth metropolitan area to the Peel and South West regions of Western Australia, which are the State's two most populous regions outside the metropolitan area and have amongst the highest growth rates in the State. Three inter-regional roads have been planned to link the Perth metropolitan area to these two southern regions. The three routes are shown on the locality plan at Appendix 1 and two of these roads already exist.

The coastal route, known as the Perth Bunbury Highway passes through the coastal development in Rockingham, Mandurah and on the Dawesville Peninsula, and is typically a divided dual carriageway, except for a section of single carriageway between Dawesville and Lake Clifton. The second inland route, known as South Western Highway passes through several inland towns including Pinjarra, Waroona and Harvey, and is typically a single carriageway with passing lanes. These routes are heavily constrained by development that has occurred adjacent to the roads.

The third central route, which is only partially developed, comprises the Kwinana Freeway to Mandurah and a new road to the east of Mandurah, referred to as the Peel Deviation, which joins the existing Perth – Bunbury coastal route south of Mandurah, near Lake Clifton. The central route will form the Perth Bunbury Corridor in AusLink National Network when completed and is shown at Appendix 2.

The Kwinana Freeway has been constructed as far south as Safety Bay Road. The undeveloped section of the Perth Bunbury AusLink corridor consists of the Kwinana Freeway extension south of Safety Bay Road to Mandurah and the Peel Deviation. This section of the corridor is now referred to as the New Perth Bunbury Highway.

The central route has been planned for many years as the long-term strategic, inter-regional route between Perth and the Peel and South West regions and land is reserved for the route in the Metropolitan and Peel Region Schemes as shown at Appendix 3. This strategic inter-regional function cannot be adequately fulfilled in the longer term by
the other two routes due to the adjacent development pressures. In the longer term,
their role will revert to a primary collector-distributor.

The total estimated cost of the New Perth-Bunbury Highway project is $450 million (in
April 2005 dollars) with the Federal Government contribution of $170 million and the
State to contribute the other $280 million. These allocations by the Federal and State
Governments are set out in Schedule A of the AusLink Bilateral Funding Agreement with
Western Australia.

As detailed in this Project Proposal Report it is estimated that land acquisition,
accommodation works, design and project management cost to the commencement of
construction will be $55 million. Based on a 50/50 contribution, the Federal funding
contribution will be $27.5 million.

This Project Proposal Report therefore requests DOTARS project and funding
approval of $27.5 million for the construction of the New Perth - Bunbury Highway
between Safety Bay Road Baldivis and the Old Coast Road Lake Clifton.

Once a Project Target Cost is finalised in October 2006 and the preferred proponent
announced a Project Proposal Report requesting approval for the release of the
remaining Federal funds for the delivery stage of this project will be submitted.

2 PROJECT DESCRIPTION

The New Perth Bunbury Highway project provides for the development of the central
route linking the Perth metropolitan area to the Peel and South West regions of Western
Australia, in particular the cities of Mandurah in the Peel region and Bunbury in the
South West region. The New Perth Bunbury Highway project comprises an extension of
the Kwinana Freeway, south of Safety Bay Road to Mandurah, and the Peel Deviation to
the East of Mandurah, as shown on the ortho photo map at Appendix 4.

The New Perth Bunbury Highway is 70.5 kilometres long and will be built as a four-lane
dual carriageway. Although the total length of New Perth Bunbury Highway is planned
for grade separation, it is proposed to initially build the 32km section between Safety Bay
Road and South Yunderup to freeway standard, while the remaining 38.5km section
between South Yunderup Road and the existing dual carriageway at Lake Clifton, will be
built as a dual carriageway with at-grade intersections. The New Perth Bunbury
Highway will complete the dual carriageway between Perth and Bunbury and will provide
a high standard inter-regional road link between Perth and the Peel and South West
regions, bypassing Mandurah on the eastern side of the Peel and Harvey Estuary.

In conjunction with the New Perth Bunbury Highway, additional road works will be
needed to provide connections to the existing road network near Mandurah. These
include the upgrading of Greenlands Road, Lakes Road and Paganoni Road. Though
these works will be required in conjunction with the New Perth Bunbury Highway, they
are not included in the Project Proposal Report.
3 PROJECT BACKGROUND

3.1 PLANNING STRATEGIES

The Western Australian State Planning Strategy Vision Statement states that "Regional Centres will have a range of realistic transport options to Perth and to other parts of the State, and will be protected from the impacts of through traffic". The State Planning Strategy Vision for the Peel Region highlights the need for strong and efficient inter-regional transport links, especially to Perth and the South West region, while the Vision for the South West region includes the need for a well developed integrated intra-regional and inter-regional transport network. To fulfill these visions, the State Planning Strategy provides for the completion of the Kwinana Freeway extension to Mandurah and the Peel Deviation to the east of the Peel Harvey Estuary, as detailed in the Southern Province Transport Strategy.

The development of these roads will provide a route between Perth and Bunbury, which tends to avoid the future urban development in the Mandurah-Pinjarra corridor, as shown in the South-West Urban System. The South West Urban System provides for future urban development in the existing town sites along the South Western Highway.

The Southern Province Transport Strategy concludes that factors such as cost efficiency, timeliness and flexibility of road transport are likely to see road transport remain as the preferred mode of transport to meet the general freight task in the Perth-Bunbury sector. The strategy recommends that in order to minimise transport costs and maintain the international competitiveness of export industries in the Southern Province, major freight routes between the southern province and Perth need to be upgraded and access to the ports of Fremantle, Kwinana and Bunbury improved.

3.2 EXISTING ROAD NETWORK AND TRAFFIC PATTERNS

The Perth Bunbury Highway currently forms the principal route between Perth and the Peel and South West regions and serves the major coastal centres of Mandurah, Bunbury and Busselton. The South Western Highway forms an inland route between Perth and the Peel and South West regions and serves a number of townships along the route including Pinjarra, Waroona and Harvey.
The Perth Bunbury Highway currently carries inter-regional traffic through the cities of Rockingham and Mandurah, which have both undergone rapid growth and development in recent years. Arising from this development, traffic volumes on the existing route, including freight traffic and commuter traffic between Mandurah and Perth, are increasing by around 7%\(^1\) per annum. This is resulting in increasing levels of congestion, which in turn is adversely affecting transport efficiency and road safety, as well as having other adverse social and environmental impacts. In recent years, the progressive upgrading of the Perth Bunbury Highway north of Bunbury and the extension of the Kwinana Freeway to Rockingham is encouraging more traffic to use the Perth Bunbury Highway in preference to the South Western Highway and this is contributing to the rate of traffic growth on this route. The average number of heavy vehicles along the Perth Bunbury corridor is 2000 trucks per day between Perth and Mandurah and 800 trucks per day south of Mandurah.

In the Rockingham-Mandurah area, the Perth Bunbury Highway serves a dual role as a through route and urban collector-distributor, particularly through the peninsular area south of the Mandurah Estuary Bridge. The highway also forms the only access for several coastal communities north and south of Mandurah. The conflicts resulting from this mix of traffic usage has increased the risk of crashes, which will continue to increase as traffic volumes grow.

The Perth Bunbury Highway also experiences significant seasonal fluctuations in traffic volumes with higher flows occurring every weekend and very high flows occurring on long weekends and major holiday periods. These high traffic flows frequently result in traffic slowing to a standstill and backing up for 10km -15km, which severely restricts local access and increases travel times for regional traffic. As a result, there have been a significant number of complaints from the community concerning the level of traffic congestion in the Mandurah area.

The South Western Highway, a two lane single carriageway, is being progressively widened and upgraded with the inclusion of passing lanes to cater for the increasing traffic on this route. While there is less total traffic on this route than on the coastal Perth Bunbury Highway, the number of heavy vehicles on the highway is similar, in the order of 700 heavy vehicles per day, creating amenity problems within the townsites through which the highway passes. With the growing congestion on the existing Perth Bunbury coastal route and extension of the Tonkin Highway to the north, the number of trucks using the South Western Highway is expected to increase unless additional capacity is provided on the network.

\(^1\) Peel Regional Road Network Development Strategy Report

MAIN ROADS Western Australia

PPR New Perth Bunbury Highway May 2006
3.3 **PROJECT OBJECTIVES AND ALIGNMENT WITH AUSLINK OBJECTIVES**

Main Roads' ultimate objective for the New Perth Bunbury Highway Project is to enhance the state of Western Australia's social, economic and environmental well being. To achieve this objective it is Main Roads' expectation that the project will achieve outstanding outcomes in asset quality, safety, cost, sustainability, stakeholder management and community satisfaction.

Nine project objectives have been established to provide strategic guidance for the project and ensure it is delivered to the required standards and in a way that is consistent with Main Roads' values. The objectives have been derived from Main Roads' Strategic Plan (2003-2007) and relate to sustaining network operations; asset management; improving project delivery; expanding capability; community; relationships; social; economic; and the environment.

The project objectives for the New Perth Bunbury Highway are:

**Sustaining Network Operations**

The project will integrate seamlessly into the existing road network and will:
- be highly regarded for its safety features by all users and road safety regulators;
- cater for the needs of all users; and
- be a showcase of best practice network operations through the use of Intelligent Transport Systems.

