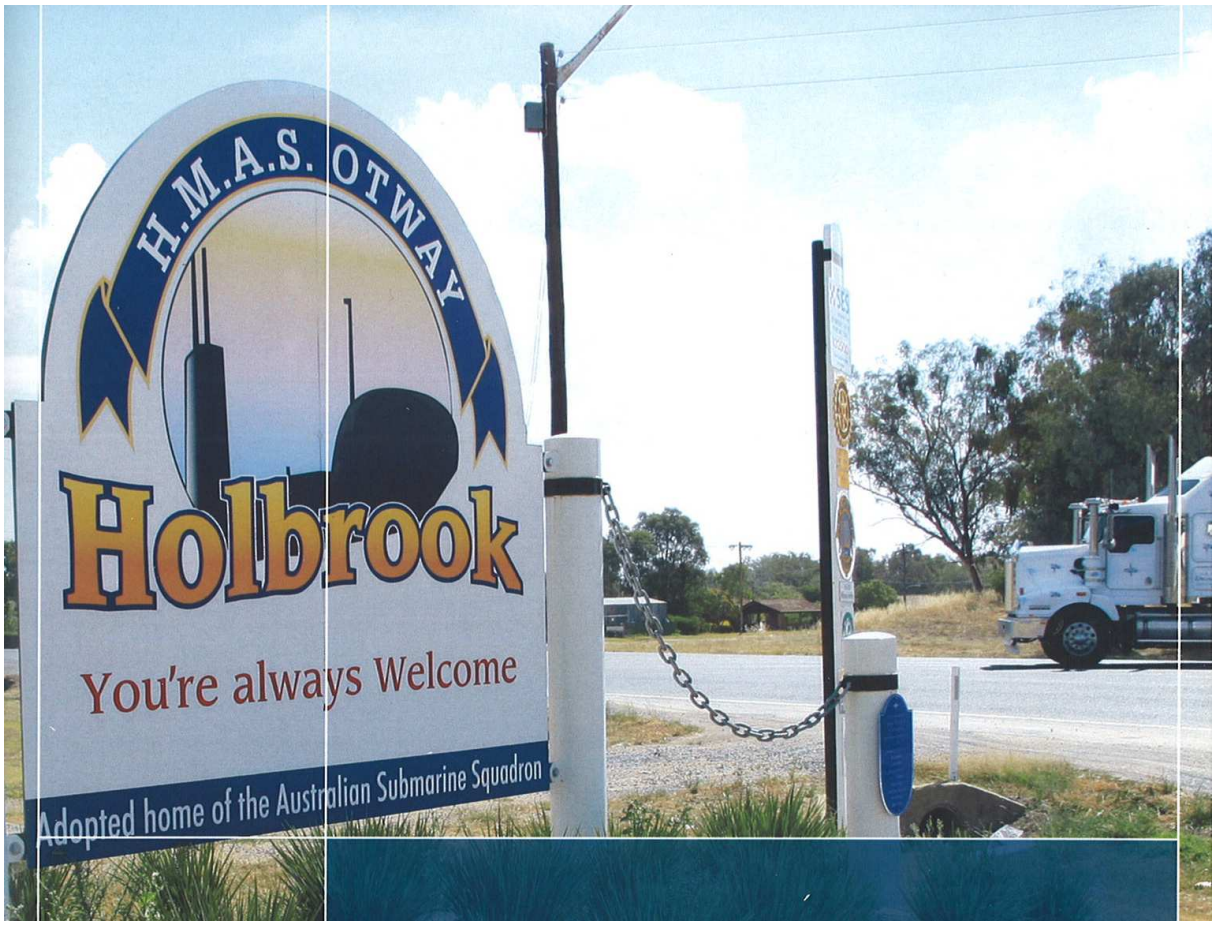
NSW GOVERNMENT | Planning

MAJOR PROJECT ASSESSMENT
Hume Highway Duplication Project
Holbrook Bypass



Director-General's
Environmental Assessment Report
Section 75I of the
Environmental Planning and Assessment Act 1979

March 2010

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EXECUTIVE SUMMARY

The Hume Highway is and will continue to be a key interstate road passenger and freight corridor within the national transport network. The importance of this corridor is expected to continue over the next 20 years, in conjunction with the expected growth in alternative modes of transport, with approximately 5,000 to 6,000 heavy vehicles forecasted to use the Hume Highway per day by 2025.

A few sections of the Hume Highway within NSW remain as single carriageway, with the Holbrook bypass being the last section to be considered and assessed. These sections pose a safety risk to all road users and impact on the overall road performance efficiencies of the highway. With the continued importance of the Hume Highway, the predicted increase in passenger and heavy vehicle volumes will exacerbate current safety and performance conditions. This will have flow on effects on the ability of this road corridor to cater for expected demands associated with its role within the national transport network.

To resolve these issues, the NSW State Government has committed under the Commonwealth Government's *AusLink National Land Transport Plan* to upgrade the remaining 89 kilometres of single carriageway located between the Sturt Highway junction and Albury Wodonga by 2012. As part of this program of works, the NSW Roads and Traffic Authority propose to bypass the town of Holbrook, with a dual carriage highway to the west of the town. It is noted that this proposal has been declared as a critical infrastructure project under the *Environmental Planning and Assessment Act 1979*.

The key issues associated with the project relate to the impacts on flora and fauna, indigenous heritage, noise and vibration and social and economic. These issues were reflected in the eleven submissions the Department received during the exhibition period for the Environmental Assessment. Submissions were received from the Department of Environment, Climate Change and Water, NSW Office of Water, Land and Property Management Authority, Industry & Investment NSW, Greater Hume Shire Council and six members of the public.

Following a thorough assessment of the Environmental Assessment and Submissions Report, the Department considers that the proposed alignment has been designed to minimise the impacts on the surrounding environment and local community, and that the extent to which these impacts can be minimised or avoided is limited by the proposed approach to the project, being the governing road design and safety specifications that must be achieved. The Department is satisfied that an appropriate balance of these conflicting factors has been achieved and that the predicted impacts have been minimised wherever possible through the proposed alignment. The Department is also satisfied that the mitigation, management and monitoring measures, as recommended in the conditions of approval and the Statement of Commitments, will ensure that these impacts are minimised further during detailed design, construction and operational phases of the projects.

The Department acknowledges that there will be some residual impacts on the surrounding environment and local community following the implementation of the recommended conditions of approval, particularly with respect to flora and fauna, economic and noise impacts. But it has been concluded that these residual impacts are acceptable given the benefit that the total project would provide to the general public, through significant improvements to road safety, and the benefits delivered to the region and the state through improved road network capacity and performance for all motorists and the economic benefits delivered through improved road freight efficiencies.

The Department considers that the project would assist in achieving the priorities of the *NSW State Plan*, in particular, the transport priorities, as the project would improve the efficiency of the road network, maintain the road infrastructure and improve road safety.

Consequently, the Department considers the proposal is in the public interest and recommends that the Holbrook Bypass project be approved subject to the recommended conditions of approval.

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1. BACKGROUND

1.1 The Hume Highway Upgrade Program

The NSW Roads and Traffic Authority (the Proponent) proposes to upgrade the Hume Highway in the vicinity of the town of Holbrook. The Hume Highway is the main road transport link between Sydney and Melbourne and forms part of the National Highway network. The highway is the subject of a commitment between the State and Commonwealth Governments to provide a continuous four lane carriageway from Sydney to the Victorian border by 2012. This commitment is otherwise known as the Hume Highway upgrade program (refer to Figure 1).

Key objectives of the program are to:

- Improve freight efficiency;
- improve the level of service;
- improve the level of safety for local, regional and interstate traffic;
- reduce congestion and travel times between Sydney and Melbourne;
- improve regional access;
- meet the key objectives for the AusLink National Network; and
- be consistent with viable, long-term economic and social outcomes, and the obligation to current and future generations to sustain the environment.

Single carriageway sections of the Highway have been the subject of significant construction activities over the last two years with 69 kilometres of dual carriageway in NSW completed by the end of 2009. Remaining single carriageway sections of the Highway are limited to the towns of Tarcutta, Holbrook and Woomargama. Planning approval for the Woomargama and Tarcutta bypasses was granted by the Minister in January 2010. The Holbrook bypass is the only section of the Hume Highway upgrade program that has not yet been approved.

The previous Federal Government committed to the completion of the full duplication of the Hume Highway by 2012. The Hume Highway duplication and its component sub-projects, including the Holbrook bypass, are included as major projects to be undertaken in the *State Infrastructure Strategy – New South Wales 2008-09 to 2017-18.*

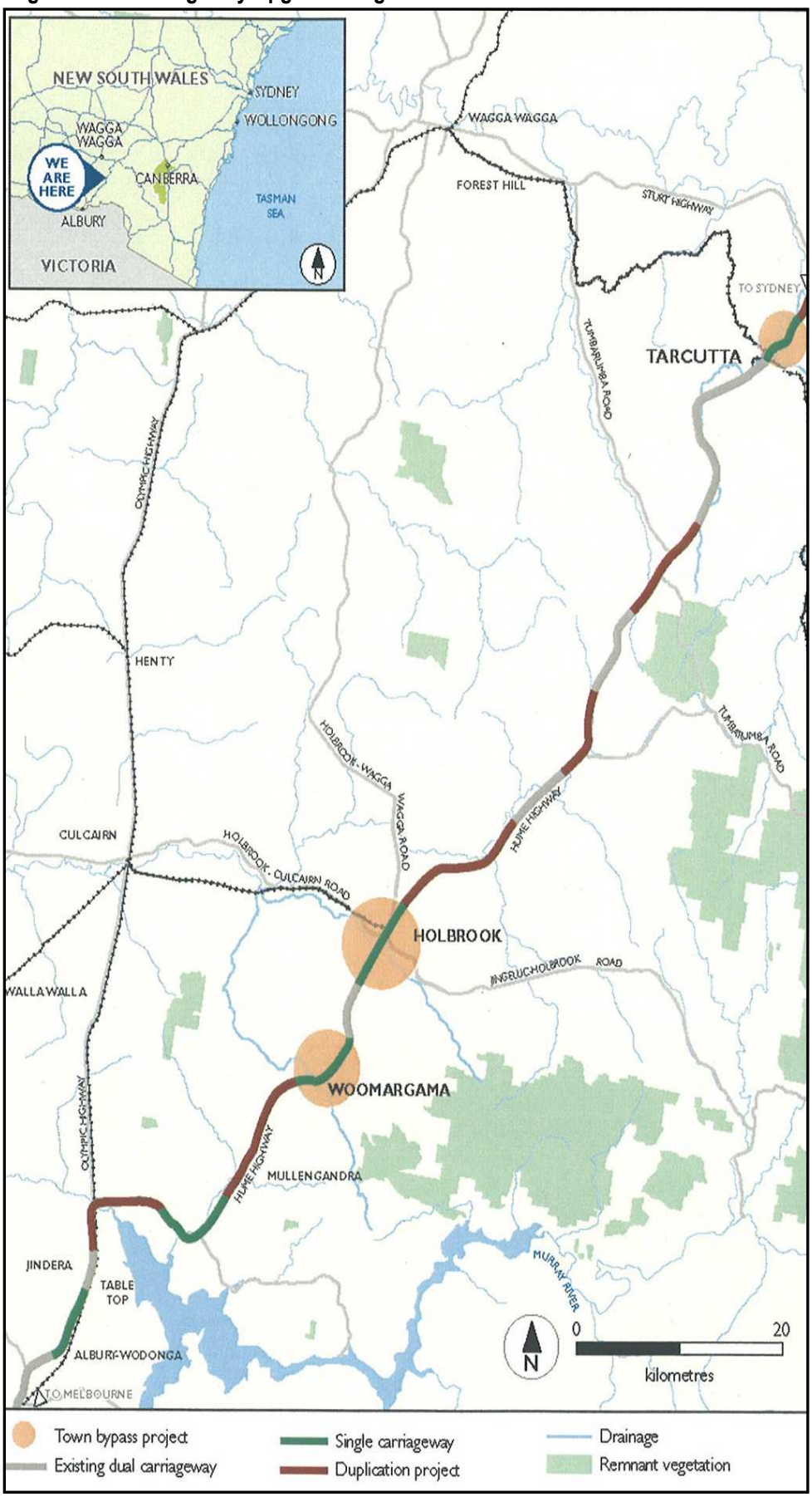
1.2 Location and Surrounding Environment

Holbrook is a small rural township located in the south-west of the state with a population of 1,336 (ABS, 2006). Located 60 kilometres north east of Albury, 114 kilometres south west of Gundagai and 90 kilometres south of Wagga Wagga, the town is positioned approximately halfway between Sydney and Melbourne.

Holbrook has a dual role as a service town for the surrounding agricultural district and as a rest stop for traffic travelling on the Hume Highway. A variety of eateries and shops, and tourist attractions such as the HMAS Otway submarine reinforce this role. Land use in the town consists of a mix of residential and commercial uses. The main residential area extends both east and west of the existing Highway. Rural residential properties and rural holdings are located around the town, whilst a racecourse, golf course and public swimming pool are located to the east of the town.

