

## 7 Recommendation of the Preferred Route

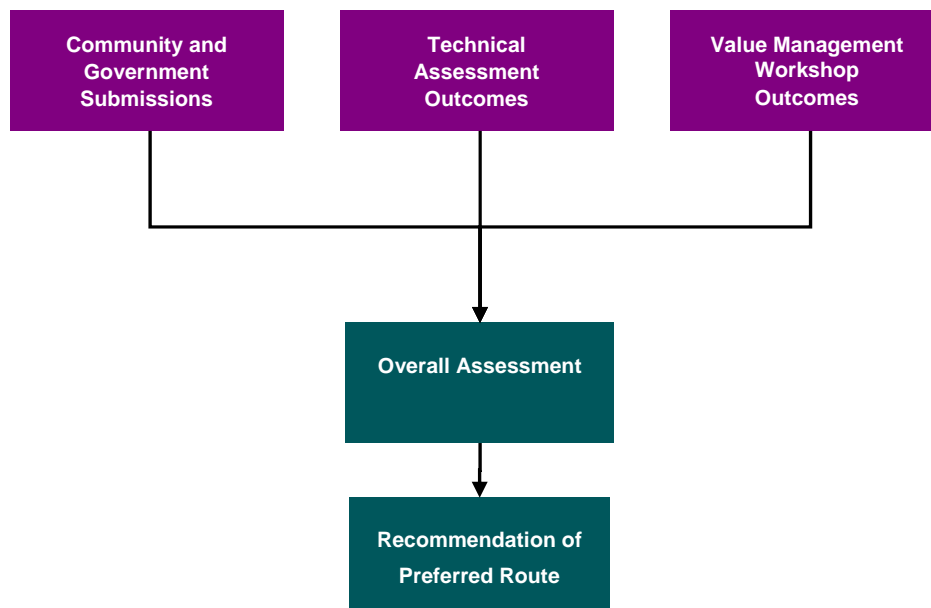
### 7.1 Methodology

The recommendation of the preferred route is an outcome based on the results of three independent 'streams' of work conducted on the Tintenbar to Ewingsdale Pacific Highway Upgrade. These three streams are:

- Community and agency submissions on the Route Options Display held in late 2005 and the corresponding RODR, as reported in the *Route Options Submissions Report* and summarised in **Chapter 4**.
- The VMW for the short list of route options held in December 2005 as reported in the *Value Management Workshop Report* and summarised in **Chapter 5**.
- The technical assessment of the short list of route options as reported in this document, PRR, **Chapter 6**.

The Project Team conducted an overall assessment of the short list of route options by comparing the outcomes of the three streams and considering costs and value for money. This process is outlined in **Figure 7.1** and the results are documented in this chapter.

**Figure 7.1 Process for Recommending Preferred Route**



### 7.2 Differences in Analysis Base by Stream

When comparing the outcomes of the three streams of work conducted on the Tintenbar to Ewingsdale Pacific Highway Upgrade, it is important to note there are some differences in the analysis base for each of the streams, including:

- The community/agency submissions were based on the RODR information and individual local knowledge.
- The VMW used the RODR information updated by some additional information collected by the Project Team following the publication of the RODR. At the VMW, evaluation criteria were developed and analysed in four separate silos: Functional, Economic, Social, and Natural and Cultural Environment.

- The technical assessment reported in **Chapter 6** of this document uses the latest information for footprints, including information collected and analysed following the VMW. It considers the comparative merits in three silos of evaluation criteria: Safety and Functionality, Social and Economic, and Natural and Cultural Environment; these categories are the same as the VMW except that social and economic are combined. The technical assessment is based on the Sieve 2 evaluation criteria; these criteria are generally a refinement of the Sieve 1 criteria used to determine the short list of route options in the RODR.

### 7.3 Key Outcomes of the Three Streams

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The key outcomes of the three streams are summarised as follows:

- Community and Agency Submissions
  - Options A and B were favoured over Options C and D.
  - Option A was preferred over Option B.
  - T2 was preferred over T1.
  - No conclusive results could be drawn on preference for sections (i.e. A2 over B2).
- Value Management Workshop
  - Option C was clearly the worst performing option and Section C1 should not be considered further.
  - Option B2 was also a poor performing section and should not be considered further.
  - Option D was considered marginal.
  - T1 and T2 were seen to be similar.
- Technical Assessment
  - Options A and B perform better than Options C and D.
  - Combinations of subsections for A1 and B1 perform better than A1 and B1 as stand alone sections.
  - Poor performing options and sections that were eliminated from further consideration include: Options C and D, and Subsection A1-c.
  - The top performing options include: A1-a, B1-a, A1-b, B1-b, B1-c, A2, B2, T1 and T2.
  - The top performing options differ in four areas: A1-a and B1-a; A1-b and B1-b, A2 and B2; and T1 and T2.
  - A1-a is preferred over B1-a.
  - B1-b is preferred over A1-b.
  - A2 is preferred over B2.
  - T2 is preferred over T1.

