

2. Approach to the project

The selection of a preferred route for the project has involved a number of key stages and inputs from a wide range of stakeholders, along with the assessments undertaken by the project team. The approach to selection of a preferred route is outlined in **Figure 2-1**.

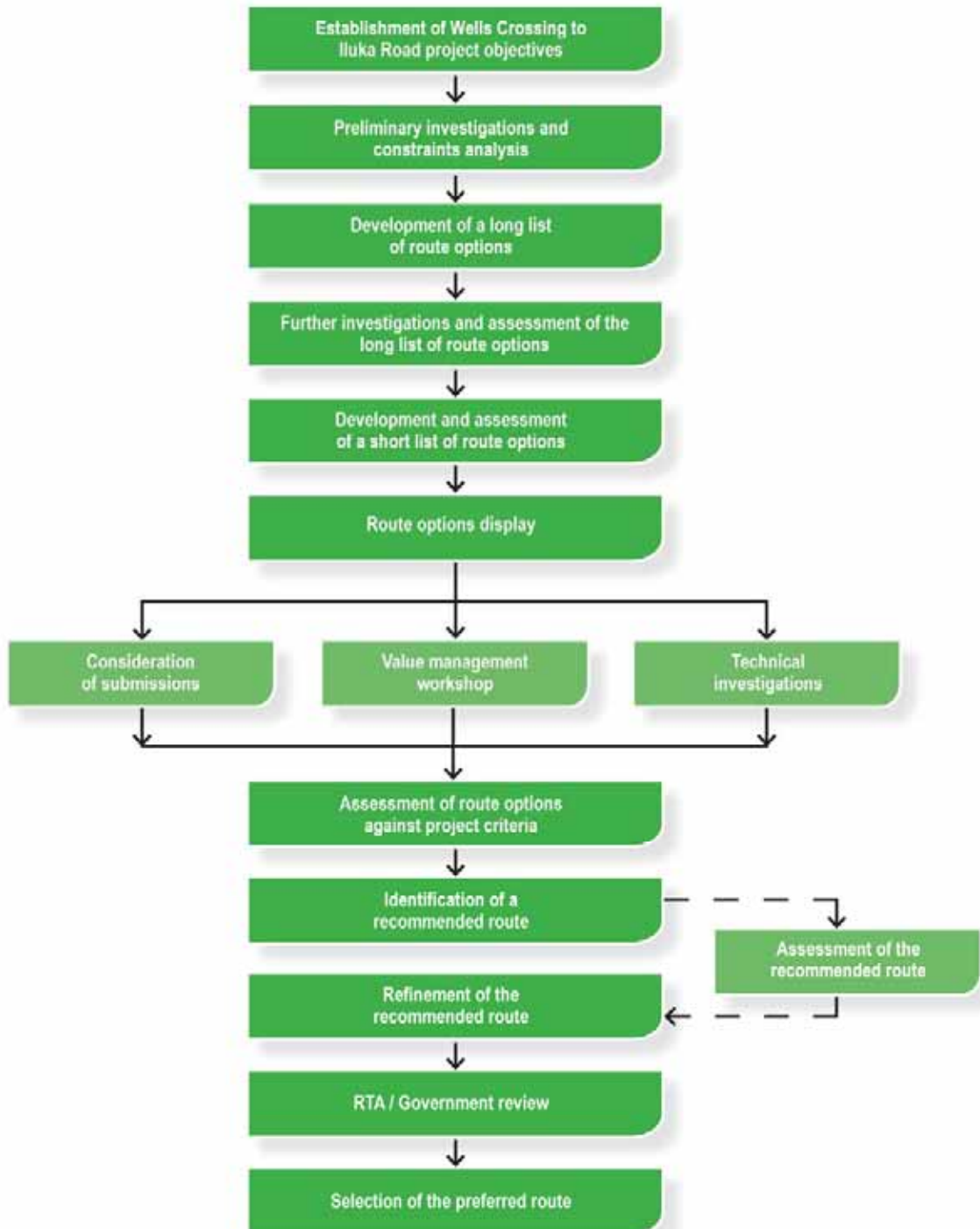
2.1 Consideration of the principles of ecologically sustainable development

