

Reid Highway — Beechboro Road to Great Northern Highway

Main Roads of Western Australia

**Report and recommendations
of the Environmental Protection Authority**

**Environmental Protection Authority
Perth, Western Australia
Bulletin 735
March 1994**

THE PURPOSE OF THIS REPORT

This report contains the Environmental Protection Authority's environmental assessment and recommendations to the Minister for the Environment on the environmental acceptability of the proposal.

Immediately following the release of the report there is a 14-day period when anyone may appeal to the Minister against the Environmental Protection Authority's report.

After the appeal period, and determination of any appeals, the Minister consults with the other relevant ministers and agencies and then issues his decision about whether the proposal may or may not proceed. The Minister also announces the legally binding environmental conditions which might apply to any approval.

APPEALS

If you disagree with any of the contents of the assessment report or recommendations you may appeal in writing to the Minister for the Environment outlining the environmental reasons for your concern and enclosing the appeal fee of \$10.

It is important that you clearly indicate the part of the report you disagree with and the reasons for your concern so that the grounds of your appeal can be properly considered by the Minister for the Environment.

ADDRESS

Hon Minister for the Environment
12th Floor, Dumas House
2 Havelock Street
WEST PERTH WA 6005

CLOSING DATE

Your appeal (with the \$10 fee) must reach the Minister's office no later than 5.00 pm on 8 April, 1994.

Environmental Impact Assessment (EIA)

Process Timelines in weeks

Date	Timeline commences from receipt of full details of proposal by proponent	Time (weeks)
	Proponent Document Released for Public Comment	8
	Public Comment Period Closed	1/12/93
	Issues Raised During Public Comment Period Summarised by EPA and Forwarded to the Proponent	1
	Proponent response to the issues raised received	7
	EPA reported to the Minister for the Environment	8

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Summary and recommendations

Main Roads of Western Australia has proposed to extend Reid Highway 8.3 km eastwards between Beechboro Road and the Great Northern Highway (see Figure 1). The Highway would initially be constructed as four lanes, (two lanes in each direction) but would ultimately be constructed as six lanes (three lanes in each direction).

Bridges would be constructed at the Bennett Brook and the Swan River crossings.

The major issues which were identified through the environmental impact assessment process, including the public submissions received during the public review period, include the following aspects:

- protection of fauna and flora (Urban conservation and wetland protection):
 - the potential impacts on the Swan River (System Six Recommendation Area M19), and Bennett Brook (System Six Recommendation Area M41), including flood plain and adjacent riverine areas;
 - the potential impact to endangered fauna, particularly the Southern Brown Bandicoot;
 - retention of the biological functions of Swan Coastal Plain wetlands which may be affected by this proposal;
 - the protection of other remnant vegetation;
- pollution and drainage management;
- noise impacts and management;
- proper management of the above;
- archaeology and ethnography; and
- transport planning and management.

Archaeology and ethnography and transport planning and management are the responsibility of other agencies and are not considered in this report. They would be considered by other decision makers for the project.

The environmental issues raised by the Environmental Protection Authority and through the submissions, the proponent's response to the issues and the Environmental Protection Authority's assessment of this response are summarised below.

Urban conservation and wetland management

The proposed highway route would impact upon the Environmental Protection Authority's System Six recommendations M 19 and M 41 where the bridges cross the Swan River and Bennett Brook. It would also impact on wetlands and some areas of upland remnant vegetation and associated fauna. Some of the vegetation systems provide likely habitat for the Southern Brown Bandicoot (*Isodon obesulus*) which is listed on Schedule 1 (species which are likely to become extinct or are rare) of the Wildlife Conservation Act.

The Environmental Protection Authority is concerned that vegetation systems and individual species (fauna or flora) which are of high conservation value are protected.

The Environmental Protection Authority considers that an adequate and representative system of reserves should be set aside for the conservation of flora, fauna and landscape and, in this regard, the System Six Report and the Environmental Protection Authority's strategy for the protection of the lakes and wetlands (Bulletin 685) have formed the principal focus for the Authority's conservation efforts on the Swan Coastal Plain.

It is recognised that there may be vegetation systems or individual species of high regional conservation value outside of these areas and proposals which may impact on such significant values would be carefully considered by the Environmental Protection Authority.

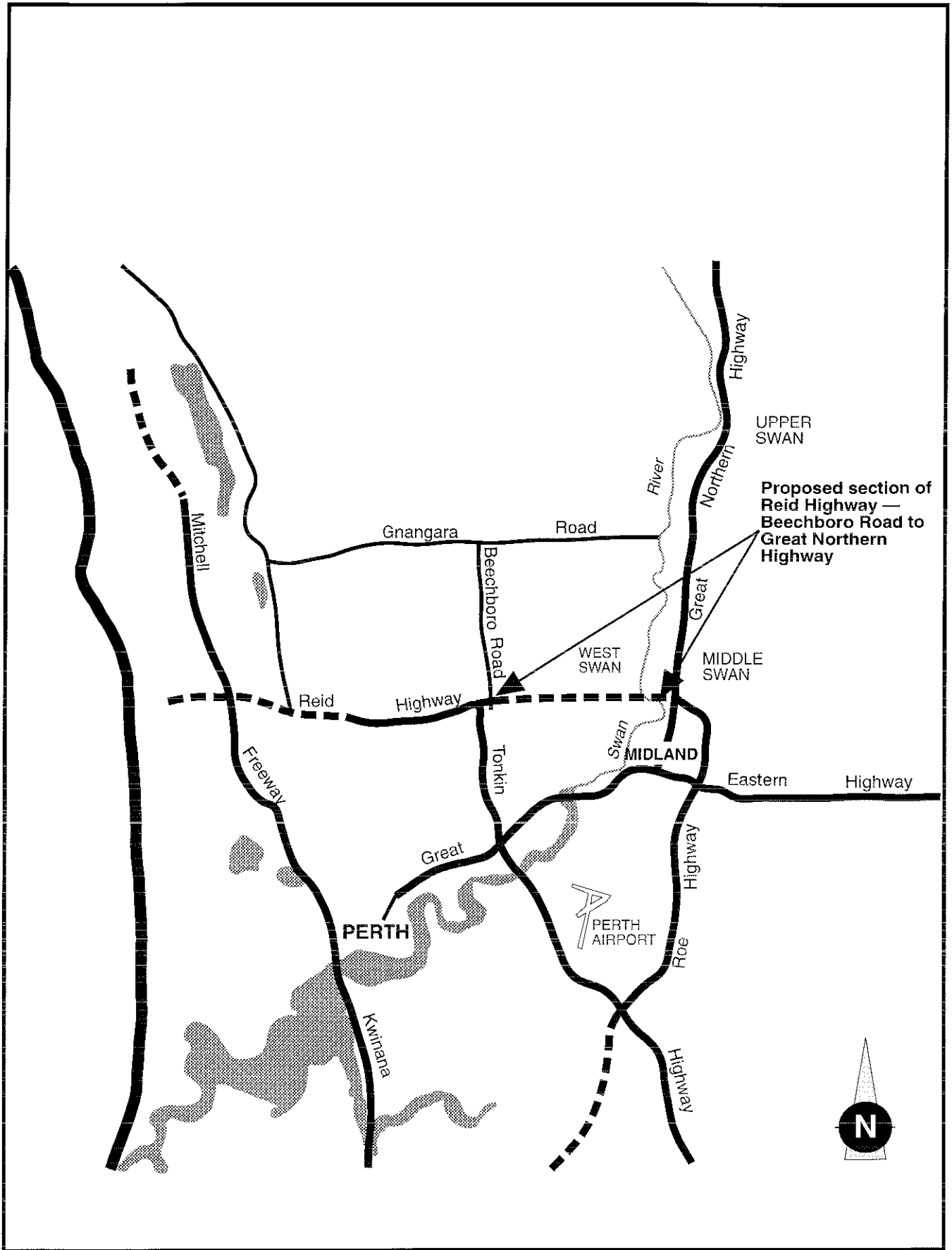


Figure 1. Reid Highway — Beechboro Road to Great Northern Highway

With regard to this proposal for the construction of the Reid Highway between Beechboro Road and Great Northern Highway, Main Roads has minimised impacts on the System Six areas over the Swan River and Bennett Brook by:

- designing the bridges so that their impacts on the conservation and recreation values of the two water bodies concerned have been minimised; and
- committing to landscape the route in a manner which would accommodate its natural values and maximise habitat diversity.