## 7.4 Comparison of Outcomes of the Three Streams

Comparison of the outcomes from the three streams provides the following results as shown in **Table 7.1**:

- Options A and B are preferred over Option C in all streams.
- Options A and B are preferred over Option D in two streams.
- A2 was preferred in one stream, and B2 was a poor performing option in one stream.
- T2 was preferred in two streams, and considered similar to T1 in one stream.

**Table 7.1 Outcomes of the Three Streams**

Options	Community and Agency Submissions*	Value Management Workshop	Technical Assessment
Options A, B, C and D	A and B preferred over C and D	C was the worst performing option and there was uncertainty regarding D	A and B preferred over C and D
A2 and B2	No definitive results	B2 performs poorly and should not be considered further	A2 preferred over B2
T1 and T2	T2 was preferred over T1	T1 and T2 considered similar	T2 preferred over T1

\*Based on submissions received on the Route Options Display and the RODR.

## 7.5 Overall Assessment

The overall assessment of the short list of route options considers the results of the three streams in combination with cost and value for money considerations. The results of this assessment are described in the following sections.

### 7.5.1 Cost Comparison

A cost comparison of all the shortlisted route option combinations is provided in **Table 3.16**. **Table 7.2** provides a summary of the cost of the top performing options discussed in **Section 6.7** and provides the basis for a value for money comparison of these options. By reviewing option combinations that vary by only one section, the cost difference of the two varying sections can be determined. The key results of the cost comparison are:

- Cost estimates for Options C and D are significantly higher than estimates for Options A and B (see **Table 3.16**, Options 17, 18, 35, and 36).
- Options incorporating B1-a are about \$5 million more expensive than similar options incorporating A1-a (see **Table 7.2**, Options 7 and 8).
- Options incorporating A1-b are about the same cost as similar options incorporating B1-b (see **Table 3.16**, Options 14 and 15).
- Options incorporating B1-c are about \$10 million less expensive than similar options incorporating A1-c (see **Table 3.16**, Options 2 and 5).
- Options incorporating B2 are about \$43 million more expensive than options incorporating A2 (see **Table 7.2**, Options 7 and 15).
- Options incorporating T2 are about \$12 million more expensive than options incorporating T1 (see **Table 7.2**, Options 7 and 25).

**Table 7.2 Cost Comparison of Top Performing Options (\$ million)**

Option	7	8	15	23	25	26	33
	A/B	A/B	A/B	A/B	A/B	A/B	A/B
	A1a	B1a	A1a	B1a	A1a	B1a	A1a
<b>Sections</b>	B1b	B1b	B1b	A1b	B1b	B1b	B1b
	B1c	B1c	B1c	B1c	B1c	B1c	B1c
	A2	A2	B2	A2	A2	A2	B2
	T1	T1	T1	T2	T2	T2	T2
<b>Comparative Cost Estimate</b>	\$373	\$378	\$416	\$389	\$385	\$390	\$428

### 7.5.2 Option C and Option D Assessment

Option C was the worst performing option in the VMW and it performed poorly in the technical assessment; additionally community and agency submissions generally preferred Options A and B over Option C.

Option D performed poorly in the technical assessment, and community and agency submissions generally preferred Options A and B over Option D. The VMW results regarding Option D were uncertain.

As previously noted, cost estimates for Options C and D are significantly higher than costs for Options A and B. The combination of poor performance and higher costs results in low value for money considerations.

In summary, Options C and D perform poorly compared to Options A and B and should not be considered further.

### 7.5.3 A1 and B1 Assessment

The technical assessment identified that combinations of subsections for A1 and B1 perform better than A1 and B1 as stand alone sections. Further assessment of Sections A1 and B1 has therefore been carried out on a subsection basis as described below.

#### A1-a versus B1-a Assessment

Subsections A1-a and B1-a were not directly compared in the community and agency submissions or at the VMW, but potential impact on Emigrant Creek Dam was an area of concern raised in both streams.

In terms of the technical assessment, A1-a performs similarly to B1-a. As noted in **Section 6.7.1**, A1-a has lower natural and cultural environment impacts, primarily because it is further from Killen Falls and Emigrant Creek Dam. In addition, it more closely matches the Ballina Bypass EIS design and allows full use of land already acquired by the RTA for the Ballina Bypass. A1-a is also about \$5 million less expensive than B1-a. On the basis of similar performance at a lower cost, A1-a provides greater value for money than B1-a.

Compared to B1-a, A1-a performs similarly in the technical assessment, better addresses issues raised in the other two streams, and provides greater value for money. In conclusion, A1-a is the preferred section.

