

Executive summary

This document summarises the information contained in the Environmental Report prepared for the Port River Expressway Project.

Transport SA proposes to build a new road from the Salisbury Highway - South Road Connector, to the Lefevre Peninsula. A new road bridge would cross the Port Adelaide River between No. 1 and No. 2 Docks, and the new road would connect with Victoria Road at a junction just north of Swigg Street.

In addition to the new expressway, alterations to the rail freight network would be made to provide a river crossing near the new road bridge. This would connect the existing rail line next to Elder Road with the freight network on the eastern side of the Port River. The new arrangements would render redundant the existing rail line from Dry Creek through Rosewater, the Causeway and Semaphore Road.

Funding of some parts of the project will be provided by the State and Commonwealth Governments. The bridges and rail connections will be funded by a private consortium. In return for constructing the bridges and rail links, the consortium will have access to parcels of Government-owned land. Revenue raised by the development of these parcels will offset the capital costs incurred in building the bridges and rail connections.

The project is likely to take four years to complete and is subject to final environmental and other approvals.

The Environmental Report considers the potential effects of the project during both its construction and operation. In the process of compiling information about the existing environment, community consultation took place.

The principal objectives of the project are to:

- reduce the quantity of heavy goods vehicles that currently use Cormack Street, Grand Junction Road, the Causeway and Semaphore Road to gain access to industries on the Lefevre Peninsula, and to reduce the heavy goods vehicle traffic that currently uses St Vincent Street and Birkenhead Bridge;
- provide direct access across the river for freight trains travelling to Outer Harbor from Gillman.
- The major environmental and social issues raised by this proposal and discussed during community consultation are:
- the potential effects of the bridges on the visual amenity of Port Adelaide and on river traffic using Inner Harbor;
- the potential effects of water runoff from the project into wetlands and drainage systems;

- the potential effects of the project on future developments in and around Port Adelaide.

The Environmental Report addresses these and other issues in detail, and includes mitigation measures to reduce adverse effects.

Project background

Plans to improve the arterial road network in the north-western area of metropolitan Adelaide have been discussed for some ten years. Originally, part of the impetus was accommodation of the Multi-function Polis (MFP) 'core site' at Gillman. The core site was to have been developed into a residential and light industrial zone, based around canals linked to North Arm.

Even though the MFP project no longer requires the Gillman site, traffic congestion on roads between South Road, Port Adelaide and Outer Harbor is getting worse. In particular, the quantity of heavy goods vehicles is increasing as more freight consolidation and forwarding companies move into the industrial zones of Wingfield and Gillman. Increasing road freight traffic is also resulting in an increase in rail traffic.

As congestion and traffic volumes increase, so also do problems such as noise and air pollution from vehicle exhausts.

The possible need for a new river crossing was first discussed in 1976, when it was realised that heavy goods vehicles were having an adverse effect on Port Adelaide Centre. In 1991 a study into traffic problems was undertaken and several possible road alignments were investigated. This study was expanded in a 1992 investigation that examined alternatives and involved consultation with the then Port Adelaide Council, State Government departments and some local business operators.

In 1997 a further review of options was undertaken and this included estimates of the costs associated with nine alternatives. The alternatives considered ranged from 'do nothing' to constructing tunnels under the river.

The outcome of all the studies was the identification of an option that achieved all the primary objectives, while keeping the cost and adverse environmental effects to a minimum.

In February 1998, approval was given for the adoption of low-level road and rail bridges crossing the Port River between No. 1 and No. 2 Docks, with opening spans for river traffic, and the associated Gillman Highway link.

Following development of the proposal, Transport SA submitted a further paper to the State Government. In December 1999, the State Government:

- reaffirmed the original route of the road and rail bridges across the Port River and of Gillman Highway;
- endorsed the principle of private sector funding involving a tolling regime for the delivery of the new road bridge across the Port River;
- approved in-principle State funding of \$18.5 million to match that offered by the Federal Government under the Roads of National Importance (RONI) programme for the Gillman Highway component of the project.

