

Eton Range Realignment Project

EPBC Ref: 2015/7552 Preliminary Documentation Main Report

December 2015

Proponent and Proposed Action

EPBC Ref	2015/7552
Proponent	Department of Transport and Main Roads
District	Mackay/Whitsunday
Branch & Division	Program Delivery and Operations
ABN	39 407 690 291
Project	Eton Range Realignment Project
Proposed Action	The Department of Transport and Main Roads proposes to realign the Peak Downs Highway at the Eton Range between Mackay and Nebo, QLD
Date Prepared	December 2015

Declaration of Accuracy

In making this declaration, I am aware that section 491 of the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) makes it an offence in certain circumstances to knowingly provide false or misleading information or documents to specified persons who are known to be performing a duty or carrying out a function under the EPBC Act or the Environment Protection and Biodiversity Conservation Regulations 2000 (Cth). The offence is punishable on conviction by imprisonment of a fine, or both. I am authorised to bind the approval holder to this declaration and that I have no knowledge of that authorisation being revoked at the time of making this declaration.

Signed:

Full name:


Patrick Aprile

District Director

Organisation: Department of Transport and Main Roads

Date:

01/12/15.

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Glossary

Term	Description
DAF	Department of Agriculture and Fisheries
DoE	Commonwealth Department of the Environment
DNPSR	Department of National Parks, Sports and Racing
DNRM	Department of Natural Resources and Mines
DSD	Department of State Development
EHP	Department of Environment and Heritage Protection
EMP(C)	Environmental Management Plan (Construction)
EPBC Act 1999	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
ERRP	Eton Range Realignment Project
FMP	Fauna Management Plan - Koala
GED	General environmental duty
IECA Manual	Erosion Control Association (IECA) Best Practice Sediment and Erosion Manual
MNES	Matter of National Environmental Significance
PESCP	Progressive Erosion and Sediment Control Plan
RFI	Request for Additional Information
RIA	Residual Impact Assessment and Offsets Proposal
SMP	Species Management Program
TMR	Department of Transport and Main Roads

1. Introduction

1.1 Project Overview

The proposed action is the realignment of a section of the Peak Downs Highway through Spencer's Gap on the Eton Range (the 'Eton Range crossing'), located between Mackay and Nebo. The Eton Range crossing has tight curves and a very steep grade (maximum 11%), rising 130 m in a little less than 1.5 km, and has been the subject of significant adverse media coverage in relation to road safety and heavy vehicle traction and trafficability issues. During the period of 1998 to 2007 there were five fatalities on the crossing which included three heavy vehicle drivers. Representatives of local heavy vehicle transport operators have been very vocal in communications with The Department of Transport and Main Roads (TMR), political representatives and the media that the Eton Range crossing urgently needs upgrading.

The 'Project area' in this Report is defined as the area within the resumption boundary that is required to accommodate the Eton Range Realignment Project (the 'Project'). The Project involves the construction of two dual lane carriageways, split carriageways, and general road construction for a 3.756 km stretch of the Eton Range crossing.

The works will involve major earthworks with geotechnically designed embankments over 30 m high and excavation to existing cut faces and current natural surface over 15 m. The Project will contain all the normal elements of a road construction project including vegetation clearing, drainage, earthworks, placement of pavement, road furnishing, etc.

Specific details are provided below:

- Sequential clearing of vegetation and ground preparation works along the alignment to accommodate construction activities.
- Installation of temporary erosion and sediment controls in accordance with the Erosion and Sediment Control Plan;
- Installation of drainage infrastructure including 15 new drainage culverts ranging in size from 1/600RCP to 3/2100RCP, as well as a culvert specifically for use as a fauna passage;
- General bulk earthworks which include approximately 400,000m³ of road excavation and 280,000 m² of road embankment;
- Installation of complex longitudinal drainage systems in the centre median ranging in size from 1/450 RCP to 1/1500RCP, approximately 1 km long, with numerous branch pits and grated inlet pits;
- Excavation and concrete lining of an elaborate surface catch and batter drainage system to intercept and direct overland flow to controlled outlet points, over 3200 m³ of reinforced concrete;
- Rehabilitation of approximately 950 m of existing roadway;
- Placement of 30,000m³ of plant mixed pavement material and 15,000 tonnes of DG14 & DG20 asphalt;
- Spraying over 220,000 litres of bituminous primes, primerseals and seals;
- Installation of an elaborate barrier system which includes w-beam, thrie-beam and concrete barriers and other road furniture including road signs; and
- 6.4 hectares of landscaping and revegetation works, with approximately 4.0 hectares of 1:1 slope to stabilise and vegetate.

Ancillary activities that will be required during construction of the Project include:

- Establishment of site offices;
- Clearing and stripping of access tracks;
- Establishment of stockpile and spoil areas;
- Establishment of laydown areas for construction materials;
- Crushing and screening of material sourced on site;

- Sourcing suitable construction materials; and
- Sourcing water for construction activities.

Post construction activities are likely to include:

- Landscaping and revegetation area maintenance and weed maintenance;
- Road maintenance, including drainage and pavement; and
- Construction site decommissioning.

The Project is expected to take between two to three years to complete.



Figure 1: Proposed Project Schematic

Approximately 12.728 ha of vegetation was previously removed for the Project. This was undertaken to accommodate survey, geotechnical works, access, and trial embankment works undertaken in 2014 and 2015. This trial area was subject to significant previous disturbance from the installation of Telstra and Ergon infrastructure, geotechnical investigations and survey. A Significant Impact Assessment for the Koala was carried out in December 2013 (EcoSM, 2013) which identified that the Project was unlikely to have a significant impact on any Matters of National Environmental Significance (MNES). Due the publication of the 'EPBC Act referral guidelines for the Vulnerable Koala' in late 2014, an additional environment assessment was conducted by TMR, and the decision was made to refer the Project for consideration.

The previously cleared areas have been included within the Project area described within this document. Further information is provided in Attachment 1 Fauna Management Plan – Koala (FMP).

1.2 Environment Protection and Biodiversity Conservation Act Referral

TMR submitted a referral to the Commonwealth Department of the Environment (DoE) for impacts on matters of national environmental significance (MNES) under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) on 27 August 2015 for the Project.

A decision on the assessment of the referral was delivered by the DoE on 28 September 2015 which determined the Project (the proposed action) to be a 'controlled action' due to the likelihood of significant impacts on MNES protected under Section 18 and 18A, Part 3 of the EPBC Act. These two sections relate to actions with significant impact on listed threatened species, specifically for the Project, this refers to the Koala (*Phascolarctos cinereus*). The determination required the proposed action to be assessed by the submission of preliminary documentation. A request for additional information (RFI) outlining the documentation to be submitted to the DoE for assessment was provided on 21 October 2015 (refer to Appendix A for a copy of the RFI).

1.2.1 Public Consultation Period

In accordance with Section 95A(3) of the EPBC Act, interested persons and organisations were invited to comment on the Preliminary Documentation in writing between 22 December 2015 and 21 January 2016. No public submissions relating to the Preliminary Documentation were received by TMR during this period.

2. Preliminary Documentation

2.1 General

This report serves to provide the necessary preliminary documentation requested by the DoE in their RFI. Where appropriate individual documents are provided as separate attachments as outlined in Table 1 below:

Table 1: Summary of report structure

RFI Reference	Document	Location in Report
Item 1	Description of the Environment and Matters of National Environmental Significance , including additional mapping, information on scientific reliability, and an assessment of the adequacy of undertaken surveys.	Section 2.2, Attachment 1 and Attachment 2
Item 2	Relevant Impacts , including an assessment, discussion and conclusion of all potential impacts that may occur as a result of the Project	Section 2.3 and Attachment 1
Item 3	Proposed Avoidance, Management and Mitigation Measures , including a revised Fauna Management Plan (Koala) and information regarding the consideration of fauna sensitive design on the Project	Section 2.4 and Attachment 1
Item 4	Proposed Offsets , including a Residual Impact Assessment and Offset Proposal	Section 2.5 and Attachment 2
Item 6	Social and Economic	Section 2.6
Item 7	Ecologically Sustainable Development	Section 2.7

Where appropriate the documents have been prepared with reference to the following guidelines as required by the DoE:

1. DoE (2014). *Environmental Management Plan Guidelines*, Department of Environment, Canberra.
2. DoE (2015). EPBC Act Environmental Offsets Policy, Department of Environment, Canberra.
3. DoE (1992). National Strategy for Ecologically Sustainable Development, Department of Environment, Canberra.