Management of the wetland areas and possible rare fauna need to be more carefully considered at the detailed design stage.

Accordingly, subject to detailed design of the bridges and management of the possible Bandicoot population and wetland areas being to the satisfaction of the Minister for the Environment, the Environmental Protection Authority has concluded that the proposal is acceptable.

Noise management

Main Roads has committed to providing a number of noise attenuation measures such as noise bunds where required. With these measures in place, predictions for noise levels for the year 2001 are in the low 60's dB(A). Main Roads has also committed to repeating the noise studies prior to the construction of the second stage of the highway and considering provision of more attenuation measures should the new predictions be above 63dB(A). This management strategy is acceptable to the Environmental Protection Authority.

Pollution and drainage management

Main Roads has put forward a management strategy to deal with potential pollution from drainage water from the road and possible spillages. The key elements of the management strategy are the use of swale drains where ever possible and, where drainage waters would enter waterbodies, the use of retention basins to strip water of pollutants. This management strategy is acceptable to the Environmental Protection Authority.

Following consideration of the environmental issues and the proponent's response to these, the Environmental Protection Authority has concluded that the proposal as described is environmentally acceptable subject to the following recommendations.

Recommendation 1

The Environmental Protection Authority has concluded that the proposed extensions to Reid Highway from Beechboro Road, Beechboro to Great Northern Highway, Middle Swan, as modified during the assessment process, could be made environmentally acceptable.

In reaching this conclusion the Environmental Protection Authority identified the major environmental issues as;

- **protection of fauna and flora (Urban conservation and wetland protection):**
 - **the potential impacts on the Swan River (System Six Recommendation Area M19), and Bennett Brook (System Six Recommendation Area M41), including flood plain and adjacent riverine areas;**
 - **the potential impact to endangered fauna, particularly the Southern Brown Bandicoot;**

- retention of the biological functions of Swan Coastal Plain wetlands which may be affected by this proposal;
- the protection of other remnant vegetation;
- pollution and drainage management;
- noise impacts and management; and
- proper management of the above.

Accordingly the Environmental Protection Authority recommends that the proposal could proceed subject to the proponent's environmental commitments listed in Appendix 2 and the following recommendations and Recommended Environmental Conditions. (Recommended Environmental Conditions are listed in Section 6)

The Environmental Protection Authority considers that the environmental aspects of final engineering and landscape plans for the bridges over the Swan River and Bennett Brook should be to the requirements of the Minister for the Environment. In support of the commitments made by the proponent, the Environmental Protection Authority makes the following recommendation.

Recommendation 2

The Environmental Protection Authority recommends that the environmental management aspects of the final design of the bridges over the Swan River and Bennett Brook and the associated landscape plans be to the satisfaction of the Minister for the Environment on the advice of the Swan River Trust, the Department of Planning and Urban Development and the Department of Environmental Protection.

The Environmental Protection Authority considers that the proponent should prepare management plans to protect wetlands and possible rare fauna on the site. In support of the commitments made by the proponent, the Environmental Protection Authority makes the following recommendations.

Recommendation 3

The Environmental Protection Authority recommends that prior to commencement of the construction of the Reid Highway, the proponent prepare and subsequently implement a strategy for the protection of the wetlands on site including details on wetland replacement, wetland management (including a monitoring plan) and the timing of any wetland replacement strategies to the requirements of the Minister for the Environment on advice from the Department of Environmental Protection.

Recommendation 4

The Environmental Protection Authority recommends that Main Roads prepare and subsequently implement an approved strategy for the protection of the Southern Brown Bandicoot (*Isodon obesulus*) prior to commencement of construction activities in areas of known habitat for this species, to the requirements of the Minister for the Environment on advice from the Department of Conservation and Land Management.

1. Introduction

Main Roads of Western Australia has proposed to extend Reid Highway eastwards between Beechboro Road and the Great Northern Highway (see Figure 1). Reid Highway (formerly known as the Northern Perimeter Highway), is included in the Metropolitan Region Scheme and forms the northern link of the planned Metropolitan Ring Road for Perth.

This stage of the highway is intended to cross Bennett Brook and the Swan River. These features were identified in the Environmental Protection Authority's System Six 'Red Book' report (Environmental Protection Authority 1983, Environmental Report 13) as open space areas of regional significance because of the high conservation and recreation potential of these waterways. Areas of cultural significance to the Aboriginal people occur also along the proposed route of the highway (Main Roads Western Australia 1993, Public Environmental Review).

Main Roads referred this proposal to the Environmental Protection Authority in April of 1993. The Environmental Protection Authority decided that the potential environmental impacts would be sufficient to warrant formal environmental impact assessment at the level of Public Environmental Review. This decision was based on the potential for impacts upon environmental values identified by the Environmental Protection Authority in the System Six report. The Environmental Protection Authority issued guidelines in August 1993 to assist Main Roads in the preparation of the relevant documentation. The Public Environmental Review document was released for an eight week public comment period which closed on 1 December 1993.

2. The proposal

Reid Highway is identified on the Metropolitan Region Scheme as a 'Controlled Access Highway'. When completed, Reid Highway would connect the Mitchell Freeway and Marmion Avenue in the west with Roe Highway just north of Midland (Main Roads Western Australia 1993). The 8.3km section of Reid Highway between Beechboro Road and the Great Northern Highway/Roe Highway intersection, which is the proposal considered in this report, would complete the link between Mitchell Freeway and Roe Highway.

Main Roads has indicated that Reid Highway forms part of a planned transport network which would improve access to areas of potential employment and residential growth in the middle and outer suburbs of Perth. Completion of the highway between Mitchell Freeway and Midland would provide a direct link between the Osborne Park, Balcatta, Malaga and Midland industrial complexes. Main Roads states that connection of Reid Highway to other major transport routes would provide easy access to industrial and commercial centres and would have direct social benefits for surrounding residential areas.

The section of the Reid Highway examined in this report comprises 8.3km of roadworks. Construction would be as a four lane (two lanes in each direction) divided highway, with provision made for eventual expansion to six lanes (three lanes in each direction) at freeway standard. Main Roads has indicated that construction of the road would be staged. However, this report examines the environmental acceptability of the ultimate proposal to a six lane freeway as indicated above.

Bridges would be constructed at the Bennett Brook and the Swan River crossings.

Most of the surrounding land use is currently rural with the exception of an existing residential area south of the highway between Beechboro Road and Lord Street. However, it is considered likely that planning proposals would realise further residential development near other sections of the highway in the future.

Construction of the highway would have an effect on the Swan River and adjacent river terraces and floodplain, Bennett Brook and its floodplain, the Emu Swamp Main Drain, and some lowlying and seasonally inundated or waterlogged areas along the length of the route. Some remnant vegetation would also be cleared. Main Roads has indicated that post construction revegetation and rehabilitation would be undertaken.

3. Review of public submissions

Comments on the proposed construction of Reid Highway were sought from the public. The Public Environmental Review document prepared for the proposal by Main Roads was available for an eight week submission period ending 1 December 1993.

A total of five submissions were received during the public submission phase, two from Government departments and three from individuals and community groups. Although only a few submissions were received some were substantial in the level of detail and comments provided.

The major issues raised in submissions from the public were as follows:

- flora and fauna concerns;
- archaeology and ethnography;
- noise impacts and management;
- pollution impacts and drainage management; and
- transport planning and management.

The Environmental Protection Authority's summarised list of issues raised through the public review phase and the Main Roads' response to those issues are included as Appendix 1 with this report.

The Environmental Protection Authority has included consideration of the submissions received on environmental matters and the Main Roads' response as part of the assessment.

Concerns raised over archaeology and ethnography and transport planning and management are the responsibility of other agencies and cannot be considered in this report. They would be considered by other decision makers for the project.

4. Environmental impacts and their management

The major environmental issues related to this proposal which have been identified through the environmental impact assessment process include the following issues.