Government endorsement of the project paved the way for Transport SA to call for tenders for the environmental assessment and community consultation process that is the subject of the Environmental Report.

Description of the project

The Port River Expressway is a joint Commonwealth and State Government initiative and is proposed to extend from the Salisbury Highway - South Road Connector in the east across the Port River to Victoria Road in the west. The total length of the project is 7 km. The project has three main elements which should be considered as an integrated package in order for the project objectives to be achieved. The three stages are described below.

Stage One: Roadworks

The roadworks component of the project extends from Ocean Steamers Road to the Salisbury Highway - South Road Connector, including Hanson Road, and comprises:

- the provision of the four-lane Port River Expressway between Eastern Parade and the Salisbury Highway - South Road Connector. The total length of this section is 4.7 km;
- the widening of Francis Street between Ocean Steamers Road and Eastern Parade to four lanes. The total length of this section is 1.05 km;
- a 'T' junction at the abandoned rail corridor in Francis Street to take traffic from the Port River Expressway to the eastern end of St Vincent Street;
- a partially grade-separated connection at the Salisbury Highway - South Road Connector;
- a four-lane extension of Hanson Road from Cormack Road to the proposed expressway. The total length of this section is 1 km.

Stage Two: River crossing

This stage encompasses the connections at Ocean Steamers Road, the road bridge and connections to Victoria Road. It comprises:

- the provision of a four-lane road bridge across the Port River between No. 1 and No. 2 Docks (with an opening span of about 30 m for river traffic) linking directly to Victoria Road and Francis Street. The total length of this section is 1.25 km;
- changes to Nelson Street (which crosses Birkenhead Bridge), Semaphore Road, Elder Road and Ocean Steamers Road to connect to the proposed expressway.

Stage Three: Rail crossing and rail connections

The rail component encompasses connections to the existing rail network on the eastern bank, a rail bridge and connections to the existing line at Elder Road. It includes the provision of a single-track rail bridge across the Port River adjacent to the road bridge, again with an opening span.

Unresolved issues

There are some unresolved issues in the project scope which are under consideration and will be determined through the outcomes of this Environmental Report and further planning and design work.

- The volume of Inner Harbor river traffic and opportunities for relocation of some users downstream of the proposed bridge need to be investigated. Relocation would minimise the frequency and duration of bridge openings.

- Increased bridge clearance for recreational river traffic needs to be investigated. This would also minimise the frequency and duration of bridge openings.
- Grade separations of Hanson Road and Elder Road need to be investigated in terms of their potential to reduce delays, improve road safety and thus make the route more attractive to road users.

Environmental effects of the project

The environmental effects have been studied under two main categories, which are:

- the biophysical environment
- the human environment.

The results of the studies are summarised in this section.

The biophysical environment

The biophysical environment comprises:

- geology and soils
- ground and surface waters
- flora, fauna and habitat.

Geology and soils

The project will not affect the geology and soils so much as they will affect the project. The Gillman area was a low-lying swampy marshland until levee banks were constructed and fill imported to raise parts of it. Some areas are still below sea level, although the levee banks prevent tides entering the area.

The geological history of the area means that the road will have to be built on imported fill materials. These will provide the necessary stability for the road pavement and foundations for the overpasses.

The fill material will come from a stockpile belonging to Transport SA and will be free of contamination.

Care will be needed in some areas to prevent the formation of acid sulphate soils. Some coastal soils contain sulphides that can be oxidised. On exposure of the soil to oxygen in air, oxidation of these sulphides occurs, leading to acidic products that can be harmful to the environment.

Land in the Adelaide plains is subsiding gradually. This subsidence is caused principally by two mechanisms: the removal of groundwater and wet land reclamation. In the Gillman area, wet land reclamation has almost ceased and the further abstraction of groundwater is unlikely. The reduced rate of subsidence will probably mean that the area will only subside by about 100 mm in the next 100 years.

There is also evidence that the rate of sea level rise in the Port Adelaide area is about 0.7 mm/year and in the Bolivar area 0.2-1.2 mm/year. Over the next 100 years, the rate of sea level rise is expected to be greater than in the past (due to the greenhouse effect), so projections based on historical rates may underestimate future levels.