The topography in the immediate area is relatively flat but becomes more undulating to hilly to the east and the west of the town. Native vegetation surrounding Holbrook has been extensively cleared or modified by agricultural land uses, including grazing and cropping. Remnant patches of native woodland generally occur in roadside reserves, the former Town Common and Travelling Stock Reserves. These remnant vegetation communities are important as they provide fauna corridors and transitions between communities. Ten Mile Creek crosses the existing highway to the south of Holbrook and flows in a north westerly direction across the project area.

Figure 1 - Hume Highway Upgrade Program



2. PROPOSED DEVELOPMENT

2.1 Project Description

The project involves the construction and operation of approximately nine and a half kilometres of four-lane dual carriageway to the west of Holbrook, as depicted in Figure 2. The new alignment will commence half a kilometre north of Holbrook (connecting to the Yarra Yarra to Holbrook duplication project) to approximately 2 kilometres to the south of Holbrook. The southern section would tie-in with the existing Highway to the south of Ten Mile Creek. Table 1 provides an overview of the key features associated with the project.

The capital investment value of the project is $250 million with an estimated construction workforce of 250 personnel. The project is estimated to take approximately two years to complete. Key objectives for the Holbrook bypass are to:

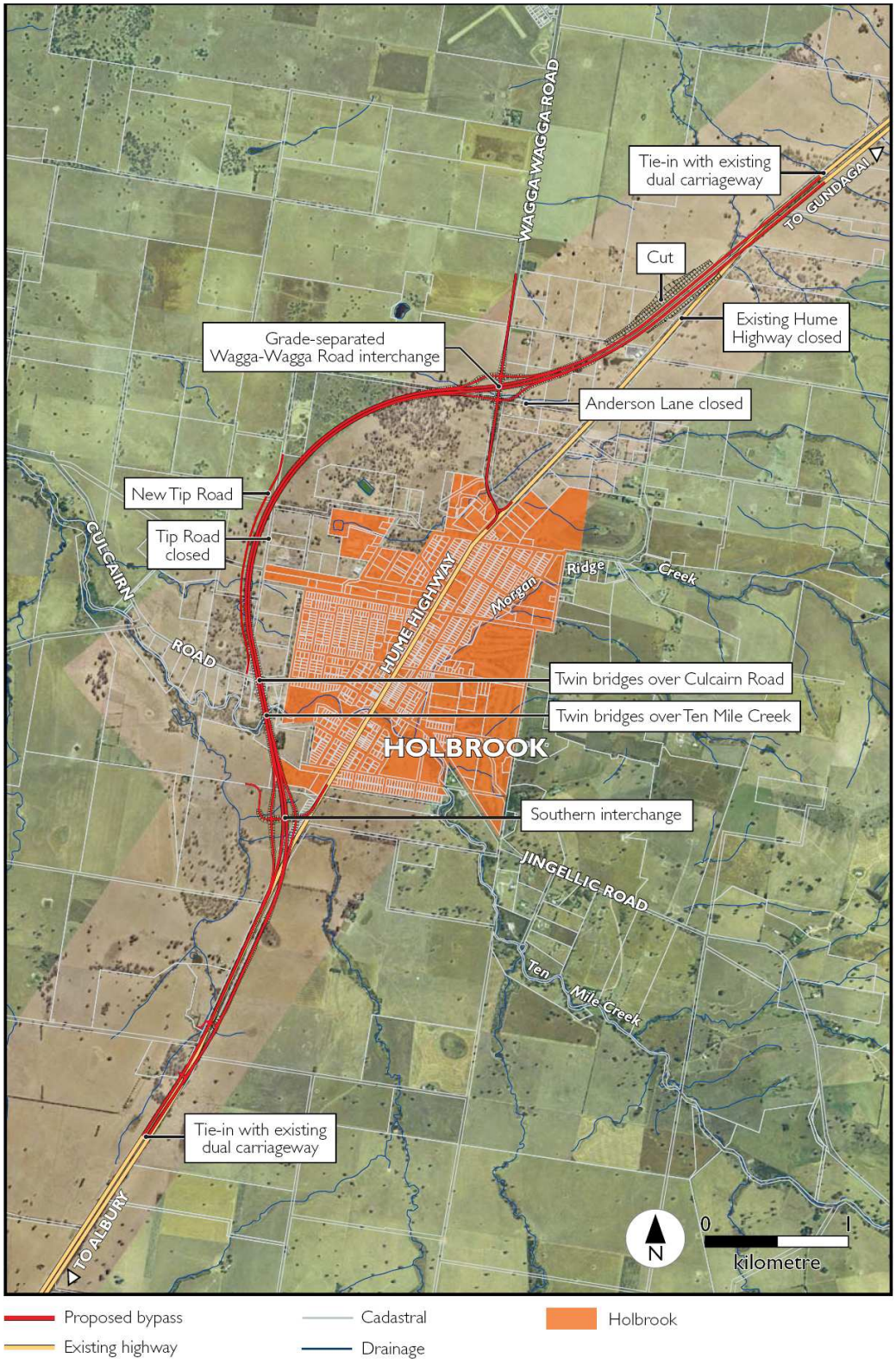
- improve safety, traffic and travel efficiency;
- meet community needs for the long term;
- minimise adverse impacts on the environmental values of the area; and
- provide a cost effective and affordable outcome.

Table 1 - Key Components of the Project

Component	Description
Road footprint	The alignment will be a dual carriageway with varying corridor widths between 90m and 100m and up to 300m around interchanges. Each lane will be 3.5m wide with a 2.5m to 3m shoulder. Medians will be depressed and landscaped with a width of 12m. Median width may be reduced in areas of high cost and/or environmental constraints. The bypass has been designed to minimise grade changes and for B-double movements with a design speed of 110km/h.
Earthworks	To construct the bypass a number of cut and fill activities will be required. Preliminary estimates have identified that 800,000m^3 of spoil will be generated with 1,500,000m^3 required for the project. Any shortfall will be sourced from quarries in the region. A number of temporary haul roads, creek crossings and access roads will also be constructed to facilitate the project.
Northern Interchange	The northern interchange would be grade-separated with Wagga Wagga Road passing over the proposed bypass on its existing alignment. Northbound and southbound on-load and off-load ramps would connect the proposed bypass to Wagga Wagga Road and the existing Hume Highway.
Southern Interchange	The southern interchange would be grade-separated. Northbound and southbound on-load and off-load ramps would connect the proposed bypass to the existing highway and provide access to two properties west of the project.
Local and Regional Road Connections	The existing Hume Highway north of the Wagga Wagga Road intersection would be closed, with a cul-de-sac provided. The intersection of Anderson's Lane and Wagga Wagga Road would also be closed. The intersection of Wagga Wagga Road and the existing Hume Highway would be modified such that Wagga Wagga Road becomes the priority road.
Wagga Wagga Road and Southern Interchange Overpasses	The bridges would likely be a multi-span structure of 90m length, comprising two 3.5m wide traffic lanes with standard shoulders. Safety screens about three metres high are proposed along each side of the bridges.
Culcairn Road Twin Bridge Overpass	Twin bridges are proposed over Culcairn Road. Each bridge would likely be a multi-span structure of 90m long. Each bridge would comprise 3.5m wide traffic lanes with standard shoulders. Safety screens about three metres high are proposed along each side of the bridges.
Culvert Crossings	New culverts will be constructed at existing watercourse crossings and depressions to minimise impact on existing flow paths. A rock or concrete channel lining (or other suitable measures) will be used to minimise erosion at locations where velocities are predicted to be high. Channels and catch drains may also be constructed to direct flows from a culvert to an existing natural watercourse.
Property Acquisition	Approximately 75 hectares will be required to accommodate the project. This will require land and property infrastructure adjustments to 15 private properties as well as land owned or administered by Council and other government agencies.
Property Access and Infrastructure	The project would result in both temporary and permanent changes to property access arrangements. Tip Road would be realigned along the western edge of the proposed bypass to provide access via Culcairn Road to properties that are currently accessed off Tip Road, including the Holbrook Tip. The relocation of utilities and services as part of the project will be undertaken in consultation with the relevant providers.

Ancillary Facilities and Temporary Works	Construction site locations have not yet been identified, but will be determined and assessed against the following environmental criteria: • more than 40 metres from waterways; • areas of low ecological and heritage conservation value; • no significant clearing of native vegetation beyond that already required for the project; • minimises impact on amenity of the closest sensitive receivers (unless a negotiated agreement is in place); and • on relatively level ground.

Figure 2 – Proposed Upgrade Alignment (RTA, 2009)



2.2 Project Need and Context

Traffic volumes along the Hume Highway in the Holbrook area have increased in the order of three to four percent annually over the last ten years. Growth has occurred in a linear pattern and the Proponent has identified that it is attributable to delivery of dual carriageway along the corridor and the corresponding improvement in travelling conditions and growth in heavy vehicle travel. This trend is likely to continue with the delivery of an additional 69 kilometres of dual carriageway in 2009.

In 2006, 4,900 vehicles used the highway in the vicinity of the project with 40 per cent being heavy vehicles. Within the Holbrook town area, traffic volumes are around 10,500 vehicles per day. The *Hume Highway Strategic Planning Study Final Report* (Connell Wagner 2004) predicted that traffic volumes on the Highway would continue to increase, where by 2021, a maximum of 9,000 vehicles per day would travel on the Hume Highway just south of the Sturt Highway.

Between 2002 and 2006, 35 crashes were reported in the single carriageway section of the Highway around Holbrook. Crash rate comparison reveals that the Highway around Holbrook experienced more crashes than the divided carriageway section of the Hume Highway, but fewer crashes than a typical two-lane rural main road. Of the 35 reported crashes, one was fatal, whilst the remaining involved injuries (15) and tow-away crashes (19). The primary crash types were 'off-road' on straight roads (45.7%) and 'rear-end' collisions (17.1%). The design of the project is likely to result in a lower rate of accidents by meeting design codes (i.e. traffic lane widths, shoulder widths, grades) and through the provision of consistent driving conditions (speed limit and dual carriageway).

The project is consistent with the *NSW State Plan* Priorities of Safer Roads and Maintain and Invest in Infrastructure. Further, the project has been identified in the *NSW State Infrastructure Strategy* (2008-2018).

Additionally, modelled freight demand for both road and rail along the Sydney-Melbourne corridor as part of the Hume Highway Strategic Planning study shows that, irrespective of the continued rail investment and associated travel volume improvements, the rate of road traffic increase along the Highway would only slow down marginally and an upgrade to the Highway would therefore still be required.

Should the project not proceed, Holbrook will remain as the only section of the entire Highway not currently duplicated or approved for duplication. This would result in Holbrook forming a choke point in the efficient movement of goods between Sydney and Melbourne as traffic will be forced to a single carriageway and halving of speeds (from 100 kilometres/hour to 50 kilometres/hour in town). Consequently, the change in driving conditions coupled with the predicted growth in traffic volumes will increase the risk of accidents on this section of the Highway. Further, predicted volumes would contribute to a long term decrease in the level of service for the Highway at Holbrook, ultimately resulting in an unsatisfactory level of service during peak traffic periods such as school holidays and long weekends in 2022.

Additionally, residents in Holbrook would continue to be exposed to amenity and connectivity impacts associated with highway traffic travelling through the town.

3. STATUTORY CONTEXT

3.1 Major Project

On 20 December 2007, the then Minister for Planning declared the Holbrook bypass (as well as the Woomargama and Tarcutta bypasses) to be projects to which Part 3A of the *Environmental Planning and Assessment Act 1979* applies.

3.2 Critical Infrastructure Project

On 4 March 2009, the then Minister for Planning declared the Holbrook bypass (as well as the Woomargama and Tarcutta bypasses) to be critical infrastructure projects under Part 3A of the *Environmental Planning and Assessment Act 1979*.

3.3 Relevant Environmental Planning Instruments

There are no State Environmental Planning Policies that expressly apply to the carrying out of the project.

3.4 Minister's Approval Power

In accordance with section 75H(3) of the *Environmental Planning and Assessment Act 1979*, the Environmental Assessment (EA) was placed on public exhibition from 11 November 2009 until 14 December 2009. Advertisements notifying of the exhibition of the EA were placed in the Sydney Morning Herald, Daily Telegraph, Henty Eastern Riverina Chronicle and Albury Wodonga Border Mail.

The EA was made publicly available on the Department's website, the Department's head office, Greater Hume Shire Council, Holbrook Library and the Nature Conservation Council.

The Department considers that it is has met all applicable legal obligations so that the Minister can make a determination in relation to the project. It is also noted that the EA submitted in support of the subject application addressed the Director General's requirements issued for the project application.

4. CONSULTATION AND ISSUES RAISED

4.1 Submissions

The Department received eleven submissions during the exhibition of the EA. Six submissions were received from the general public and the remaining five were from Government agencies.