- protection of fauna and flora (Urban conservation and wetland protection):
 - the potential impacts on the Swan River (System Six Recommendation Area M19), and Bennett Brook (System Six Recommendation Area M41), including flood plain and adjacent riverine areas;
 - the potential impact to endangered fauna, particularly the Southern Brown Bandicoot;
 - retention of the biological functions of Swan Coastal Plain wetlands which may be affected by this proposal;
 - the protection of other remnant vegetation;
- pollution and drainage management;
- noise impacts and management; and
- proper management of the above.

Following consideration of these issues and the proponent's response to them, the Environmental Protection Authority has concluded that the proposal as described is environmentally acceptable.

Recommendation 1

The Environmental Protection Authority has concluded that the proposed extensions to Reid Highway from Beechboro Road, Beechboro to Great Northern Highway, Middle Swan, as modified during the assessment process, could be made environmentally acceptable.

In reaching this conclusion the Environmental Protection Authority identified the major environmental issues as:

- **protection of fauna and flora (Urban conservation and wetland protection);**
 - **the potential impacts on the Swan River (System Six Recommendation Area M19), and Bennett Brook (System Six Recommendation Area M41), including flood plain and adjacent riverine areas;**
 - **the potential impact to endangered fauna, particularly the Southern Brown Bandicoot;**
 - **retention of the biological functions of Swan Coastal Plain wetlands which may be affected by this proposal;**
 - **the protection of other remnant vegetation;**
- **pollution and drainage management;**
- **noise impacts and management;**
- **proper management of the above;**

Accordingly the Environmental Protection Authority recommends that the proposal could proceed subject to the proponent's environmental commitments listed in Appendix 2 and the following recommendations and Recommended Environmental Conditions. (Recommended Environmental Conditions are listed in Section 6)

4.1 Urban conservation and wetland protection

4.1.1 Background information: urban conservation

The Environmental Protection Authority considers that an adequate and representative system of reserves should be set aside for the conservation of flora, fauna and landscape. Such reserves should be properly managed and given security of tenure commensurate with their conservation value. The integrity of such reserves should be maintained.

The System Six Report established through the Conservation Through Reserves studies has formed a principle focus for the Environmental Protection Authority's conservation efforts on the Swan Coastal Plain.

System Six covers the most intensively used part of the State where land values are high and competition for differing land use is often intense. The study's objective was to define those parts of the region which should be kept mainly natural.

This study identified 209 metropolitan and country areas of regional conservation significance and/or regional representation of biological and physical values on the Swan Coastal Plain and made recommendations for their management. The recommendations of the System Six Study were endorsed in principle by Government in 1983.

The Environmental Protection Authority believes the integrity of System Six Recommendation areas should not be further compromised and defends them strongly.

The Swan River from Guildford to Walyunga National Park (System Six Recommendation Area M19) and Bennett Brook (System Six Recommendation Area M41) are directly affected by the recommendations contained within the System Six report.

The Environmental Protection Authority recognises that there may be areas of high conservation value that have not been included in reserve and System Six boundaries. Such proposals are viewed carefully by the Environmental Protection Authority but decisions to protect land outside System Six are the exception.

It is also recognised that there are areas of bushland which may have significant local conservation value for linkages or buffers or may have social value. As the decision to set aside substantial areas of public open space is not without cost, the Environmental Protection Authority considers that the decisions to protect these areas should be made within the planning process which provides a framework with the capacity to recognise a community's interest in the preservation of bushland areas which have limited conservation value and also to account for other factors.

4.1.2 Background information: wetland protection

Since 1971, the Environmental Protection Authority has consistently recognised the need to conserve lakes and wetland and has developed a strategy for wetland protection on the Swan Coastal Plain (Environmental Protection Authority 1993, Bulletin 685).

The Environmental Protection Authority discourages proposals which would affect significantly functional lakes and wetlands, that is:

- Lakes nominated for protection in the Environmental Protection (Swan Coastal Plain Lakes) Policy;
- representative wetlands recommended for protection in the Environmental Protection Authority's System Six report;
- wetlands with rare vegetation communities not adequately represented in reserves, or rare flora and fauna (and their habitats); and
- wetland recognised by international agreement because of their importance primarily for waterbirds and their habitats.

Any proposals affecting wetlands which do not fall into the above categories are expected to be managed by the proponent within the management objectives for the relevant category of wetland identified in the Environmental Protection Authority's Bulletin 686 '*A Guide to Wetland Management in the Perth and near Perth Swan Coastal Plain Area*'.

4.1.3 System Six recommendations

Swan River (System Six Recommendation Area M19)

Issue

The Swan and Canning Rivers and their tributaries are an important resource of the Perth metropolitan region. These rivers and their foreshores provide habitats for a variety of terrestrial and aquatic flora and fauna. They are also an important scenic feature and a focus for leisure activities for metropolitan and tourist populations (Government of Western Australia 1988).

As discussed above, the Swan River from Guildford to Walyunga National Park is also directly affected by the recommendations contained within the System Six report. The report identifies the Swan River from Guildford to Walyunga National Park as an open space area of regional significance because of its high conservation and recreation potential. It provides a link between other open space areas of regional significance, Walyunga National Park and the Swan River further downstream.

Proponent's response

Main Roads has recognised the conservation, recreational and cultural significance of the Swan River.

Main Roads has advised that the highway would cross the Swan River some 40 to 50 metres downstream of the existing bridge carrying Middle Swan Road. The existing Swan River Bridge at Middle Swan Road would be retained for use by local traffic.

At the proposed highway crossing site the main watercourse is approximately 30 metres wide, and the flood-plain is regarded by Main Roads as being greater than 700 metres wide on the west and between 30 and 40 metres on the east. The new bridges over the Swan River are proposed to be five span structures with total lengths of 240 metres. A 60 metre span would straddle the river and its banks. There would be one span on the east and three on the west of the river to accommodate the flood plain.

Drainage on the bridges would be directed through roadside drains to collection points off the bridges themselves. In order to guard against pollution from road runoff or accidental spillage, Main Roads has stated there would be no direct discharge into the watercourses or onto the floodplains below the bridges.

Whilst some removal of existing trees is required to allow construction of the bridge, the post construction rehabilitation and landscaping using species native to the riverine environment should compensate for this loss.

Construction of the bridge would require approval of the Minister of the Environment on advice of the Swan River Trust, under Part 5 (Development Control) of the *Swan River Trust Act* 1988. The Swan River Trust is established by law with the responsibility for planning, protection and management functions in respect of the Swan and Canning Rivers and adjoining parks and recreation reserves.

The Environmental Protection Authority's evaluation

The Environmental Protection Authority acknowledges the proponents efforts to effectively manage the impacts of the proposed bridges over the Swan River so that the conservation and recreation values of the area would be maintained and has concluded that the proposal as described is environmentally acceptable, subject to recommendation 2 below.

The Environmental Protection Authority believes that it is the role of the Swan River Trust to give due consideration to the environmental issues associated with this portion of the proposal in its advice to the Minister for the Environment regarding the detailed design of the Reid Highway bridge over the Swan River.

Bennett Brook (System Six Recommendation Area M41)

Issue

Bennett Brook feeds into the Swan River downstream of West Swan Bridge and is of particular significance to Aboriginal culture (Government of Western Australia, 1988).

The System Six report identified the conservation and recreation value of the area as high. Main Roads has indicated that at the proposed crossing point, Bennett Brook is a narrow braided, perennial stream with a seasonal tributary joining the main channel within the road reserve. The highway crossing site is currently used for grazing and has little native vegetation.

Proponent's response

The proposed Bennett Brook bridge would have a single 30 metre span and, in order to guard against pollution from road runoff or accidental spillage, Main Roads would incorporate design features to ensure no direct discharge into the watercourse or onto the floodplain below the bridge.

The System Six values have been recognised by Main Roads, which has advised that the opportunity would be taken at the Bennett Brook bridge site to enhance what native vegetation exists, with plantings of indigenous vegetation, including Flooded Gums and Swamp Paperbarks. Additional landscaping measures are also proposed and are included in the proponent's commitments.