**Asset Management**

The project will provide for safe and efficient asset management and will:
- be a durable asset with a long service life that will require minimal and low cost maintenance resulting in significant reductions in whole of life costs;
- cater for current and future asset management and data management needs; and
- provide the facilities expected by road users on a world-class road.

**Improving Project Delivery**

The project team will be highly motivated and innovative and will:
- deliver project outcomes that exceed the functional brief and stakeholder expectations;
- deliver exceptional value for money;
- deliver outstanding safety, environmental, economic and social outcomes;
- involve key Main Roads' staff and stakeholders throughout the project lifecycle; and
- be widely acclaimed for its achievements in project delivery.

**Expanding Capability**

The project will allow to:
- maximise the development opportunities for Main Roads;
- maximise the involvement of local and regional industry; and
- promote and expand the alliance culture throughout industry.
**Community**

During the project, excellence in stakeholder management will be achieved by:
- actively engaging the community and stakeholders in the decision making process;
- resolving issues with affected stakeholders in an open and transparent manner; and
- delivering on promises.

**Relationships**

During the project, open and collaborative relationships are developed and fostered that:
- will leave a legacy of excellence in customer service, relationship management and contract management;
- will involve all stakeholders in a coordinated and cooperative way and not only achieve mutual goals, but exceed stakeholder expectations; and
- the approach to stakeholder management enhances the project participants’ environmental and social credibility.

**Social**

The project will be highly regarded and will be renowned for its:
- excellence in safety management and the outstanding safety outcomes it achieves;
- outstanding workplace relations and employee relations outcomes; and
- employment and training schemes that result in ongoing employment opportunities for those who participated in the schemes.

**Economic**

The project will contribute to the economic development of the region and State by ensuring that:
- it provides world-class freight access between ports and markets for regional and local businesses; and
- the commercial goals and objectives of those who participate in the Project are realised.

**Environmental**

The project is seen as setting new benchmarks in environmental management by:
- enhancing both the built and natural environment in the locality of the Project; and
- minimising the Project’s impact on the environment and significantly improving the local environment where possible.

**AusLink Program objectives:**

AusLink will promote sustainable national and regional economic growth, development and connectivity by contributing to the development of an integrated National Network which:
- improves national and interregional connectivity for people, communities, regions and industry;
- improves national, interregional and international logistics;
- enhances national, interregional and international trade;
- enhances health, safety and security;
- is consistent with the obligation to current and future generations to sustain the environment;
- is consistent with viable, long-term economic and social outcomes; and
- is linked effectively to the broader transport network.

Alignment of Objectives

As shown by the matrixes below, the project objectives for the New Perth Bunbury Highway are strongly aligned with those of the Auslink Program. The project will advance economic growth in regional Australia by providing improved and safer transport infrastructure.

The construction of the new highway will complete the interregional transport corridor between Perth and the Peel and South West regions; strengthen the linkage between intermodal transport (road, port and airport); improve the connection of main production centres to metropolitan markets; and enhance the lifestyle and social amenity for the communities connected by this new gateway.

PROJECT AND AUSLINK OBJECTIVES

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<th>National, interregional and international logistics</th>
<th>National, interregional and International trade</th>
<th>Health, safety, security</th>
<th>Sustainable Environment</th>
<th>Viable Economic &amp; Social outcomes</th>
<th>Linkage to the broader transport network</th>
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**ALIGNMENT WITH AUSLINK OBJECTIVES**

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<td>AusLink will promote sustainable national and regional economic growth, development and connectivity by contributing to the development of an integrated National Network which:</td>
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<td>improves national and interregional connectivity for people, communities, regions and industry;</td>
<td>- The project will overcome current traffic congestion and enhance access to a recognised major growth corridor.</td>
<td>3.4, 6.1</td>
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<td>improves national, interregional and international logistics</td>
<td>- When completed the project will link the main production centres in the Peel and South West regions to the metropolitan markets and ports with a seamless high-speed road system.</td>
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<td>enhances national, interregional and international trade</td>
<td>- Reduces travel time and distance for substantial freight efficiencies</td>
<td>6.5</td>
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<td>enhances health, safety and security</td>
<td>- The project will improve safety and amenity in Mandurah through the removal of traffic congestion in existing developed areas and also greatly assist industry and tourism in the South West through reduced travel times.</td>
<td>3.4, 6.2</td>
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<td>- Construction of the freeway extension and the new deviation will be to a high standard in accordance with current AUSTROADS design standards, and hence safety benefits will be achieved through these higher standards.</td>
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<td>is consistent with the obligation to current and future generations to sustain the environment</td>
<td>- Revegetation of road reserve will increase area of vegetation on palus plain.</td>
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<td>- Reduced maintenance costs</td>
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<td>- The current route through Mandurah effectively severs the community and acts as a barrier to cohesive development of the area.</td>
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<td>is consistent with viable, long-term economic and social outcomes; and</td>
<td>- By providing an effective high-speed link that bypasses Mandurah, and therefore reduces traffic congestion in existing urban developed areas, the function of the existing Perth Bunbury Highway can be changed to an urban collector-distributor road for Mandurah and the surrounding urban communities. The social amenity of these communities will be improved due to the reduction of regional traffic and the improved accessibility afforded by the changed function of the existing highway.</td>
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<td>- Reduced travel time and traffic congestion</td>
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<td>- Reduced Traffic noise</td>
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<td>is linked effectively to the broader transport network</td>
<td>- Peel Regional Road Network Development Strategy considers the development strategy for the regional network between Perth, Mandurah and Bunbury.</td>
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3.4 PROJECT JUSTIFICATION

Western Australia is the most open, export-oriented economy in Australia and accounts for about 30% or $32.3\(^2\) billion of the nation’s exports with only 9.9% of the population. The Peel and South West regions are the most populous regions outside the Perth metropolitan area. The population of these regions is growing rapidly and is projected to increase from an existing population of about 190,000 to 390,000 over the next 25 years\(^3\). Centres within these regions have some of the highest growth rates in Australia with Mandurah being the fastest growing regional city in the State. These areas support a wide variety of industries including mining, agriculture and tourism. Maps showing the key features of the Peel and the South West regions are at Appendix 5.

The volume of road freight between Perth and the Peel and South West regions is expected to increase in the future. The volume of heavy vehicles on the Perth Bunbury Highway south of Mandurah is in the order of 800 vehicles per day or 11% of total traffic, while on South Western Highway, the volume of heavy traffic is similar but constitutes around 15% of the total traffic volume. The population and economic growth in these regions is generating increased travel and transport demands, which together with the large freight movements is resulting in increased pressure on the existing transport system.

The current economic development of the Peel and South West regions is being constrained by the lack of a quick and efficient transport route linking the cities of Perth, Mandurah and Bunbury and the Ports at Fremantle and Bunbury. Investment in land transport infrastructure in the Peel and South West regions is required to cater for the movement of people and freight due to the:

- large population growth concentrating in the coastal parts;
- continued development of Mandurah as a satellite city to Perth;
- preference for private motor vehicle use to access the growing recreational and tourist destinations in the Peel and South West region;
- increase in tourism; and
- increase in the freight haulage task; primarily bulk commodities from mining, forestry and agricultural sectors.

In the broader transport context, construction is underway for the Perth-Mandurah passenger rail link, which is expected to be in operation in 2007, some two years prior to the opening of the New Perth Bunbury Highway. The railway is targeted at increasing the share of public transport for trips to and from Perth, reflecting a commitment towards sustainable transport systems. While it is acknowledged that the railway will help to reduce the number of road trips made by commuters, it will not remove the need for the regional road network to service the growing freight task in Western Australia. Traffic modelling undertaken by Main Roads Western Australia for the New Perth Bunbury Highway has taken into the account the impact of the future Perth Mandurah rail link.

The timing of the New Perth Bunbury Highway will complement rather than compete with the extension of the urban passenger rail system from Perth to Mandurah and allow the railway to attract patronage before any major road improvements are implemented.

The existing inter-regional routes not only constrain transport and regional development, they also present significant safety, community and environmental issues that need to be

\(^2\) Australian Bureau of Statistics – 2005 Western Australia at a Glance (ABS Catalogue No. 1306.5)
\(^3\) Department of Local Government and Regional Development – Economic Perspectives May 2003
addressed. The proposal is to join the main production centres in the Peel and South West regions to the metropolitan markets and ports with a seamless high-speed road system.

The development of the New Perth Bunbury Highway will result in a significant redistribution of traffic off the existing Perth Bunbury Highway and South Western Highway. The traffic modelling indicates that about 45% of the traffic on the Perth Bunbury Highway north of Mandurah, about 20% of the traffic within Mandurah and more than 90% of the traffic south of Mandurah will shift to the New Perth Bunbury Highway. In addition, the analysis also indicates that on the South Western Highway about 50% of the traffic north of Pinjarra and about 30% of the traffic south of Pinjarra will shift to this route.