The key issues raised in the submissions received from members of the public include:

- location and need for interchanges/ overpasses;
- traffic congestion and dangerous conditions created by the proposed service centre;
- loss of land;
- restrictions to develop business due to uncertainties in final boundaries and the provision of noise walls'
- noise impacts, including loss of business due increases in noise;
- impacts on water sources;
- clearing of vegetation and loss of habitat;
- loss of trade and tourism due to road design;
- accessibility to town; and
- visual amenity and landscape impacts on privately owned properties.

Issues raised in submissions from Government agencies are summarised below.

Table 2 - Overview of Government Agency Submissions

Agency	Concerns
Department of Environment, Climate Change and Water (DECCW)	• Area of native vegetation clearing. • Effectiveness and long term sustainability of fauna crossing points. • Monitoring and surveying of flora and fauna. • Aboriginal heritage management. • Construction noise and hours of construction. • Amenity impacts resulting from ancillary activities. • Operational noise. • Quarrying.
Land and Property Management Authority (LPMA)	• Land acquisition. • Loss of habitat and offsets. • Access to reserves. • Sediment and dust control. • Weed management.
NSW Office of Water (NOW)	• Water supply and licensing. • Groundwater impacts. • Watercourse crossing design.
Industry and Investment NSW (I&I NSW)	• Management of works at individual waterway sites. • Riparian vegetation. • River snagging. • Fish passage. • Water quality. • Monitoring.
Greater Hume City Council	• Flora and fauna, including opportunities for habitat improvement. • Noise and vibration. • Social and economic. • Transport and traffic. • Visual amenity and landscape.

4.2 Submissions Report

On review of the issues identified in submissions, the Department required the Proponent to prepare a Submissions Report to address each of the issues raised in those submissions. As part of this process, the Proponent reviewed each submission and made specific comment in relation to each issue identified. Some changes to the Statement of Commitments were also made. The revised Statement of Commitments and the Response to Submissions are attached to this report as Appendix C and Appendix D respectively.

The DECCW, NOW, I&I NSW and LPMA were provided copies of the Submissions Report for review. No further comments/ issues were raised subsequent to this review process.

5. ASSESSMENT OF ENVIRONMENTAL IMPACTS

After consideration of the EA, submissions, Submissions Report and the Government agency response to the Submissions Report, the Department has identified the following key environmental issues associated with the proposal:

- flora and fauna;
- Aboriginal heritage;
- noise and vibration; and
- social and economic.

5.1 Flora and Fauna

Issues

The project is located within the NSW south-western slopes bioregion, where native vegetation is dominated by eucalypt woodlands, Callitris forests and woodlands and eucalypt tall open forests. Due to extensive clearing of native vegetation for grazing and dryland agriculture, the existing landscape is highly modified, and vegetation within the locality of the project is highly fragmented, with isolated patches of vegetation surrounded by large areas of cleared land. Whilst some vegetation patches are sufficient in size to maintain viable populations, connectivity amongst these patches is limited given the extent of clearing and distance between patches. Consequently, vegetation within roadside reserves and riparian corridors, although of poor to moderate condition, are important in their roles in providing connectivity between the remnant patches of vegetation and are likely to be used by a range of species, including woodland birds, mammals and reptiles, as part of the wider corridor network.

Four vegetation community types were recorded in the assessment area, Blakely's Red Gum – Yellow Box Grassy Woodland, Grassy Yellow Box Woodland on Alluvial Flats, Grassy White Box – Blakely's Red Gum – Yellow Box Woodland and River Red Gum very tall open forest of the NSW South Western Slopes Bioregion. The first three of these vegetation communities correspond with one state and one nationally threatened ecological community, White Box Yellow Box Blakely's Red Gum Grassy Woodlands (Box-Gum Woodland). Box-Gum Woodland is listed as an endangered ecological community (EEC) under the *Threatened Species Conservation Act 1995* (TSC Act) and a critically endangered ecological community under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Box-Gum Woodland is present in the assessment area in roadside reserves, the former Town Common and the Wagga Wagga Road (Northern) and Culcairn Road (Southern) Travelling Stock Reserves and is considered to have moderate value to fauna species, providing a variety of tree hollows and dead trees suitable for bird species and arboreal mammals (including the threatened Squirrel Glider).

The construction of the project would result in the clearance of 24 hectares of native vegetation, which equates to approximately 43 per cent of vegetation within the study area. This clearing would comprise:

- 22 hectares of Box-Gum Woodland; and
- two hectares of River Red Gum very tall open forest of the NSW South Western Slopes Bioregion (Riparian Woodland).

The project is likely to have a significant impact on the former Town Common as the proposed alignment would bisect the central portion of the Common and directly impact an area of approximately five hectares of vegetation, which is in poor to moderate condition, being affected by intensive grazing and pasture improvement. The proposed alignment is located on the periphery of the eastern and western sides of the Southern and Northern Travelling Stock Reserves, respectively, and will require minimal vegetation clearing thus significantly avoiding habitat fragmentation and also preventing the introduction of new edge effects in the Reserves. The vegetation within the Reserves is generally in medium to good condition.

Habitat fragmentation can result in significant adverse impacts and has been identified as an issue relevant to the project. The project would increase the average distance between remnant patches of vegetation to core areas of habitat from 2,150 to 3,216 metres. The project would present a barrier within the Ten Mile Creek riparian corridor and remnant patches within the former Town Common and the Southern Travelling Stock Reserve, which

may effectively isolate vegetation and increase the level of fragmentation experienced by some fauna species, in particular small and sedentary fauna, including the Squirrel Glider. To address this fragmentation, the Proponent has proposed mitigation measures, including the provision of crossing zones to minimise impacts on connectivity and access in key areas, such as the Riparian Woodland along Ten Mile Creek and within the former Town Common.

A number of weed species (approximately 99) have been observed in the area of the project. The construction of the project would have the potential to disperse weeds into areas of remnant vegetation where weed species do not currently occur. Weed dispersal would potentially occur due to earthworks, movement of soil, and attachment of seed (and other propagules) to vehicles and machinery. Edge effects could further promote the growth of vegetation types, including weeds and introduce pest animals specialising in edge habitats and/or change the behaviour of resident animals. The assessment identified that new edge effects would be introduced in larger vegetation patches such as the former Town Common and the Southern Travelling Stock Reserve.

Field surveys of the assessment area identified ninety eight species of native fauna and six introduced species. Of the recorded fauna, two are threatened species, the Brown Treecreeper (listed as vulnerable under the TSC Act) and the Superb Parrot (listed as vulnerable under the TSC Act and the EPBC Act). Both threatened species were recorded in Box-Gum Woodland. The greatest diversity of fauna were recorded in the Box-Gum Woodland (76 species), while 37 species were recorded in the Riparian Woodland vegetation. Native birds were the most diverse group of animals recorded in the assessment area, the majority being common open country or species common to grassy wooded environments.

Twelve species of native mammals, eight reptile species and 4 amphibian species were recorded in the field surveys. The Box-Gum Woodland provided potential habitat for the Squirrel Glider, although none were recorded. No native fish were caught at the survey locations, although the threatened Southern Pygmy Perch has the potential to be present in the assessment area's watercourses.

Ten Mile Creek and its tributaries form part of the Lower Murray River EEC. The project would include waterway crossings within this EEC, which would contribute to the disturbance of the creeks. It is noted the waterways within the project area are currently affected by riparian vegetation clearance, erosion and sedimentation, alteration to flows and bank instability due to stock access and vegetation removal. The installation of waterway crossings, including bridges and culverts, may further modify the natural hydrology of watercourses and could introduce sediment impacts, which could alter water quality characteristics with resultant disturbance to aquatic species. However, samples of water bodies reveal fish and mobile invertebrate assemblages are fairly typical of freshwater habitats within the region, and consist of introduced species only. As suitable habitats exist up and downstream of many of the drainage lines to be crossed by the project, long-term impacts from the proposed waterway crossings on fish and mobile invertebrate assemblages are not expected within the area.

An assessment of significance of the potential impacts of the project was undertaken for two EECs, two threatened flora species and sixteen threatened species that were likely to occur in the assessment area. The assessment concluded that the project will have a significant impact on the Box-Gum Woodland EEC, particularly from a reduction of existing roadside vegetation in the road reserve and fragmentation of the remnant vegetation in the former Town Common and Southern Travelling Stock Reserve. However, the project will not have a significant impact on the other threatened species with the implementation of mitigation measures.

The Proponent has identified measures that could be implemented, including:

- checking hollow-bearing trees for fauna;
- collection of native seeds;
- using endemic species for landscaping;
- implementing strategic revegetation works in the corridor to increase fauna habitat linkages;
- undertaking ongoing management of weeds;
- clearly demarcating limits of clearing;
- developing fauna crossing treatments;
- maintaining fish passages; and
- developing a biodiversity offset package.

There will also be cumulative impacts as a result of the Hume Highway duplication projects. The cumulative impacts would include a greater extent of clearing of native vegetation and habitats, including endangered ecological communities, as well as further fragmentation of habitats, including habitat for threatened flora and fauna. It is estimated that a total of approximately 133 hectares of native vegetation has been or would be cleared for the duplication projects and the three town bypass projects on the Hume Highway. The current project would contribute 19 percent of this clearing. The total extent includes an estimated 101 hectares of EEC, of which the Holbrook bypass project contributes 22 hectares. The loss of 101 hectares of EEC is considered significant.

Submissions

The DECCW considers that the loss of 24 hectares of native vegetation is a significant reduction in available habitat for threatened species in the vicinity of the project and is concerned that this area could be underestimated. It is opined that this reduction will negatively impact on local populations of threatened species and may have consequences at a regional level. The DECCW considers that the project has the potential to fragment vegetation remnants and impact on important movement corridors, thus negatively impacting on threatened species. Concern has also been raised in relation to the conservation value assigned to the former Town Common and the need to ensure connectivity for Squirrel Gilders and Woodland birds. The DECCW recommends that a range of mitigation measures be implemented to decrease impacts, to maintain connectivity and be supported by a biodiversity offset package and a threatened species monitoring program.

The LPMA raised concerns with the loss of habitat values on Crown Land and have requested this loss be minimised and that appropriate weed management be undertaken.

The I&I NSW noted a lack of detail in relation to stream crossing and aquatic habitat rehabilitation, and requested ongoing consultation regarding this matter and the consideration of relevant design guidelines to ensure crossings are designed to facilitate fish passage.

Greater Hume Shire Council suggests that the former Town Common could be enhanced to complement Council land set aside for environmental purposes.

Members of the public have requested that impacts on existing flora and fauna be reduced and habitats be maintained.

Consideration

Terrestrial Flora and Fauna Impacts

The Department recognises that the project corridor is confined given other constraints associated with the project, such as indigenous heritage and road design and considers that the Proponent has reasonably endeavoured to avoid or minimise the extent of disturbance to the EEC, fauna habitat and the key habitat corridors. Notwithstanding, the project would still have an adverse impact on the EEC and threatened fauna species in the region. These impacts will arise out of habitat clearing, increased fragmentation, barrier effects and increased rates of road strike.

Given the adverse impact, and the limitations associated with mitigating this impact within the project corridor, the Department supports the proposed combination of corridor-specific mitigation measures, such as the use of endemic species for revegetation and fauna crossings, and the implementation of regional biodiversity offset measures. In general, the Department is satisfied that this approach would ensure that localised impacts are minimised wherever possible, and that cumulative and longer-term impacts on the EEC and the relevant threatened fauna species are appropriately addressed.

However, whilst the Department considers that the mitigation measures proposed by the Proponent are generally good practice, the Department recommends a number of conditions which aim to ensure that impacts are kept to an absolute minimum. These conditions include requirements such as the following:

- restricting the amount of vegetation to be cleared and application of a comprehensive biodiversity offset strategy consistent with that developed for the Hume Highway duplication projects;

- details of fauna underpasses and aerial crossings to be undertaken with advice from a qualified ecologist. Crossing treatments are specifically required for threatened woodland birds and squirrel gliders at the former Town Common, in recognition of the importance of this area for fauna connectivity;
- the road reserve and adjoining areas, including the former Town Common and travelling stock reserves shall be revegetated with native species consistent with cleared vegetation to facilitate habitat rehabilitation and to improve connectivity;
- installation of nest boxes and relocated hollows;
- implementation of effective weed control;
- implementation of a Flora and Fauna Monitoring Program; and
- preparation of a Construction Flora and Fauna Management Plan.

The then Minister, as a condition of the concept plan approval for the Hume Highway Duplication Project, required the Proponent to develop a Biodiversity Offset Strategy to offset the cumulative and longer-term impacts on the Box-Gum Woodland community and the regional populations for the relevant threatened fauna species. The department considers it is appropriate to adopt the concept plan Strategy with revisions to be made to include biodiversity offsets required for this (and other) Hume Highway bypass projects. In determining the suite of biodiversity measures for the project, the Department has recommended a condition of approval requiring the Proponent to develop a Biodiversity Offset Package, based on the revised Strategy, to be prepared in consultation with the DECCW and submitted for the approval of the Director General. The approvals for the Woomargama and Tarcutta bypasses have a similar requirement.