The Environmental Protection Authority's evaluation

The Environmental Protection Authority acknowledges the proponent's efforts to effectively manage the impacts of the proposed bridges over Bennett Brook so that the conservation and recreation values of the area would be maintained and has concluded that the proposal as described is environmentally acceptable, subject to recommendation 2 below.

Recommendation 2

The Environmental Protection Authority recommends that the environmental management aspects of the final design of the bridges over the Swan River and Bennett Brook and the associated landscape plans be to the satisfaction of the Minister for the Environment on the advice of the Swan River Trust, the Department of Planning and Urban Development and the Department of Environmental Protection.

4.1.4 Swan Coastal Plain wetlands

Issue

There are no wetlands affected by the Reid Highway extension which are gazetted in the Environmental Protection (Swan Coastal Plain Lakes) Policy 1992. However, a number of wetlands which have been identified in the wetland mapping and classification work undertaken by Water Authority of Western Australia would be affected by the highway alignment.

These were categorised using the Environmental Protection Authority's wetland evaluation method published in Bulletin 374 *A guide to wetland management in Perth* (recently updated by Bulletin 686), as Resource Enhancement or Multiple Use wetlands.

The proponent's response

Main Roads has advised that amelioration of the impacts on the category R and M wetlands is difficult to address *in situ* within the existing reserve boundary which is just sufficient to accommodate roadworks. Opportunities may exist for compensatory enhancement in the vicinity of the future Lord Street interchange, and the south east quadrant of the intersection at Beechboro Road where landscaped compensating basins could be provided. These issues would be addressed during design.

The Environmental Protection Authority's evaluation

The Environmental Protection Authority expects that Main Roads would recognise that all wetlands have special value and that they should be appropriately managed to maintain their human use and natural values when assessing possible uses. The main factors to take into account in protecting these seasonal wetlands include:

- assessment and management of the wetlands having regard to the Environmental Protection Authority's guidance contained in Bulletin 686; and
- protection of water levels and water quality through management of drainage.

In previous assessments, the Environmental Protection Authority has required Main Roads to ensure that wetland functions are replaced where impacts upon the wetlands cannot be avoided. This strategy is consistent with recent environmental approvals granted to Main Roads for the extension of Kwinana Freeway from Forrest Road to Thomas Road, Casuarina, and the Water Authority of Western Australia for development of Stage 2 of the Jandakot Groundwater Scheme. The Environmental Protection Authority notes the commitments and undertakings provided by the proponent. These requirements are reflected in recommendation 3 below.

Recommendation 3

The Environmental Protection Authority recommends that prior to commencement of the construction of the Reid Highway, the proponent prepare and subsequently implement a strategy for the protection of the wetlands on site including details on wetland replacement, wetland management (including a monitoring plan) and the timing of any wetland replacement strategies to the requirements of the Minister for the Environment on advice from the Department of Environmental Protection.

4.1.5 Fauna

Issue

Main Roads has provided a list of the fauna expected to occur along the highway route. One of the mammal species expected, the Southern Brown Bandicoot (*Isoodon obesulus*), is listed on Schedule 1 (species which are likely to become extinct or are rare) of the Wildlife Conservation Act.

Concern was expressed in the submissions that the highway would result in the loss of habitat utilised by the Southern Brown Bandicoot and that this would result in loss of the animals.

Submissions also asked if there was a possibility for rehabilitating the area so that the range of fauna expected to be found could once again be found within the survey areas.

Proponent's response

Main Roads has advised that the Southern brown Bandicoot was not recorded during the survey conducted in 1989. The zoological consultants have stated that it could be present in two vegetation types represented in the road reserve (Flooded Gum/Swamp Paperbark Fringing Woodland and Moonah Paperbark Low Woodland and associated heath vegetation type). The extent of the remnant vegetation has been significantly reduced since the surveys were undertaken in 1989 and remaining areas have been degraded by trail bikes. Main Roads concludes that it is unlikely that Bandicoots do exist and that, if they are present, they, and other fauna on the site would be benefited by the landscaping measures along the reserve, which would require indigenous vegetation to be retained where ever possible and that habitat diversity would be expressly incorporated in the landscape plans.

However, Main Roads notes that the loss of habitat in the region would impact on the population diversity of the area as a whole and, given this, it is unlikely that the full range of species found in the area historically can be reintroduced. Construction of the highway should not reduce the list of species actually found during the survey.

Advice from other agencies

The Department of Conservation and Land Management has recommended that Main Roads needs to establish the extent of the bandicoot use in the wetland vegetation complexes which would be affected by construction and develop management strategies for the protection of the population.

The Environmental Protection Authority's evaluation

Provided the proponent prepares a management strategy for the protection of the Southern Brown Bandicoot which accommodates the requirements of the Department of Conservation and Land Management, prior to the commencement of construction activity for the highway, the Environmental Protection Authority has concluded that the potential impacts are environmentally acceptable.

Recommendation 4

The Environmental Protection Authority recommends that Main Roads prepare and subsequently implement an approved strategy for the protection of the Southern Brown Bandicoot (*Isoodon obesulus*) prior to commencement of construction activities in areas of known habitat for this species, to the requirements of the Minister for the Environment on advice from the Department of Conservation and Land Management.

4.1.6 Other remnant vegetation

Issue

The proposal would destroy sections of identified remnant bushland near the intersection with Arthur Street, at least in part, notwithstanding incidental damage.

The proponent's response

The route of the Highway would impact on an area of remnant woodland east of Arthur Street. The location of this section of the Highway is constrained by and cannot be relocated to avoid the woodland. The section has been identified as a 'Special Purpose' area in the landscape recommendations and as such would be treated with site specific landscaping/rehabilitation. Marri and Sheoak with a mixed understory would be used to ameliorate the impact of the highway's construction.

The Environmental Protection Authority's recommendation

The area is not within a System Six recommendation area and has not been shown to have highly significant regional conservation values. The landscaping plans would ensure that the impacts on the vegetation would be minimised. The Environmental Protection Authority has concluded that this potential impact is environmentally acceptable.

4.2 Noise management

Issue

The traffic on the Highway would create noise. Submissions expressed concern over the commitments provided by Main Roads to manage this issue.

Proponent's response

Main Roads has committed to providing a number of noise attenuation measures such as noise bunds where required. With these measures in place, predictions for noise levels for the year 2001 are in the low 60's dB(A) at nearest residences (Main Roads Western Australia 1993). Main Roads has also committed to repeating the noise prediction study during the final design phase of the project and considering the incorporation of additional noise attenuation measures should the new predictions be above 63 dB(A). These may take the form of higher bunds, or a combination of bunds and walls where space in the highway reserve is limited.

The Environmental Protection Authority's evaluation

The Environmental Protection Authority has concluded that the noise management strategy proposed by the proponent would keep noise levels to an acceptable level and that the proposed impact as described is environmentally acceptable.

4.3 Pollution and drainage management

Issue

Concern was raised over Main Roads proposed management of potential pollution from spills and drainage.

Proponent's response

Main roads has advised as follows:

- Intersections and bridges would be kerbed, with the rest of the length of the highway serviced by simple swale drains.
- Swale drains allow storm water to infiltrate the permeable soils which also act as a filter for particulates in the road runoff. Dissolved pollutants in normal road runoff have been found to be negligible in sampling conducted along Leach Highway. Major spills are easily contained in the swale drains, and contaminated soil can be easily and swiftly removed.
- Retention basins would be provided where ever drainage waters may enter a waterbody. Nutrient absorbing vegetation and red mud would be used along with retention time to help settle particulates and strip the stormwater of most pollutants before they find their way into any of the watercourses or the watertable.

- Risk of major contamination is low (1991 - nine incidents in transit, no spillage in two and minor in others; 1992 six incidents in transit, no spillage in three and minor in others).

The Environmental Protection Authority's evaluation

The Environmental Protection Authority has concluded that the pollution and drainage management strategy would enable the proponent to effectively manage potential pollution of ground and surface water from drainage waters and spillages and, accordingly, the potential impact as described is environmentally acceptable.