2.2 Item 1 – Description of Environment and Matters of National Environmental Significance

The following information addresses Item 1.1 in DoE's RFI.

2.2.1 Koala Habitat and Mapping

A detailed analysis of Koala habitat, areas of disturbance and relevant mapping for the Project is presented in Attachment 1 Fauna Management Plan – Koala (FMP), and Attachment 2 Residual Impact Assessment and Offset Proposal (RIA), prepared as part of the Preliminary Documentation to be assessed by DoE.

2.2.2 Previous Investigations – Adequacy of Data

The Project has been surveyed in detail for its general ecological values over an extended period of time. The two most recent surveys completed by EcoSM (2013) and SMEC (2015) have either focused specifically on the Koala or have incorporated targeted survey elements aimed at the Koala.

The data collected shows that a resident Koala population is present in and around the Project area. Data collected to date suggests that Koalas tend to favour the topographically flatter areas at the southern end of the Project area.

In general the abundance and distribution of the Koala in the Eton Range area and the Central Queensland coastal area generally is not well understood (McAlpine et al, 2015). This is illustrated in Figure 2 which shows the estimated current status of Australian koala populations based on the current scientific knowledge of these populations. This figure shows the Central Queensland coastal region (which encompasses the Project) as being one of only two areas which are represented with a question mark, indicating that there is insufficient scientific knowledge to accurately estimate population status in this area.

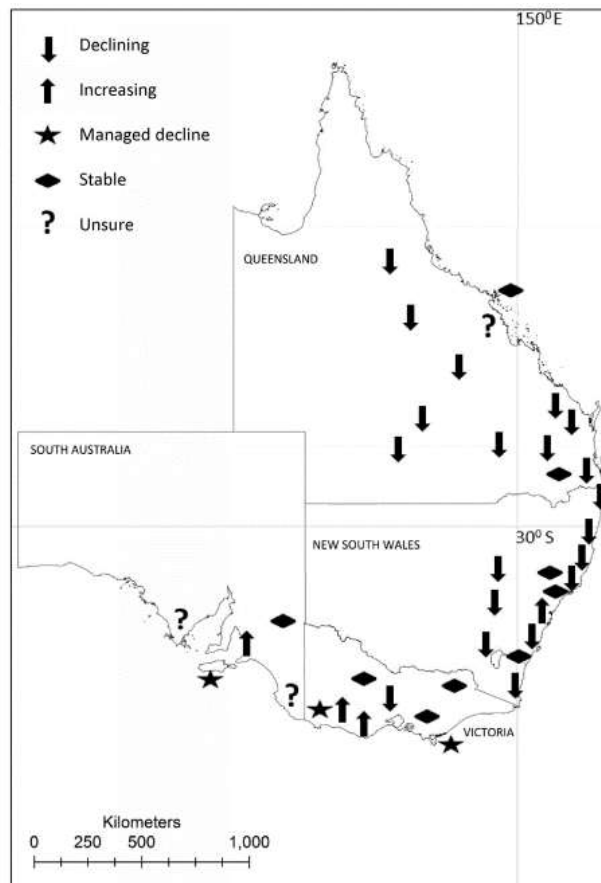


Figure 2: Estimated status of Australian Koala populations (McAlpine et.al, 2015)

2.2.2.1 EcoSM, 2009 (Ecological Assessment Report)

This investigation focused primarily on a detailed flora assessment and a habitat level assessment of the area values for a range of threatened fauna. The fauna species identified as having potential to occur in the area were identified via a desktop assessment. A modified BioCondition assessment based on the methods developed by Eyre et.al (2008) was also conducted.

This assessment pre-dated the Federal listing of the Koala and as the survey area was outside SE Qld where Koala was listed as Vulnerable, Koala were not considered in the assessment of threatened fauna species. Therefore this assessment does not contribute directly to the understanding of Koala in the survey area. However, the habitat and BioCondition assessments provide useful background data regarding the general quality of habitat in the vicinity of the Project.

2.2.2.2 EcoSM, 2011 (Flora and Fauna Assessment Memo)

This assessment was primarily an assessment of potential route options being developed as part of the road planning and design process. The techniques and scope of the study largely replicated the 2009 investigation. Koala presence and habitat were not a specific focus of the assessment and no data directly relating to Koala was collected. However, the habitat quality data collected again provides useful back ground on the general quality of habitat in the area and its potential to support Koala.

2.2.2.3 EcoSM, 2013 (Fauna Assessment Report)

This assessment involved:

- Review of existing information such as existing field-validated regional ecosystem (RE) mapping and previous assessments, aerial photography and relevant database searches such as Queensland Museum, Wildlife Online and the EPBC Protected Matters Search Tool;
- Completion of a four (4) day fauna assessment to assess quality of habitats and apply targeted survey techniques aimed at identifying significant fauna species;
- Identification of potential breeding places, such as bird nests, hollow bearing trees and caves within the Project area;
- Preparation of a significance assessment for EPBC Act listed fauna species known or considered likely to occur in the Project area;
- Completion of a one (1) day vegetation mapping exercise to capture REs in the expanded Project area and map additional locations of significant species known to occur in the area; and
- Utilisation of a Modified BioCondition Assessment to determine the generic habitat quality of the Project area.

Targeted line transects were conducted in the Project area to provide information in relation to the use of the Project area by Koalas. The methodology employed for the line transects involved two ecologists walking a distance of 25 m apart for a length of 500 m on one side of a centreline and then returning along the other side of the 500 m centreline also remaining a distance of 25 m apart, while inspecting each tree along this transect. This results in a search area of 5 ha (500 m x 100 m search area) for each transect. In total, five line transects were conducted, with 25 ha of potential habitat actively searched for this species in the Project area. For trees where a Koala or evidence of a Koala was identified, the type of observation, species of the tree and location were noted. Additionally call playbacks for Koala was also undertaken.

The assessment determined the Project area to have a relatively low Modified BioCondition score. This was most likely a reflection of the disturbance within the Project area due to the existing Peak Downs Highway.

The assessment identified Koalas at three locations and heard calling during spotlighting activities. Two females and one male animal were observed in two Lemon Scented Gums (*Corymbia citriodora*) and one in a Broad-leaved Stringybark (*Eucalyptus portuensis*). All three animals observed were within RE 8.12.7. Calls of the species were also heard in adjacent areas during spotlighting activities during the field survey.

The timing of this survey (December) was appropriate for the direct observation methods being applied. Specific results of the survey can be found in Attachment 1 (FMP) and Attachment 2 (RIA).

2.2.2.4 SMEC, August 2015 (Field Survey Report for Matters of National Environmental Significance)

During this investigation ten Koala Spot Assessment Techniques (KSATs) were conducted at representative locations across the Project area, including six impact sites (in areas previously undisturbed by trial works) and four control sites (areas immediately adjacent to the Project area). These were located at approximate intervals of 200-300m, unless otherwise deemed appropriate e.g. where site conditions did not allow due to steep terrain. This approach was

considered to systematically assess the Project area and adjacent habitat while making no prior assumptions about which areas may be used by the Koala and enabled both the steep escarpment and flatter ridgeline to be assessed.