Construction of the Port River Expressway must take account of both land subsidence and sea level rise.

Ground and surface waters

Groundwater in the Gillman area is shallow and in places no more than 0.5 m below the ground surface. The depth varies with the tides and is also influenced by the seasons. Close to the Port River, tidal variation can be as much as 1.3 m, but in areas further away from the river or the estuary, it is about 50 mm.

The salinity of the groundwater varies from good quality under the Lefevre Peninsula to four times that of sea water in the Wingfield area to the east.

Because of the shallow depth of the groundwater, care will need to be taken in the design of the road and overpasses to provide a solid base and to avoid 'damming' the groundwater and preventing its flow towards the north, where it discharges into the estuary. Structural members that penetrate the groundwater surface, such as bridge supports, will need to be protected from the saline waters to prevent corrosion.

Surface water in the project area is drained northwards to North Arm and North Arm Creek. All existing drainage systems will be retained and will channel stormwater under the Port River Expressway. In addition, the drains provided on either side of the carriageways and in the median strip of the expressway in the Gillman area will channel water into existing drains to the north of the corridor.

The stormwater volumes flowing from the Port River Expressway into the existing drains will represent a tiny fraction of the volumes currently flowing from the drainage catchment. The total surface area of the paved portions of the Port River Expressway will be approximately 0.2 km² (including hard shoulders, and pedestrian and bicycle paths). The total catchment area that drains through the Gillman area is approximately 66 km². While runoff from paved areas is greater than from unpaved areas, the paved area of the Port River Expressway represents only 0.3% of the total catchment area.

The water quality of runoff from the Port River Expressway is expected to be similar to that of the Southern Expressway, which was measured in a recent study. Runoff from the Southern Expressway shows traces of contaminants such as fuel and worn road surface materials, but is generally of a similar quality to urban runoff. Port River Expressway runoff water will join runoff water from a largely industrial catchment as it enters the wetlands. The quality of the water currently entering the wetlands is poor, with high heavy metal and nutrient loads, reflecting the largely industrial catchment.

All the wetlands have been designed so that the receiving pond can be isolated from the other ponds in the event of an accidental spill of chemicals or fuel. Once the section is isolated, the water and spilled pollutants can be collected and disposed of without adverse effects on the remaining ponds in the wetland system.

In short, runoff from the Port River Expressway will not affect the operation of the wetlands.

Drilling and pile driving during construction of the bridges are likely to disturb river bed sediments, increasing the suspended solids load of the Port River. Effective management planning will be required to reduce unnecessary disturbance. Experience gained during shipping channel dredging should inform the operation, and consideration should be given to

the use of silt nets. Spoil from the bore holes should be collected and disposed of on land as fill, provided that the fill meets Environment Protection Agency (EPA) guidelines for its use.

It should be recognised that the quantity of sediment disturbed and the duration of disturbance will be significantly less than during routine dredging of the shipping channel. As the stretch of water near the bridges is largely devoid of marine flora, the problem of plants being smothered is unlikely to arise.

Pile driving is likely to mean that aquatic fauna, including dolphins, will avoid the area. As pressure waves travel significant distances in water the effect is likely to extend upstream and downstream for several hundred metres. This effect is unavoidable but will last for a short time only.

Flora, fauna and habitat

Potential impacts on fauna, flora and habitat include clearance of native vegetation and alteration of habitat for animals.

The vegetation of the Port River and Gillman areas has significantly altered since early European settlement. The area was originally characterised by samphire low shrublands, and by low woodlands of mangroves with isolated salt paperbarks adjacent to the Port River. Since that time, the study area has undergone extensive disturbance from various sources.

Within the study area, the mangrove low woodlands and salt paperbark low woodlands have been cleared, as has much of the samphire low shrublands. Along the Port River, the mangrove and salt paperbark low woodlands have been replaced by the bitumen and concrete of general industry.

Within the Gillman area, much of the samphire community is degraded and dominated by exotic species. The samphire low shrublands have been further degraded through the dumping of fill and wastes, and drainage of the coastal fringe.