5. Conclusion

The Environmental Protection Authority concludes that the proposed extension to the Reid Highway from Beechboro Road, Beechboro, to Great Northern Highway, Middle Swan, could be made environmentally acceptable provided that the proponent's commitments and the recommendations of this report are implemented. This includes protection of areas of high conservation or recreational value, ensuring that there is no overall loss of wetland function on the Swan Coastal Plain, protecting bandicoots and management of the above.

The Environmental Protection Authority's experience is that it is common for details of a proposal to alter through the detailed design and construction phase. In many cases alterations are not environmentally significant or have a positive effect on the environmental performance of the project. The Environmental Protection Authority believes that such non-substantial changes, and especially those which improve environmental performance and protection, should be provided for.

The Environmental Protection Authority believes that any approval for the proposal based on this assessment should be limited to five years. Accordingly, if the proposal has not been substantially commenced within five years of the date of this report, then such approval should lapse. After that time, further consideration of the proposal should occur only following a new referral to the Environmental Protection Authority.

6. Recommended environmental conditions

Recommendation 1

The Environmental Protection Authority recommends that the following Environmental Conditions, based on this Report and the Recommendations and Procedures in Bulletin 735 be applied to REID HIGHWAY FROM BEECHBORO ROAD TO GREAT NORTHERN HIGHWAY

1 Proponent Commitments

The proponent has made a number of environmental management commitments in order to protect the environment.

- 1-1 In implementing the proposal, the proponent shall fulfil the commitments made in the Public Environmental Review and in response to issues raised following public submissions, provided that the commitments are not inconsistent with the conditions or procedures contained in this statement. These commitments are consolidated in Environmental Protection Authority Bulletin 735 as Appendix 2. (A copy of the commitments is attached.)

2 Implementation

Changes to the proposal which are not substantial may be carried out with the approval of the Minister for the Environment.

- 2-1 Subject to these conditions, the manner of detailed implementation of the proposal shall conform in substance with that set out in any designs, specifications, plans or other

technical material submitted by the proponent to the Environmental Protection Authority with the proposal. Where, in the course of that detailed implementation, the proponent seeks to change those designs, specifications, plans or other technical material in any way that the Minister for the Environment determines on the advice of the Environmental Protection Authority, is not substantial, those changes may be effected.

3 Urban Conservation and Wetland Management

Final design for the highway and bridges should ensure that regionally significant conservation issues are managed.

3-1 Prior to construction of the bridges over the Swan River and Bennett Brook, the proponent shall prepare the final engineering and landscaping plans for the bridges and associated riverine environs to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority, the Swan River Trust and the Department of Planning and Urban Development.

3-2 The proponent shall implement the plans required by condition 3-1.

3-3 Prior to construction, the proponent shall prepare a strategy for protection of the wetlands on the site, to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority

This strategy shall include, but not be limited to the following:

1. details of wetland replacement,
2. wetland management, including a monitoring plan, and
3. timing of any wetland replacement.

3-4 The proponent shall implement the strategy required by condition 3-3.

3-5 Prior to construction, the proponent shall prepare a strategy for protection of the Southern Brown Bandicoot (*Isodoon obesulus*) to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority and the Department of Conservation and Land Management.

3-6 The proponent shall implement the strategy required by condition 3-5.

4 Proponent

These conditions legally apply to the nominated proponent.

4-1 No transfer of ownership, control or management of the project which would give rise to a need for the replacement of the proponent shall take place until the Minister for the Environment has advised the proponent that approval has been given for the nomination of a replacement proponent. Any request for the exercise of that power of the Minister shall be accompanied by a copy of this statement endorsed with an undertaking by the proposed replacement proponent to carry out the project in accordance with the conditions and procedures set out in the statement.

5 Time Limit on Approval

The environmental approval for the proposal is limited.

5-1 If the proponent has not substantially commenced the project within five years of the date of this statement, then the approval to implement the proposal as granted in this statement shall lapse and be void. The Minister for the Environment shall determine any question as to whether the project has been substantially commenced. Any application to extend the period of five years referred to in this condition shall be made before the expiration of that period, to the Minister for the Environment by way of a request for a change in the

condition under Section 46 of the Environmental Protection Act. (On expiration of the five year period, further consideration of the proposal can only occur following a new referral to the Environmental Protection Authority.)

6 Compliance Auditing

In order to ensure that environmental conditions and commitments are met, an audit system is required.

- 6-1 The proponent shall prepare periodic "Progress and Compliance Reports", to help verify the environmental performance of this project, in consultation with the Environmental Protection Authority.

Procedure

The Environmental Protection Authority is responsible for verifying compliance with the conditions contained in this statement, with the exception of conditions stating that the proponent shall meet the requirements of either the Minister for the Environment or any other government agency.

If the Environmental Protection Authority, other government agency or proponent is in dispute concerning compliance with the conditions contained in this statement, that dispute would be determined by the Minister for the Environment.

7. References

- Environmental Protection Authority (1983), Conservation Reserves for Western Australia as Recommended by the Environmental Protection Authority. The Darling System - System 6 Part I: General Principles and Recommendations. Department of Conservation and Environment Report 13, Perth, Western Australia.
- Environmental Protection Authority (1983), Conservation Reserves for Western Australia as Recommended by the Environmental Protection Authority. The Darling System - System 6 Part II: Recommendations for Specific Localities. Department of Conservation and Environment Report 13, Perth, Western Australia.
- Environmental Protection Authority (1993), Strategy for the protection of lakes and wetlands of the Swan Coastal Plain. Report of the Environmental Protection Authority. Bulletin 685. Environmental Protection Authority, Perth, Western Australia.
- Environmental Protection Authority (1993), A Guide to Wetland Management in the Perth and Near Perth Swan Coastal Plain Area - An update to EPA Bulletin 374. Report of the Environmental Protection Authority. Bulletin 686. Environmental Protection Authority, Perth, Western Australia.
- Environmental Protection Authority (1993), Roe Highway, Stages 3 to 5, Welshpool Road to South Street. Report and Recommendations of the Environmental Protection Authority. Bulletin 709. Environmental Protection Authority, Perth, Western Australia.
- Government of Western Australia (1988), Swan River Management Strategy. Prepared for the Government of Western Australia by the Management Strategy Task Force.
- Main Roads Western Australia (1993), Reid Highway, Beechboro Road to Great Northern Highway. Public Environmental Review.

Appendix 1

**Summary of submissions and
proponent's response to submissions**

Commissioner
Main Roads Department
Waterloo Crescent
EAST PERTH WA 6004

90-1470-188
56/92
Mr I Harvey

ATTENTION: MR M WALKER

**REID HIGHWAY STAGE 3 - BEECHBORO ROAD, BEECHBORO TO
GREAT NORTHERN HIGHWAY, MIDDLE SWAN (726)**

Further to previous discussions on answers to questions raised during the public submission period, please find attached a list of questions for your response.

A copy of these questions and your responses will be appendicised in the Environmental Protection Authority's assessment report. The Authority will, if necessary, include specific comments on issues with potential environmental impacts which are not adequately covered by your response.

Under the Environmental Protection Act 1986, the Authority's report is subject to a 14 day appeal period. During this period the public may appeal the Authority's Report and Recommendations. An incomplete answer to any of the attached questions could cause the public to appeal and this would delay the setting of Ministerial conditions. Accordingly, please ensure that you give a full and reasoned answer to each question.

The general issues of concern in the submissions include:

- Flora and fauna concerns;
- Archaeology and ethnography;
- Noise impacts and management;
- Pollution impacts and drainage Management; and
- Transport planning and management.

The Authority considers that a more detailed evaluation of the following potential environmental impact is required:

- The presence of otherwise of the Southern Brown Bandicoot on the highway alignment, including, whether the construction of the highway will result in the loss of habitat utilised by the bandicoots, and the significance of this loss to the population. A strategy for protection of bandicoot populations should be identified.

The Authority looks forward to an early response so that it can finalise its assessment.

Also included with this letter are copies of submissions received from the Department of Conservation and Land Management and the Swan River Trust for your information.

Should you have any queries about the attached questions, please contact Mr I Harvey on 222 7083.