The project will overcome current traffic congestion and enhance access to a recognised major growth corridor. A map showing existing and estimated future traffic volumes on the major roads for the recommended development strategy is at Appendix 6.

The New Perth Bunbury Highway is needed to provide an efficient transport link for through traffic between the Perth metropolitan area and the Peel and South West regions, to avoid heavily populated areas through Mandurah and along the Dawesville Peninsula. The project will improve safety and amenity in Mandurah through the removal of traffic congestion in existing developed areas and also greatly assist industry and tourism in the South West through reduced travel times.

The New Perth Bunbury Highway will link the Peel and South West regions to the Perth Airport and to the National Highway network via Roe Highway. In addition the route will provide an improved linkage to the Stirling Naval Base at Garden Island as well as the Ports at Fremantle and Bunbury. Construction of the New Perth Bunbury Highway will also provide an effective high-speed route as part of the national round-Australia coastal route.

4 PROJECT OPTIONS AND STAGING

4.1 PEEL REGIONAL ROAD NETWORK DEVELOPMENT STRATEGY

The Perth Bunbury Highway Route Development Strategy prepared in 2001 considered the development strategy for the regional road network between Perth, Mandurah and Bunbury. The strategy was summarised into the Peel Regional Road Network Strategy (2003).

The strategy investigated existing and future traffic patterns and traffic characteristics on the Peel Region road network between Perth and Bunbury. Actual and predicted levels of service were determined on road links in accordance with Austroads (1996) and the Highway Capacity Manual (1997). Sections of the network were then identified where and when the levels of service fell below Target Performance Levels (level of service C for an inter-regional route). The strategy indicated that the existing Perth Bunbury Highway north and south of Mandurah would fall below acceptable level of service standards by 2006.

The strategy then determined the improvement works required on the existing road network over the following 25 years to maintain acceptable levels of service over the network during that period (Base Case). This typically involved upgrading sections of

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4 Peel Regional Road Network Development Strategy – Summary Report - MRWA
highway up to 4 or 6 lanes and improving intersections, including grade separation as required. The Base Case scenario concentrated on maintaining the level of service and did not result in an improvement in travel times or road safety. Signalisation of more intersections and the increase in number of intersections as land development occurred is likely to see travel times and the number of accidents increase.

The strategy then considered the development of the road network through the construction of new roads, including construction of the Kwinana Freeway Extension and the construction of the Peel Deviation. Several project case strategies were investigated including construction of:

i. Kwinana Freeway Extension and Peel Deviation as one project;
ii. Peel Deviation only;
iii. Peel Deviation followed by Kwinana Freeway Extension; and
iv. Kwinana Freeway Extension followed by Peel Deviation.

Construction of the Kwinana Freeway Extension and the Peel Deviation as one project was not investigated in detail as this was seen as being cost prohibitive during the study and unlikely to occur.

Construction of the Peel Deviation by 2006 followed by construction of the Kwinana Freeway Extension by 2011 represented the preferred outcome of the strategy as it provided significant economic and social benefits over the other strategies, in particular the Base Case, identified in the study.

The Peel Regional Road Network Development Strategy (Main Roads July 2001) was prepared to summarise the key findings and recommendations of the HGM report. It was endorsed by the Western Australian Planning Commission in August 2001 and subsequently endorsed by the State Government in August 2003.

4.2 STAGING OPTIONS

Staging of the highway was considered in the Perth Bunbury Route Development Strategy. It was considered during the study that the construction of the Kwinana Freeway Extension and the Peel Deviation as one could not be afforded by the State Government and was an unrealistic scenario. As the Federal Government has agreed to contribute funds towards the cost of the project, the construction of the road as the one project is now viable and the preferred option.

The staging option presented as the preferred option in the strategy, ie the construction of the Peel Deviation followed by the construction of the Kwinana Freeway, was not supported by the Peel Deviation Stakeholder group, as it placed greater pressures on local roads and provided minimal benefit to the town of Pinjarra until the completion of the Kwinana Freeway Extension. It would also require the construction of Road B and part of Road A (future Mandurah Freeway Link in the Locality Plan at Appendix 1), valued at approximately $80M.

Similarly, construction of the Kwinana Freeway followed by the construction of Peel Deviation will require the construction of the Mandurah Freeway Link, valued at approximately $90M.

Staging options therefore, have not been considered further as they will result in a significant increase in cost to the project or direct inter-regional traffic, including heavy
vehicles, onto the local road network, not suitable or designed to accommodate that volume and type of traffic.

5 ROUTE DEVELOPMENT

5.1 ROAD RESERVATION PLANNING

Land use planning for the area through which the route passes is managed through the Metropolitan Region Scheme and the Peel Region Scheme.

Planning for a new route between Perth and Bunbury commenced in the 1970's as part of the original Corridor Plan for Perth and continued throughout the 1980's and 1990's as part of the regional planning for the south west corridor. The route for the Perth Bunbury Highway was first developed as far south as the Murray River in the early 1970's and was first included in Town Planning Schemes around that time.

The alignment for the Kwinana Freeway section of the project was included in the strategy plan for the South West Corridor published in 1980, with little adverse reaction on the alignment.

A planning study was undertaken in the 1980's to include the reservation for the Kwinana Freeway Extension in the Metropolitan Region Scheme. An envelope of alternative alignments centred about the strategy plan line was agreed to by the former Metropolitan Region Planning Authority in October 1984.

A Technical Committee was formed under the chairmanship of the WAPC with representatives from Main Roads, Kwinana Town Council, Rockingham Shire Council, Department of Conservation and Environment, Department of Transport, West Australian Water Authority and the State Energy Commission, to oversee the planning process for the Perth Bunbury Highway. The Committee recommended that public opinion be sought as part of the planning process.

The preferred route for the section between Miller Road and Stakehill Road was selected based on the outcomes and support of community consultation (1985). The route also presented the greatest advantage in terms of social, planning and engineering factors. The route south of Stakehill Road is highly constrained and therefore only one alignment was considered practical.

A Public Environmental Review and highway location report were prepared and released for public comment, concluding in August 1987. The Environmental Protection Authority (EPA) released its bulletin in 1988.

In 1989, the reservation for the section of the Perth Bunbury route between Thomas Road and the Metropolitan Region Scheme (MRS) boundary was given conditional approval by the Minister for Environment and was subsequently included in the MRS as part of amendment No 645/33 in May 1991.

A further round of community consultation was undertaken by engineering consultants Ove Arup in 1999 as part of the Master Planning stage for the Kwinana Freeway Extension between Safety Bay Road and Mandurah.

Planning for the Peel Deviation section, between the MRS boundary and Lake Clifton, has been in progress for a similar period. The alignment for the section between Lakelands and Pinjarra Road was selected in the 1970's and included in the Shire of Murray Town Planning Scheme in 1976. The alignment for the southern section of the
Perth Bunbury Route between Pinjarra Road and Lake Clifton was selected in the mid 1980's.

In 1995, the planned route for the New Perth Bunbury Highway between the Metropolitan Region Scheme boundary (end of the Kwinana Freeway reservation) and Lake Clifton was re-assessed and a preferred route that minimised environmental impacts was selected. The preferred route was based on the original planning but involved a minor realignment in the northern section to avoid a significant wetland and a major realignment in the southern section to increase the separation to the Peel Harvey Estuary and surrounding reserves. The preferred route was released for public comment via a Public Environmental Review in January 1997.

Main Roads reviewed the northern section in March 1997 and the southern section in July 1998 in response to social and environmental concerns raised by the community. In both cases, the result was that the preferred route was retained.

The preferred route was given conditional approval by the Minister for Environment and Heritage in 2002 and subsequently incorporated into the Peel Region Scheme (PRS), which took effect in 2003.

5.2 ENVIRONMENTAL APPROVALS

(i) State Environmental Approvals

The alignment for the New Perth Bunbury Highway is located predominantly on cleared farmland. It does impact on several EPP wetlands in the northern section and crosses major rivers including the Serpentine River, Nambeelup Brook, Murray River and Harvey River, as well as numerous Water Corporation drains. The Kwinana Freeway section is located adjacent to the Serpentine River and associated wetland system. The Peel Deviation between the Serpentine River and the Harvey River is located on palus plain, a wetland subject to seasonal inundation. The palus plain has been substantially cleared for farming. Most of the route is located in the catchment of the Peel Harvey Estuary. At the southern end, the route is located near Lake Clifton. Both water bodies form the Peel Yalgorup System, which is a Ramsar listed wetland. The route impacts on several areas of remnant vegetation, including the Paganoni Bushland, State Forrest near the southern end, and bushland within the road reserve in the vicinity of the Serpentine River. Environmental impacts assessments have been completed for the whole route.

The whole alignment for the New Perth Bunbury Highway has been given conditional environmental approval by the Minister for the Environment. This conditional approval requires the preparation of environmental management plans to the requirements of the Environmental Protection Authority and the provision of environmental offsets to replace environmental values lost by construction of the highway.