Consideration of the principles of ecologically sustainable development is a requirement of the Pacific Highway Upgrade Program objectives and statutory requirements for environmental assessment in NSW. The considerations relevant to ecologically sustainable development that apply to the project include:

- Conservation of biological diversity and ecological integrity through the use of constraints mapping to identify ecological resources, investigations including field survey, literature reviews and consultation, adopting the principle of avoiding impacts where possible, and where impacts are unavoidable, taking all reasonable steps to minimise impacts.
- Development of route options which, as far as practicable, consider the impacts on local communities and balance these impacts against the functional requirements of the project, ensuring that the needs and actions of this generation do not compromise the quality of life of future generations.
- A precautionary approach to the identification of constraints, recognising that at this early stage of the project there is uncertainty in relation to the accuracy and completeness of data.
- Use of economic indicators where appropriate to value resources within the study area and to consider the impacts of route options on those resources.

Of particular relevance for this project is the level of information available on a number of threatened species and other ecological values of the study area. There have been few previous studies, however, the project team has undertaken extensive investigations and has developed an understanding of ecological issues relevant to the selection of a preferred route. There is a high diversity of species (including threatened species), high value habitats and the presence of potentially the last viable breeding sub-population of the coastal Emu endangered population. The preferred route has been selected as it would have less potential than some other options for significant impacts on a wide range of threatened species including the coastal Emu. Investigations will be ongoing stages of the project to develop understanding of potential impacts and mitigation measures.

■ Figure 2-1: The study process to date



Flooding is another area of potential uncertainty and risk for the project. In considering the route options, the risk of changes to flooding behaviour and the potential for impacts on local communities in the catchment has been recognised as an important issue. The potential for some route options to have a major impact on flooding was an important factor in the decision on the preferred route.

2.2 Development of a long list of route options

The initial phase of the project comprised data collection and constraints analysis across the study area. Data relating to the physical characteristics of the study area were obtained from a wide range of sources, including Clarence Valley Council, government agencies and investigations by the project team. Aerial photography was obtained in November 2004, along with airborne laser survey across the whole study area to provide detailed topographic information. Information on the project has been progressively updated as investigations have proceeded.

The spatial data obtained for the study area have been incorporated into the project Geographic Information System (GIS), which has assisted to develop an understanding of constraints to the development of route options. A number of physical constraints were identified within the study area, mapped and ranked on a scale of one to five, as defined in **Table 2-1**. These constraints are further discussed in relation to the long list options in **Section 4.2** and key constraints are shown in **Figure 4-1**.

■ **Table 2-1: Constraint ranking framework for option development**

Rank	Category	Constraint to Route Options
Level 5	Very High	Avoid unless no other practical and feasible options exist.
Level 4	High	Avoid where possible. Perimeter impacts may be acceptable.
Level 3	Moderate	Avoid where possible. Direct impacts manageable through mitigation measures.
Level 2	Low	Minimal constraint, or some benefit.
Level 1	Nil	No constraint, or benefit from locating options in these areas.

Route options were developed and evaluated using a multi-criteria approach to ensure the Pacific Highway Upgrade Program and project objectives are integral to the development and assessment of options. Criteria were developed relating to functional aspects of the upgraded highway, social and local economic impacts, and environmental impacts.

The long list of route options, described in **Section 4.2**, was generated using criteria developed at that stage of the project. Feedback from the community was also important in the initial development of route options. A range of scenarios were generated and tested to consider the

influence of social, environmental and physical constraints on the development of route options. The GIS was used to generate a line of best fit for each scenario, assuming end points for each option at Wells Crossing and Harwood Bridge. Scenarios were also tested using end points at different locations along the highway.

The long list options were identified as route corridors, rather than specific road alignments. Preliminary concept design was then undertaken to ensure that the options were able to meet the RTA design standards. Preliminary design included conceptual identification of horizontal and vertical alignments, cut and fill requirements, waterway crossings and cost estimates. While indicative routes were designed for each of the long list options, it was recognised that there was potential for the options to be realigned as investigations become more advanced.