Whilst the Package will ensure that the delivery of regional offsets would address the contributions that the project would have towards the cumulative impacts of the Hume Highway upgrade program, the Department considers that localised impacts will also need to be addressed through the implementation of management and mitigation measures. The Proponent has proposed to implement corridor-specific measures during the pre-construction and construction periods, such as habitat clearing procedures to minimise the disturbance of fauna. The Department supports the proposed measures to minimise and avoid biodiversity impacts resulting from the project. Nonetheless, to ensure due consideration is given to the biodiversity impact during the construction stage, the Department has recommended a condition of approval requiring the preparation of a Construction Flora and Fauna Environmental Management Plan to manage, mitigate and monitor construction impacts.

Specific controls are also considered necessary for the former Town Common and travelling stock reserves as they provide Box-Gum Woodland habitat in the form of tree hollows and dead trees suitable for a range of fauna species. These habitats are considered as having moderate to high value for fauna species as they play a significant role in providing and maintaining connectivity within the surrounding cleared landscape.

In conclusion, the Department is satisfied that the species specific mitigation and offset measures, in conjunction with a management, monitoring and review regime for both corridor specific and regional offset measures would ensure that the local and regional impacts are appropriately mitigated and that the desired ecological outcomes are achieved. Consequently, the terrestrial ecological impacts are considered to be acceptable.

Aquatic Flora and Fauna Impacts

The Department notes that there may be impacts on watercourses (including Ten Mile Creek), which may lead to impacts upon aquatic fauna. At the forefront of such concern is the removal and/or damage of riparian vegetation, which acts as a stabilising mechanism for river systems. Once riparian vegetation is adversely affected, other flow on impacts, such as turbidity and erosion, may arise affecting the aquatic ecosystem as a whole. However, given that the key impacts upon the aquatic ecosystem will occur as a result of the proposed crossings or works in proximity to watercourses, the Department is satisfied that any potential impacts to aquatic ecology could be effectively minimised through the implementation of construction management controls and appropriate design of all new or modified crossings.

In order to ensure that project construction is undertaken in a manner which would minimise adverse impacts upon the aquatic ecology of the area, the Department recommends a number of conditions, including:

- the rehabilitation of riparian areas in consultation with I&I NSW;
- watercourses affected by the proposal are to be rehabilitated to emulate a natural stream system; and

- liaison with I&I NSW on the retention of felled timber to assist in the NSW Murray River Re-snagging Project.

The Department is satisfied that the above recommendations would ensure that any impact is appropriately mitigated and managed during all phases of the project ensuring that impacts are contained to acceptable levels.

5.2 Aboriginal Heritage

Issues

An assessment of the Aboriginal cultural heritage of the Holbrook bypass identified a total of 20 places of specific Aboriginal cultural value within or immediately adjacent to the proposed corridor and 13 Aboriginal archaeological sites. Of these, it is expected that seven cultural places and nine archaeological sites will be impacted by the proposal. These are summarised in Table 3.

Table 3 - Aboriginal Heritage Items and Site Impacted by the Project

Site	Site Type	Significance	Impact and Mitigation Measure
HB1	Artefact scatter	Moderate to high	Would be impacted. Salvage excavation recommended.
HB2	Artefact scatter	Moderate to high	Would be impacted. Salvage excavation recommended.
HB3	Artefact scatter	Moderate to high	Would be impacted. Salvage excavation recommended.
HB4	Artefact scatter	High	Partial impact. Salvage excavation recommended to the (impacted) eastern portion of the site.
HB5	Artefact scatter	High	Would be impacted. Salvage excavation recommended.
HB8	Artefact scatter	Moderate to high	Would be impacted. Salvage excavation recommended.
HB11	Artefact scatter	Low to moderate	Would be impacted. Artefacts should be salvaged by surface collection within the impact area.
HB12	Isolated find	Low	Would be impacted. Artefacts should be salvaged by surface collection within the impact area.
HB13	Artefact scatter	Low	Would be impacted. Artefacts should be salvaged by surface collection within the impact area.
Place 1	Cultural Place	Very high	Partial impact. Knowledge holder has requested cultural salvage of the impacted Place. Sensitive area signage to be erected on construction site boundary fence. Any future work in this area or deviation from the concept design would require further consultation with the knowledge holder.
Place 4	Cultural Place	Very high	Would be impacted. Funding to be provided for a cultural heritage consultant and the knowledge holders to be engaged to design cultural heritage interpretative signage in relation to cultural values. This interpretative signage to be displayed by the RTA within the Holbrook area, subject to agreement by relevant stakeholders.
Place 15	Cultural Place	Medium	
Place 16	Cultural Place	High	
Place 17	Cultural Place	High	
Place 18	Cultural Place	Very high	
Place 19	Cultural Place	Very high	

The Proponent undertook a comprehensive heritage assessment including archaeological surveys, excavations and consultation with local knowledge holders to determine the cultural significance of items and places. Excavation was undertaken at four locations to test the extent and significance of Aboriginal archaeology within the bypass corridor. Results of the testing and preliminary field analysis revealed water as the controlling feature directly correlating with archaeology. Water attracted past Aboriginal activities, including their occupation near these resources, as confirmed by the frequency of artefacts found near water features, such as the Ten Mile Creek, Billabong Creek and related springs and swamps.

The recovered artefacts contain a range of tools and imported raw materials of different frequencies within the landscape, which suggests the use of these areas for different purposes, including events for one-off actions or other more permanent but short term occupation. The Aboriginal stakeholders have a strong attachment to the identified sites as there is evidence of their ancestors in this landscape. The places also provide a pathway demonstrating the lives of the past people and their connection with places along the creek systems, and allows the Aboriginal stakeholders to gain a greater understanding of their forebears and the past events that have occurred within this cultural zone.

It is noted that the route selection for the project was partly determined on minimising impacts to Aboriginal heritage. Where significant sites or places were identified, the design was modified where possible to avoid or limit the impact to the identified cultural places and archaeological sites. During the detailed design stage, consultation was undertaken with relevant knowledge holders on the potential impacts within the corridor and proposed mitigation and management measures. The measures were accepted by the knowledge holders.

In addition to the design methods to minimise impacts, the Proponent has committed to a number of measures to reduce the impacts, which have been comprehensively defined in an Aboriginal Heritage Management Policy, with measures such as the managing of Aboriginal heritage items in consultation with the DECCW and Aboriginal stakeholders, fencing significant sites, undertaking salvaging prior to construction, providing training to staff, ongoing consultation with Aboriginal stakeholders, and immediately stopping works in the event that any skeletal remains are discovered.

Submissions

The DECCW did not object to the project on heritage grounds, but provided a number of recommendations and comments including a request for the preparation of an Aboriginal Heritage Management Plan.

Consideration

The Department acknowledges the importance of the heritage items and cultural sites that would be impacted by the proposed project, particularly the cultural significance of these items and sites to Aboriginal stakeholders, and considers that priority should be given to the protection of these items and sites, where possible. It is also recognised that the extent to which impacts can be avoided or minimised is limited by road design requirements and other key project corridor considerations or constraints that also influence the final alignment, such as biodiversity impacts.

The Department is satisfied that the Proponent has adequately, through the proposed road design, minimised the number and extent of the potential impacts on Aboriginal heritage places and sites and that there is opportunity through the construction stage to further minimise these impacts. The Department notes that the remaining features are significant and that the value of these features is enhanced by their physical connections, which can be interpreted as a landscape microcontinuim. It is conceded that the removal of the items and/or destruction of these places and sites would have a permanent impact on cultural heritage in the region. However, it is considered that benefits will also be derived through the recommended salvage and investigations in conserving these items and furthering knowledge of Aboriginal heritage and landscapes in the region.

The Department is satisfied that the mitigation strategy and management policy detailed in Technical Paper 2 of the EA are adequate in minimising potential indigenous heritage impacts. Nonetheless, the Department also recommends the imposition of a condition requiring the preparation of an Aboriginal Heritage Construction Management Plan prior to the commencement of construction, which requires, *inter alia*, a strategy for the salvage and curation of objects.

Consequently, the Department is satisfied that appropriate design and management measures have been taken and/or will be implemented during construction and final design to ensure Aboriginal heritage across the corridor is appropriately protected and the impacts minimised wherever possible. The Department is also satisfied that sufficient weight has been given to Aboriginal heritage during the design of the proposed alignment with the impacts minimised wherever possible, and that the recommended salvage and excavation of items and sites directly impacted by the project would provide mitigation towards the permanent loss of these items within the cultural landscape.

5.3 Noise and Vibration Impacts

Issues

Construction Noise and Vibration

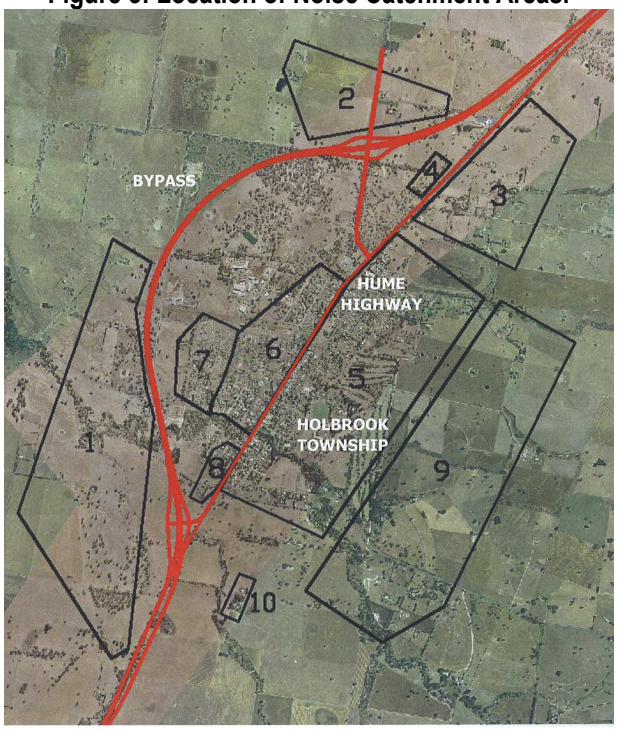
The Proponent undertook a construction noise impact assessment in accordance with the Environmental Noise Control Manual (EPA, 1994). The assessment was undertaken based on 10 Noise Catchment Areas (NCA). Refer to Figure 3 showing the location of each NCA.

The NCAs can be grouped into town and isolated receivers. The town receivers are located to the west (NCAs 6, 7 and 8) and east (NCA 5) of the existing highway. The isolated receivers are located in the rural areas to the west (NCAs 1, 2 and 4) and east (NCAs 3, 9 and 10) of Holbrook.

The Proponent has predicted exceedance of the construction noise goals at receivers within 500 metres of the project, potentially affecting 472 receivers in Holbrook and 17 isolated/ rural receivers. Construction work during the day time and evening is predicted to comply with the noise goals beyond 500 metres from the project, although noisy work such as piling and rock hammering could cause exceedances up to 1 kilometre away.

Night time construction work (e.g. paving and saw cutting) will exceed the noise goals at all receivers within 1 kilometre of the project. Sleep disturbance is expected during the early morning (6.00am - 7.00am) at receivers within 300 metres and at night within 500 metres of the project.

Figure 3: Location of Noise Catchment Areas.



The Proponent has not identified specific locations for construction compounds/ concrete batch plant, but undertook a noise assessment based on noise modelling of a similar plant. The assessment predicted exceedances of the day and evening noise goals at isolated and town receivers located within 1 kilometre and within 1.5 kilometres during the night time. Where compound accesses are located within 200 metres of residences, the noise goals are likely to be exceeded, though by reduced margins if only light vehicles are used.

The greatest expected noise exceedances at the worst affected receiver for each construction period and the dominant noise source is summarised in Table 4.

Table 4 – Predicted Construction Noise Exceedances at Worst Affected Receiver

Activity – Dominant Source	Rural (Isolated) Receiver dB(A)						Town Receiver dB(A)					
	Day time		Evening		Night time		Day time		Evening		Night time	
	Typical	Max	Typical	Max	Typical	Max	Typical	Max	Typical	Max	Typical	Max
Piling	10	11					20	21				
Earthworks	13	31					17	39				
Saw cutting			19	37	20	36			11	33	20	42

Exceedance based on a criteria equivalent to background (L_{A90}) plus 5db(A)
Typical – estimated noise level that would be audible for a prolonged period at the worst affected receiver
Max – maximum noise level generated at the nearest point to the receiver

Vibration levels generated by general construction and blasting are predicted to be below the relevant criteria for human comfort and structural damage at all residential receivers. Although vibration levels at the Hereford Stud Homestead (HH-3) from the use of hydraulic hammers and vibratory rollers are predicted to be in the range 0.8 – 1 mm/s, which is below the criteria for structural damage to a building (3 mm/s), the Proponent has given a commitment to undertake a preconstruction building survey and vibration monitoring as a precaution given its close proximity (40 - 50 metres) to the project boundary.