R A D Sippe
DIRECTOR
EVALUATION DIVISION

8 December 1993

enc

(726) Reid Hwy Submissions 081293 IHA

Reid Highway Stage 3 - Beechboro Road, Beechboro to Great Northern Highway, Middle Swan (Assessment Number 726)

Consultative Environmental Review

A list of concerns and questions has been compiled from submissions received during the period of public comment. The Environmental Protection Authority would appreciate responses to these concerns / questions as soon as possible. This list and the responses from Main Roads will be reproduced in the Authority's report on the project to the Hon Minister for the Environment.

1. Flora and fauna concerns

- 1.1 The PER is unclear on the extent of bandicoot use in the wetland vegetation complexes which will be affected by construction.
 - (i) Will the construction of the highway result in the loss of habitat utilised by the bandicoots and what is the significance of this loss to the population?
 - (ii) If losses of habitat are to occur, what measures to manage the impact such as compensating habitat, and/or relocating some of the population (subject to advice from the Department of Conservation and Land Management) will be implemented by Main Roads.
- 1.2. The proposal will destroy sections of identified remnant bushland near the intersection with Arthur Street, at least in part, notwithstanding incidental damage.
 - (i) What possibilities were canvassed for natural or artificial rehabilitation and revegetation of the area, as opposed to construction of the highway, or options for changes to occur in the land use situation?
- 1.3. The fauna survey mentions the expected range of fauna that were to be surveyed and contrasts this with the actual range found.
 - (i) What possibility may exist for rehabilitating the area to where the range of fauna expected to be found could once again be found within the survey area?

2. Archaeology and ethnography

- 2.1 There is a complete failure within the PER to demonstrate the methodology used in the 1987 archaeological survey prepared by O'Connor & Quartermaine. No plan of the survey, or abstract of the survey report has been provided with the PER for public viewing.
- 2.2 There is no discussion within the Sections dealing with Archaeology (2.7 & 3.7) of the significance of the isolated find, nor of the significance or otherwise of the possible finds within the margins of the Swan River.
 - (i) What knowledge of sub-surface archaeological material exists at these potential sites, or along the length of the proposal?
 - (ii) If excavations are not planned or contemplated being carried out by the MRD, have other bodies such as the West Australian Museum, been advised and offered the opportunity to excavate?
- 2.3 What safeguards exist within MRD work practices to ensure that further sites will not be destroyed without notification or without due consideration of the site?

- 2.4 How will MRD staff be trained to recognise archeological sites in the course of construction?
- 2.5 On-going and continuous consultation with the Aboriginal community in regards to both mythological sites and archaeological sites must be carried out with Aboriginal people. Will there be a commitment from MRD to maintain contact with Aboriginal communities with regard to any chance of further site discoveries, in relation to their significance?

3. Noise impacts and management

- 3.1 Are earth bunds considered sufficient by the MRD in reducing noise penetration into residential areas?
 - (i) If they are not, and screening walls are considered, what designs are being considered or will be considered for reducing noise penetration?
- 3.2 Are screening walls considered for the length of the extension?
 - (i) With the possible encroachment of residential development along the extension, is this considered necessary or likely?
 - (ii) If screening walls are used the designs should not be unsightly as they are along the Mitchell Freeway at Leederville. Furthermore, screening walls should not restrict motorists leaving the roadway in the event of a breakdown or accident.
 - (iii) Fencing and baffles constructed of natural materials should be used. While increasing the cost of screening, the aesthetic aspect is very important.

4. Pollution impacts and drainage management

- 4.1 With respect to pollutant runoff, what permanent drainage for the highway will exist along its entirety?
- 4.2 While recognising that direct discharge to watercourses will be avoided, what provision exists for indirect drainage of pollutants into watercourses and the watertable.
- 4.3 If the original 4 lane proposal is expanded to 6 lanes what level of pollution of watercourses and the watertable can be expected from fuel spillages and leakages?
 - (i) How are these figures (if any) arrived at?
 - (ii) What action is contemplated (if any) by the MRD to the effects of pollution and indirect drainage upon the watercourses and watertable?
- 4.4 Drainage management should be retained in nutrient and hydrocarbon stripping basins as a permanent provision for pollution control. In particular, retention traps should be constructed near all wetlands and watercourses to prevent pollution by petrol, oil, etc caused by everyday runoff and by accident.

5. Transport planning and management

- 5.1 The Stephenson-Hepburn plan of 1955 is 38 years old and out of date. To use this plan as a primary justification for the development of a highway network around the Metropolitan area is to ignore the considerable body of work developing around the notion of removing motor vehicles from society not encouraging their usage.
- 5.2 The comparison cost of providing heavy rail as to providing highways can be seen by comparing the costs of the Northern Suburbs Rail link to the proposed Northern City bypass (Burswood Bypass). The railway cost \$240 million to lay track and construct stations for approximately 20 kilometres, while the bypass is estimated to cost \$235 million for only 7 kilometres, this figure not including any provision for social costs prior, during and after construction.

- (i) While the nations of the world move toward leaving the motor vehicle, Perth is being propelled into accepting them as a fait accompli.
 - (ii) Funds required to build the extension should be diverted immediately into the development of other forms of transport (public or otherwise)
- 5.3 Should the Reid Highway extension proceed, the Department of Planning and Urban Development should be directed to properly re-evaluate plans such as the Metropolitan Region Scheme, with the primary focus of transport provision being on public and alternative transport modes.
- 5.4 Given that the MRD stated the expected load for the Roe Highway was in excess of 10% being heavy vehicles, what basis is being used to calculate demand for the Reid Highway extension and what demand by Heavy transport is expected for the Reid Highway?
- 5.5 There is no comparison of current (being routes currently used) and expected usage of the extension. What benefit in lowered Heavy transport usage is expected for the Reid Highway?
- 5.6 Consistently ignored is the usage gaining access to and from the highways. Given this what increased Heavy transport usage is expected on and particularly around access to Reid Highway?
- 5.7 Project costs and traffic forecasts are important in determining the validity of a project and its overall and on-going worth to the community, both in the immediate vicinity and the Metropolitan Region.
- (i) What are the traffic forecasts? How are they done? Who performs, monitors and audits them?
 - (ii) Without forecasts, the only apparent justification for the construction of the extension is the MRD's desire to build more roads, increase the road network, and stick to old, outdated urban planning guidelines.
 - (iii) What is the overall cost of the project in dollar terms?
 - (iv) What on-going costs are expected or budgeted for?
 - (v) Has there been costing for alternatives (both routes and transport alternatives, including heavy and light rail)?
 - (vi) What were the cost arrived at for these alternatives?
- 5.8 There is a suggestion in the PER that because the land for the highway has already been purchased that this provides a further justification for the building of the highway.
- (i) This suggests the PER simply acknowledges a fait-accomplis.
 - (ii) No other alternatives to motor vehicle transport appear to have been considered, apart from the lipservice to bicycles (there has been a consistent failure to provide a safe manner for bicycles to use the ordinary road system to gain access to and from the cycleways provided), or canvassed, whether in terms of this project or the wider road network..
- 5.9 The provision of the extra lanes (taking the highway from 4 to 6 lanes in total) appears to be totally provisional on an increased traffic flow.
- (i) Where are the traffic forecasts to support the idea of the extra lanes?
 - (ii) What sort of time frame are we looking at in which these extra lanes will be built?
- 5.10 What are the additional effects of the construction of the extra lanes in relation to further disturbance to both environment and any Aboriginal sites that may be discovered and reported.
- (i) Are the construction of the extra lanes considered part of this PER, another PER, or not considered appropriate for a PER.

5.11 Pedestrians are also ignored in these projects. There should be shelter points at intervals to provide cover in winter, and trees along the route to provide shade in summer and break the visual monotony of the road.



MRO
MAIN ROADS
Western Australia

Metropolitan and Traffic
Operations
2 Adams Drive
Welshpool WA 6106

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Enquiries: Mr Walker on 311 8310

Our Ref: 90-1470-188

Your Ref: 56/92

Director Evaluation Division
Environmental Protection Authority
Westralia Square
141 St George's Terrace
PERTH WA 6000

ATTENTION: IAN HARVEY

ENVIRONMENTAL PROTECTION AUTHORITY	
18 JAN 1994	
File No 56/92	Initials IHA

**RESPONSES TO THE REID HIGHWAY (BEECHBORO ROAD TO
GREAT NORTHERN HIGHWAY) PUBLIC ENVIRONMENTAL REVIEW**

Enclosed please find the responses to the questions/comments which arose out of the public submissions to the Public Environmental Review. No new commitments have been made in these responses. I trust that this is satisfactory.