In 1989, the reservation for the section of the New Perth Bunbury Highway between Thomas Road and the Metropolitan Region Scheme (MRS) boundary (Kwinana Freeway Extension) was given conditional approval by the Minister for Environment. The alignment was modified in 2005 to minimise impacts on wetlands as required by the conditional approval. The preferred route for the Peel Deviation was given conditional approval by the Minister for Environment and Heritage in 2002.

Main Roads is in the process of preparing the environmental management plans in consultation with state environmental agencies and has prepared the environmental offset packages for consideration.
(ii) Commonwealth Environmental Approvals

The project has been referred to the Federal Department of Environment and Heritage (DEH). The Minister for Environment and Heritage advised in July 2005 the project is a controlled action and will require assessment under Part 8 of the Environmental Protection and Biodiversity Conservation Act 1999. Assessment and approval is needed under the Act before action may proceed.

DEH’s key areas of concern relate to Ramsar wetlands, listed threatened fauna species, the impact on woodlands and shrub lands of the Swan Coastal Plain, and the consequential impacts of increased development pressure and greater recreational usage of the Peel Harvey Estuary.

Main Roads has met with DEH to discuss their concerns and has prepared additional information to assist with their assessment. Depending on the level of assessment set, it is anticipated that approval under the EPBC Act will be available by October/November 2006.

5.3 Heritage Approvals

Aboriginal heritage surveys (archaeological and ethnographic) have been completed - two Aboriginal heritage sites occur adjacent to the Kwinana Freeway section and nine sites will be impacted or occur adjacent to the Peel Deviation section. Consultation with the aboriginal community has been undertaken for the whole project on many occasions.

On the advice of the Aboriginal Cultural Material Committee, the Minister for Indigenous Affairs has granted Main Roads permission to use the land containing or adjacent to the heritage sites for the purpose of constructing the New Perth Bunbury Highway in accordance with Section 18 of the Aboriginal Heritage Act. This approval is conditional and subject to further monitoring during the works, which are to cease should aboriginal artefacts be discovered during the works.

Two European heritage sites occur in the project area and will be considered in the management plans. These are the Four Acres Cottage and the bridle trail historically used by the Australian 10th Light Horse Brigade. No issues have been identified on the Register of National Estate.

5.4 Development Works Completed

Development work completed to date on the alignment includes:

i. ground surveys;
ii. geotechnical investigations;
iii. traffic modelling;
iv. waterways analysis and conceptual design of bridges;
v. preparation of environmental management strategies;
vi. preliminary road and drainage design and preparation of preliminary design drawings, including estimates of quantities and costs; and
vii. preparation of a fill materials supply strategy.
5.5 Technical Design Issues

The New Perth Bunbury Highway is located predominantly on palus plain, which is subject to seasonal inundation, but also contains many associated wetland systems, rivers and man-made drains. Main Roads has committed to design road drainage according to best practice and to the satisfaction of the Department of Environment. This includes the maintenance of surface hydrology characteristics.

A waterways analysis has been conducted to provide accurate estimates of drainage requirements and to detail the type, size, configuration and associated features of the infrastructure. These details have been supported by calculations of peak flows and the hydraulic flow characteristics have also been assessed at bridge and major culvert crossings.

A drainage management strategy has been prepared with the input of key stakeholders. The drainage management strategy incorporates the principle of infiltration "at source" where practicable, with direct off-road runoff to vegetated roadside swale drains to increase detention times and provide for settlement of any sediment. (This treatment will not be used at river crossings, which will be kerbed and water directed to adjacent detention basins to prohibit direct runoff.) Culverts are to be installed at frequent intervals in recognition of the surface water flow on the palus plain and to manage localised flows.

Main Roads has also committed to carry out monitoring to evaluate any impacts on water table levels post construction.

The seasonal inundation of the palus plain will require the elevation of the roadway well above ground levels. The preliminary design completed has determined that up to 9 million cubic meters of fill will be required on the project.

5.6 Social Issues

The New Perth Bunbury Highway project has a long-standing history and has been subject to numerous studies and approval processes, which have helped Main Roads to identify community issues, concerns and preferences. Many of these issues have been addressed by the current preliminary design or will be further investigated as part of the detailed design process and/or environmental management plans.

The New Perth Bunbury Highway affects over 50 private landowners. Most of the land required within the Kwinana Freeway section has been acquired and is in State Government ownership. Acquisition of land within the Peel Deviation section commenced in 2005 and negotiations with landowners are underway with all land anticipated to be acquired by July 2006.

Where feasible, the alignment follows cadastral boundaries to minimise the impact on privately owned properties. Main Roads is also committed to maintain access to all properties affected by the project (albeit, in some instances, in modified form).

As with most large infrastructure projects, residents have raised concern regarding the impact of the project on their properties including issues such as severance and access; noise and visual impacts; and the impact of construction. The route passes next to an existing urban development at the Murray River where the residents requested a realignment of the highway during the consideration of the Peel Region Scheme. However, this was not agreed to by Government. Further consultation will occur with the residents to minimise the impacts of the highway on the community.
Main Roads has committed to design the road to mitigate noise levels consistent with the Main Roads' noise policy and as agreed with the Department of Environment (DoE). It has also committed to develop a Traffic Noise Management Plan to address the impact of post-construction traffic noise on the amenity of adjacent residences and residential areas. The plan will include consideration of acceptable noise levels to protect the amenity of adjacent residences and measures to manage the impact of traffic noise on adjacent residences. Preliminary noise modelling has been completed and indicates that noise walls/bunds will be required where residences are located in close proximity to the highway.

Main Roads has also committed to undertake further community consultation to understand and embrace the needs of the community and stakeholders and together develop sustainable design solutions. This consultation will include the formation of a Community Representative Group and active participation by stakeholders and community members in workshops held to develop the final design and ensure value management.

Main Roads recognises the importance of building relationships with stakeholders and engaging the community, and understands the significance that such dealings will have on successfully delivering this key infrastructure project. With this in mind, both of these areas have been embraced by Main Roads' project team in activities to date, and subsequently incorporated into the New Perth Bunbury Highway project objectives for continuous attention. A communication strategy has been prepared to guide the communication and consultation activities for the initial phase of the project.

6 PROJECT BENEFITS

6.1 ROAD EFFICIENCY

Traffic counts on the existing road network in the area show that traffic on the existing Perth Bunbury Highway in the Peel Region has been increasing at a rate of 7 percent per annum\(^5\). Traffic predictions for this route indicate that if the existing roads were maintained at their current condition, travel time between Perth and Bunbury on the coastal route would increase by 11 minutes by 2011, and 30 minutes by 2021. This additional travel time will result in enormous transport inefficiencies, as well as being detrimental to the tourism industry and the local communities\(^6\).

The figure below illustrates the difference in travel times between Safety Bay Road and Lake Clifton with and without the New Perth Bunbury Highway. It is anticipated that by 2011 without the Kwinana Freeway / Peel Deviation route the journey time, between Safety Bay Road and Lake Clifton will increase to 72 minutes. With the full route in place, by 2011, the time saving will be in the order of 34 minutes.

\(^5\) Peel Regional Road Network Development Strategy – Summary Report - MRWA
\(^6\) Tourism Western Australia – Peel S & South West Tourism Fact sheets 2004
6.2 Road Safety

As traffic volumes increase and the population in the Peel and South West regions continues to grow, traffic conflicts will increase and result in an increase in the number of vehicle crashes in this area. The cost of injuries at the nine main intersections on the coastal route in the Mandurah area exceeded $21M during the last five years.

The existing Perth Bunbury Highway presently consists of a four-lane divided carriageway except for a 30 km section between Dawesville and Lake Clifton, which is only two-lane single carriageway. The existing section of the Perth Bunbury Highway between Dawesville and Lake Clifton further compromises safety due to sections of substandard geometry, difficulty overtaking slower vehicles and traffic congestion.

Statistics collected over the period from January 1 1999 to December 31 2003 for sections of the existing Perth Bunbury Highway indicated the following results:

<table>
<thead>
<tr>
<th>Severity of Accident</th>
<th>Perth Bunbury Highway</th>
<th>South Western Hwy Byford to Pinjarra</th>
<th>Kwinana Fwy Thomas Rd to Safety Bay Rd</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Safety Bay Road to Meadow Springs</td>
<td>Meadow Springs to Tims Thickett Rd</td>
<td>Tims Thickett Rd to Lake Clifton</td>
</tr>
<tr>
<td>Fatal</td>
<td>9</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Hospital</td>
<td>39</td>
<td>54</td>
<td>16</td>
</tr>
<tr>
<td>Medical</td>
<td>120</td>
<td>239</td>
<td>20</td>
</tr>
<tr>
<td>Property Damage Only: Major</td>
<td>441</td>
<td>780</td>
<td>69</td>
</tr>
<tr>
<td>Property Damage Only: Minor</td>
<td>112</td>
<td>244</td>
<td>19</td>
</tr>
<tr>
<td><strong>Total Accidents</strong></td>
<td><strong>721</strong></td>
<td><strong>1323</strong></td>
<td><strong>128</strong></td>
</tr>
<tr>
<td><strong>Crash rate/100million Km travelled</strong></td>
<td><strong>55</strong></td>
<td><strong>111</strong></td>
<td><strong>33</strong></td>
</tr>
</tbody>
</table>
These crash statistics are of serious concern when compared with the average for rural main roads in Western Australia, which is 49 crashes per 100 million kilometres, travelled.