The Proponent has committed to a range of mitigation and management measures to mitigate potential construction noise and vibration impacts, including:

- development of a Construction Noise and Vibration Management Plan (CNVMP), which includes procedures to manage on-site activities and at residential receptors;
- monitoring to determine effectiveness of mitigation measures;
- a notification and negotiation procedure where noise impacts from evening and night construction activities are above criteria; and
- a procedure for responding to complaints.

Operational Noise

Operational noise assessment was undertaken in accordance with DECCW's *Environmental Criteria for Road and Traffic Noise* (ECRTN), which provides assessment criteria for different types of road development. The bypass is considered to be a 'new freeway or arterial road corridor' except at the southern end where the proposal involves an upgrade to and duplication of the existing highway. This section is classified as a redevelopment of an existing freeway/ arterial road.

The Proponent has adopted the RTA's *Environmental Noise Management Manual* (ENMM) to guide the assessment of operational road traffic noise. The Manual provides guidance to the application of the ECRTN noise criteria and the provision of feasible and reasonable noise mitigation measures.

The original noise modelling in the EA assumed 54 percent of all light vehicles and 64 percent of all heavy vehicles would use the bypass. This traffic scenario was based on traffic counts representing the existing traffic conditions and assumed through traffic and traffic for Wagga Wagga Road would use the bypass, while Culcairn Road traffic and traffic starting or finishing in Holbrook would use the existing highway. The Proponent in the Submissions Report has modelled an additional traffic scenario in which 90 percent of all light and heavy vehicles would use the bypass during the night time period.

The noise assessment identified 591 receivers in Holbrook and surrounding rural areas as being potentially affected by traffic noise. Based on the 90 percent night time diversion scenario, 108 receivers will experience noise above the ECRTN goals 10 years after the bypass opens. Typical exceedances are in the range of 2-4 dB(A), however more significant exceedances are up to 8dB(A), with the maximum exceedance predicated at 13 dB(A). Of these, 92 receivers (82 in Holbrook and 10 isolated receivers) will be considered for mitigation measures in accordance with the ENMM as predicted noise exceedances are greater than 2 dB(A). Potential mitigation measures include at road mitigation (noise barriers and low noise pavements) and architectural treatments of residences. A final decision on which of these measures will be implemented will be decided during detailed design. Generally, grouped residences will be subject to at source mitigation measures and isolated residences will be considered for architectural treatment of buildings. In addition, the Proponent has committed to measuring operational noise along the project between six months and one year after opening and implementing

further reasonable and feasible mitigation measures in instances where actual noise levels exceed predicted levels.

Non-residential receivers
There are seven non-residential receivers (2 educational establishments, 3 churches, hospital and golf course) located near the existing Highway alignment which will be impacted from the bypass. The noise assessment predicted all non-residential receivers, with the exception of the golf course would experience noise levels above the noise goals. The EA states that in most cases noise mitigation could be achieved by the provision of suitable ventilation to allow windows to remain closed.

Submissions

The DECCW raised concerns regarding noise and vibration, specifically in relation to variation of standard construction hours and the need for refinement of noise modelling based on detailed design. The DECCW recommended conditions of approval with respect to both the construction and operation stages of the project, including construction and blasting hours, operational noise review and monitoring requirements.

The Greater Hume City Council raised concerns regarding the choice of mitigation measures to be provided at selected locations.

Consideration

Construction Hours
The Proponent seeks approval to extend construction hours beyond DECCW's standard construction hours, commencing an hour earlier at 6.00am (rather than 7.00am) and finishing an hour later at 7.00pm (rather than 6.00pm) on weekdays and between 7:00 am and 4:00 pm on Saturdays (compared with standard hours of 8:00 am to 1:00 pm). The extension to the standard construction hours would enable the Proponent to maximise productivity and deliver the project earlier. This would provide benefits such as providing safer travel to road users in a shorter timeframe and reducing overall construction impacts on residents.

The construction noise assessment predicted significant exceedances of the noise goal, particularly from noisy activities such as rock hammering, piling, concrete paving and saw cutting, at receivers within 500 metres of the project during the early morning 6.00am to 7.00am period. The Department acknowledges that for technical reasons and because of local climatic conditions there is an argument for flexibility in construction hours, particularly in relation to paving and concrete saw cutting activities. However, in this case the Department does not believe adequate justification or community support for the need to extend the standard construction hours has been provided and therefore it would be inappropriate to support a blanket extension as proposed by the Proponent.

The Department recognises there may be circumstances when flexibility is warranted and considers that a more appropriate approach (as adopted for the Woomargama and Tarcutta bypasses) is to permit the Proponent to seek exemptions from the standard construction hours on a case-by-case basis or activity specific basis. The Proponent would be required to seek approval for such requests, with the application to be supported by a risk assessment and consideration of mitigation measures to protect local amenity. The DECCW supports the extension of construction hours on a justified needs basis for certain activities, rather than a blanket extension of construction hours. The Department has recommended conditions of approval which:

- restrict construction hours to 7.00am to 6.00pm, Monday to Friday, and 8.00am to 1.00pm on Saturday;
- requires the Proponent to develop a Construction Noise and Vibration Management Plan and monitoring program;
- implement an out-of-hours protocol for work outside the standard construction hours;
- obtain approval from the Director General or Environmental Representative for out-of-hours work in accordance with the out-of-hours work protocol; and
- permit out-of-hours work where a negotiated agreement has been reached with affected receivers.

Construction Noise
The assessment of construction noise was undertaken in accordance with the noise goals in the ENCM. The Department confirmed in May 2009 that the construction noise assessment should be undertaken using the

ENCM goals, however, in July 2009 DECCW published the *Interim Construction Noise Guideline* (ICNG) to manage noise generated by construction works. Notwithstanding that the construction noise assessment were not based on the ICNG goals, the Department is satisfied that the impacts were appropriately and adequately considered. Despite this, the Department recognises that the noise management levels in the current policy (ICNG) are based on a review of achievable levels measured on recent construction projects and international best practice. The noise management objectives of the ICNG are set out in Table 5. It is considered that the ICNG provides more robust and appropriate guidance for managing construction noise impacts. To this end, the Department believes that the predicted outcomes would not be compromised by adopting the ICNG's noise goals. This is consistent with recent approvals for other Hume Highway bypass projects.

Table 5 – Interim Construction Noise Guideline – Noise Management Goals for Residential Receivers

Construction Hours	Noise Management Level $L_{Aeq\ (15\text{- minute})}$
Standard Construction Hours: Monday to Friday 7.00am to 6.00pm	Noise affected RBL + 10 dB
Saturday 8.00am to 1.00pm No work on Sundays or public holidays	Highly noise affected 75 dB(A)
Outside standard construction hours	Noise affected RBL + 5 dB(A)

The Department notes that construction of linear infrastructure such as roads is such that each activity would progress along the construction corridor meaning that a continuous noise source is not experienced at any single receiver for the duration of the construction period. The noise level experienced at any receiver along the construction corridor depends on factors such as distance to the construction site, shielding between the site and the receiver and the type of activity along the corridor. Different activities with different noise intensities would occur at different times throughout the construction period. (i.e. high and low noise periods would be transient and temporary). This provides significant benefits in managing noise, enabling high noise periods to be tempered with respite periods for all receivers.

While the Proponent has predicted significant exceedances of construction noise goals for Holbrook and isolated receivers, it should be noted that these exceedances represent worst-case 'maximum impact' scenarios in close proximity to the works and where a range of high noise generating activities are assumed to be occurring simultaneously when in reality this is considered unlikely to occur, at least for long periods of time. Therefore the maximum predicted noise levels are unlikely to be experienced. Although there may be short duration, high impact/ intensity events (such as piling or rock breaking), the Department recognises these can be managed through scheduling (including respite periods) and implementation of appropriate mitigation measures to minimise impacts on receivers. It should also be noted that these impacts will cease once construction is complete.

To ensure that construction noise impacts to sensitive receivers are mitigated as far as is practicable, the Department requires the Proponent to:

- prepare and implement a Construction Noise and Vibration Management Plan, which would detail how construction and vibration impacts would be minimised and managed;
- consult with affected educational institutions in relation to noise generating construction works; and
- implement a complaints handling and response program.

Construction Vibration

The Department is satisfied with the assessment of potential vibration impacts and the conclusion that the use of equipment such as vibratory rollers and hydraulic hammers and blasting at the northern cut would have minimal impact on human comfort levels and damage to buildings. Potential impacts can be appropriately managed through the implementation of the Construction Noise and Vibration Management Plan. The recommended conditions of approval require the Proponent to comply with airblast overpressure and peak particle velocity levels to ensure that vibration impacts would be minimised.

Traffic Assumptions Used in Operational Noise Assessment

A number of concerns were raised by the DECCW with the operational noise assessment in the EA:

- flaws with the noise predictions for those receivers likely to experience impacts from both the eastern and western facades; and
- the night time traffic diversion to the bypass was underestimated thereby underestimating impacts for residences affected by night time traffic on the bypass.

The Proponent undertook a supplementary noise study to address these concerns.

The noise study in the EA predicted future existing noise levels at receivers in the residential areas west of Holbrook to be identical for facades facing toward and away from the existing highway. This is incorrect as the future existing noise levels should be lower at the western facade of these receivers. The supplementary noise study updated the future noise levels 10 years after opening and concluded an additional 17 residences would need to be considered for noise mitigation as the predicted noise levels are above the operational noise goal.

The Proponent considers that a diversion of 90 percent of traffic (both light and heavy vehicles) to the bypass at night is overly ambitious and that in reality less than 90 percent of traffic is likely to take this option. Although this level of traffic, averaged over a 24-hour period may be valid, it is likely that additional vehicles would divert to the bypass during the night time period (due to a different travelling purpose and destination). Night time heavy vehicles are predominantly inter-capital or inter-regional haulage whereas day time vehicular movements (light and heavy) include a proportion with Holbrook or surrounding area as a destination/ origin. Notwithstanding, the Department agrees that the 90 percent night time diversion assessment provides a "worst case scenario" for those receivers affected by noise from traffic on the bypass and in effect it is shown that generally this results in noise levels approximately 1 dBA higher than the original operational noise assessment.

The Department also notes that many residents along the existing highway would experience a decrease in traffic noise as traffic volumes through the town (particularly during the night time period) would be significantly reduced with the bypass. These receivers currently experience noise levels above the relevant criterion and this would continue (and worsen) if the proposal were not to proceed. Conversely, it is acknowledged that a number of residents, particularly in isolated or rural areas that are not currently exposed to road traffic noise would experience increased noise levels as a result of the proposal, however, overall the proposal would result in fewer receivers being adversely affected by road traffic noise and the broader benefits of the proposal outweigh the negative impacts.

Operational Noise

Noise was assessed along the project in 10 noise catchment areas (see Figure 3) defined by similar characteristics including topography, land use and existing noise environment. Table 6 provides a summary of the receivers in each noise catchment and the predicted operational noise impacts. Overall, the assessment found that a significant proportion of Holbrook town receivers would benefit from the bypass through reduced noise levels. The Department notes that 469 receivers would experience noise levels below the criterion ten years after the bypass opens (2022) compared with 408 prior to the bypass opening in 2012. Another 12 receivers would experience no change in noise levels but those levels would remain below the criterion. A further 12 would experience lower noise levels in 2022 than would have been experienced in 2012 even though these levels would be above the criterion.

Conversely, noise levels at 115 receivers would be above the criterion in 2022 compared with 227 if the bypass was not built. This shows that a significant number of residences would benefit immediately from the bypass.

Despite these improvements, a large number of residents/ receivers would experience noise increases over time. The bypass would introduce a number of new receivers (between the bypass and the existing highway in Holbrook) to traffic noise or increase the noise levels experienced to levels above the appropriate noise criterion. An additional 184 receivers (particularly NCA 6) would continue to experience noise levels below the criterion in 2022, though these would be increased from those that they would have experienced without the bypass.

The Department is aware that there is a perception that any increase in noise is unacceptable, however it should be noted that the noise criteria established in the ECRTN is based on a review of international standards and

what is considered an acceptable noise environment. Compared to the criteria adopted by many other countries, these criteria are considered relatively stringent.

The 92 residential receivers identified as requiring consideration for noise mitigation are located to the west of the existing highway, the town receivers in NCA 6, 7 and 8 and isolated receivers in NCA 1 west of the proposed bypass and NCAs 2 and 4 to the north of Holbrook. The Proponent has committed to providing low noise pavement for a section of the bypass in conjunction with noise walls where there are clusters of residences that would benefit from this type of mitigation. Further refinement of these mitigation measures, including the use of alternatives such as noise mounds would be determined at the detailed design stage. The Proponent considers that it would not be cost effective to use low noise pavement or noise walls to mitigate residences in more isolated or scattered locations. These receivers would be considered for architectural treatment of the residence, including ventilation, to reduce noise levels. Generally it is found that use of at receiver mitigation can reduce noise levels by up to 15 dB(A).