J G O Hackett
ACTING DIRECTOR METROPOLITAN AND TRAFFIC OPERATIONS

January 14 1994

Enc

72356

REID HIGHWAY - BEECHBORO ROAD TO GREAT NORTHERN HIGHWAY.

RESPONSES TO QUESTIONS RESULTING FROM PUBLIC SUBMISSIONS TO THE PUBLIC ENVIRONMENTAL REVIEW.

1. Flora and Fauna Concerns

- 1.1 The Southern Brown Bandicoot was not recorded during the survey conducted in 1989 as part of the biological assessment of the highway reserve. The zoological consultants considered that it was possibly present in vegetation type 3 - Flooded Gum/Swamp Paperbark Fringing Woodland. It may also be present in vegetation type 4 - Moonah Paperbark Low Woodland and associated heath vegetation (see Section 2.5 of the PER for descriptions and a map of the vegetation types).

In the road reserve these vegetation types are represented as follows:

Type 3 - along a natural drainage line some 500 metres west of Bennett Brook;
- along Bennett Brook
- along the Swan River

Type 4 - in the area associated with the Emu Swamp Main Drain just east of
Beechboro Road
- a small remnant half way between Beechboro and Altone Roads.

The spread of housing to the edge of the highway reserve on the south between Beechboro and Altone Roads in the period since the survey was undertaken, has resulted in far smaller remnants of vegetation today than appear on the vegetation map, and also a larger degree of disturbance in the remaining native vegetation.

The Fringing Woodland remnant west of Bennett Brook is intensively used by trailbikes, the Bennett Brook area itself is grazed, and the native vegetation along the Swan River is restricted to the very margins of the river, and is also grazed.

For these reasons, the area is likely to be of reduced significance to Bandicoots, if they are present at all. During the disturbance associated with construction of the highway there will be ample opportunity for any individuals present to move into adjacent rural properties,

and up- and downstream along the corridors afforded by Bennett Brook and the Swan River. If present, bandicoots, along with any other fauna are likely to benefit from the measures outlined in Sections 3.4 to 3.6 of the PER.

- 1.2 The route of the highway between Beechboro Road and Great Northern Highway is constrained by reasons set out in Section 1.2 of the PER. The impact of the roadworks will be limited to a strip of some 15 to 20 metres along the northern edge of the remnant woodland east of Arthur Street. This area has been identified as a "Special Purposes" area in the landscape recommendations and as such will be treated with site specific landscaping/rehabilitation. Marri and Sheoak with a mixed understorey will be used to ameliorate the impact of the highway construction.
- 1.3 The provisional fauna lists (species which may be present) for the survey area were based on historic records from the WA Museum and published work, as well as an assessment of the condition and size of remnant habitat. The zoological consultants state that with intensive sampling over a period of several years all of the species listed as provisional would probably be recorded. It must be remembered that particularly as far as the birds are concerned, more than half of the provisional species are migrants or nomadic species with only a tenuous connection to the habitats for which they are recorded. Of the eleven mammals listed as possibly present, eight are bats. Population levels in the area would already be adversely affected by extensive tree clearing. The reptiles and amphibians listed as provisionally present would be at very low population levels if present at all. Since the survey was conducted many of the remnants in the Beechboro area have been reduced in size due to urban development. The effect of this reduction on the composition of the provisional list is not known.

Construction of the highway should not reduce the list of species actually found during the survey, however, along with other developments in the area it would tend to lessen the probability of all the species listed as possibly present being found in the area.

2. Archaeology and Ethnography

- 2.1 The salient points in the results of the Archaeological survey are presented in the PER. The PER document is not considered to be the appropriate place for recording detailed methodology.

2.2 The isolated archaeological finds were not seen to be significant by the archaeological consultant or by the Aboriginal Cultural Materials Committee. The ACMC considered the Consultant's report in detail when an application to enter and work in all areas of the highway reserve was made under Section 18 of the Aboriginal Heritage Act.

The Department of Aboriginal Sites (WA Museum) has the Consultant's report and is aware of the plans for the highway.

2.3 & In areas where there is a high possibility of finding archaeological material, such as along the banks of the Swan River, appropriately qualified people will be present during any excavation work. This has already been the case where soil testing was undertaken at the Swan River bridge site, and is in accordance with the conditions under which the Section 18 clearance for the project was granted.

2.5 Main Roads is currently consulting with local Aboriginal groups on all matters of Aboriginal Heritage associated with the project, and will continue to do so (see also Section 3.3 and 3.4 of the PER).

3. Noise Impacts and Management

See Section 3.9.3 of the PER.

If noise attenuation measures other than, or in addition to, earth bunds are considered necessary for any area along the highway, they will be designed with local community input to be in keeping with the surroundings.

4. Pollution Impacts and Drainage Management

4.1 Intersections and bridges will be kerbed, with the rest of the length of the highway serviced by simple swale drains. These allow stormwater to infiltrate the permeable soils which also act as a filter for particulates in the road runoff. Dissolved pollutants in normal road runoff have been found to be negligible in sampling conducted along Leach Highway. Major spillages due to accidents are easily contained in the swale drains, and contaminated soil can be easily and swiftly removed. Data on spillages of dangerous goods during transport for the metropolitan area from the Dangerous Goods Division of the Department of

Minerals and Energy indicate that the risk of major contamination is low (1991 - nine incidents in transit, no spillage in two and minor in others; 1992 - six incidents in transit, no spillage in three and minor in others).

- 4.2 Compensating basins will be designed with two stages. Nutrient absorbing vegetation and red mud (Alcoa) will be used along with retention time to help settle particulates and strip the stormwater of most pollutants before it finds its way into any of the watercourses or the watertable.
- 4.3 Drainage for the project is being designed and will be constructed to service the ultimate (ie 6 lane) development. See also 4.2 above.
- 4.4 See Sections 3.2 to 3.4 of the PER and paragraphs 4.1 to 4.3 above.

5. Transport Planning and Management

- 5.1 The Stephenson-Hepburn plan was not used as a justification for the project (See Section 1.1 of the PER).
- 5.2 & Neither of the projects mentioned in this paragraph (one rail and one road) can be
- 5.3 compared with the Reid Highway project. Transport planning for the metropolitan area as a whole is currently being addressed by a specially convened Metropolitan Transport Strategy Group. Resources for this group have been drawn from the Department of Transport, the Department of Planning and Urban Development, Main Roads and Transperth, and are directed towards producing a Metropolitan Transport Strategy which includes all alternative methods.
- 5.4 Heavy vehicle usage for Reid Highway after completion are predicted to be similar to those for Roe Highway, ie. around 10% of all traffic. These figures are obtained from an analysis of traffic at existing intersections at various locations adjacent to the project area.
- 5.5 It is expected that much of the through traffic (including heavy vehicles) currently using routes which incorporate Morley Drive, Benara and Marshall Roads, and Lord Street, and some of the Guildford through traffic will use Reid Highway in preference to current routes because of the higher standard of the carriageways, a reduction in traffic signals, and the direct access provided to Roe Highway.

- 5.6 Access to the highway and associated changes to local traffic circulation has not been ignored in the planning process. The views of residents in the areas affected by the highway project were canvassed during the public information days (see Sections 3.9.1 and 4 of the PER). When completed, no local roads will be connected to the highway, thus there will be no adverse impacts on residential areas.
- 5.7 For justification of the project see Section 1.1 of the PER.

Traffic forecasts are carried out by Main Roads during the planning process for future projects. A model which incorporates demographic predictions for the area serviced by the projects is used. The model is continually updated and improved, and its performance has been checked over the years by matching predicted traffic figures with actual counts as they become available. During the design of the project, the engineering consultants check the traffic forecasts, and may make use of independently obtained data.