The KSAT methodology adopted from Phillips and Callaghan (2011) categorises the Koala activity levels into low, medium (normal) or high use, based on the mean activity level. This is further broken down into activity categories, based on the density of the area. The Project area has been identified as an East Coast (med-high) use 'activity category', whereby the following categorisation of activity levels applies:

- (1) Low use = less than 22.52%;
- (2) Medium use = more than or equal to 22.52% and less than or equal to 32.84%; and
- (3) High use = more than 32.84%.

Within the Project area (the impact sites), three (3) KSATs were determined to have low use, one (1) had medium use while two (2) had high use. The control sites identified two (2) KSATs with low use, one (1) with medium use while one (1) had high use. One low activity site at each of the impact and control areas recorded a scat beneath 20% of trees, so they were close to the threshold of medium activity. This suggests that the Koala population extends across the Project but also into adjacent habitat.

In general, the sites within the southern extent of the Project area recorded the highest Koala activity levels. The previous sightings of Koalas were also largely within this area of the Project which is relatively flat in elevation but has been recently subject to vegetation clearing due to trial embankment works. On the contrary, the northern extent of the Project area recorded the lowest evidence of Koala activity. These locations were also noted to have the steepest gradient.

The timing of the survey was considered appropriate for a scat based survey (end of dry season). Specific results of the survey can be found in Attachment 1 (FMP) and Attachment 2 (RIA).

2.3 Item 2 – Relevant Impacts

An assessment of the relevant impacts of the Project are presented in the FMP (Attachment 1). An assessment of the residual impacts of the Project, after the implementation of mitigation and management strategies, is presented in the RIA (Attachment 2). These documents address Items 2.1 and 2.2 of DoE's RFI.

2.4 Item 3 – Proposed Avoidance, Management and Mitigation Measures

A FMP for the Project has been prepared for the Koala to address the impact of the Project to the species.

Specifically, DoE considered that the Project may result in habitat fragmentation and increased occurrence of vehicle strike for the Koala, in addition to the loss of habitat. The FMP has been prepared in accordance with the Environmental Management Plan Guidelines (DoE, 2014) and addresses items identified in Items 3.1 – 3.4 of DoE's RFI.

The FMP provides specific monitoring regimes and management actions, sets performance indicators, and details corrective actions to be implemented by TMR to minimise impacts of the Project on these species during and following the construction phase in a manner that is compliant with the requirements of the EPBC Act requirements.

2.5 Item 4 – Residual Impacts Assessment and Proposed Offsets

A RIA for the Koala has been prepared for the Project to address Items 4.1 - 4.5 of DoE's RFI. The document includes a discussion on significant impacts to the Koala, and an assessment of the likelihood of residual impacts to this species and their habitat. The residual impact assessment has been undertaken based on the impacts anticipated to occur following the mitigation and management measures proposed for the Project. Two offset options have been discussed within the RIA in line with the EPBC Act Offset Policy.

2.6 Item 6 – Social and Economic

This section analyses the economic and social impacts of the Project based on the Project Business Case Report (2013), providing responses to information requested from DoE in Items 6.1 and 6.2

2.6.1 Social Impacts

2.6.1.1 Project Background

The Eton Range crossing has received significant adverse media coverage in relation to the issues of safety and accidents, traction and heavy vehicle trafficability and slope stability. Between 1998 and 2007 there were five fatalities on the Eton Range crossing, which included three heavy vehicle drivers.

Representatives from the local heavy vehicle transport operators have been very vocal in expressing their opinion that the range urgently requires upgrading. Their advocacy was one of the key factors in securing state and federal government commitment to undertake the initial planning study. The planning study's goal was to determine the best means of improving safety on the crossing.

Subsequently trial geotechnical works (as previously described in Section 1.1) have occurred since the completion of the planning study in 2010, with the Options Analysis and Detailed Design completed in 2012 and 2014. Tendering for the construction contract was released late March 2015. The early participation of tenderers was sought to enable scrutiny of the design and incorporation of suggested improvements. Construction is planned for commencement in early 2016.

2.6.1.2 Deficiencies of Existing Eton Range Crossing

The initial planning study concluded that the most significant deficiencies of the existing Eton Range crossing were:

- The existing Eton Range crossing features steep vertical grades (up to 11%) and tight horizontal curvature. This combination of poor vertical (steep gradient) and horizontal (tight curvature) geometry presents serious safety risks for road users, with over 30% of accidents on the range resulting in serious injury or fatality. The southern approach to the Eton Range crossing is the most significant safety concern, with the straight and steep road alignment unable to slow vehicles in a controlled manner prior to the first tight radius bend.
- The roadway geometry causes some heavy vehicles to lose traction and become “stuck” on the range. This requires either partial or full closure of the Eton Range crossing for typically one to two hours until the vehicle can be recovered. These incidents represent a serious safety and operational risk and significantly reduce travel time reliability.
- The existing grade requires heavy vehicles to ascend and descend the Eton Range crossing at very low speeds. With limited climbing/overtaking lanes, other traffic travelling behind the slow-moving vehicles can be significantly delayed. This reduces the operational efficiency of the Eton Range crossing, and results in some drivers becoming impatient and driving dangerously in attempting to overtake at the first opportunity.
- Roadway width restrictions require closure of the range to permit the passage of over-dimensional loads. The number of these closures currently averages about 10 per day.
- The geometry of the existing crossing prohibits as-of-right access to vehicles larger than B-double combinations, limiting freight transport efficiency.

Figure 3 below highlights the deficient areas of the existing Eton Range crossing.

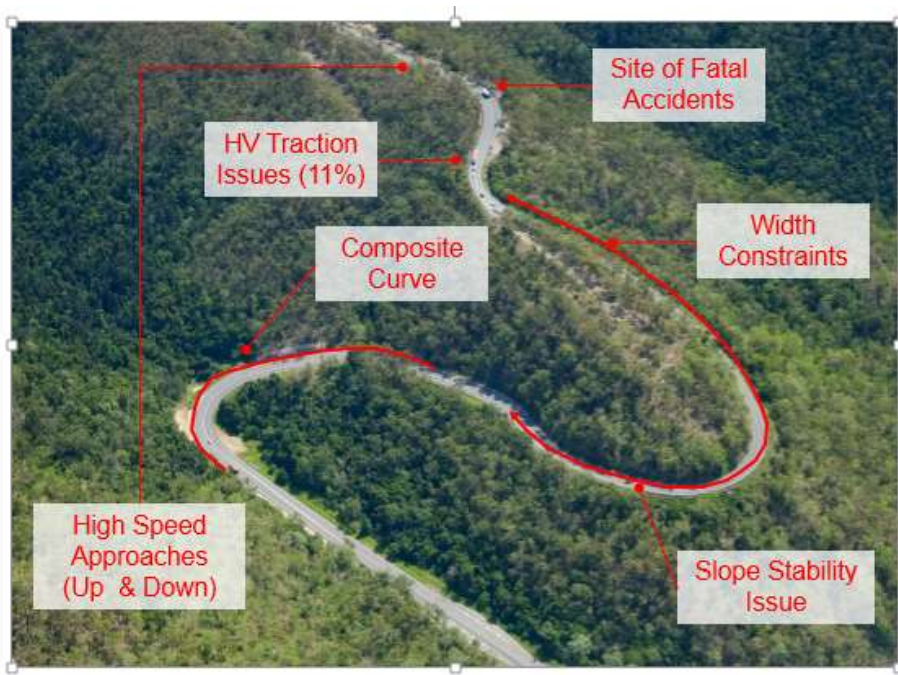


Figure 3: Eton Range crossing deficiency

2.6.1.3 Options Analysis

The options analysis investigated the delivery of Project objectives into two categories:

- (1) New alignments in a new corridor.
- (2) New alignment utilising the existing corridor.