#### A1-b versus B1-b Assessment

Subsections A1-b and B1-b were not directly compared in the community and agency submissions or at the VMW, but potential impacts on high value agriculture and Emigrant Creek were areas of concern raised in both streams.

In terms of the technical assessment, Section B1-b performs better than A1-b, particularly in terms of safety (see **Section 6.7.2**) and has a similar cost. On the basis of better performance at a similar cost, B1-b provides greater value for money.

#### A1-c Versus B1-c Assessment

Subsections A1-c and B1-c were not directly compared in the community and agency submissions or at the VMW, but potential impacts on Newrybar and the Newrybar school were areas of concern raised in both streams.

In terms of the technical assessment, B1-c performs much better than A1-c, and none of the route options with A1-c were included in the top performing options. B1-c also costs about \$10 million less than A1-c, thus B1-c provides greater value for money.

B1-c performs better in the technical assessment and better addresses key issues raised in the other two streams. In conclusion, B1-c is the preferred section.

#### 7.5.4 A2 versus B2 Assessment

A key outcome of the VMW was the recommendation that Section B2 should not be considered further.

Results of the technical assessment indicate that A2 and B2 are very similar (see **Section 6.7.3**), thus the only significant difference is the relative cost. A2 is significantly less expensive than B2, by about \$43 million, mainly due to the higher structure costs in B2. Additionally, A2 utilises the 9(a) proposed road reserve zone and almost half of the existing Bangalow Bypass. On the basis of similar performance at a much lower cost, A2 provides greater value for money.

Selection of A2 over B2 is consistent with the results of two of the streams and value for money considerations. In conclusion, A2 is the preferred section.

#### 7.5.5 T1 versus T2 Assessment

While the performance of T1 and T2 were considered similar in the VMW, T2 was generally preferred in the community and agency submissions. In the technical assessment of T1 and T2, T2 was preferred based on a small performance advantage (see **Section 6.7.4**).

T2 is more expensive than T1 by about \$12 million; however T2 provides benefits which off-set the additional capital costs. These benefits include:

- Lower grades providing ongoing benefits over the project life in travel time savings, accident reduction, fuel savings and reduced greenhouse gas emissions.
- Less complex construction and traffic management, thus easier and safer to build.

Considering the results of the three streams and the above benefits, the additional cost of T2 is considered justified in terms of value for money considerations. In conclusion, T2 is the preferred section.

## 7.6 Recommendation of Preferred Route

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Based on the comparison of the outcomes of the three streams and value for money considerations, the recommended preferred route (see **Figure 8.1**) is the option made up of: **A/B, A1-a, B1-b, B1-c, A2 and T2**. This route was selected for the following key reasons:

- Provides the best overall balance between functional, ecological, heritage, social, and economic considerations and provides for staging opportunities.
- Best meets the objectives of both the Pacific Highway Upgrade Program and the Tintenbar to Ewingsdale project.
- Achieves high safety standards.
- Provides for grade separation of the upgraded Pacific Highway and the local road system.
- Provides a good outcome in terms of transport efficiency.
- Provides reasonable physical separation from existing and proposed major residential areas such that acceptable visual and traffic noise outcomes could be achieved with sensitive urban design.
- Considers the outcomes of the VMW and community submissions.
- Allows for potential water quality risk reductions in the Emigrant Creek Dam area.
- Provides good road user benefits for a reasonable construction cost.
- Retains 'Macadamia Castle', a local landmark.
- Retains the existing highway as a local/tourist road.
- Has a lower impact on the escarpment and visual amenity compared to coastal options.
- Utilises the highest amount of existing and planned highway reserves (Ballina Bypass, 9(a) proposed road reserve zone and Bangalow Bypass).
- Avoids known aboriginal heritage sites.
- Avoids State significant agricultural land.
- Has a lower impact on EEC's compared to coastal options.
- Has a lower risk associated with soft soils, flooding and land slips compared to coastal options.
- Has the minimum impact on wildlife corridors compared to other options.
- The T2 tunnel has reduced travel time, lower greenhouse gas emissions, and less road user costs than the T1 tunnel.
- Impacts on agricultural properties could be reduced, where possible, through discussions with individual land owners and refinement of the design.

## 7.7 Preferred Route Summary

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The preferred route consists of sections A/B, A1-a, B1-b, B1-c, A2, and T2. This route is on the plateau and uses the approved alignment of the northern section of the Ballina Bypass, the 9(a) proposed road reserve zone and the southern half of the Bangalow Bypass.

The alignment of the route south of the Bangalow Bypass is near to the existing Pacific Highway alignment but not coincident. North of the Bangalow Bypass, the route traverses farmland to the tunnel under St Helena Road. From the tunnel to the Ewingsdale interchange, the route is immediately to the east of the existing Pacific Highway but at a considerably flatter grade and a much lower level. The preferred route is described in detail in **Chapter 8**.