There is one patch of remnant vegetation in the proposed road corridor, alongside the Dean Rifle Range. It is a patch of locally significant, remnant native vegetation with a number of species of conservation status. The patch has sandy soil and is generally weed free, with only the odd soursob present. It comprises a collection of mounding shrubs 1-3 m high and 1-3 m wide over a dense grassy sward of common reed.

Elsewhere in the corridor, the original surface lies under bitumen and concrete.

It is not possible to completely avoid the removal of remnant vegetation where it occurs near the rifle range. A small adjustment has been made to the road alignment to reduce the clearing that will be necessary, and the landscape plan will provide opportunities to plant species found in this patch. Remnant vegetation on land that is not required for road construction will be fenced off to prevent disturbance during construction.

Largely because of the degraded nature of the vegetation in the Gillman area, there are few suitable habitats for native wildlife. The area also supports a large number of introduced animals that prey on native animals, further reducing the local populations. Native mammal species are restricted to the water rat and the white-striped mastiff bat. The white-striped mastiff bat is adapted to foraging in open landscapes, such as the Gillman area, whilst the water rat is adapted to semi-aquatic habitats (e.g. the Port River and estuary environments). A greater diversity of bird species is present in the project area. Water and sea birds, and birds of prey are the dominant species recorded in the area. Such species include: the common

sandpiper, the white-faced heron and the black-shouldered kite. The remainder are cosmopolitan species, including the galah, Australian magpie and crested pigeon.

The Port River Expressway will not further degrade habitats through which it passes and will have little effect on the native animals that remain in the area. The expressway will have no effect on the birds of the area.

Biodiversity and conservation

From the preceding section it can be concluded that:

- the current biodiversity values of the Port River estuary, in the vicinity of the proposed bridges, are likely to be low;
- the biodiversity values of the remnant vegetation on the Gillman site, particularly on land abutting the proposed corridor, are low;
- the wetland and landfill remediation projects are increasing the habitat diversity and biodiversity values.

Human environment

The human environment matters relevant to the project include:

- transport and traffic
- Aboriginal and European heritage
- land use
- economics
- amenity (including aesthetics, noise and air quality).

Transport and traffic

Existing traffic patterns were measured and predictions were made of likely traffic volumes in the year 2011 with and without the Port River Expressway.

The Port River Expressway is forecast to produce great benefits to road users, particularly within Port Adelaide and the region surrounding the road corridor. These benefits will be in the form of improvements in network efficiency and reductions in traffic volumes on roads around the Port Adelaide commercial centre. Reductions in truck traffic passing through Port Adelaide and using the immediate arterial road system will benefit both residents and commercial premises in the region.

With the expressway, network efficiencies in the year 2011 are likely to result in a 6% reduction in the total number of kilometres travelled, a 13% reduction in travel time and a 6% saving in total fuel usage, compared to the current network.

Without the expressway, by 2011 traffic along Grand Junction Road (between Commercial Road and South Road) is forecast to be approximately 30% greater than at present.

With the expressway, forecasts indicate a reduction of more than 50% in total traffic movements across Birkenhead Bridge and through Port Adelaide via St Vincent Street.

There will be a smaller but still significant reduction in traffic volumes along Causeway Road of about 12.5%.

There will be a 25% increase in traffic along Hanson Road from Grand Junction Road to the expressway.

Traffic flows along Cormack Road will be reduced by some 83%. Cormack Road will effectively change from being an industrial distributor to a local industrial access route.

It is forecast that by 2011 the Port River Expressway will attract 23,000 vehicles per day at the Port River bridge crossing and 44,000 vehicles per day where it joins the existing Salisbury Highway - South Road Connector. This demand will be accommodated on a new four-lane road, well separated from existing residential and commercial areas (particularly east of Eastern Parade).

Traffic is forecast to increase on Eastern Parade by some 30% as this road becomes an important access route to the expressway.

