8. Conclusion

This section provides the justification for the proposal taking into account its biophysical, social and economic impacts, the suitability of the site and whether or not the proposal is in the public interest. The proposal is also considered in the context of the objectives of the EP&A Act, including the principles of ecologically sustainable development as defined in Schedule 2 of the Environmental Planning and Assessment Regulation 2000.

8.1 Justification

8.1.1 Social factors

As outlined in Section 6.10, the proposal would have some negative social impacts during the construction phase of the proposal. These would include:

- Disruptions for motorists and road users during construction due to temporary changes to road conditions, reductions in speed limits, temporary traffic lane closures and temporary diversions and access changes. These changes have potential to result in longer traffic delays and disruptions, and increased road safety risks for motorists using the Great Western Highway, including freight operators.
- The intensification of road infrastructure and the clearing of vegetation from bushland areas, rural properties and the road reserve impacting on the rural character and visual amenity from locations within the proposal area
- Some rural and rural residential properties at Hartley are likely to experience impacts on residential amenity due to the construction of multiple proposal stages. This would mainly affect occupants of properties at the eastern end of the River Lett to Forty Bends phase of the proposal, which may experience noise, dust and traffic impacts from construction activities for both the Little Hartley to River Lett and River Lett to Forty Bends stages of the proposal.
- Temporary changes to local amenity for occupants of residential and commercial properties, and users of community facilities near to construction works. These temporary changes would possibly impact on individuals' use and enjoyment of these properties, particularly within outdoor areas
- Temporary noise and light spill from night works, potentially impacting night-time amenity at residential properties closest to these works and impacts on health and wellbeing due to sleep disturbance or disruptions to sleeping patterns
- Dust from construction activities, resulting in possible effects on the health and wellbeing of some people near to construction works who may be more sensitive to changes in air quality.

It is also likely that some residents, business owners and employees in the study area facing changes associated with property acquisition may experience a level of stress and anxiety about these changes, potentially affecting the health and wellbeing of some individuals. These impacts are likely to already be occurring in the study area given the investigations for the proposal and delivery of safety upgrades have been occurring over several years. Transport has commenced consulting with affected property owners and has already purchased numerous properties directly impacted by the proposal. It is expected that this has provided a level of certainty about the proposal for some property owners.

Further, mitigation measures as detailed in Section 6 and Section 7 of this REF would be implemented to minimise adverse impacts due to the proposal.

Once operational, the proposal would have long term positive impacts on access and connectivity for local and regional communities, business, and industry. Specifically, the proposal would support quicker, more reliable and safer regional connections and links to and from destinations within the study area,

surrounding Blue Mountains, Lithgow and Central West and Orana regions, and greater Sydney. Access changes during operation to properties and local destinations such as Little Hartley village and Hartley Historic village would generally be localised to individual stages of the proposal. Locally, changes to the alignment of the highway, new access roads and widening of the existing highway has potential to intensify road infrastructure at some locations and move the alignment closer to residential uses. Traffic noise from the proposal has potential to impact on amenity for residents, including during the evening and night-time given the relatively low existing noise environment.

Reduction of through traffic, including heavy vehicles within the Little Hartley village would support safer access and enhanced amenity for residents and businesses within the village. The separation of local traffic and through traffic would also support safer access to properties and destinations in the study area, although this may require increased travel for motorists accessing some locations.

8.1.2 Biophysical factors

Throughout the options development process for the proposal, an important consideration has been to minimise potential impacts on biodiversity and particularly the removal of native vegetation. The result of the optioneering process means that only 75.19 hectares of the 267 hectares impacted by the proposal comprises native vegetation. Impacts to this native vegetation would further be reduced through the implementation of mitigation measures including minimising vegetation clearing where feasible and reasonable.

The proposal would result in the removal of approximately 75.19 hectares of native vegetation including the following protected plant community types:

- Around 17.59 hectares of Tablelands Basalt Forest in the Sydney Basin and South Eastern Highlands Bioregion, listed as Endangered under the BC Act
- Around 5.82 hectares of White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions, listed as Critically Endangered under the BC Act
- 3.6 hectares is consistent with White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland, listed as Critically Endangered under the EPBC Act.

These plant community types could potentially serve as habitat for threatened fauna species.

Mortality and injury of terrestrial fauna species could potentially occur, including potential mortality and injury of threatened fauna species. This occurrence would be minimised through pre-clearing procedures during construction and installation of fauna fencing during operation.

Construction of the proposal would require the removal of a series of culvert structures. These structures have the potential to be used for roosting by cave roosting threatened microbat species. Potential impacts are considered to be minor and not likely to reduce the persistence of local or bioregional populations as habitat to be impacted is unlikely to be important to any of the species for breeding

The realignment and upgrade of the Great Western Highway would increase habitat fragmentation (ie would widen an existing gap in otherwise continuous fauna habitat), which could create a further barrier to fauna movement between habitat to the north and south of the Great Western Highway.