Construction of the freeway extension and the new deviation will be to a high standard in accordance with current AUSTROADS design standards, and hence safety benefits will be achieved through these higher standards. The crash rate for the Perth Bunbury Highway and the South Western Highway are substantially higher that those on the Thomas Road to Safety Bay Road section of the Kwinana Freeway, which is constructed to the same standard that the Safety Bay Road to Pinjarra Road section of the New Perth Bunbury Highway will be built to.

Once constructed, the New Perth Bunbury Highway will remove regional traffic from heavily populated areas in Mandurah and on the Dawesville Peninsula, which will significantly improve road safety for regional traffic by reducing the potential conflicts on the highway.

### 6.3 Social

The Peel and South West coastal corridor is recognised as a growth corridor of National and State significance. Unless industry can keep pace with population migration and growth, unemployment and other social problems will arise.

The current route through Mandurah effectively severs the community and acts as a barrier to cohesive development of the area. Once constructed, the New Perth Bunbury Highway will provide a safe, free flowing alternative route for regional traffic, away from the built up area and will relieve increasing traffic pressure and congestion on the existing coastal route through Mandurah. There will also be a reduction of heavy haulage through existing towns along South Western Highway.

Numerous other community benefits will also be achieved, including reduced traffic noise, reduced air pollution, improved access, improved amenity and reduced travel time, however, these benefits are discussed elsewhere in this document.

By providing an effective high-speed link that bypasses Mandurah, and therefore reduces traffic congestion in existing urban developed areas, the function of the existing Perth Bunbury Highway can be changed to an urban collector-distributor road for Mandurah and the surrounding urban communities. The social amenity of these communities will be improved due to the reduction of regional traffic and the improved accessibility afforded by the changed function of the existing highway.

### 6.4 Environmental

Main Roads is committed to minimising the project's impact on the environment and significantly improving the local environment where possible by enhancing both the built and natural environment in the locality of the project. While it is acknowledged that the
project will have detrimental impacts on the environment (through clearing of vegetation; impact on wetlands, watercourses and native fauna; and the severance of flora and fauna communities), it is considered that these impacts can be mitigated through the implementation of effective management measures.

Main Roads is also committed to revegetating the road reserve and adjacent areas to result in a net increase in the area of vegetation on the palus plain, which has been substantially cleared through farming activities.

The diversion of traffic from the existing highways, in particular the Perth Bunbury Highway, which is situated in close proximity to the Peel Harvey Estuary, onto the new route, which will have superior drainage management features, will reduce the risk of contaminants entering the wetland system.

Main Roads is also investigating measures to reduce the nutrient flow into the Peel Harvey Estuary through construction of nutrient retention basins and modification of the palus plain drainage system. If acceptable, the nutrient retention basins will generate fill material for the project.

6.5 Economic

Western Australian exports are critical to both the national and state economy. Western Australia exports in 2002/03 contributed 29.6 percent of the total national exports.

Within Western Australia the Peel and South West regions contribute approximately ten percent of the State’s Gross Regional Product at some $8.9 billion.

Contributing $38.5 billion of Australia’s total imports and exports annually, Western Australia is paramount to the national economy. Producers rely heavily on the road network for the transport of produce to centres for forwarding to the national and international market. The competitiveness of export and locally consumed goods is significantly affected by transport costs.

The New Perth Bunbury Highway will be around eight kilometres shorter than the existing route through Mandurah and will have no traffic signals or reductions in speed limits through urban areas. This will result in significant benefits for transport efficiency with travel times reduced by more than 30 minutes.

Tourism is an expanding industry in the Peel and South West regions and the New Perth Bunbury Highway will enhance the regions appeal by reducing travel time and traffic congestion. In 2003 and 2004 the regions were visited by an average of 5.6 million visitors per year generating around $730 million per year of tourism expenditure.

6.6 Benefit Cost Analysis

The benefits were calculated using a combination of Main Roads TRIPPS model and the WARES model over a 30 year period. Based on a project cost of $450M (in 2005 $) with construction over two years and a discount rate of 7%, the analysis shows a benefit cost

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7 Australian Bureau of Statistics – 2005 Western Australia at a Glance (ABS Catalogue No. 1306.5)
8 Dept of Local Government and Regional Development – Regional Economic Snapshot (2003/04)
9 Tourism Western Australia – Peel & South West Tourism Fact sheets 2004
ratio (BCR) of 5.12. A sensitivity analysis was undertaken using a discount rate of 4% which gave a BCR of 8.22. (See Appendix 10 for a summary of the economic analysis)

The table below reflects the result of the network view on the completion of the Peel Deviation and the Kwinana Freeway.

<table>
<thead>
<tr>
<th>Benefit</th>
<th>Discount Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>7%</td>
</tr>
<tr>
<td>Accident Costs</td>
<td>$635.5M</td>
</tr>
<tr>
<td>Vehicle Operating Costs</td>
<td>$461.5M</td>
</tr>
<tr>
<td>Commercial Travel Time Costs</td>
<td>$1380.6M</td>
</tr>
<tr>
<td>Maintenance Costs</td>
<td>-$10.8M</td>
</tr>
<tr>
<td>Total Benefits</td>
<td>$2466.8M</td>
</tr>
<tr>
<td>Discounted Project Cost</td>
<td>$481.5M</td>
</tr>
<tr>
<td>Benefit Cost Ratio (BCR)</td>
<td>5.12</td>
</tr>
</tbody>
</table>

The transport model uses existing and projected land use data, which is provided by the Department for Planning and Infrastructure. The model generates trips, distributes the trips to different transport modes and geographical areas. The vehicle trips table is then assigned to the road network. The model has been used by Main Roads for many years and is proven to be very reliable, especially for the regional road network.

The BCR component of the model uses the information from the vehicle trips assignment to determine the difference in road users costs and benefits between the base and project networks. The WARES model was used to evaluate the sections of the highway outside of the Metropolitan Transport Model where the traffic volumes changed as a result of the project.

Both models are based on the standard Austroads methodology and costs for BCR analyses.

7 PROJECT DETAILS

7.1 PROJECT SCOPE

The New Perth Bunbury Highway is 70.5 kilometres long and will be built as a four-lane dual carriageway.

The northern 32km section between Safety Bay Road and South Yunderup Road will be constructed to freeway standard including grade separated interchanges to accommodate the higher traffic volumes and maintain traffic flow. The southern 38.5km section between South Yunderup Road and the existing dual carriageway at Lake Clifton, will be built to rural highway standard with at-grade intersections, however, planning is in place to grade separate these intersections as and when required.

The project will include the construction of grade separated interchanges at:
(i) Safety Bay Road;
(ii) Karnup Road;
(iii) Paganoni Road;
(iv) Lakes Road; and
(v) Pinjarra Road.

The project will include the construction of at grade intersections at:
(i) Beacham Road;
(ii) Greenlands Road;
(iii) Paull Road;
(iv) Mills Road;
(v) Herron Point Road;
(vi) Old Bunbury Road;
(vii) Dorsett Road;
(viii) Old Bunbury Road; and
(ix) Peppermint Grove Road.

In addition to the interchanges, bridges will be constructed over:
(i) Serpentine River;
(ii) Nambeelup Brook;
(iii) Murray River;
(iv) Murray River Floodplain;
(v) Harvey River;
(vi) South Yunderup Road; and
(vii) New Perth Bunbury Highway at Red Road.

Other features included in the project are:
(i) principal shared path and underpasses from Safety Bay Road to South Yunderup Road;
(ii) noise walls and bunding;
(iii) fauna and stock underpasses;
(iv) major culverts at numerous drains;
(v) lighting at interchanges;
(vi) construction of service roads to provide access to severed properties;
(vii) fauna fencing and farm fencing;
(viii) accommodation works, including service relocations and modifications to the Baldivis Explosives Depot; and
(ix) land acquisition.

Other works required to maintain connectivity of the New Perth Bunbury Highway to the existing network but not included in the PPR cost estimate include:

- upgrading Paganoni Road;
- upgrading Lakes Road; and
- upgrading Greenlands Road.

Funding for these works will be obtained from other sources.

7.2 Project Timetable

Construction of the New Perth Bunbury Highway is planned to commence in 2006 and open to traffic by December 2009, in accordance with the commitments made in the Auslink Bilateral Agreement. Development works, including obtaining environmental and planning approvals and acquisition of land, will be completed in 2006.
The timeframe for key activities for delivery of the New Perth Bunbury Highway are shown on the attached Gantt Chart in Appendix 8. Note that while the opening of the road is planned to occur in 2009, further works such as final sealing and rehabilitation works will be ongoing until 2011.

7.3 PROJECT COST

The estimated costs in April 2005 dollars for completion of the New Perth Bunbury Highway are shown in the table below. These estimates are based on preliminary design and are subject to future escalation.