One of the major traffic benefits of the Port River Expressway will be the shifting of large volumes of light and heavy trucks from roads around Port Adelaide onto the expressway. This will have a very positive impact on the amenity of the street system in the region, especially in terms of reductions in noise and emissions. Major reductions in truck movements are expected on:

- Birkenhead Bridge and St Vincent Street-with demand expected to reduce by over 50%;
- Grand Junction Road-with reductions of around 50% west of Eastern Parade, and around 25-30% east of Eastern Parade;
- the Salisbury Highway - South Road Connector-with reductions in the order of 40% north of Grand Junction Road.

Daily truck volumes on the Port River Expressway are expected to range from 3,000 trucks per day (along the Francis Street section) to about 5,800 trucks per day at the Salisbury Highway - South Road Connector. Forecast truck crossings of the Port River bridge in 2011 are in the order of 1,700 to 1,800 vehicles per day, of which about 800 are expected to be light trucks and the balance heavy trucks.

By any measure, the shift of truck volumes to the Port River Expressway will yield major environmental and social benefits to residents and traders in the region.

Aboriginal heritage

Representatives of the Aboriginal community participated in a survey of the proposed route. This, together with archaeological surveys undertaken in the region, indicated that there are unlikely to be sites of significance along the corridor. This is not surprising given the extent of land disturbance since European settlement. Nevertheless, during construction great care must be taken to avoid disturbing any artefacts excavated accidentally. If any artefacts are found, work will cease until an assessment is made of the significance of the items. If items can be preserved they will be donated to appropriate agencies. If sites cannot be avoided, a permit will be obtained under the appropriate legislation and in consultation with the Aboriginal people.

European heritage

Port Adelaide has a fascinating European history, largely connected with commercial shipping. Buildings such as the wharf sheds and wool stores are reminders of an era when South Australia relied heavily on exporting and importing through the Port.

Today, the Inner Harbor is used mainly for pleasure and tourism, although several boat yards operate on the western side of Birkenhead Bridge, and tugs berth at Cruickshank's Corner.

The Port River Expressway will necessitate the removal of wharf sheds between No. 1 and No. 2 Docks, and the Aviation Museum. Arrangements are being negotiated for the relocation of the Aviation Museum and of the workshops and stores belonging to the Maritime Museum.

In order to preserve a good example of a wharf shed, Heritage SA is considering listing Shed 5 (on the southern side of No. 1 Dock). While this shed would be unaffected by the Port River Expressway, it stands on land that is currently owned by the Government of South Australia and may become part of the land development package negotiated between the Government and the private developer of the bridge component of the Port River Expressway.

The Maritime Museum has expressed interest in Shed 5 as a multiple use site that could contain a mixture of display boat building and retail areas.

Land use

The corridor of the Port River Expressway runs through several land use zones including Metropolitan Open Space System (MOSS), general and light industry, Port Adelaide Centre and residential areas. Land that was set aside for the MFP and is no longer required for that purpose borders the corridor on its northern side through Gillman.

The MOSS Zone is the short section of corridor on either side of which lie the Barker Inlet Wetlands. Road construction in this section will require minor adjustments to the earth banks of the wetlands, particularly where the intersection with South Road will be located. This minor adjustment will not impinge on the wetland ponds, but will affect a small vegetated area on the northern shoulder of the road. Plantings to compensate for this loss will be included in the landscape plan and there is potential to use the spaces between carriageways of the junction and slip roads to extend the water features.

Construction of the Port River Expressway offers the opportunity to enhance the appearance of the landfill sites and to provide future access to recreational space developed on rehabilitated landfill areas.

The general industrial zone between the landfill sites and Eastern Parade, and to the south of the proposed corridor, will gain from the expressway since it will provide ready access to national highways to the east and Port Adelaide and Outer Harbor to the west. No residential areas are present in this area and noise from the road traffic will not affect industrial sites that border the corridor.

Along the northern border of the corridor between the landfill sites and Eastern Parade is land that remains set aside for the MFP and is still part of the Development Plan for the area (even though the MFP proposals will not proceed). While the expressway creates the potential to provide access to this land for future development, industrial use of the land would require significant expenditure to overcome the poor geotechnical conditions.