The proposal is expected to result in only localised changes to flood behaviour at River Lett within the banks of the river with no flood impacts outside of the creek banks and impacts dissipating within a short distance downstream. Flood impacts at Rosedale Creek are expected to affect some previously flood-affected pastureland. Flood levels would increase by approximately 100 millimetres at the upstream end of

the main culvert which is proposed to be extended at its downstream end. The flood extent would not be increased in practical terms because the terrain is relatively steep.

The proposal would require excavation, removal of vegetation, disturbance of soil and the construction of road surfaces and drains, which may lead to exposed soils, sediment entering waterways and the degradation of water quality.

The proposal has some long-term negative biophysical impacts that would be managed through implementation of the mitigation measures proposed in Section 7.1. However, these impacts of the proposal would be outweighed by the long-term benefits once the proposal is operational through improvements to the transport network in and around the proposal area.

8.1.3 Economic factors

Locally, the proposal would improve road safety and accessibility, including through reduced congestion, travel time savings and improved travel reliability for staff, customers and deliveries. This would impact positively on businesses, supporting general improvements to local business and industry within the study area and surrounding suburbs.

The proposal will contribute to the NSW Future Transport Strategy 2056 state-wide outcome for a strong economy. The proposal supports this outcome by enabling growth in economic activity, including the movement of freight

As outlined in Section 3.2.1 the proposal will require a workforce of up to 200 people over a 3-year period. The Great Western Highway Upgrade Environment and Sustainability Policy presented in Section 6.15 summarises that local employment and skills development are a key point of the policy. This includes increasing local employment, adopting Infrastructure Skills Legacy Program or similar outcomes and embracing Aboriginal Participation in Construction (APIC) Policy targets.

8.1.4 Public interest

The public interest is best served through the equitable distribution of resources, and investment in public infrastructure that fulfils the need of the majority. The proposal represents a cost-efficient investment in public infrastructure that would maximise the long-term social and economic benefits, while minimising the long-term negative impacts on communities and the environment. By improving local and regional transport facilities, the proposal would better enable movement of people, goods and services.

The proposal would result in some short-term impacts on amenity, accessibility and transport efficiency during construction. In addition, the clearing of approximately 75.19 hectares of native vegetation would be required to construct the proposal. Mitigation measures would be implemented to manage and reduce these impacts.

There are a number of Commonwealth and State strategic plans that specifically aim to improve safety and efficiency of the road network. The proposal is consistent with these plans including the State Infrastructure Strategy and the Future Transport Strategy among others.

8.2 Objects of the EP&A Act

Object	Comment
1.3(a) To promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State's natural and other resources.	Development of the proposal has considered potential impacts to all environmental resources, including air, water, land and biodiversity, that may be affected by the development of the proposal. Wherever possible, the design of the proposal has avoided and minimised impacts and safeguards have been developed to further reduce and mitigate impacts on the environment. The proposal will contribute to a broader program of works on the Great Wester Highway thereby continuing traffic safety and efficiency improvements which are promoting social and economic welfare of the community.
1.3(b) To facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment.	The principles of ecologically sustainable development, being the precautionary principle, intergenerational equity, conservation of biological diversity and ecological integrity and improved valuation, pricing and incentive mechanisms have been considered for the proposal in Section 8.2.1. The consideration of these principles has found that ecologically sustainable development had been facilitated throughout the design of the proposal and the safeguards developed in this REF.
1.3(c) To promote the orderly and economic use and development of land.	The proposal would form an important element in the upgrade of the Great Western Highway throughout the Blue Mountains in NSW. It would assist in the coordination of the orderly economic use and development of land for the region and along this significant freight transport corridor.
1.3(d) To promote the delivery and maintenance of affordable housing.	Not relevant to the proposal.
1.3(e) To protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats.	The proposal would result in the removal of approximately 75.19 hectares of native vegetation including the following protected plant community types: • Around 17.59 hectares of Tablelands Basalt Forest in the Sydney Basin and South Eastern Highlands Bioregion, listed as Endangered under the BC Act • Around 5.82 hectares of White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions, listed as Critically Endangered under the BC Act