Table 6 – Operational Noise Impacts 2022

Noise Catchment Area	Below/at criterion & reduced from 2012	Above criterion but reduced from 2012	Below/at criterion but increased from 2012	Above criterion and increased from 2012	Above criterion no change	Below criterion no change
Town Receivers						
5	251	5	16	-	-	6
6	22	-	143	6	-	4
7	-	-	16	54	-	-
8	-	2	1	23	1	-
Rural/ Isolated Receivers						
1	-	-	1	6	-	-
2	-	-	1	3	-	-
3	8	5	-	-	-	-
4	-	-	-	2	-	-
9	4	-	6	-	-	2
10	-	-	-	2	-	-

In order to ensure that the all reasonable and feasible measures to address noise impacts are implemented and that the Proponent is held accountable to the impacts predicted in the assessment, the Department recommends a two staged approach. The first stage requires that the Proponent prepare and submit to the Director General for approval 6-months after commencing construction, a review of the proposed operational noise mitigation measures based on the detailed design, rather than that put forward in the EA. This would include a review of predicted noise levels and feasible and reasonable noise mitigation based on design refinements. The second stage involves monitoring of actual noise levels, which is required to be carried out 12 months after opening of the project to traffic, to confirm whether noise mitigation applied to the project is effective and that predicted noise levels can be achieved. Should noise monitoring indicate any exceedance of the predicted noise levels, mitigation measures must be reviewed and further feasible and reasonable measures implemented where available and appropriate. These requirements are included in the recommended conditions of approval.

Subject to the commitments undertaken by the Proponent and the recommended conditions of the approval, the Department is satisfied that the project can be constructed and operated in a manner which adequately addresses noise and vibration impacts.

5.4 Social and Economic Impacts

Issues

Holbrook is the largest town in the Greater Hume Shire, with a total population of 1,336 people in 2006, and is strategically located between Wagga Wagga and Albury. The town's economy has traditionally been agriculture based, but retail and service industries have grown providing a number of services and facilities to cater for the local community of Holbrook and surrounding smaller towns and villages.

The town is also known as the 'submarine town', as it is host to the HMAS Otway. The town was renamed Holbrook in 1914 in honour of Lieutenant N.D. Holbrook of the Royal Navy who was the first submariner to receive the Victoria Cross in World War 1 and skippered the original HMAS Otway during the war. The HMAS Otway, located within the submarine precinct of Holbrook, attracts the majority of through stopping traffic.

Properties within Holbrook are located in both the township and in the rural hinterland, whilst the commercial precinct of the town is built around the existing highway, with businesses located on either side. The former Town Common located adjacent to the proposed northern interchange was recently purchased by Council with the aim of rezoning and developing it as a Service Centre site and Industrial Park.

The proposed bypass would bring a number of changes in the vicinity of the existing and proposed highway and within the town of Holbrook. Potential impacts include amenity issues such as noise and vibration, air quality and public safety, and social and economic issues such as property connectivity and severance, and business viability, including for agribusinesses and highway dependent businesses. .

The project will require the acquisition of approximately 75 hectares of land over 15 private properties, and land owned or administered by Council and other government agencies. This includes nine agribusinesses, five rural residential properties, one travelling stock reserve and route (Crown land), the former Town Common, the Rural Fire Service depot, Holbrook caravan park and Holbrook saleyards. The acquisition will lead to connectivity and severance issues, particularly on the western side of Holbrook, with both temporary and permanent changes to property access and travelling stock routes.

The project would involve construction works at and between Culcairn Road and Wagga Wagga Road, which may prevent or interrupt the movement of stock. Access to the Wagga Wagga Road Travelling Stock Reserve would also be severed by the bypass. The Proponent has proposed to relocate the Wagga Wagga Road Travelling Stock Route to a suitable location on the western side of the proposed bypass, whilst part of the Culcairn Road Travelling Stock Reserve would be acquired for the purposes of the project. During the construction stage, management measures such as the programming of works and the relocation of the stock reserve would be refined at the detailed design stage and in consultation with affected stakeholders, including the Land and Property Management Authority and the Hume Livestock Health and Pest Authority.

During construction, the project could lead to positive economic benefits for local businesses, brought by construction personnel (approximately 250 workers) which may provide localised economic stimulus and increase business turnover. Surveys undertaken of local businesses for the EA identified that spending from construction workers in Holbrook accounted for 10 to 15 per cent of turnover for the 2007-2008 periods, with an increase in local consumption of goods from highway construction personnel undertaking the Hume Highway duplication projects to the north and south of Holbrook.

Notwithstanding, the most significant socio-economic impact of the project is likely to be at the operation stage. Reduction in business activities is expected due to a reduction in the amount of stopping traffic following the opening of the bypass, thus potentially causing impacts to highway generated trade, and possibly the closure of highway-related businesses, which could lead flow-on effects for other businesses and the community as a whole. Up to 40 businesses could be potentially affected, with accommodation, retail and eatery business most affected. Changes in traffic patterns are estimated to result in a reduction in motorists stopping by up to 40 percent, resulting in a gross annual turnover loss of between $4.7 to $7.4 million to local businesses and potentially affecting approximately 73 to 90 jobs, which represents approximately 13 to 16 per cent of the total labour force in the Holbrook locality.

Furthermore, the project would require the acquisition of 75 hectares of land, of which 26.5 hectares are classified as Class 1 prime agricultural land. A total of nine local agribusiness would be directly affected, resulting in a reduction of productive land and capacity, severance, edge effects, amenity and farm infrastructure impacts. The area of land affected on individual properties would vary from one to 43 (Property 4) per cent. However, impacts are not expected to have long term impacts and the loss of agricultural land is equivalent to less than one per cent of the total region. Further, the Proponent has agreed to a whole of property acquisition of Property 4, thus significantly reducing the impact on this agribusiness.

Submissions

The LPMA identified several parcels of Crown land that may be impacted by the proposal, including a reserve managed by Council which is subject to an Aboriginal Land Claim. The LPMA recommended that public access to Crown land be retained and any acquisition be carried out under the provisions of the *Land Acquisition (Just Terms) Compensation Act 1991.* The Proponent has advised that the land claim is currently under investigation and a determination has not yet been made.

Greater Hume Shire Council raised concerns about the economic and social impacts as a result of the severed agricultural land and upon local businesses, including the expansion of a Caravan Park which is currently on freehold land owned by Council, and expressed a desire for the Proponent to fund the delivery of a Streetscape Plan, that has been funded and prepared by the Proponent. Council considered that the impacts to the Caravan Park were understated, particularly in relation to land acquisition, noise and visual impacts. Council also sought an improved signage strategy prepared in consultation with itself and the community and the southbound off ramps be designed to facilitate an entrance into the proposed Holbrook Service Centre and Industrial Park in close vicinity of the Bypass.

A number of public submissions requested changes to the road design to retain existing access, and the provision of more direct entry to the town to encourage visits, whilst another enquired about access to the Holbrook landfill and horse access from Wagga Wagga Holbrook Road to the showgrounds.

Consideration

The proposed bypass of Holbrook has the potential for adverse impacts on the local economy at both the construction and operation stages. The project will divert traffic away from the town and therefore lead to a reduction in highway related business. This is an unavoidable impact associated with most road bypass projects, which will be partially offset by other benefits brought by the bypass, such as improved safety and reduced traffic congestion and associated improvements in amenity.

Whilst there would also be some residual level of traffic prepared to exit the highway bypass and enter the town for a service stop, noting that there is little opportunity to do so along the highway outside of the town, local business impacts in Holbrook are expected to be noticeable, in particular highway-related businesses. As has been identified by the Proponent, direct and indirect impacts could affect not only businesses through their closure or a decrease in individual business revenue, but also through flow on effects to the community as a whole which warrants the implementation of mitigation and management measures to reduce their severity.

The bypass will have a substantial economic impact on Holbrook with a potential reduction of up to $7.4 million in gross annual turnover for highway-related businesses. The Proponent has committed to continual consultation with Council throughout the detailed design, construction and operation stages to assist in developing strategies to encourage the continued viability of Holbrook. One of these is a Signage Strategy in which signage would be placed within the Hume Highway corridor on the approaches to Holbrook to encourage rest and service stops. The Proponent has also funded the development of a Streetscape Plan which aims to identify programs and initiatives to enhance the character and amenity of the town.

The Department supports the development of a signage policy which aims to mitigate the economic impact of the bypass, however, due to the scale of the impact, further measures are deemed appropriate. Whilst the construction period of the bypass is for two years, within which it is expected that local business will prosper from increased trade, and will allow affected businesses to plan for the future by considering relocation or other changes as deemed appropriate by the business owners, further measures are required to encourage businesses to adapt and change to the post-operation economic environment.

The local economic impacts would be partially offset by other benefits brought by the bypass, such as improved safety and reduced traffic congestion and associated improvements in amenity, however, the Department considers the Proponent has a responsibility to address the negative socio-economic impacts of the project. In the short term following opening of the bypass there is likely to be a significant reduction in retail trade, particularly for highway related businesses. However, the Department considers that the socio-economic impacts of the project could be reduced by applying mitigation measures such as development of business strategies,

signage, streetscape improvements and access to expert advice. The net effect of mitigation measures would likely be a reduction in the impact of the project on Holbrook's economy. In the longer term, the opportunity would exist for the town to attract more travellers to stop and build on its position as the largest town in the Greater Hume local government area.

Consequently, the Department has recommended a condition which requires the Proponent to consult with Council and agree on the preparation and implementation of measures to address the socio-economic impacts of the project on the Holbrook community and to encourage the continued viability of Holbrook. Should agreement on the measures not be reached, then the matter may be referred to the Director General for resolution.

With respect to the severance and acquisition of agricultural land, the Department considers that there would be impacts but also notes that the affected owners will be duly compensated for the loss of any land. Whilst the project would require the acquisition of 26.5 hectares of prime agricultural land, resulting in production and amenity losses for individuals, the total area of land directly and indirectly lost due to acquisition and severance is considered to be limited at a regional level and would not severely affect the profitability, productivity, viability or sustainability of the agricultural sector of Holbrook.

The Department notes that the project has the potential to isolate certain properties from Holbrook and to general access requirements, which may be needed to provide continued use of properties and utilities and services for their intended function. In order to ensure that these impacts are not extensive, the following requirements are incorporated into the recommended conditions of approval:

- ensure that access is maintained to provide continued use of the surrounding properties existing functions;
- design and construction of the project in a manner that mitigates direct and indirect impacts to property and property infrastructure, including fencing, landscaping, walls, dams, bores and the like; and
- the Proponent is to identify utilities and services potentially affected by construction to determine requirements for diversion, protection and/or support.

The Department supports the maintenance of the travelling stock routes and reserves during the construction and operation of the project to minimise impacts on agri-businesses and subsequent social impacts on the community in general and it is recognised that impacts on access have been taken into account in determining the preferred route. Notwithstanding, the Department acknowledges that there is scope in minimising these impacts during detailed design and has recommended conditions that require the Proponent to ensure changes to the travelling stock reserves and routes be refined in consultation with affected stakeholders and that the project permit safe non-vehicular access, including horse riders along Wagga Wagga Holbrook Road.

Land acquisition by the Proponent will be undertaken in accordance with the *Land Acquisition (Just Terms Compensation) Act.* An objective of the legislation which is included in the Proponent's policy is to encourage negotiated land purchase in preference to compulsory acquisition. Acquisition requirements for the project range from minor partial acquisition to property severance where the viability of enterprises could be severely impacted. The Holbrook Motor Inn (caravan park) is concerned the potential for the business to expand could be severely restricted due to property acquisition and possible amenity impacts (it is located close to the southern interchange). Whilst it is the Department's understanding that the Proponent will only acquire land no more than is required for the project, it is considered necessary for the Proponent to undertake further consultation with Council to minimise the amount of land to be acquired at the Caravan Park to minimise any direct and indirect impacts that would be experienced by the business owner. A condition to this effect has been recommended.

The Department is satisfied that through the implementation of the recommended conditions of approval, the socio-economic impacts will be mitigated as far as practicable. Whilst it is acknowledged that some economic impacts are likely as a result of this project, on balance, the benefits to the wider community are significant and therefore the Department considers that the socio-economic impacts of the project are acceptable.

5.5 Other Issues

Traffic and Transport Impacts

Issues

The existing Hume Highway through Holbrook is a single carriageway with one lane in each direction and has the following traffic characteristics:

- traffic volumes to the north and south of Holbrook are similar, with the north being slightly higher;
- usage by light and heavy vehicles are similar during the weekdays, but significantly less heavy vehicles travel on the weekend;
- the majority of light vehicle traffic occurs in the afternoon, whilst heavy vehicle traffic volumes rise from a low at 4.00am to a peak around 11.00pm to midnight;
- the peak traffic time of all vehicles is between 3.00pm and 4.00pm on weekdays and weekends; and
- travel time through Holbrook in a northbound direction is approximately four minutes, whilst travel in a southbound direction is approximately six minutes.

Traffic conditions on the existing Highway through Holbrook are currently generally acceptable in the context of existing levels of service (LoS) and road capacities, as summarised in Table 7.