Between Harwood Bridge and Iluka Road, options at this initial stage of the project were limited to widening of the existing highway either to the east or west (or a combination of both). However, following display of the short list options and community feedback options east and west of Harwood village were investigated, as discussed in **Section 6.2**.

2.3 Development and assessment of the short list of route options

The process for developing and assessing the short listed options refined and updated the approach applied to the long list options. The long list of options was assessed against the criteria to consider how well each option met the objectives of the project. The evaluation of the long list options identified some key differences between options that utilise the existing highway for greater distances and new routes in the east of the study area. Because both the easterly and westerly route options present different advantages and disadvantages in terms of meeting the project objectives, the evaluation of the options resulted in a short list including both easterly and westerly options.

The short listed route options were assessed against similar criteria to that used at the long list stage of the project. Specialist investigations were undertaken across disciplines including:

- Traffic and transport.
- Flooding.
- Geotechnical.
- Terrestrial and aquatic ecology.
- Aboriginal and European heritage.
- Water quality.
- Noise and vibration.
- Land use and planning.

- Socio-economic impacts.
- Visual impacts and landscape assessment.

The results of the assessment of the route options were reported in the *Wells Crossing to Iluka Road Route Options Development Report* (RTA, 2005).

2.4 Development and assessment of the preferred route

The process of identifying a preferred route for the project involved further refinement of the assessment criteria for the project and extensive community and stakeholder input. There are three key project activities that have contributed to the selection of the preferred route:

- Submissions received from the community and stakeholders during the public display of the route options, from October to December 2005.
- The outcomes from a three day Value Management Workshop held between 8-10 March 2006, and attended by community and government agency representatives and members of the RTA and SKM project team.
- Technical inputs from the project team, including a two day route selection workshop in late April 2006 and attended by RTA and SKM project team members.

The project team received more than 1500 submissions during the display of the *Route Options Development Report* (RTA, 2005). The key issues raised in submissions are summarised in **Section 5.1**. A comprehensive *Route Options Submissions Summary Report* (RTA, 2006h) has also been prepared and publicly released. The submissions raised important issues that were considered by the project team in the assessment of the route options.

The Value Management Workshop related to the section of the project between Wells Crossing and Harwood Bridge. The section between Harwood Bridge and Iluka Road was considered separately. The workshop had as its primary purpose to “*Obtain a common understanding of the project and its objectives, review the work undertaken to date and to recommend a preferred direction, if appropriate, so as to progress the project to the next stage of development.*”

The Value Management Workshop did not reach consensus on a preferred route for consideration by the RTA. However, it did provide a way forward through the development of criteria for assessing the options, and development of “modified” options. These were not new routes, but combinations of sections of the route options that had been on public display. Conclusions were drawn from the workshop deliberations on the relative performance of the route options against the criteria. Some areas where additional work was considered necessary to enable selection of a preferred route were identified, and these formed the basis of additional technical investigations undertaken following the Value Management Workshop. The Value Management Workshop process and outcomes are discussed in more detail in **Section 5.3**.

The project team undertook a route selection workshop to review the route options that were put on display in October 2005, the outcomes of the Value Management Workshop and the submissions.

The process followed at the route selection workshop was similar to that of the Value Management Workshop and included:

- Further consideration and, where required, revision of the criteria and development of new criteria for selection of a preferred route based on those developed at the Value Management Workshop and with reference to the Pacific Highway Upgrade Program objectives and project objectives.
- Weighting the criteria according to the relative importance of each, based on the collective expertise and project knowledge of those present.
- Presentation of information from additional investigations undertaken since the Value Management Workshop.
- Review of issues raised in submissions.
- Assessment of the route options to develop refined route options as a basis for the selection of a preferred route.
- Assessment of the refined route options using the criteria.
- Comparison of the outcomes of the route selection workshop with those of the Value Management Workshop.
- Review of the results of the assessment and identification of a recommended preferred route as the basis for further assessment.
- Identification of further work required to be undertaken prior to finalisation of the preferred route.

The recommended preferred route identified at the route selection workshop was progressed as the preferred route for the project, subject to the outcomes of additional investigations and confirmation by the NSW Minister for Roads. **Section 5** further describes the process and outcomes of investigations and assessment undertaken between the route options display and selection of a preferred route.