Four options were shortlisted for detailed comparison - one new corridor alignment and three existing corridor alignments as follows.

- (1) Four lanes, 5km long new corridor alignment, 800m west of the existing Eton Range crossing, with a 100km/h design speed and a maximum grade of 6%.
- (2) Four lanes - single carriageway, 3.2km long utilising portions of the existing corridor, offline at the top of the Eton Range to the west of the existing highway, with a 60km/h design speed and a maximum grade of 7.5%.
- (3) Four lanes - single carriageway, 3.0 km long utilising portions of the existing corridor, offline at the top of the Eton Range to the east of the existing highway, with a 60km/h design speed and a maximum grade of 7.5%.
- (4) Four lanes - split carriageway, 3.2km long utilising portions of the existing corridor at the top of the Eton Range, with two lanes to the west for the downhill direction and two lanes to the east for the uphill direction, with a 60km/h design speed through the descent and ascent sections and a maximum grade of 7.5%.

The four different alignment options assessed during the options analysis are illustrated in Figure 4 below. The diagram provides a good perspective of the scale difference between the new and existing corridor options. The new corridor option (1) rated poorly with respect to constructability. The challenging geological conditions significantly increased the complexity of the solution and the impact to the environment.

The existing corridor options rated better than the new alignment in almost all categories. They have a reduced footprint and consequently a reduced impact on environment, social, land use and cultural heritage.

The preferred existing corridor option selected was the split carriageway option (Option 4). It was superior to all other options because it allowed for the use of natural terrain features to incremental slow vehicles to the desired speed, provided the ability to follow natural ridge lines which reduced the footprint and excavation and embankment quantities. Figure 5 is a 3D representation of the chosen split carriageway option.

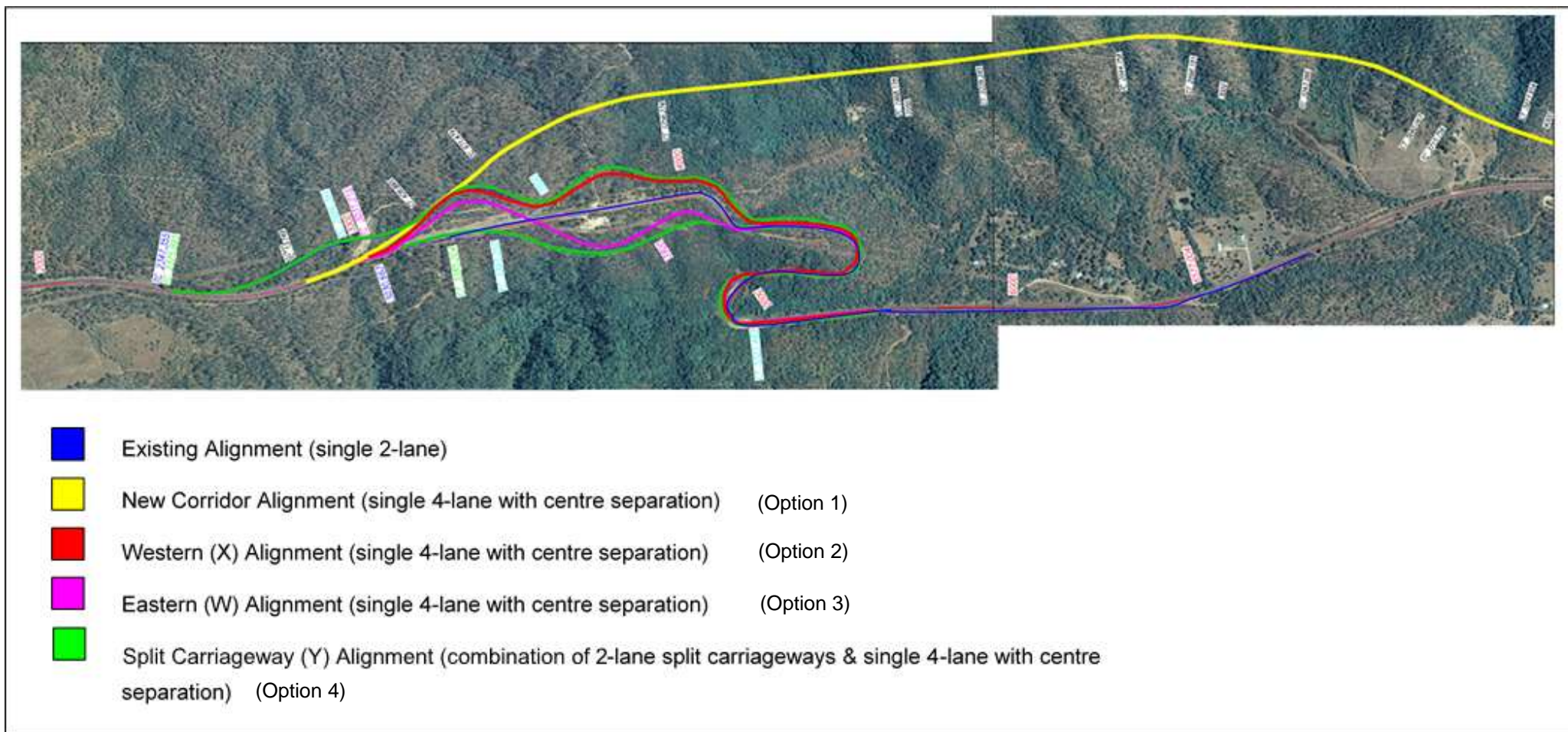


Figure 4: Eton Range crossing alignment options

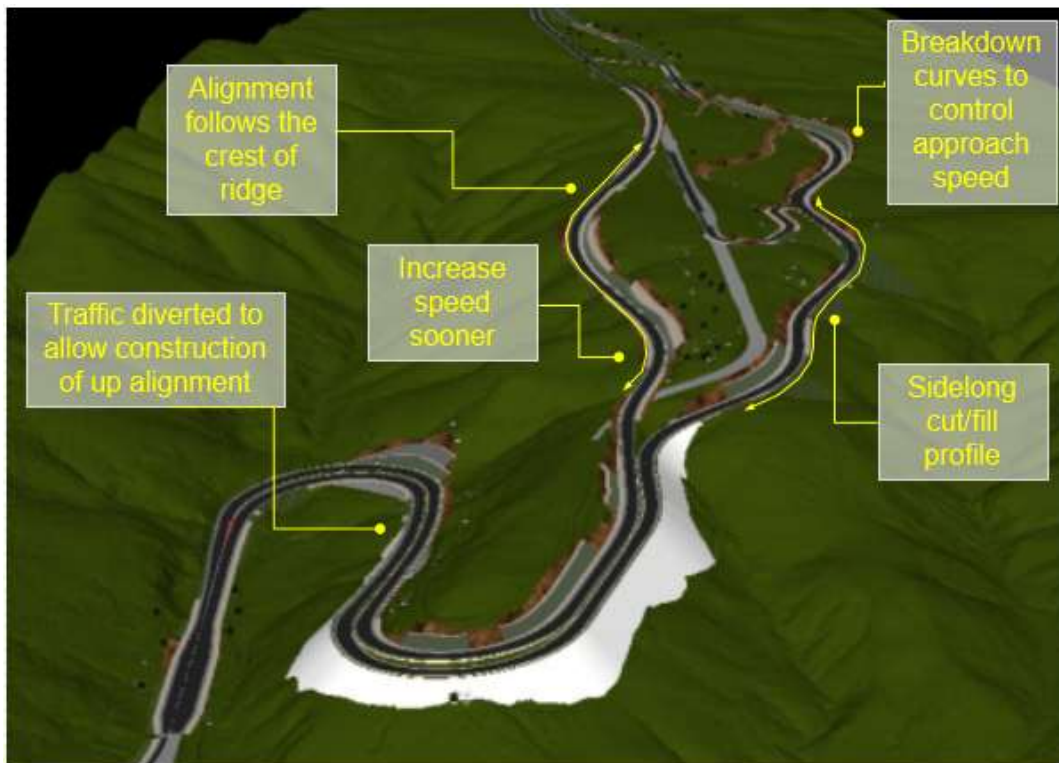


Figure 5: Eton Range crossing – chosen split carriageway option

2.6.1.4 Public Consultation

TMR has endeavoured to consult with all key stakeholders throughout the planning and detailed design phases of the Project. The stakeholder included representatives from the transport and mine-support industry, adjacent property owners, traditional owners, public utility service provider (Telstra, Ergon, NBN), regional councils and state and federal government departments. A summary of the outcomes from the consultation process are as follows:

- The transport and mine-support industry provided their views on current deficiencies of the crossing and future fleet requirements to be considered. This feedback enabled the design to be developed to cater for Type A Road Trains and B-Triples which will replace the current B-Double fleet over time. A Project specific safety road crash barrier selection guideline was prepared, presented and supported by industry for incorporation into the detailed design.
- Directly affected property owners have been consulted throughout every stage of the Project development process. Once the preferred alignment was chosen discussions immediately occurred about potential future acquisition of land. Their concerns about property severance and right-of-access were addressed with accommodation works being agreed and incorporated into the design early. It should be noted that consent was obtained to undertake geotechnical investigative and trial works for the detailed design.
- All property owners were supportive of the preferred existing corridor alignment in comparison to the new corridor alignment impacts.
- An assessment of cultural heritage values of the Project area was undertaken by Northern Archaeology Consultancies (2009 and 2012) with the assistance of the traditional owners from the Yuwibara and Wiri People. The study concluded that although there were no cultural heritage sites identified within the proposed realignment area the following conditions must be abided to during construction:
 - monitoring during initial clearing and topsoil excavation;
 - useful grass tree species that need to be cleared be offset / replanted elsewhere to maintain the cultural diversity of the area; and
 - appropriate control procedures are developed and implemented prior to commencement of works to minimise impact to artefacts discovered during construction.

Cultural heritage is discussed further in Section 2.6.1.5.

- Multiple flora and fauna assessments have been undertaken by EcoSM (2009, 2011, 2013). This information was used to develop an Environmental Assessment Report for the Project. This content of this report has been disseminated further to support applications to state and federal government departments to adhere and satisfy legislative requirements.
- Consultation has been ongoing with local environmental community groups, including Fauna Rescue Whitsundays, regarding the proposal and potential effects to local fauna.
- Public Utility Plant (PUP) Services providers have been involved throughout the planning and detailed design phases to identify, design and relocate impacted services.

2.6.1.5 Indigenous Consultation

Initial consultation for the Project commenced in 2009, between representatives of TMR, the Yuibera Registered Native Title Claimants and the Widi People of the Nebo Estate Registered Native Title Claimants (previously Wiri #2 Core Country). Below is a brief outline of consultation and cultural heritage assessment conducted for the Project:

- Preliminary Cultural Heritage desktop assessment occurred in 2009 as per TMR's standard Cultural Heritage Process, which provides sequential steps required to assess and manage all categories of Cultural Heritage to maintain Duty of Care under the *Aboriginal Cultural Heritage Act 2003* (ACH Act).
- November 2009 – preliminary archaeological report undertaken (Northern Archaeology Consultancies Pty Ltd, 2009) during the options analysis of a wider investigation area, with relevant Native Title Claimants involved in the field assessment (Yuibera and Wiri representatives). A number of natural features with possible Indigenous significance were recorded, and several sites of potential cultural significance were also identified within the zone of influence of the realignment options.
- Recommendations of this preliminary archaeological report included continuing the engagement with relevant Native Title claimants throughout design of the Project, to ensure direct involvement in protection of cultural heritage values, and use of monitors for any clearing and topsoil excavation.
- February 2012 – archaeological report revised and finalised (Hatte, 2012) which involved a follow up survey to focus on the alignment options that had been selected during the options analysis. No cultural heritage sites were identified within the proposed alignment area, though cultural values were identified for the area surrounding the Project.
- Mid 2014 - Preliminary geotechnical investigations and disturbance for trials occurred in with the presence of Traditional Owners monitoring any clearing and earthworks as per TMR Cultural Heritage Processes.
- 2015 (Ongoing) – Consultation with the Traditional Owners and the development of Cultural Heritage Management Arrangements for the Project. These will concentrate on engagement processes and protection of cultural heritage values for the construction phase of the Project, in accordance with the ACH Act. Ongoing negotiations and consultation are in progress.

2.6.2 Economic Impacts

2.6.2.1 Cost Benefits Analysis

2.6.2.1.1 Costs

The capital cost estimate for the Project, based on a 50% and 90% probability level, is \$167,353,979 and \$189,206,044.

The criteria for the viability of a Project is determined by its Net Present Value (NPV) which must be greater than zero and Benefit Cost Ratio (BCR) which must be greater than one. The NPV and BCR for the Project is \$30.0M and 1.3 respectively, at a discount rate of 4%. For cost sensitivity analysis a discount rate is applied which is a percentage factor used to convert future costs and benefits into current equivalents for the purpose of the economic and financial appraisals. At a discount rate of 4%, the sensitivity analysis suggests that even if capital costs were to increase by 20% or one of the major benefit components were to decrease by 20% the Project would still be viable.

2.6.2.1.2 Benefits

The benefits of the Project are primarily safety and reliability improvements. The poor alignment and lack of safety features of the existing section of road has produced numerous accidents. Many of these accidents have resulted in serious injuries and fatalities. The poor alignment has also resulted in numerous non-accident related incidents such as spillage from and jack-knifing of heavy vehicles. These incidents have resulted in many road closures, some of which have lasted several hours and resulted in additional works needing to be performed to remove or treat contaminated land.

The methodologies outlined in Austroads, Australian Transport Council (ATC) and TMR CBA guidelines and manuals have been applied to perform the Cost Benefit Analysis (CBA).

The benefits, as demonstrated by the CBA, comprise mainly of Road User Cost (RUC) savings. The RUC savings of the Project include: accident cost savings; Travel Time Cost (TTC) savings; Vehicle Operating Cost (VOC) savings; and reliability improvements. The externality cost savings are environmental benefits.

Environmental benefits of the Project were considered and calculated in accordance with Austroads. However, environmental benefits are calculated purely based on changes in vehicle kilometres travelled from the base case / present day configuration. As the new section of road is slightly longer than the present day the environmental benefits were marginally negative and rounded up to 0% of benefit.

Figure 6 below contains a pie chart of the breakdown of calculated benefits. Improved reliability from reduced road closures forms the largest component of benefits produced by the Project, accounting for approximately 39%. TTC, normally the largest component benefits accounts for 24% (17% commercial vehicles and 7% private vehicles) and VOC accounts for 20% (14% commercial vehicles and 6% private vehicles) of the benefits. Accident cost savings account for 17% of the benefits.

These savings are lower than initially expected. This is because reductions in accidents relating to drive error could not be fully quantified due to lack of cross-sectional data pertaining to the treatments applied to the Project to determine reduction factors. There remain a number of unquantified benefits such as wider economic benefits and benefits to the network from improving the connectivity provided by the Peak Downs Highway. These additional benefits have been summarised in sections 2.6.2.1.3 and 2.6.2.1.4 below.