<table>
<thead>
<tr>
<th>Description</th>
<th>Freeway</th>
<th>Rural Highway</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Safety Bay Road to South Yunderup Road</td>
<td>South Yunderup Road to Lake Clifton</td>
<td>Safety Bay Road to Lake Clifton</td>
</tr>
<tr>
<td></td>
<td>32km</td>
<td>38.5km</td>
<td>70.5km</td>
</tr>
<tr>
<td>Land Acquisition</td>
<td>$14,000,000</td>
<td>$19,250,000</td>
<td>$33,250,000</td>
</tr>
<tr>
<td>Accommodation Works</td>
<td>$3,000,000</td>
<td>$2,750,000</td>
<td>$5,750,000</td>
</tr>
<tr>
<td>Design</td>
<td>$9,000,000</td>
<td>$6,000,000</td>
<td>$15,000,000</td>
</tr>
<tr>
<td>Roadworks</td>
<td>$136,000,000</td>
<td>$129,500,000</td>
<td>$265,500,000</td>
</tr>
<tr>
<td>Bridgeworks and Structures</td>
<td>$52,500,000</td>
<td>$21,500,000</td>
<td>$74,000,000</td>
</tr>
<tr>
<td>Drainage</td>
<td>$3,000,000</td>
<td>$5,700,000</td>
<td>$8,700,000</td>
</tr>
<tr>
<td>Landscaping/ Rehabilitation</td>
<td>$8,500,000</td>
<td>$10,100,000</td>
<td>$18,600,000</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>$5,400,000</td>
<td>$3,700,000</td>
<td>$9,100,000</td>
</tr>
<tr>
<td>Project Management &amp; Development</td>
<td>$9,000,000</td>
<td>$6,000,000</td>
<td>$15,000,000</td>
</tr>
<tr>
<td>Contingency</td>
<td>$3,000,000</td>
<td>$2,100,000</td>
<td>$5,100,000</td>
</tr>
<tr>
<td>TOTAL</td>
<td>$243,400,000</td>
<td>$206,600,000</td>
<td>$450,000,000</td>
</tr>
</tbody>
</table>

7.4 PROJECT FUNDING AND CASHFLOW

On June 7 2004 the Federal Government announced the AusLink program with an allocation of $150 million for the construction of the New Perth Bunbury Highway. This highway forms part of the Perth Bunbury Corridor on the Auslink National Network.

During the 2004 Federal election campaign, the Coalition Government announced that it would allocate a further $20 million to the project, increasing its total allocation to $170 million. The Western Australian Government has also agreed to allocate $280 million to the project. These allocations by the Federal and State Governments are set out in Schedule A of the AusLink Bilateral Funding Agreement with Western Australia.

The State Government has committed an additional $10 million for improved road access into the City of Mandurah from the New Perth Bunbury Highway. This work will include the upgrading of Lakes Road and Paganoni Road.

Appendix 7 shows the cash flow funding requirements and project timeframe for this project.
7.5 **PROJECT RISK**

A detailed risk assessment has been undertaken of the New Perth Bunbury Highway Project to identify the probability, consequence and manageability of project risks. This assessment involved consideration of a number of risk areas including technical, financial, commercial/legal, organisational, political, social and environmental.

Mitigation strategies were identified with the majority of key risks deemed to be shared by Main Roads and the delivery team, thereby strengthening the decision to adopt an alliance contracting strategy.

Key project risks that were identified in the risk management workshops include:

- securing Federal Government funding;
- obtaining Federal environmental approvals required under the EPBC Act;
- obtaining community and stakeholder acceptance of the detail design;
- managing community expectations with regard to project scope;
- gaining community acceptance of environmental impacts;
- lobbying by environmental groups results in major alignment changes;
- regulators (eg DoE, DEH) response times delay project;
- access to all land delayed, delays construction works;
- impacts and costs of material supply are unacceptable/excessive;
- delays to selection process delay commencement of the construction;
- developing a Direct Cost Target within budget; and
- managing industrial relations issues (National Construction Code).

A Risk Management Plan (see Appendix 11) has been drafted to manage and mitigate the risks identified. It is considered that most risks can be effectively managed or mitigated by Main Roads and/or the Alliance with the appropriate management effort. The Risk Management Plan will be continually reviewed and updated throughout the development and delivery of the project.

**Industrial Relations Risk Management**

An industrial relations risk minimisation strategy for the project is being developed.

A key component of the strategy is to adopt a different dispute resolution process than those traditionally used on construction sites. It has been traditional for the State Government as the principal for construction work not to get involved in disputes between the contractors and their employees and/or union representatives. However, due to the nature of the project being an alliance project, the State Government will be able to assist in the resolution of disputes. It is the intention that Main Roads, as the client, will assist in resolving any disputes through formal internal processes as part of the internal dispute resolution process.

7.6 **PROJECT DELIVERY**

Main Roads has selected an alliance contracting strategy as the delivery strategy for the New Perth Bunbury Highway Project. It is considered that an alliance will achieve exceptional results far beyond those normally achieved using traditional contracting arrangements.

In the selection of a suitable delivery strategy, Main Roads conducted a workshop to explore the characteristics of the New Perth Bunbury Highway project and determine the most appropriate contract strategy under which the project should be delivered. The
assessment included analysis of the characteristics of each of the delivery options and of this project, as well as consideration of the values driving the project and potential risks.

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

The decision to use an alliance contract was primarily due to the number of project risks that required joint management, the potential for significant community/stakeholder issues; tight completion dates and budget; and the strategic importance of the project to Main Roads and Government.

The decision was also founded on the belief that an alliance will focus on solutions, foster innovative thinking and be driven by the values that incorporate the views of stakeholders and the community. It will also facilitate an earlier commencement, provide access to resources (during a period of skill shortage) and create opportunities for staff learning and development.

The Alliance will be founded on the principles of trust, equity, respect and no blame. The Alliance will be an open and integrated organisation where all risks will be shared and managed by the Alliance.

The Alliance will be governed by an Alliance Board (Board) and managed by an Alliance Management Team (AMT). The Board will be responsible for the governance and conduct of the Alliance and the AMT will be responsible for the management and delivery of the project to the standards of performance determined by the Board and Participants.

Main Roads will have two representatives on the Board and will have a Client Representative, who will be responsible for ensuring the Alliance is properly supported and does all it can to ensure the project objectives and requirements are fully satisfied.

Under the project objective of expanding capability the Alliance will maximise the development opportunities for Main Roads and the other Participants’ staff. In accordance with this objective, Main Roads expects to provide personnel in the areas of project management, alliance management and community and stakeholder relationships.

Local content and local industry participation are key features of this project and are being fostered through close relationships with the Peel Development Commission and the South West Development Commission. A local industry participation plan will be developed by the Alliance to maximise opportunities for local employment and the use of local subcontractors and suppliers. Wherever possible, contracts will be unbundled to provide opportunities for smaller businesses to be involved. Relationships with training providers to address local unemployment and the skills shortage are also being investigated.

In order to form the Alliance, Main Roads invited Request for Proposals from industry in August 2005. From October to December Main Roads evaluated three consortia using a rigorous evaluation process designed to identify the Proponent most capable and best able to work with Main Roads in an Alliance. Main Roads has recently elected to undertake a further level of assessment, which would see the two short listed proponents participate in a price competitive process. The two consortia will have four months to prepare the Project Target Cost and submit the associated corporate overheads and
profit rates to Main Roads. In the meantime, Main Roads will continue to acquire land required for the project and obtain Commonwealth environmental approvals in readiness for the formation of the Alliance in September 2006.

The New Perth Bunbury Highway will meet the requirements of the Australian Government Implementation Guidelines for the National Code of Practice for the Construction Industry (pre 1 November 2005 Guidelines).
APPENDICES
EXCERPT PERTH METROPOLITAN REGION SCHEME (APRIL 2004) AND PEEL REGION SCHEME (SEPTEMBER 2003)
APPENDIX 5 – PEEL AND SOUTH WEST REGIONS – ECONOMIC INFORMATION

A snapshot of the Peel and South West regions is given below.

PEEL REGION

The Peel region is located immediately south of Perth and lies between the Metropolitan Area and the South West region. It is bordered by the Indian Ocean to the west, with jarrah forests and the rolling farmlands of the Darling Range to the east.

Five Local Government Authorities are incorporated in the Peel region, including the City of Mandurah and the Shires of Boddington, Murray, Serpentine-Jarrahdale and Waroona. The Peel region covers an area of approximately 5,648 square kilometres, including 137 square kilometres of inland waterways. The region is geographically diverse with coastal areas, river systems, an expansive estuary, multiple dams, agricultural and horticultural land, an escarpment and plateau.

Economic Activity

The Peel region has a diverse economy, predominantly based on mining and mineral processing, although agriculture, the equine industry, timber production, fishing, manufacturing, construction and tourism also make valuable contributions. Department of Local Government and Regional Development estimates show that the Peel region’s Gross Regional Product was $3.02 billion in 2003/04.11

Mining and mineral processing is dominated by large reserves of bauxite, which are processed into alumina. Alumina production in the region is significant on a world-scale and nearly all production is exported to either the eastern states or overseas markets.