Object	Comment
	• 3.6 hectares is consistent with White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland, listed as Critically Endangered under the EPBC Act. These plant community types could potentially serve as habitat for threatened fauna species. Mortality and injury of terrestrial fauna species could potentially occur, including potential mortality and injury of threatened fauna species. This occurrence would be minimised through pre-clearing procedures during construction and installation of fauna fencing during operation. Construction of the proposal would require the removal of a series of culvert structures. These structures have the potential to be used for roosting by cave roosting threatened microbat species. Potential impacts are considered to be minor and not likely to reduce the persistence of local or bioregional populations as habitat to be impacted is unlikely to be important to any of the species for breeding The realignment and upgrade of the Great Western Highway would increase habitat fragmentation (ie would widen an existing gap in otherwise continuous fauna habitat), which could create a further barrier to fauna movement between habitat to the north and south of the Great Western Highway.
1.3(f) To promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage).	An assessment of potential impacts to Aboriginal heritage and non-Aboriginal heritage is provided in Section 6.4 and Section 6.5 respectively. The assessment includes measures to avoid or mitigate impacts due to the proposal to promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage).
1.3(g) To promote good design and amenity of the built environment.	An urban design, landscape character and visual impact assessment has been prepared for the proposal which outlines the urban design and landscape strategy for the proposal. The strategy aims to facilitate an integrated urban design and engineering design outcome for the proposal.
1.3(h) To promote the proper construction and maintenance of buildings, including the protection of the health and safety of their occupants.	Not relevant to this proposal
1.3(i) To promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the State.	Not relevant to the proposal.

Object	Comment
1.3(j) To provide increased opportunity for community participation in environmental planning and assessment.	Consultation with the community and relevant government agencies was carried out during the development of the proposal. There would be further opportunities for the public to comment on the proposal during the exhibition of the REF. Details on this consultation can be found in Section 5.

8.2.1 Ecologically sustainable development

Ecologically sustainable development (ESD) is development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends. The principles of ESD have been an integral consideration throughout the development of the proposal.

ESD requires the effective integration of economic and environmental considerations in decision-making processes. The four main principles supporting the achievement of ESD are discussed below.

The precautionary principle

This principle states: "*if there are threats of serious or irreversible damage, lack of scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation*".

Evaluation and assessment of alternatives and options have aimed to reduce the risk of serious and irreversible impacts on the environment. Stakeholder consultation considered issues raised by stakeholders and a range of specialist studies were carried out for key issues to provide accurate and impartial information to assist in the evaluation of options.

The concept design has sought to minimise impacts on the amenity of the study area while maintaining engineering feasibility and safety for all road users. A number of safeguards are proposed to minimise potential impacts. These safeguards would be implemented during construction and operation of the proposal. No safeguards have been postponed out of any lack of scientific certainty.

A CEMP would be prepared before construction starts. This requirement would ensure the proposal achieves a high level of environmental performance. No mitigation measures or management mechanisms would be postponed because of a lack of information.

Intergenerational equity

The principle states: "*the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations*".

The proposal would not result in any impacts that are likely to adversely impact on the health, diversity or productivity of the environment for future generations.

The proposal would cater for future population and traffic growth in the region. The proposal would benefit future generations by improving safety and helping to address the future increases in traffic volumes and traffic congestion associated with movement of traffic along Great Western Highway. While the proposal would have some adverse impacts, they are not considered to be of a nature or extent that would result in disadvantage to any specific section of the community or to future generations.

Should the proposal not proceed, the principle of intergenerational equity may be compromised, as future generations would experience an increase in travel time on Great Western Highway by about four per cent in 2036. Without the proposal, travel times and intersection level of service would deteriorate to unacceptable levels. Traffic modelling of future year periods indicate that the proposed upgrade would

provide a safer, reliable and more efficient road corridor on the Great Western Highway between Little Hartley and Lithgow.

Conservation of biological diversity and ecological integrity

This principle states: "*the diversity of genes, species, populations and communities, as well as the ecosystems and habitats to which they belong, must be maintained and improved to ensure their survival*".

The principle of conservation of biological diversity and ecological integrity requires the maintenance and improvement of genes, specie, populations and communities, as well as the ecosystems and habitats to which they belong, to ensure their survival. A thorough assessment of the existing local environment was undertaken to identify and manage any potential impacts of the proposal on local biodiversity (refer to Section 6.1 Biodiversity).

The proposal would result in the removal of approximately 75.19 hectares of native vegetation including the following protected plant community types:

- Around 17.59 hectares of Tablelands Basalt Forest in the Sydney Basin and South Eastern Highlands Bioregion, listed as Endangered under the BC Act
- Around 5.82 hectares of White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions, listed as Critically Endangered under the BC Act
- 3.6 hectares is consistent with White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland, listed as Critically Endangered under the EPBC Act.

These plant community types could potentially serve as habitat for threatened fauna species including the Large-eared Pied Bat (*Chalinolobus dwyeri*), Purple Copper Butterfly (*Paralucia spinifera*), Greater Glider (*Petauroides volans*) and Squirrel Glider (*Petaurus norfolkensis*).