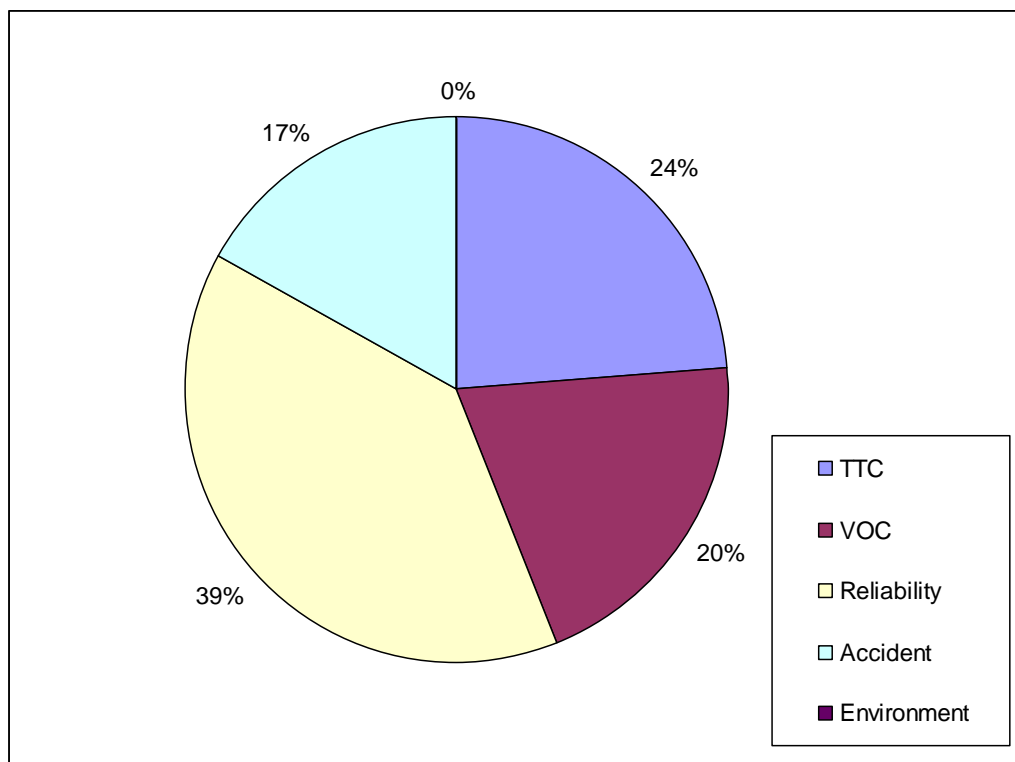


Figure 6: Breakdown of Project Benefits

2.6.2.1.3 Economic Development Employment Opportunities

The Peak Downs Highway is part of the State Strategic Road Network in recognition of its importance to the economy of both Mackay and Queensland. The highway is part of the Emerald to Mackay freight corridor, and is the primary access between Mackay and the Bowen and Galilee Basins. It also represents the main link between Queensland's Whitsunday Coast and the Central West region of the state.

The success of the Bowen and Galilee Basin mining industry is dependent on efficient transport of the inputs. These include labour, diesel, explosives, chemicals and over-dimensional mining equipment. The importance of mining in the Mackay/Isaac/Whitsunday Region is evident, with mining accounting for 12.1% of employment compared with 1.7% in Queensland. Table 2 below shows the employment demographic of the Mackay, Isaac and Whitsunday (MIW) region.

Table 2: Working Population Employment by Industry, MIW Region and Queensland

	Mackay RC	Isaac RC	Whitsunday RC	MIW Region	Queensland
Agriculture, forestry and fishing	4.8%	8.1%	11.2%	6.8%	3.4%
Mining	2.6%	48.7%	4.6%	12.1%	1.7%
Manufacturing	10.9%	1.8%	6.2%	8.2%	9.9%
Electricity, gas, water and waste	1.0%	0.4%	0.9%	0.9%	1.0%
Construction	8.8%	8.1%	9.0%	8.7%	8.9%
Wholesale trade	5.2%	1.4%	2.6%	3.9%	4.0%
Retail trade	12.9%	5.4%	12.0%	11.3%	11.8%
Accommodation and food	7.1%	5.3%	16.7%	8.7%	7.0%
Transport, postal and	6.4%	3.0%	6.7%	5.8%	5.1%
Information media and	0.9%	0.1%	0.5%	0.7%	1.5%
Financial and insurance services	2.1%	0.5%	1.4%	1.6%	2.9%
Rental, hiring and real estate	2.1%	0.9%	2.2%	1.9%	2.2%
Professional, scientific and	5.0%	1.5%	3.2%	3.9%	5.8%
Administrative and support	2.1%	1.7%	3.0%	2.2%	3.1%
Public administration and safety	4.5%	2.3%	3.5%	3.9%	6.8%
Education and training	7.1%	4.2%	5.0%	6.1%	7.8%
Health care and social	9.1%	2.8%	6.2%	7.3%	10.4%
Arts and recreation services	0.7%	0.2%	0.9%	0.6%	1.4%
Other services	5.1%	2.6%	3.0%	4.2%	3.8%
Inadequately described	1.4%	1.0%	1.1%	1.2%	1.3%
Industry of employment not	0.1%	0.1%	0.0%	0.1%	0.1%
Total (no. people)	40,191	13,073	13,554	66,818	1,737,619

Mackay's role as regional service centre is apparent in the above employment data. Levels of employment are higher than surrounding local government areas in the sectors of:

- manufacturing;
- wholesale and retail trade;
- financial and insurance services;
- rental, hiring and real estate services;
- professional scientific and technical services;
- public administration and safety;
- education and training; and

- health care and social assistance.

The existing constraints along the Peak Downs Highway (including the Eton Range crossing), if not addressed, have the potential to significantly impact existing and future mining operations as well as regionally significant residential and industrial developments. The *Mackay and Whitsunday Regional Economic Development Committee* has regarded the Peak Downs Highway as the Achilles Heel for economic growth of the region.

To address these economic development concerns a variety of projects have been earmarked along the Peak Downs Highway to support the transport of freight between the Bowen and Galilee Basins and Mackay. There is a complex interplay of related project timing, staging and potential benefits that requires consideration. The key projects that are underway or where significant planning has been undertaken are:

- Eton Range Realignment Project
- Mackay Ring Road Project
- Narrow Timber Bridges Replacement Project
- Peak Downs Highway Realignment (Walkerston Bypass)
- Paget Southern Access
- Bruce Highway Upgrade Project - southern approaches to Mackay.

The potential benefits of all these projects are unable to be achieved without investment in a safe and unconstrained Eton Range crossing, where the current deficiencies pose unacceptable risks to all users and where freight transport inefficiencies serve as a barrier to expansion in the mining sector - the key generator of economic and employment growth in the region. This is made more urgent given the potential for mining projects to commence in the Galilee Basin, such as Adani's Carmichael coal mine.

2.6.2.1.4 Project Employment Opportunities

The Office of Economic and Statistical Research (OESR) projects that every \$1 million of Government gross fixed capital formation will, on average, support approximately 3 full time equivalent (FTE) jobs across the Queensland economy in 2014-15.

Based on this assumption, approximately 567 FTE jobs will be supported over the three year construction period of the Project. A break up of the jobs supported per financial year is provided in Table 3 below.

Table 3: Average Full Time Equivalent jobs supported over the construction period of the Project

Financial Year	Capital Cost	Number of FTE supported
2013	\$6,695,949	20.09
2014	\$12,240,071	36.72
2015	\$16,233,581	48.70
2016	\$56,170,990	168.51
2017	\$59,541,250	178.62
2018	\$38,324,203	114.97
	\$189,206,044	567

The Queensland government has adopted a policy initiative designed to improve the levels of workforce development on major government funded building and construction projects. The policy requires that a minimum of 10 per cent of the total labour hours on any Queensland government building or civil construction project (valued over \$250,000 for building or \$500,000 for civil construction) must be undertaken by on-site apprentices, trainees or cadets, Indigenous workers, or used for the upskilling of existing employees (to a maximum of 25 per cent of the deemed hours). Meeting the training policy will require structured on-the-job training and external education/training course that can culminate in an accredited qualification.