There are a number of primary industries within the Peel region that make a significant contribution to the National, State and regional economy. Beef cattle, calf disposal and milk production are the largest agricultural industries in the region, with the equine also providing an important contribution to the Peel’s economy. The region’s forestry industry is based primarily on the logging of hardwoods. In addition, the fishing industry, centered in Mandurah, is dominated by the rock lobster catch.

10 Dept of Local Government and Regional Development – Economic Perspective May 2003
11 Dept of Local Government and Regional Development – Regional Economic Snapshot 2003/04
The main manufacturing industries in the region include metal products, wood products, food processing, transport equipment and metal fabrication.

Tourism plays an important role in the Peel regions economy. For 2003/04 the region attracted an annual average of 465,000 overnight domestic and International visitors and an estimated 1.75 million day trips were made to the region with expenditure at destination of $120M.\textsuperscript{12}

**Population\textsuperscript{13}**

The estimated resident population of the Peel region was 78,854 in 2002, or 4.1% of the State’s population, making it the second highest non-metropolitan regional population. The Department for Planning and Infrastructure has projected the Peel population will increase to an estimated 5.3 per cent of the State’s population by 2016. Peel was the fastest growing region in the State from 1992 to 2002. During this time, the population increased at an average of 4.0 per cent per annum, compared to 1.5 per cent per annum for the State and 1.4 per cent for regional Western Australia. Based on projected growth rates for the Peel region it is estimated that the population will reach 98,000 by 2007, increasing to 130,000 by 2017 and reaching 170,000 by 2031.

**Investment Opportunities & Future Prospects**

The Peel region has experienced substantial economic growth in recent years and is acknowledged as Western Australia’s most rapidly developing region outside the Perth metropolitan area.

Large deposits of gold and bauxite in the region have fostered a substantial mineral extraction and processing sector. The region is Western Australia’s largest producer of alumina and has a diverse economic base with well-established tourism, forestry, agriculture, fishing and equine industries.

One of the region’s major competitive advantages is its close proximity to the metropolitan area and its low competitive cost structures. Prices for goods and services are equivalent to those in the Perth metropolitan area.

The City of Mandurah, the largest regional urban centre in the State, is the focal point in the Peel region, and is by far the most popular regional day tripping destination in the State. The proximity of Mandurah to the Peel Inlet and the Indian Ocean offers significant tourism and related land development opportunities. Major tourism initiatives include a Marina in Mandurah, as well as a variety of resort developments within the region.

\textsuperscript{12} Tourism Western Australia – Peel Tourism Fact sheet 2004
\textsuperscript{13} Dept of Local Government and Regional Development – Peel Economic Perspective May 2003
The expansion of the Perth metropolitan area into land previously occupied by market gardens provides excellent investment opportunities for the region to supply horticultural produce to metropolitan and overseas markets.

Given the region’s reliable rainfall and ready availability of surface water, potential investment opportunities have been identified for aquaculture to develop into a commercial industry. The large waterways of the Peel Harvey estuary provide outstanding opportunities for marine fish farms and many of the inland rivers and dams offer good trout and marron fishing.

SOUTH WEST REGION

The South West region, in the southwest corner of Western Australia, is the State’s most populous and economically diverse regional area. About one-quarter of Western Australians who live outside Perth reside in the South West and the population continues to grow.

The region consists of 12 municipalities including the City of Bunbury and the Shires of Augusta-Margaret River, Boyup Brook, Bridgetown-Greenbushes, Busselton, Capel, Collie, Dardanup, Donnybrook-Balingup, Harvey, Manjimup and Nannup, and covers approximately 24,000 square kilometres. More than one-third of the region’s population is concentrated in an area known as Greater Bunbury, encompassing the city itself and the dormitory centres of Australind, Eaton, Geralup and Dalyellup in the adjacent Shires of Harvey, Dardanup and Capel respectively.

The region has reliable rainfall, good farmland, extensive hardwood and softwood forests and valuable mineral deposits, including mineral sands and coal. The latter supplies much of the State’s power needs through coal-fired power stations at Collie and Bunbury.

With a Mediterranean climate and a wealth of attractions, including national parks, forests, beaches and wineries, the South West also draws more visitors than any other regional area in the State.

Economic Activity

14 Dept of Local Government and Regional Development – South West Economic Perspective May 2003
MAIN ROADS Western Australia
PPR New Perth Bunbury Highway May 2006
The South West has the most diverse regional economy of Western Australia and is well positioned to capitalize on this diversity. It has abundant mineral deposits, rich hardwood forests and agricultural soils, as well as substantial manufacturing, commercial, retail construction, fishing and tourism industries. The Department of Local Government and Regional Development estimates that the South West’s Gross Regional Product was $5.87 billion in 2003/04.

Mineral extraction, processing and manufacturing together make the largest contribution to the region’s economy at approximately $2.2 billion per annum. The South West produces all Western Australia’s coal, while mineral sands mining and processing in the South West provide 36% of the State’s mineral sands production. Alumina production and the manufacturing of titanium dioxide pigment are also significant mineral related industries.

The region’s hardwood forests, softwood plantations and tree farms produce a diverse resource suitable for adding value and the creation of a wide range of forest products. The establishment and growth of plantation timber and the development of timber products are growing industries in the South West.

Tourism plays an important role in the South West and there is considerable optimism that tourism related income will continue to grow. The region attracted an annual average for 2003 & 2004 of 1.73 million overnight domestic and international visitors and an estimated 1.65 million day trips were made to the region. The expenditures at destination by tourist in the South West is estimated to be $609M annually.

There are many coastal attractions between Mandurah and Augusta, especially the coastal fringes. The Leeuwin – Naturalist National Park boasts some of Australia’s premier surfing locations, together with the Margaret River wine growing area, which is renowned internationally, are priority destinations for visitors to the region.

Population

There were 132,026 people living in the South West region in 2002, the largest resident population of Western Australia’s nine rural regions. The region is projected to continue to have the State’s largest regional population. The South West currently makes up 6.9 per cent of the State’s population and 25.1 per cent of the State’s regional population. From 1997 to 2002, the population grew at an average rate of 2.8 per cent per annum, exceeding both the State and regional average of 1.4 per cent per annum. Projections of the South West region’s future estimated population predict growth to 142,200 by 2006, rising to about 172,300 by 2016 and reaching 218,000 by 2031.
The South West has the State's most diverse regional economy. Its mineral wealth has enabled the region to become a major world producer of mineral sands. The region's proximity to Perth, reliable rainfall, and rich soils provide the basis for diverse agriculture, horticulture, timber, viticulture, dairy and livestock industries.

The South West's mineral resources and agricultural base, as well as transport access to Perth and international markets, has created a significant manufacturing base in the processing of locally harvested or extracted primary produce. The region is also a significant manufacturer of building and construction materials.

The South West region's wealth of attractions, including national parks, forests, beaches and wineries, make it the most popular regional Western Australian tourist destination for local, interstate and overseas visitors. Nature-based or eco-tourism has emerged as an activity of enormous growth potential and ventures in the region are being developed.

The region's hardwood forests, softwood plantations and tree farms are diverse sources for the value adding of forestry products. Activities such as pine milling, medium density fibreboard and veneers, and the creation of fine furniture niche markets provide considerable investment opportunities for the industry.

The growth of markets in South East Asia for fresh and processed food is providing commercially viable investment opportunities for the region's well-established horticulture, dairy, fruit growing, food processing and viticulture industries.

In particular the wine industry, has access to a skilled and experienced workforce, a strong reputation for quality, relatively low entry costs, and offers attractive investment potential.

The alumina, titanium minerals and gas sectors of the mining industry are all set for major expansion in the next few years leading to additional opportunities in the high tech fabrication and service industries of the region.
New Perth Bunbury Highway - Cash Flow Projections

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# New Perth Bunbury Highway Project

## Safety Bay Road to Lake Clifton

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## Project: New Perth Bunbury Highway
Date: Thu 8/06/06

### Milestones
- 3/11

### External Milestone
- 16/10

### Deadlines
- 1/10/10
APPENDIX 9 – Design Standards

Design standards for the New Perth Bunbury Highway are listed below.

**Safety Bay Road to South Yunderup Road**

- **Level of Service:** Level of Service C or better for traffic forecasts at the year 2011
- **Design Speed:** 110 km/h
- **Lane Details:** 2 x 2 lanes, each lane 3.5m wide (provision for future widening to 2 x 3 lanes north of the future Mandurah Entrance Road)
- **Seal Width:** Seal width 11.5m each carriageway
- **Formation Width:** 11.5m formation width each carriageway
- **Median:** varies up to 27.6m median width
- **Pavement Design:** 40 year pavement life
- **Drainage Design:** 1 in 100 year average recurrence interval (major transverse systems)
- **Structural Design:** 100 year life under current Austroads loadings

**South Yunderup Road to Lake Clifton**

- **Level of Service:** Level of Service C or better for traffic forecasts at the year 2021
- **Design Speed:** 110 km/h
- **Lane Details:** 2 x 2 lanes, each lane 3.5m wide
- **Seal Width:** Seal width 9.5m each carriageway
- **Formation Width:** 11.5m formation width each carriageway
- **Median:** varies up to 33m median width
- **Pavement Design:** 40 year pavement life
- **Drainage Design:** 1 in 100 year average recurrence interval (major transverse systems)
- **Structural Design:** 100 year life under current Austroads loadings
APPENDIX 10 – SUMMARY OF ECONOMIC ANALYSIS

New Perth Bunbury Highway
Safety Bay Road to Lake Clifton

INTRODUCTION

Economic analyses for major road projects in Western Australia are normally undertaken using either the BCR feature within the Main Roads TRIPS Model (for projects within the Perth metropolitan area) or WARES (for projects outside of the metropolitan area). Both models are based on the standard Austroads methodology and costs for BCR analyses.