Table 7 – Existing Highway Traffic Performance

	Northbound Vehicles	Southbound Vehicles	Capacity Saturation	Level of Service
50th highest hourly volume	349	442	0.46	D
Weekday peak hour	193	175	0.20	B
Weekday night-time truck peak	123	124	0.18	B

50th highest hourly volume = the 50th largest hourly traffic volume recorded across the entire year, ranked from highest to lowest. This measure is often used as an upper bound for road design.

Construction Traffic

Construction of the project is expected to result in a number of impacts upon traffic and access. The Proponent aims to program construction work so that conflicts between construction works and the local and regional road networks are minimised to avoid disruptions. Nonetheless, temporary diversion of traffic will be required to facilitate construction, and traffic would be switched between the existing and newly constructed sections of the road as work progresses to facilitate the continual flow of traffic through and around Holbrook.

Construction activities would generate up to 470 light vehicle and 500 heavy vehicle trips per day on public roads. This represents an increase of 16 per cent and 22 per cent in daily traffic and weekend volume, respectively. Whilst this traffic would be perceptible, the performance of the road network would remain at an acceptable level of service.

The proposed bypass would also sever travelling stock routes in and around Holbrook, including the Wagga Wagga Road and Culcairn Road travelling stock routes, and a travelling stock route connecting two stock reserves, which are used around six times per year. In order to maintain the movement of stock during construction, the Proponent proposes to realign an existing road to provide an alternate stock route, and to relocate the Wagga Wagga Road stock route in consultation with the Hume Livestock Health and Pest Authority and any potentially affected landowners.

Operational Traffic

Generally, it is predicted that the bypass will have a range of benefits once operational by reducing travel time and congestion within Holbrook and improving road safety. The Proponent has estimated the levels of service for current and future scenarios, both with and without the project, as summarised in Table 8.

Table 8 – Operational Traffic Implications

Scenario	Without Bypass Project		With Bypass Project			
	Traffic on Existing Highway		Traffic on Existing Highway		Traffic on Bypass Route	
	Capacity Saturation	Level of Service	Capacity Saturation	Level of Service	Capacity Saturation	Level of Service
2008						
50th highest hourly volume (H_{50})	0.43	D	-	-	-	-
Weekday peak hour	0.20	B	-	-	-	-
Weekday night-time truck peak	0.18	B	-	-	-	-
2012						
50th highest hourly volume (H_{50})	0.48	D	0.22	C	0.18	A
Weekday peak hour	0.22	B	0.09	A	0.09	A
Weekday night-time truck peak	0.20	B	0.07	A	0.08	A
2022						
50th highest hourly volume (H_{50})	0.64	E	0.29	C	0.24	A
Weekday peak hour	0.29	C	0.11	B	0.11	A
Weekday night-time truck peak	0.27	C	0.10	A	0.09	A
2032						
50th highest hourly volume (H_{50})	0.89	E	0.36	D	0.32	A
Weekday peak hour	0.41	C	0.16	B	0.14	A
Weekday night-time truck peak	0.37	C	0.13	B	0.12	A

As indicated in the forecasts above, traffic volumes on the existing highway will continue to increase if the project is not implemented and would eventually reach unacceptable conditions (LoS E) during peak traffic times, including long weekends and school holidays. With the implementation of the project, the majority of traffic would travel on the bypass, with levels being maintained at acceptable levels.

The project will also benefit the community in terms of improved travel efficiencies and safety and security. It is anticipated that the project would have a lower crash rate as it is dual carriage, therefore providing adequate overtaking opportunities and limiting potential for head on collisions. It is further predicted that the reduction of traffic on the existing Hume Highway will also reduce the likelihood of crashes with reduced traffic levels and potential for conflict.

Submissions

Council requested the provision of a slip lane from the proposed service centre to the southbound lane of the bypass, and the introduction of speed limits for Wagga Wagga Road west of the bypass.

Submissions from the public raised concern regarding non vehicular access at intersections and the proposed location of the service centre as it would add to traffic congestion and creates dangerous traffic conditions.

Consideration

Construction Traffic

The Department notes that traffic generated by construction activities would utilise both local roads and the existing Highway, thus creating impacts on the existing access and the road network where travel times may consequently increase with potential delays. To mitigate construction traffic impacts, the Proponent has committed to the implementation of traffic control measures. The Department is satisfied that the proposed traffic management measures as outlined in the EA and Statement of Commitments can adequately manage construction traffic impacts of the project and minimise potential conflicts with non-project related traffic. Notwithstanding, due to the importance of the travelling stock routes and reserves to the local community, the following requirements are incorporated into the recommended conditions of approval:

- ensure affected travelling stock routes are maintained unless otherwise agreed by the LPMA and the Hume Livestock Health and Pest Authority; and
- changes to the Travelling Stock Reserves and routes shall be further developed during the detailed design of the project in consultation with affected stakeholders.

Operational Traffic
The Department is satisfied that the Proponent has undertaken a robust and comprehensive operation traffic assessment. Through this assessment, the Proponent has demonstrated that the project will maintain an appropriate level of access and will result in benefits to roads users of the proposed bypass and existing Highway by reducing congestion and generally decreasing travel times, which is consistent with the objectives of the project.

The Department considers that issues associated with operational traffic and concerns raised in the public submission have been adequately addressed as part of the Proponent's Submissions Report and Statement of Commitments, and notes that the Service Centre does not form part of this project. Specific concerns regarding road designs and similar matters raised by Council and a submission from the public would be addressed by the Proponent during the detailed design of the project in consultation with affected stakeholders.

Surface and Ground Water Impacts

Issues

Surface Water
The project is located in the Ten Mile Creek catchment, where Ten Mile Creek is the largest watercourse that flows across the existing highway to Billabong Creek, approximately 10 km to the west of Holbrook. Ten Mile Creek has a seasonal flow pattern and has a history of flooding, with the 100 year flood event causing localised flooding in the southern part of Holbrook.

Twin bridges about 120 metres in length would span Ten Mile Creek and its floodplain and culverts would be provided to convey runoff across the upgrade at the 11 other watercourses/ drainage lines crossed by the project. The project does not require the realignment or diversion of Ten Mile Creek, however, some excavation or reclamation works would be required for the temporary crossing of Ten Mile Creek and for culvert and scour protection in the drainage channels crossed by the upgrade.

The construction of structures and construction works in and close to watercourses and drainage lines has the potential to affect flow distribution, flood behaviour and localised scouring in the Ten Mile Creek catchment. However, these impacts are considered to be temporary and minor. Runoff from the construction site has the potential to concentrate flows, erode the landscape and increase siltation and sedimentation of drainage lines. The Proponent states that the temporary construction impacts would be managed through the implementation of standard construction techniques.

Flooding
Hydraulic modelling of the project indicates an increased afflux in the Ten Mile Creek floodplain for the 20 and 100 year ARI rainfall events (up to 30 millimetres and 40 millimetres, respectively). The greatest afflux would be located immediately upstream of the proposed Ten Mile Creek bridge, primarily as a result of a reduction in the conveyance area by the bridge and bridge piers. The project would not result in any additional properties subject to flood impacts in the 100 year flood event, however, potentially up to 6 properties would be affected by flooding in the 100 year event (10 millimetre increase in flood afflux).

The project is unlikely to change the duration of flood inundation and frequency of flooding, however, changes in the velocity of water flows is likely. The Proponent states the change in velocity is minor and less than 2 metres/sec and consequently the proposal does not pose a major flood risk to existing/ proposed bridges and the main channel of Ten Mile Creek. Overall, the project is not likely to change the existing flood hazard in the vicinity of Holbrook.

The Proponent would develop flood management measures with affected landowners, which may include flood proofing of structures. Drainage structures would be designed to convey flows under the upgrade and appropriate scour protection measures would be installed to protect bridge piers and abutments.

Ground Water

The project falls within the Billabong Creek groundwater management area which comprises two main aquifer systems. The upper aquifer is located within unconsolidated alluvial sediments and existing bore depths range from 1.9 to 15.2 metres below ground level. The lower aquifer is located within fractured rock (Holbrook granite) where existing bore depths are between 67.1 and 165.5 metres below ground level.

The water table in the alluvium is generally shallow, ranging from 2.74 to 8.5 metres below ground level. There is a hydraulic connectivity between the upper and lower aquifers, with recharge into the ground water system through rainfall and runoff and through the overlying creeks. Groundwater discharge is likely to occur though springs in low lying areas, the base of slopes and base flows to watercourses.

The majority of high yielding bores obtain groundwater from the alluvial sediments. An embargo currently applies to the Billabong Creek groundwater management area preventing the granting of any new high yield groundwater licences. The Proponent has identified a construction water requirement of 400 megalitres over the two year construction period. The water would be obtained from a number of sources, including reuse of sediment basin water, purchase of existing groundwater licences, use of existing surface water (e.g. local dams) and import of off-site water.

The Proponent has identified a number of potential short term groundwater impacts from construction of the project, including:

- compaction of the alluvial aquifer caused by filling, construction of structures and compaction activities. The impacts on the groundwater regime may include flow changes, localised water logging/ ponding, lowering of the water table and increase in dryland salinity;
- changes to flow rates at local springs and water levels at local bores; and
- inflow of groundwater into deep excavations.

The operation of the project may result in permanent changes to the groundwater in the vicinity of the upgrade, particularly long term impacts from aquifer compaction (described above). The Proponent states that groundwater impacts would be minimised through standard design and construction practices. The Proponent would also develop strategies to manage dryland salinity, including management of recharge areas, and monitor groundwater extraction and relocate bores/ dams to maintain a reliable water supply for landowners.

Submissions

The NSW Office of Water (NOW) did not object to the proposal but noted that a water licence may be required for groundwater works, realignment of waterways or capture of surface water in excess of Maximum Harvestable Rights and that an embargo applies to new surface water extraction. NOW supported the monitoring of groundwater to identify potential construction impacts on groundwater and suggested that a groundwater management plan be developed prior to construction commencing.

Industry and Investment NSW requested consultation on the design of watercourse crossings and the implementation of best practice sediment and erosion control measures.

Council expressed concern at the number and location of drainage structures and believed the drainage in the former Town Common area was insufficient.

One landowner raised concerns about the flow of water in a waterway through their property and the supply of water to an existing dam on the property.

Consideration

The project is predicted to have a minor increase in flood levels upstream of the Ten Mile Creek bridge in a 20 year and 100 year flood event, however, there is no change to the existing flood risk in the southern part of

Holbrook. The Proponent has committed to implement appropriate measures in consultation with affected landowners to minimise predicted flooding impacts on property and provide scour protection of the Ten Mile Creek bridge piers and abutments to minimise any impacts of increased flow velocities. The Department is satisfied the project is unlikely to significantly affect the existing flood risk in Holbrook and accordingly recommends conditions which require the Proponent to design the project to maintain existing hydrological characteristics to the greatest extent possible and to consult with landowners on the implementation of flood mitigation measures.

The Proponent has undertaken an assessment of the impact of construction of the project on watercourses and drainage lines in the Ten Mile Creek catchment that the upgrade crosses. Drainage structures such as culverts would be located and aligned to follow natural drainage lines and sized to accommodate anticipated water flows from major rainfall events. Scour protection would be provided in the vicinity of culvert discharge points to minimise bank and landscape erosion. The Department is satisfied that erosion and sediment control during the construction stage have been adequately considered and that the project is likely to have minimal impact on surface water quality.

The project has potential short term construction impacts and longer term operational impacts on groundwater in the vicinity of the upgrade. The groundwater level in the underlying alluvium sediments is shallow and a number of springs and bores would be impacted by the road corridor. The NOW has flagged potential groundwater impacts as requiring further consideration, particularly in establishing background levels, flows and quality. The Proponent has identified a number of management and mitigation measures to address potential construction and operational ground water impacts. The Department considers further investigation of groundwater impacts is required given that short and long term impacts are likely. Accordingly, it is recommended that the Proponent undertake a geotechnical investigation in consultation with NOW to assess the risk of aquifer compaction and to implement mitigation measures as required.

The Department also recommends conditions requiring that the final design of the project minimises changes to groundwater and surface water hydrology and that a Construction Soil and Water Management Plan be prepared in consultation with the DECCW, NOW and I&I NSW and include details on the management of spoil and fill, erosion and sediment discharge, and groundwater levels, quality and flow.

Non-Aboriginal Heritage

Issues

The area around Holbrook was settled in the 1830s by pastoralist with the village of Holbrook being well established by the 1860s. The Holbrook Town Common was reserved in 1876 for use by town residents to graze and water stock. By 1915 the Culcairn to Holbrook railway line was opened and a number of Travelling Stock Reserves (TSR) were created around Holbrook. The TSRs were established close to the Station to facilitate the transportation of stock.

The EA identified 6 non-Aboriginal heritage items in the vicinity of the project corridor through historical research and site inspections. These items are:

- HHI-1: Montpellier Shearer's quarters.
- HHI-3: Hereford Stud Homestead.
- HHI-4: Historic dairy and well.
- HHI-5: Potential site of old homestead.
- HHI-6: Historic artefact scatter and mound.
- HHI-7: Culcairn to Holbrook rail line.