Francis Street is currently used by freight consolidation and distribution companies. The expressway offers additional development opportunities to business along Francis Street, principally through its provision of ready access to transport networks. In the detailed design of this section of the expressway it will be necessary to cater for entry and egress of heavy vehicles, while providing through traffic with safe passage.

Economics

The Port of Adelaide/Gillman corridor is an important strategic transport link for South Australia. The corridor links directly with the national highway route to Perth and Darwin via Port Wakefield Road, and to national highway links to Sydney and Melbourne. It serves the State's major port and rail terminals at Port Adelaide and Outer Harbor, and the extensive industrial areas north-west of the city. The project will contribute to South Australia's economic development by providing a much-improved connection between Port Adelaide's industrial and port facilities and these key industrial routes.

The Port River Expressway traverses the Port Adelaide Enfield Council area, which has the following characteristics confirming its economic importance:

- 9.5% of South Australia's businesses
- 70% of Adelaide's transport sites
- 37% of Adelaide's warehouse sites
- 31% of Adelaide's developed land for industrial use
- 32% of Adelaide's vacant industrial land.

From an economic point of view, the Port River Expressway will materially enhance this area of Adelaide since it will provide stronger transport links both to the national highways and to the port facilities. Other economic outcomes will include:

- reduction in transport costs (through shorter journeys and less frequent interruptions to traffic flows);
- enhanced tourism opportunities in Port Adelaide Centre, through both easier access to national highways and reductions in heavy vehicle traffic in the Centre;
- enhanced opportunities for recreation and tourism resulting from easier access to the wetlands and to open spaces north of the Port River Expressway corridor;
- increased industrial property values in the Hanson Road and Wingfield precincts following improved access for heavy vehicles;
- increased property values on roads that will gain from reduced heavy vehicles movements (e.g. Grand Junction Road and St Vincent Street);
- additional employment opportunities during construction of the Port River Expressway and flowing from increased industrial activity during operation of the expressway.

Amenity (including aesthetics, noise and air quality)

The expressway offers an opportunity to design a transport corridor that is an integral part of the built environment as opposed to the current situation where roads and rail lines have been built

at various times and for various purposes, often without sensitivity to their surroundings or regard to surrounding land uses.

Judicious use of landscaping, coupled with new and improved access for bicycles and pedestrians, and consideration of a theme for streetscapes and street furniture (such as signs and lighting) has the potential to produce a project in harmony with its surroundings and one that will be both more functional and pleasing to the eye than the current arrangements.

All aspects of the natural and human environments have been considered in the development of the project. As a consequence of this integrated approach, it has been predicted that the project will give rise to the following benefits:

- reduced noise in residential areas
- improved air quality in residential areas
- improved bicycle and pedestrian facilities.

Environmental management

A draft Environmental Management Plan (EMP) has been developed in parallel with the Environmental Report. The EMP will provide a framework within which contractors building the Port River Expressway must work. The contractors' first task will be to develop environmental management implementation plans (EMIPs) detailing how environmental safeguards (set out in the EMP) will be addressed during design, construction and operation of the Port River Expressway.

Transport SA will arrange for regular audits of contractors' environmental performance during construction.

The principal environmental issues identified in the Environmental Report, which will be addressed in the EMP, EMIPs and audit programme, mean that contractors are required to:

- design the expressway in accordance with the need to allow for land subsidence and sea level rise;
- preserve as much as possible of the remnant native vegetation patch near Eastern Parade and the Dean Rifle Range;
- avoid producing conditions in which acid sulphate soils can be created. These conditions are unlikely since most of the project will be built on imported fill; however, care will need to be taken in areas where culverts or service trenches are constructed;
- minimise disruption and nuisance created by dust and noise during construction;
- manage water runoff in a manner that minimises sediment loads entering stormwater channels during construction, and directs stormwater to constructed wetlands during operation of the expressway;
- preserve water quality in the Port River during construction of the river crossings by implementing a spoil management programme;
- inform local inhabitants of construction matters throughout the construction period, particularly when noisy or dusty operations are to be carried out, or when traffic is likely to be disrupted.