The WARES model is designed for rural type projects where the traffic volumes remain unchanged or can be relatively easily predicted. The WARES model can estimate the benefits from improvements in road geometry, roughness and gradients as well as any changes in the road length and operating speed. Any redistribution of traffic must be predicted and entered into WARES as part of the input file. Also, the WARES model does not account for delays associated with traffic signals or congestion. For this reason, the WARES model is not suitable for projects within the metropolitan area.

The TRIPS model is designed for urban type projects that can result in a complex redistribution of traffic across the road network as a result of a project. The TRIPS model uses existing and projected land use data (population, employment, etc.) which is provided by the Department for Planning and Infrastructure. The TRIPS model then generates trips, distributes the trips to different modes (vehicles, public transport, walking, etc.) and geographical areas. The vehicle trips table is then assigned to the road network. The TRIPS model has been used for many years and proven to be very reliable, especially for the regional road network. The BCR part of the TRIPS model uses the information from the vehicle trips assignment to determine the difference in road user costs and benefits between the base and project networks.

MODEL SELECTION

The New Perth Bunbury Highway project involves the extension of the Kwinana Freeway from Safety Bay Road in Baldivis to the existing dual carriageway on the Old Coast Road in Lake Clifton. The new highway will be constructed to a 4-lane dual carriageway freeway from Safety Bay Road to South Yunderup (32km) and a 4-lane dual carriageway rural highway from South Yunderup to Lake Clifton (38.5km).

The project is within the area covered by the TRIPS model and will result in a significant redistribution of traffic within this model. For this reason, the TRIPS model was used to estimate the economic benefits of the project. However, external nodes are used to generate traffic where roads cross the boundaries of the TRIPS model. Changes to the road network as a result of a project do not change the amount of traffic generated by these nodes. Therefore, the benefits of traffic shifting from the South Western Highway to the Perth Bunbury Highway between Bunbury and Pinjarra are not accounted for in the analysis.

For the New Perth Bunbury Highway project, the economic analysis was undertaken using a combination of the TRIPS model and the WARES model because the project is on the boundary of the TRIPS model and affects traffic volumes and route choices both within and outside of this model.
Existing road data was extracted from Main Roads’ road information system (IRIS) for the road sections identified in Table 2. This resulted in a very large data file with more than 1100 records each containing 79 fields. In order to simplify the calculation, the records were amalgamated into broad road sections based on speed zones and dual/single carriageways. Other road attributes such as seal width and roughness were averaged over the amalgamated road sections. No vertical or horizontal geometry was considered in the analysis given the generally high standard of both routes. This amalgamation of the road sections is not expected to significantly affect the result.

The existing South Western Highway south of Pinjarra has an AADT of 4662 vehicles per day in 2003 with an average annual growth rate of 1.8% (based on data from permanent count site 4025). Classified count data shows that there are 15.3% heavy vehicles on this section of South Western Highway. Previous traffic studies using the TRIPS model showed that approximately 1800 vehicles per day are expected to shift from the South Western Highway to the Perth Bunbury Highway south of Pinjarra when the New Perth Bunbury Highway is completed in 2009. It was assumed that 65% of heavy vehicles class 9 and above and 50% of all other heavy vehicles would shift because of the attractiveness of the new route with no slow points through townsites and no stop/starts at traffic signals. This would leave about 10% heavy vehicles on South Western Highway. A summary of the assumed traffic that was used in the WARES analysis is shown in Table 3:

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</tr>
<tr>
<td>Total</td>
<td>1800</td>
</tr>
<tr>
<td>Year</td>
<td>2009</td>
</tr>
<tr>
<td>Growth Rate</td>
<td>1.8%</td>
</tr>
</tbody>
</table>

Table 3 – Traffic Volumes used for WARES Analysis

In order to simplify the traffic scenario, the WARES analysis only considered the traffic that moved from the South Western Highway route to the Perth-Bunbury Highway route and would be expected to be a conservative estimate of the benefits (i.e. does not include the effect of the total traffic on the two roads).
A summary of the model outputs is provided in Table 4. All costs are in 2005 dollars.

<table>
<thead>
<tr>
<th>Benefit</th>
<th>Discount Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>7%</td>
</tr>
<tr>
<td>Accident Costs</td>
<td>$17.6M</td>
</tr>
<tr>
<td>Vehicle Operating Costs</td>
<td>$59.8M</td>
</tr>
<tr>
<td>Commercial Travel Time Costs</td>
<td>$47.7M</td>
</tr>
<tr>
<td><strong>Total Benefits</strong></td>
<td><strong>$125.0M</strong></td>
</tr>
</tbody>
</table>

Table 4 – Output from WARES Analysis

Combined Economic Analysis

Table 5 contains a summary of the economic analysis that was undertaken for the New Perth Bunbury Highway project based on construction starting in late 2006 and completion/opening in 2009. These benefits include the additional benefits of the traffic that shifts from the South Western Highway to the Perth Bunbury Highway between Bunbury and Pinjarra/Mandurah.

The benefits were calculated using a combination of Main Roads TRIPS model and the WARES model over a 30 year period. Based on a project cost of $450M (in 2005 $) with construction over two years and a discount rate of 7%, the analysis shows a benefit cost ratio (BCR) of 5.12. A sensitivity analysis was undertaken using a discount rate of 4% which gave a BCR of 8.22.

<table>
<thead>
<tr>
<th>Benefit</th>
<th>Discount Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>7%</td>
</tr>
<tr>
<td>Accident Costs</td>
<td>$635.5M</td>
</tr>
<tr>
<td>Vehicle Operating Costs</td>
<td>$461.5M</td>
</tr>
<tr>
<td>Commercial Travel Time Costs</td>
<td>$1380.6M</td>
</tr>
<tr>
<td>Maintenance Costs</td>
<td>-$10.8M</td>
</tr>
<tr>
<td><strong>Total Benefits</strong></td>
<td><strong>$2466.8M</strong></td>
</tr>
<tr>
<td>Discounted Project Cost</td>
<td>$481.5M</td>
</tr>
<tr>
<td>Benefit Cost Ratio (BCR)</td>
<td>5.12</td>
</tr>
</tbody>
</table>

Table 5 – Combined Economic Analysis
<table>
<thead>
<tr>
<th>Number</th>
<th>Risk Description</th>
<th>Risk Severity Before Treatment</th>
<th>Action Plan</th>
<th>Risk Severity After Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Regulators response times and uncertainty in responses</td>
<td>Extreme</td>
<td>Timely engagement of DoE/DEH, relationship building, involvement in impact identification and management, and provision of resources where appropriate.</td>
<td>B Likely 4 Major Extreme</td>
</tr>
<tr>
<td>8</td>
<td>Can't get access to all land and project delayed</td>
<td>Extreme</td>
<td>Adequate resourcing of and timely acquisition of privately owned land. Monitor and facilitate excision of reserves. Elevate issue as required to CEO then Government if required.</td>
<td>E Rare 4 Major High</td>
</tr>
<tr>
<td>9</td>
<td>Impacts and cost of construction materials are unacceptable or excessive.</td>
<td>Extreme</td>
<td>Prepare materials supply strategy and undertake material search / investigate alternative materials eg Red Sand (Alcoa); Secure material supplies; Alliance to consider setting up sub-alliances with materials contractors; and Actively seek innovative solutions to reduce the quantities of fill required.</td>
<td>D Unlikely 4 Major High</td>
</tr>
<tr>
<td>10</td>
<td>Delays to Alliance selection process adversely delays commencement of construction</td>
<td>Extreme</td>
<td>Monitor progress and review process, if required.</td>
<td>C Moderate 4 Major Extreme</td>
</tr>
<tr>
<td>11</td>
<td>Direct Cost Target is significantly over budget</td>
<td>High</td>
<td>Alliance selection process extended to include cost competitive process.</td>
<td>D Unlikely 4 Major High</td>
</tr>
<tr>
<td>12</td>
<td>Industrial Relations issues including adoption of National Construction Code Impact adversely on project costs and schedule</td>
<td>Extreme</td>
<td>Alliance to develop suitable IR plan in with consultation with interested stakeholders. Develop an IR risk management strategy.</td>
<td>C Moderate 4 Major Extreme</td>
</tr>
</tbody>
</table>