2.7 Item 7 – Principals of Ecologically Sustainable Development

This section (in addition to Section 2.6), provides responses to Items 7.1 and 7.2 of DoE's RFI.

Ecologically Sustainable Development (ESD) is defined in the *National Strategy for Ecologically Sustainable Development* (Commonwealth of Australia, 1992) (the National Strategy) as '*development which aims to meet the needs of Australians today, while conserving our ecosystems for the benefit of future generations... to develop ways of using those environmental resources which form the basis of our economy in a way which maintains and, where possible, improves their range, variety and quality. At the same time we need to utilise those resources to develop industry and generate employment*' (Commonwealth of Australia, 1992). The National Strategy requires government departments to develop institutional arrangements to ensure that the principles and objectives of ESD are delivered.

TMR adheres to the principles of ESD through their Environment and Heritage Policy and Strategy. The strategy has been developed with consideration of the Queensland government's priorities and community outcomes to build Queensland's economy, strengthen Queensland's communities and protect Queensland's environment and achieves these via a defined set of strategic opportunities, priorities and challenges and the following objectives and key result indicators:

- **Objective 1:** Be a leader in stakeholder engagement and community and industry relations
 - Key Result Indicators:
 - Established relationships with key internal and external stakeholders.
 - TMR's environmental performance recognised and valued by stakeholders.
- **Objective 2:** Lead integrated road system planning across the transport sector
 - Key Result Indicators:
 - A clear, consistent and concise direction for environmental and heritage.
 - A strategic approach to environmental and heritage management in road system planning.
- **Objective 3:** Develop and deliver the roads program effectively
 - Key Result Indicators:
 - Integration of environmental and heritage management in the delivery of road programs.
 - Road construction and maintenance activities do not result in unnecessary negative impacts on environmental or heritage values.
 - Adequate financial resources available for environmental and heritage management.
- **Objective 4:** Lead the sustainable management of road corridor land
 - Key Result Indicator:
 - Environmental and heritage values within the State-controlled road network managed in a strategic and proactive manner.
- **Objective 5:** Provide a safe, efficient and reliable road network
 - Key Result Indicator:
 - State-controlled road and traffic operations minimise impacts on environmental and heritage values where possible.
- **Objective 6:** Achieve excellence through the performance of our people, systems and practices
 - Key Result Indicators:
 - TMR's environmental and heritage capability and performance is continually enhanced.
 - Adequate resources available for environmental and heritage management.

The Project has been developed with due consideration of TMR's Environment and Heritage Policy and Strategy and objectives as outlined below:

- Strategic planning of the road alignment and continual review through each design phase has been undertaken to minimise impacts to the environmental and heritage values of the region. This included the use of the existing road corridor for the new Eton Range crossing to minimise the overall Project footprint and restrict the introduction of additional ecological threats (ie habitat fragmentation). This decision was made in consideration of the conservation of biological diversity and ecological integrity of the area.
- Detailed environmental desktop assessments and field investigations have been undertaken throughout the lifetime of the Project to inform the detailed design and minimise impacts to environmental and heritage values.
- Given the lack of scientific knowledge on the local Koala population, the Precautionary Principle has been utilised throughout the Project planning stages to ensure that all unknown and unpredictable risks to the Koala are considered.
- The preferred offset proposal has been prepared to achieve the most suitable environmental outcome for the impacted species by providing funding of research into the Koala population in the region, identifying current high risk areas for Koala vehicle strike along the Peak Downs Highway, and committing future investment into the installation of structures to facilitate fauna movement. This preferred option has the potential to leave a positive environmental legacy for the benefit of future generations.
- A Koala underpass has been incorporated into the design in areas where medium – high Koala activity has been identified and there is the ability for Koalas to physically traverse the new highway.
- Regular consultation has been undertaken with stakeholders including other government departments, community groups (including local wildlife rescue volunteers), the local Aboriginal Parties and private landholders as outlined in Section 2.6.

Furthermore the Project has been designed to achieve the following economic, social and environmental objectives:

- Reduce the incidence and severity of traffic accidents and incidents on the Eton Range crossing through the provision of flatter grades (approximately 7.5%), larger radius curves, additional lanes and modern safety standards and devices.
- In particular, improve safety on the descent by eliminating the straight approach to the steep 11% vertical grade, the main contributor to three fatalities and numerous other accidents.
- Eliminate dangerous overtaking of slow-moving vehicles by eliminating bunching of traffic behind heavy vehicles.
- Improve travel time reliability and efficiency of a designated freight route because the separation of the carriageways and additional lanes reduce delays to faster vehicles and avoid the need to close the range for most OSOM loads.
- Enable the use of larger vehicle combinations, such as B-triples and Type 1 Road Trains, which has the potential to increase freight efficiency by 50%.
- Encourage investment to the region by facilitating the movement of machinery and services and improving supply chain efficiency between the Bowen Basin and Galilee Basin coal mines and businesses located in Mackay.
- Enable expansion of the mines and western townships by removing the constraints on inputs imposed by the current crossing.
- Complement the strategic benefits of other planned projects including the Mackay Ring Road and Peak Downs Highway Realignment (Walkerston Bypass) with respect to enhanced freight movements between the Port of Mackay and the Bowen and Galilee Basins.

3. References

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Appendix A - Request for Additional Information – Preliminary Documentation



Mr Pat Aprile
District Director (Mackay/Whitsunday)
Queensland Department of Transport and Main Roads
PO Box 62
MACKAY QLD 4740

Dear Mr Aprile

**ADDITIONAL INFORMATION REQUIRED FOR PRELIMINARY DOCUMENTATION
ETON RANGE REALIGNMENT, PEAK DOWNS HWY, QLD (EPBC 2015/7252)**

I am writing to you in relation to your proposal to realign the Peak Downs Highway at Eton Range.

On 28 September 2015, a delegate of the Minister for the Environment decided that the proposed action is a controlled action and that it will be assessed by preliminary documentation. Further information will be required to be able to assess the relevant impacts of the proposed action. Details outlining the further information required are at Appendix A.

In the letter dated 28 September 2015, you were informed that your project is likely to be suitable for the application of outcomes-based conditions in the event that your action is approved with conditions. If the project is approved and conditions are to apply you should consider if you would like those conditions to be outcomes-based. Further details about the draft *Outcomes-based Conditions Policy 2015* are provided in Appendix A. Please discuss this matter further with the Department if you wish to have outcomes-based conditions fully considered for your proposal.

Once we have received the requested information and the Department is satisfied with this information, you will be provided with instructions on the public consultation requirements to progress assessment of the project.

If you have any questions about the referral process or this decision, please contact the project manager, Malcolm Wares, by email to Malcolm.Wares@environment.gov.au, or telephone (02) 6274 2470 and quote the EPBC reference number shown at the beginning of this letter. Please note that Mr Wares will be on leave until 27 October 2015. If you have queries while Mr Wares is away please direct them to Justin Keast (Justin.Keast@environment.gov.au) or call him on (02) 6275 9953.

Yours sincerely

Mike Smith
Director
Queensland Assessments and Sea Dumping Section

21 October 2015



ADDITIONAL INFORMATION REQUIRED FOR ASSESSMENT BY PRELIMINARY DOCUMENTATION

It has been determined that the action proposed by the Queensland Department of Transport and Main Roads to realign the Peak Downs Highway (2015/7552) is likely to have a significant impact on the following controlling provision which is protected under Part 3 of the *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act):

- Listed threatened species and communities (section 18 & section 18A)

It has also been determined that the proposed action will be assessed by preliminary documentation. The information about the action and its relevant impacts, as outlined in the referral and in the additional information described below, will make up the required information.

GENERAL CONTENT, FORMAT AND STYLE

The preliminary documentation, which includes the referral information and the additional information described below, should be contained as one document with attachments, and include sufficient information to avoid the need to search for supplementary reports.