Whilst these items are not listed as items of heritage significance in the Council's Local Environmental Plan or the State Heritage Register, the Proponent undertook a heritage assessment of the items in accordance with the NSW Heritage Council's assessment criteria. The assessment concluded the items were of local heritage significance. Items HH1, 2, 3 and 4 are located outside the construction site and potentially have heritage value by contributing to the knowledge of the settlement and establishment of pastoral uses in the Holbrook area in the late 19th/ early 20th Century. These items would be indirectly impacted by the location of the bypass in their visual landscape.

Two of the items, the historic artefact scatter and mound (HHI-6) and a section of the Culcairn to Holbrook rail line (HHI-7), will be directly impacted by the construction of the project. The artefact scatter site will be destroyed and a section of the rail line removed. The Proponent has committed to undertake an archaeological investigation/ excavation of the artefact scatter site and record and archaeologically monitor the removal of a section of the non-operational rail line. The heritage values of the indirectly impacted items will be considered as part of the landscaping and urban design of the project.

Consideration

The Department is satisfied an appropriate assessment of the heritage significance of the identified non-Aboriginal items has been undertaken. The significance of these items is related to the settlement and establishment of pastoral uses in Holbrook. The Department accepts that two of the items would be destroyed by the project, however, the Proponent has committed to manage the impacts on these items, through an archaeological investigation and salvage of the potential artefact scatter, and recording and archaeological monitoring of the removal of the rail line. The Department considers the proposed actions to be acceptable and has reinforced these management measures with recommended conditions of approval requiring excavation and archival recording be overseen by a qualified archaeologist and a methodology prepared in consultation with the Department. Additionally, should further archaeological deposits and/or State significant relics be discovered, additional assessment would be required in consultation with the Department.

Contaminated Land

Issues

The Proponent has reviewed past and present land uses of properties along the project route and undertaken site inspections to determine the potential for contamination. The review identified a number of potential sites of contamination in the surrounding rural properties and properties in Holbrook. These include: Council landfill, sewage treatment works and works depot; service station/ truck wash and concrete blocks industrial use; Hume Livestock Health and Pest Authority land and sale yards; Culcairn to Holbrook rail line; rural properties; and roads. Identified contaminants on the sites include agricultural pesticides, hydrocarbons, metals, solvents and asbestos. The Proponent has committed to undertake further investigation of the identified sites to determine the extent of contamination and determine appropriate remediation measures.

Consideration

The Department notes that none of the sites were listed on DECCW's contaminated land register and that no environment protection licences or notices apply to the sites. The sites have the potential to either be contaminated or contain contaminated material and may require soil and/ or groundwater contaminants to be removed and the site(s) remediated.

The Department considers that the potential impacts in relation to contamination should be further investigated in a Phase 2 contamination assessment to ensure that contaminants are appropriately identified and managed. The Department therefore recommends a condition requiring the Proponent to prepare a Soil Contamination Report for areas identified as having a risk of contamination, which would detail whether or not the soil is suitable for the intended land use or can be made suitable for reuse through remediation, the likely remediation strategy for addressing any contamination that has been encountered, and how the environmental and health risks will be appropriately mitigated and managed during the disturbance, remediation and removal of contaminated soil. The Proponent would be required to obtain the Director General's approval for the investigation and remediation strategy. The findings of the Report would be incorporated into the Construction Environmental Management Plan.

Visual Amenity

Issues

The landform of the project area is predominantly undulating with low lying hills dominated by cleared grazing land with scattered paddock trees. . Remnant native vegetation patches are along the ten Mile Creek riparian corridor and on the former town Common and the TSRs. The visual catchment of the project comprises six

landscape character units: northern rural (rural residential properties); former Town Common (grazing paddocks and vegetated areas); industrial landscape (industrial uses on the western edge of the town); Holbrook urban area (residential streets to the west of the existing highway); Ten Mile Creek (urban fringe landscape with small industrial and residential properties); and Southern rural (rural residential uses). The EA considered the project would have a moderate visual impact on the northern and southern landscape units and moderate to high impact on the former Town Common and Ten Mile Creek landscape units. The project was considered to have minimal visual impact on the Holbrook urban area and industrial landscape units.

Land use in the vicinity of the project is mainly agricultural, with open space (recreation), utility and facility sites, a cemetery and some isolated rural properties are also in the vicinity. The introduction of a highway into the rural to semi-rural/ urban environment would result in some changes to the landscape character, with works such as the removal of vegetation and construction of bridges and interchanges. The Proponent has identified that the project could potentially have a high visual impact on 11 of the 20 identified viewpoints, and a moderate, or moderate to high visual impact on seven viewpoints.

The Proponent has developed an urban and landscape design strategy to mitigate visual and landscape character impacts. The main features of the strategy are illustrated in Figure 4. The strategy maintains the existing open rural views from the northern approach to the bypass. The southern interchange and Wagga Wagga Road interchange will act as gateways to Holbrook with feature street tree planting and signage. At the southern end of the bypass exotic tree species will be planted to create an avenue approach to Holbrook. Landscape planting will be provided to screen houses in the western part of Holbrook. In the former Town Common dense landscaping to supplement the existing vegetation will be provided.

Submissions

The Council requested consideration be given to the aesthetic design of noise walls and bridge structures to reduce bulk, that public art be incorporated into the design of noise walls and landscaping be easily maintained and appropriate to the climatic conditions of Holbrook.

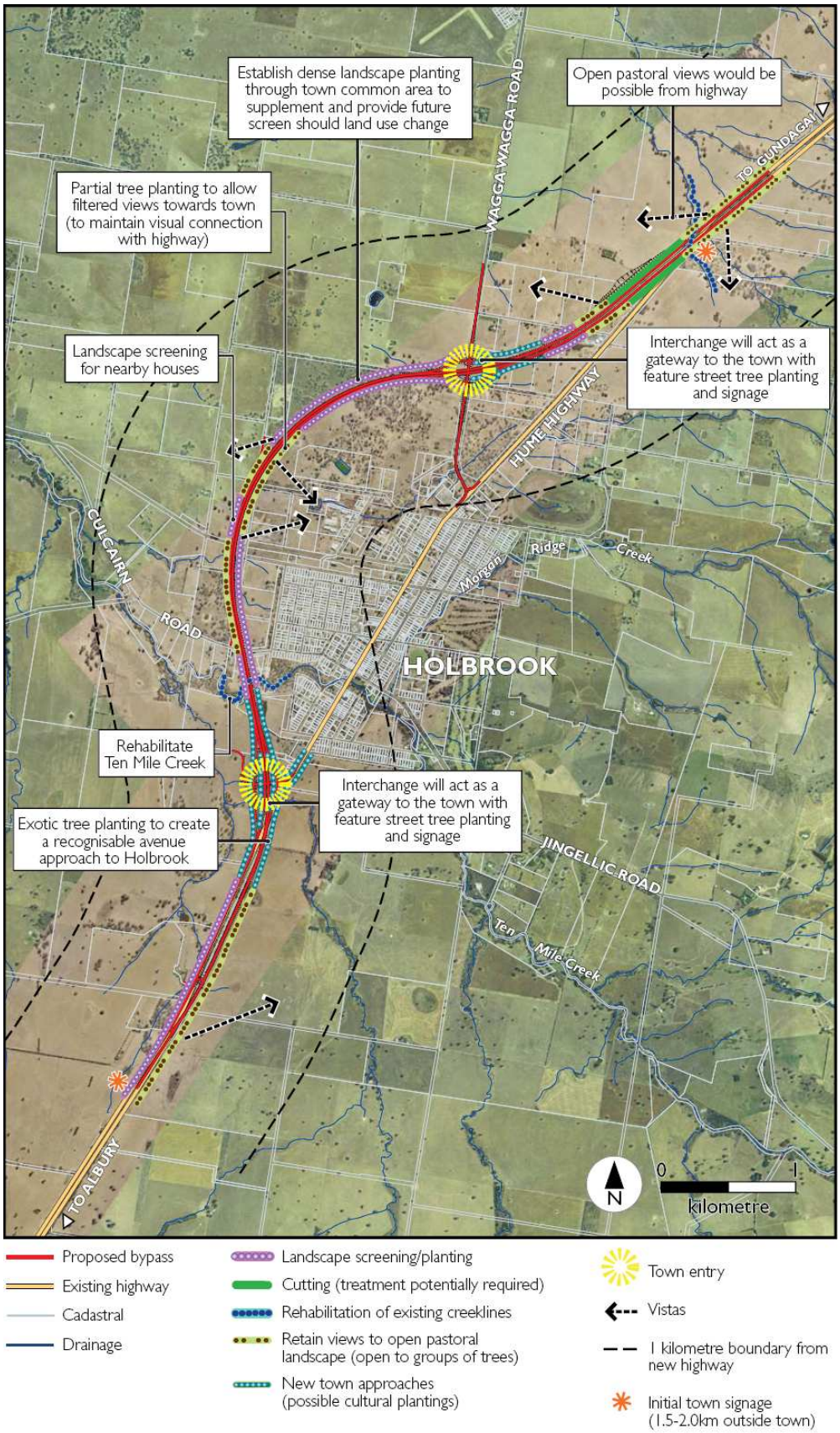
Consideration

Apart from the concept design of the urban and landscape strategy the EA provides little detail of the consideration of visual amenity and landscape design. The project corridor is characterised by relatively flat and cleared land, consequently the construction of the upgrade in this landscape, including bridges and embankments over local roads and Ten Mile Creek introduces a substantial visual barrier, which will require careful management. Consequently the Department has recommended a condition which requires the Proponent to prepare and implement an Urban Design and Landscape Plan for the project. The Plan would need to consider:

- location of existing and proposed vegetation;
- treatment of features such as noise walls, bridges, safety screens, fencing and signage;
- visual treatment and responses to the landscape units and heritage items; and
- monitoring and maintenance procedures.

The Plan would be developed in consultation with the Council and community and approved by the Director General.

Figure 4 – Urban and Landscape Design Concept



6. CONCLUSIONS AND RECOMMENDATIONS

Following a detailed assessment of the Environmental Assessment, Submissions Report and the submissions received during the exhibition period for the project, the Department is satisfied that the project is justified and its impacts are acceptable.

The project will finalise the duplication and carriage separation of the Hume Highway and will enhance the efficiency of the Highway, which is a key interstate road passenger and freight corridor within the national transport network. The importance of this corridor is expected to continue over the next 20 years, in conjunction with the expected growth in alternative modes of transport, with approximately 5,000 to 6,000 heavy vehicles forecasted to use the Hume Highway per day by 2025. The project will also remove the inherent safety risks associated with the existing highway and improve the safety environment on the highway and within Holbrook. The project will also assist in achieving the *NSW State Plan* priorities, in particular, the transport priorities, as the project would improve the efficiency of the road network, maintain the road infrastructure and improve safety.

As reported there will be a range of ecological, noise and socio-economic impacts. Of particular note are flora and fauna impacts, including the clearance of significant remnants of endangered ecological communities. The Department accepts that this impact is unavoidable and that the extent of the impact has been minimised as much as reasonably possible through the proposed project alignments. The Department is confident that the corridor specific measures and the proposed biodiversity offset package will ensure that predicted impacts are appropriately minimised to acceptable levels, and that the required ongoing monitoring shall ensure that the ecological objectives of the corridor specific and wider offset measures are achieved.

Traffic noise impacts on the local community are already significant. The project will alleviate some of this operational noise by taking traffic away from the town centre and diverting it to the west, although it is acknowledged that there a number of receivers that would receive an increase in noise as a result of the project. Notwithstanding, the Department considers that the noise impacts have been minimised wherever possible through the proposed road design and that the recommended conditions of approval, which require the Proponent to consider the implementation of reasonable and feasible mitigation measures, traffic noise impacts on residences will be further reduced.

The economic impact of the project will result in direct and indirect impacts on the Holbrook economy, particularly to highway related businesses such as accommodation, retail and food businesses. To ensure that these impacts are comprehensively addressed by the Proponent, the Department has recommended that the Proponent negotiate with Greater Hume Shire Council on the implementation of measures to encourage the continued viability of Holbrook.

The recommended conditions of approval for the project also provide for the mitigation and management of other impacts associated with the project during the detailed design, construction and operational phases of the project, such as heritage and hydrology. The Department believes that these requirements provide for the implementation of best management practices during all phases of the project, and will ensure that the construction and operation impacts of the project on the surrounding environment are managed to acceptable levels and that the amenity of local residents is protected.

Consequently, the Department considers that the proposal is in the public interest and recommends that the Minister approve the Holbrook Bypass project, subject to the recommended conditions of approval.

Marcus Ray
A/Deputy Director General

Sam Haddad
Director General

APPENDIX A – RECOMMENDED CONDITIONS OF APPROVAL

APPENDIX B – STATEMENT OF COMMITMENTS

Note: copy in CD attached to Appendix C

APPENDIX C – RESPONSE TO SUBMISSIONS

Note: copy in attached CD.

APPENDIX D – ENVIRONMENTAL ASSESSMENT

Note: copy in attached CD.