The estimated cost for the project, including land purchase, design, construction (including the bridges at Bennett Brook and the Swan River), landscaping and rehabilitation is \$48.9M.

Alternative transport methods or routes for the highway were not costed in the planning for this section of Reid Highway.

- 5.8 The prior purchase of land set aside in the MRS for the highway is not considered to be justification for the building of the highway, but is certainly good planning practice. Because of rapid urbanisation in the North-Eastern corridor, not providing this link in the highway system is no longer considered an option. As mentioned in the PER (Section 1.2), the route for the highway is constrained by earlier planning decisions in the area.

Planning for dual-use paths, including linkages into the local suburban network was an integral part of the planning for the project as a whole.

- 5.9 The addition of an extra lane in each direction will be dependent on the level of usage of the highway. The timing will depend to some extent on the pace of urbanisation in the North-East corridor, and although provision for the expansion is made during the planning and design, no date has been set at this stage.

5.10 During the first stage of construction, the road formation will be constructed to accommodate the future expansion. Major drainage services and most rehabilitation/landscaping will be provided for the final project at this stage. Thus there will be minimal disturbance when the additional lanes are provided in the future.

The PER was for the project as ultimately constructed with three lanes in each direction.

5.11 Pedestrians are prohibited on controlled access highways. The landscaping will incorporate trees where appropriate.

Appendix 2

Proponent's commitments

LIST OF COMMITMENTS

Main Roads undertakes responsibility for the implementation of the commitments listed below. This holds whether the work is done directly by Main Roads personnel, or by others contracted for specific phases or elements of the project. All commitments will be expedited promptly at the appropriate stage during the design or construction of the project, and will be carried out to the satisfaction of the Project Manager through the Design or Construction Co-ordinator.

NOTE: These commitments are also highlighted in the main text.

SECTION 3.

3.2 Watercourses and Surface Hydrology (Pages 13 and 14)

1. *When completed, the highway will not impede the flow of any of the watercourses. The bridges at Bennett Brook and the Swan River will be designed to accommodate a 100 year flood event and comply with the backwater constraints of the Water Authority of Western Australia.*
2. *Application for the necessary clearances from the Swan River Trust for construction of the bridges over the Swan River will be made through the local authority (Shire of Swan) during the final design period*
3. *Should the flow of any of the watercourses need to be dammed temporarily during construction, Main Roads will ensure that ponding is not long-term or severe, and will pump ponded water downstream if necessary to maintain the hydrological conditions.*
4. *A connection to the diverted Emu Swamp Main drain will be provided so that the current water regime in the swamp on the Public Open Space near Beechboro Road is maintained.*
5. *During construction, pollution and siltation of the watercourses will be avoided through well planned operations, and the use of sandbags or other temporary traps if necessary.*
6. *Where compensating basins are required such as in the Lord Street area and adjacent to the bridges at Swan River and Bennett Brook, these will be constructed so that they function as spillage and pollution control mechanisms for the watercourses.*

7. *In order to guard against pollution from road runoff or accidental spillage there will be no direct discharge into the watercourses or onto the floodplains below the bridges.*

SECTION 3.3 Swan River Crossing - System Six and Aboriginal Heritage Aspects
(Pages 15)

8. *When post construction rehabilitation and landscaping are completed, the new bridges and highway will not detract in any way from the existing amenities or stand in the way of active or passive recreation activities along the Swan River. The opportunity will be taken to enhance the vegetation along the river banks with species native to the riverine environment, and similar vegetation will be planted to soften the visual impact of the bridge approaches*
9. *Access to the existing picnic area will be maintained off Middle Swan Road, and a connection to the dual-use path is proposed to allow cyclist access under the Middle Swan Road bridge.*
10. *The final design plans for the Swan River bridges will be shown to the Aboriginal community.*

SECTION 3.4 Bennett Brook - System Six and Aboriginal Heritage Aspects (Pages 15 and 16)

11. *The opportunity will be taken at the Bennett Brook bridge site to enhance what native vegetation exists*
12. *Landscaping of the bridge approach embankments will be sympathetic to the floodplain environment, and provide potential for additional small vertebrate habitat.*
13. *A bridge design concept for the crossing at Bennett Brook will be discussed with the Aboriginal community before the design is finalised.*
14. *Further consultation will provide the opportunity for the Aboriginal community to have an input into the final landscaping plans for the area, and to explore the possibility of including an educational display near the dual use path.*

SECTION 3.5 Flora and Vegetation (Pages 16 to 18)

15. *Wherever space permits, good quality remnants of native vegetation will be conserved.*
16. *Post construction revegetation of the embankments and noise bunds will augment and link these remnants of native vegetation.*
17. *Where possible landscape treatments will utilise indigenous plant species as recommended in the biological survey (See Appendix D).*

SECTION 3.6 Fauna (Page 18 and 19)

18. *The impact of habitat loss along the highway reserve will be reduced by the following measures:*
 - *Indigenous vegetation will be retained wherever possible; and*
 - *Habitat diversity will be expressly incorporated in the landscaping plans.*
19. *The remnant woodland east of Arthur Street which was identified as having the most significance from a fauna conservation perspective will only be disturbed along the northern edge in a band some 20m wide.*
20. *The riverine habitat at the crossing of the Swan River will suffer minimal disturbance, and this will only be for the duration of construction.*

SECTION 3.7 Archaeology (Page 19)

21. *Project personnel will be made aware of the provisions of the Aboriginal Heritage Act which prohibit unauthorised interference with Aboriginal sites. Any concentrations of artefacts noticed during construction will be notified to the Aboriginal Sites Department of the WA Museum.*

SECTION 3.8 Ethnography and Cultural Heritage (Page 19)

22. *Final plans for earthworks in the Arthur Street area, as well as for the Bennett Brook and Swan River crossings will be shown to the local Aboriginal community during the next stage of consultation.*

SECTION 3.9 Social Impacts (Pages 19 to 22)

23. *Service roads will be provided to connect existing roads to access points as follows:*
- *The west end of Middle Swan Road to be connected northwards to Victoria Road;*
 - *Harris Street to be connected to West Swan Road by a service road on the south side of the highway; and,*
 - *Middle Swan Road to be connected to the Great Northern Highway north of the Roe/Reid intersection.*
24. *The project will provide highway crossing points for pedestrians and cyclists at the intersections as well as a dual use path under the highway along Bennett Brook*
25. *A dual use path will also be provided on the south of the highway between Beechboro Road and West Swan Road to connect into the proposed service road. East of Harris Road a dual use path will continue over the Swan River to the Great Northern Highway.*
26. *Noise bunds will be provided both north and south of the highway for the whole length of the project between Beechboro and West Swan Roads.*
27. *Additional noise attenuation measures will be considered for the current and possible future residential areas should the predictive study carried out during the design phase be above 63 dB(A)*
28. *Actions to help reduce the impact of construction for local residents will include the following:*
- *Careful timing of road closures to ensure minimum disruption to commuters;*

- *Ensuring that the following commitments are included in the instructions to the contractor;*
 - *Reasonable working hours will be adhered to in areas where disturbance to residents is a factor;*
 - *Where vibrating rollers are used, the vibration levels will be monitored, and work practices modified to reduce the nuisance and possibility of damage;*
 - *Dust suppression measures such as the use of water carts will be employed throughout the construction process;*
 - *Site offices and equipment compounds will be sited away from residences wherever possible;*
 - *The importance of good hygiene practices on site will be communicated to the workforce, and compliance with acceptable standards will be monitored by the site manager.*

ADDITIONAL ENVIRONMENTAL COMMITMENTS MADE IN RESPONSE TO SUBMISSIONS.

1. Noise impacts and management

If noise attenuation measures other than, or in addition to earth bunds are considered necessary for any area along the highway, they will be designed with local community input to be in keeping with the surroundings.

2. Pollution impacts and drainage management

Intersections and bridges will be kerbed, with the rest of the length of the highway serviced by simple swale drains.

Compensating basins will be designed with two stages. Nutrient absorbing vegetation and red mud will be used along with retention time to help settle particulates and strip the stormwater of most pollutants before it finds its way into any of the water courses or the watertable.

Drainage for the project is being designed and will be constructed to service the ultimate development.