The documentation must enable interested stakeholders and the Minister for the Environment, the Hon Greg Hunt MP, to understand the environmental consequences of the proposed action on matters of national environmental significance. The information provided should be objective, clear and succinct and where appropriate, supported by maps, plans, diagrams or other descriptive detail.

Detailed technical information, studies or investigations necessary to support the main text should be included. It is recommended that any supporting documentation and studies, reports or literature, from which information has been extracted and which are not normally available to the public, be attached as appendices to the main document and made available at appropriate locations during the period of public display of the preliminary documentation. The proponent must also make the documentation and supporting information available on the internet.

If it is necessary to make use of material that is considered to be of a confidential nature, the proponent should consult with the Department of the Environment (the Department) on the preferred presentation of that material, before submitting the documents to the Minister for approval for publication.

The level of analysis and detail in the documentation should reflect the level of expected impacts on the environment. Any variables or assumptions made in the assessment must be clearly stated and discussed. The extent to which the limitations, if any, of available information may influence the conclusions of the environmental assessment should be discussed.

Maps, diagrams and other illustrative material should be included where appropriate. The additional information should be produced on A4 size paper capable of being photocopied with maps and diagrams on A4 or A3 size and in colour where possible. The proponent should consider the format and style of the document appropriate for publication on the internet. The capacity of the website to store data and display the material may have some bearing on how the document is constructed.

SPECIFIC CONTENT OF THE ADDITIONAL INFORMATION

1. DESCRIPTION OF THE ENVIRONMENT AND MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

1.1. The preliminary documentation must provide:

- i. updated maps detailing areas of disturbance overlaid with known populations and habitat for Koala (*Phascolarctos cinereus*), including known movement corridors within and in the vicinity of the proposed site;
- ii. information on the scientific reliability of investigations and conclusions drawn, including the degree of certainty or statistical confidence where appropriate. This must include any assumptions or limitations of any models used to make predictions.
- iii. an assessment of the adequacy of any surveys undertaken (including survey effort and timing).

2. RELEVANT IMPACTS

2.1. The preliminary documentation must include an assessment of potential impacts (including direct, indirect, consequential and cumulative impacts) that may occur as a result of all elements and project phases of the proposed action on the Koala. Consideration of impacts must not be confined to the immediate areas surrounding the proposed action but must also consider the potential of the proposed action to impact on adjacent areas that are likely to contain Koala.

2.2. The assessment at 2.1 above must include, but not be limited to, an assessment of:

- i. the quantum and quality of habitat in hectares likely to be directly impacted;
- ii. details on whether any impacts are likely to be unknown, unpredictable or irreversible;
- iii. analysis of the potential magnitude of the relevant impacts and the acceptability of the impacts;
- iv. any technical data and other information used or needed to make a detailed assessment of the relevant impacts

2.3. All discussions and conclusions drawn regarding the assessment of impacts, direct or indirect, on the Koala from the proposed action should include a full justification based on the best available information including available scientific literature, existing databases and mapping, and must be referenced. The discussion of impacts must incorporate the relevant conservation advice, if applicable.

3. PROPOSED AVOIDANCE, MANAGEMENT AND MITIGATION MEASURES

3.1. As well as the clearing of Koala habitat, the Department considers that the proposed action may result in loss of habitat connectivity for Koalas, edge effects, increased vehicle strikes and Koala mortality or injury during the construction phase. To assist in our assessment of these potential impacts, please provide a revised Koala or Fauna Management Plan including:

- i. the location and design of exclusion fencing to benefit Koalas within the proposed project site during construction and post construction, including ongoing maintenance plans and maps;
- ii. the location and design of proposed permanent culverts, underpasses and/or fauna crossings to benefit Koalas, within the proposed project site, including maps;

- iii. the timing for installing the proposed exclusion fencing, culverts, underpasses and/or fauna crossings at each location within the proposed project site;
- iv. traffic management plans aimed at minimising impacts on fauna (please also include the location and design of road traffic barriers);
- v. clear and concise outcomes and performance indicators against which achievement of the outcomes identified will be measured;
- vi. methods to monitor the impact and effectiveness of the mitigation and management measures described above;
- vii. identification of the contingency measures and appropriate corrective actions that reflect an adaptive approach to be undertaken if the performance indicators or outcomes are not being met;
- viii. assessment of the expected or predicted effectiveness of the avoidance and mitigation measures for Koalas, including the scale and intensity of impacts of the proposed action and the on-ground benefits to be gained through each of these measures;

3.2. All management plans must be prepared in accordance with the Department's Environmental Management Plan Guidelines (2014)
<http://www.environment.gov.au/epbc/publications/environmental-management-plan-guidelines>.

3.3. If the proponent wishes to pursue outcomes-based conditions in the event that the action is approved with conditions, the preliminary documentation must provide information on the outcomes that the proponent will achieve for the Koala. These may include outcomes related to habitat connectivity, impacts on Koala from vehicle strikes and direct impacts on Koala arising from land clearing and construction.

3.4. Outcomes need to be specific, measurable and achievable, and must be based on robust baseline data. Outcomes must be developed in consideration of the *Outcomes-based Conditions Policy 2015* and *Outcomes-based Conditions Guidance 2015*, with suitable justification for considerations identified in the policy and guidance.

4. PROPOSED OFFSETS

4.1. The preliminary documentation must include an assessment of the likelihood of residual impacts occurring, after mitigation and management measures relating to the project have been applied. Based on information provided in the referral, the Department considers that residual significant impacts to Koalas are likely. In the light of this, please provide an offset management plan or proposal to be implemented to compensate for the residual significant impacts on Koalas.

4.2. The offset management plan/proposal must comply with the *Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy* (October 2012) and accompanying *Offsets assessment guide*, accessible from:
www.environment.gov.au/epbc/publications/environmental-offsets-policy.html

4.3. If you wish to propose indirect offsets instead of direct offsets you must address requirements at section 4.2.1 of the *Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy*. Discussions about the benefits of the proposed indirect offsets must consider the conservation advice for the Koala. You must also compare the anticipated cost (financial and other) of delivering the indirect offset(s) against the anticipated cost of delivering direct offsets.

- 4.4. Offsets should compensate for an impact for the full duration of the impact.
- 4.5. Offsets must directly contribute to the ongoing viability of the Koala and deliver an overall conservation outcome that improves or maintains the viability of habitat for the Koala, as compared to what is likely to have occurred under the status quo, i.e., if neither the action nor the offset had taken place.

6. SOCIAL AND ECONOMIC

6.1 The economic and social impacts of the action, both positive and negative, must be analysed. Matters of interest may include:

- (a) details of any public consultation activities undertaken, and their outcomes;
- (b) details of any consultation with Indigenous stakeholders;
- (c) projected economic costs and benefits of the project, including the basis for their estimation through cost/benefit analysis or similar studies; and
- (d) employment opportunities expected to be generated by the project (including construction and operational phases).

6.2 Economic and social impacts should be considered at the local, regional and national levels.

7. ECOLOGICALLY SUSTAINABLE DEVELOPMENT

7.1 Provide a description of the proposed action in relation the principles of ecologically sustainable development, as defined in the EPBC Act, including:

- a) the long-term and short-term economic, environmental, social and equitable considerations,
- b) the precautionary principle which states that a lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation where there are threats of serious or irreversible environmental damage,
- c) the principle of inter-generational equity which states that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations,
- d) the conservation of biological diversity and ecological integrity should be a fundamental consideration in decision-making, and
- e) improved valuation, pricing and incentive mechanisms should be promoted.

7.2 To assist you, the National Strategy for Ecologically Sustainable Development (1992) is available on the following web site: <http://www.environment.gov.au/resource/national-strategy-ecologically-sustainable-development>.

Attachments

Attachment 1 - Fauna Management Plan – Koala

Attachment 2 - Residual Impact Assessment and Offset Proposal