As the proposal would require the removal of native vegetation and potential fauna habitat from the subject land, Transport are required to offset these impacts on biodiversity. The offsets required for the proposal were calculated using the BAM calculator. A total of 2,195 ecosystem credits and 3,227* species credits are required to offset the direct impacts of the proposal. An additional number* of ecosystem credits may be required to offset indirect impacts; these would be in addition to BAM credit obligations and are at the discretion of the Minister for Planning and Public Spaces.

The proposed culvert extension works and scour protection would potentially impact instream habitat of several creeks mapped as Key Fish Habitat. Under the 'Policy and guidelines for fish habitat conservation and management' (NSW DPI, 2013) this would require offsetting. Final offset calculations will be carried out following further design development.

The species credit offset requirement and credits to offset indirect impacts from the proposal will be updated upon completion of remaining surveys.

Improved valuation, pricing and incentive mechanisms

This principle is defined as:

improved valuation, pricing and incentive mechanisms, namely, that environmental factors should be included in the valuation of assets and services, such as:

(i) polluter pays, that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement,

(ii) the users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste,

(iii) environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structures, including market mechanisms, that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems.

This REF has examined the environmental consequences of the proposal and identified mitigation measures to manage the potential for adverse impacts. The requirement to implement these mitigation measures would result in an economic cost to Transport and would increase the capital and operating costs of the proposal. The costs of the generation and management of waste and pollution would be captured in any waste disposal charges for construction activities. This signifies that environmental resources have been given appropriate valuation.

The concept design has been developed with an objective of minimising potential impacts on the surrounding environment. This indicates that the proposal is being developed with an environmental objective in mind.

8.3 Conclusion

The proposed upgrade of the Great Western Highway between Little Hartley and Lithgow is subject to assessment under Division 5.1 of the EP&A Act. The REF has examined and taken into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the proposed activity.

This has included consideration (where relevant) of conservation agreements and plans of management under the NPW Act, biodiversity stewardship sites under the BC Act, wilderness areas, areas of outstanding value, impacts on threatened species and ecological communities and their habitats and other protected fauna and native plants. It has also considered potential impacts to matters of national environmental significance listed under the Federal EPBC Act.

Transport has commenced the revocation process with National Parks and Wildlife Service for a portion of land reserved as National Park. Transport intends to exclude from its determination any works requiring revocation until such time that a decision has occurred, via an Act of Parliament.

A number of potential environmental impacts from the proposal have been avoided or reduced during the concept design development and options assessment. The proposal as described in the REF best meets the proposal objectives but would still result in some impacts including construction noise and vibration, changes to access and traffic delays during construction, land acquisition and property adjustments, visual and landscape changes, loss of around 75.19 hectares of native vegetation and non-Aboriginal heritage impacts. Safeguards and management measures as detailed in this REF would ameliorate or minimise these expected impacts. The proposal would form part of the broader Greater Western Highway Upgrade program that aims to reduce congestion and deliver safer, more efficient and reliable journeys for those travelling in, around and through the Blue Mountains, while also better connecting communities in the Central West. Provision of dual carriageway would provide travel time savings in 2036 of around 10 minutes between Katoomba and Lithgow. In addition, the proposal is predicted to reduce the number of crashes on the Great Western Highway from 89 to 39 over a six year period. On balance the proposal is considered justified and the following conclusions are made.

Significance of impact under NSW legislation

The proposal would be unlikely to cause a significant impact on the environment. Therefore it is not necessary for an environmental impact statement to be prepared and approval to be sought from the Minister for Planning and Public Spaces under Division 5.2 of the EP&A Act. A Biodiversity Development

Assessment Report is required and has been prepared for the proposal. The proposal is subject to assessment under Division 5.1 of the EP&A Act. Consent from Council is not required.

The NorBE assessment for the proposal shows that the proposal is likely to have a positive effect on surface water quality and a neutral impact on groundwater quality. The annual average pollutant loads for the upgraded road conditions with the proposed water quality controls are anticipated to provide between 6 and 68 per cent improvement on existing surface water conditions. These results demonstrate compliance with the NorBE requirements.

Significance of impact under Australian legislation

The proposal is not likely to have a significant impact on matters of national environmental significance or the environment of Commonwealth land within the meaning of the *Environment Protection and Biodiversity Conservation Act 1999*. A referral to the Australian Department of Agriculture, Water and the Environment is not required.

This REF has been prepared to meet the requirements of the EPBC Act strategic assessment approval for Transport Division 5.1 road activities. A referral to the Australian Department of Agriculture, Water and the Environment is not required.