

# DUNNS CREEK ROAD ALIGNMENT INVESTIGATION AND COST REVIEW





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## **Executive Summary**

In response to the expected increase in traffic volumes associated with new land developments in South Queanbeyan, Queanbeyan City Council (Council) are examining the construction of Dunns Creek Road to provide an additional access link between Tralee (Monaro Highway) and Googong (Old Cooma Road) as part of the overall road network for the southern area of Queanbeyan.

A review of the *Queanbeyan Residential Economic Strategy 2031* by the NSW Department of Planning (DoP) required Council's Transport Strategy to specifically address the need, timing and funding (including the preparation of contribution plans) for required transport infrastructure works to address forecasted growth for the region. The original review required Council to specifically look at Dunns Creek Road as a road option however the 2008 addendum removed this particular requirement and specified a more generalised investigation into transport infrastructure works.

As a result, Gabites Porter (now Traffic Design Group) were engaged by Council on the recommendation of the NSW Roads and Traffic Authority (now Roads & Maritime Services) to conduct a fully functioning integrated land use/transport model to analyse Queanbeyan's traffic network. This work was detailed in the *Draft Queanbeyan Strategic Traffic Plan (2031)*. Dunns Creek Road was included in several scenarios tested in this work however it was found that this road option was not required within the 2031 planning horizon that was investigated. On 26 August 2009 Council adopted the *Draft Queanbeyan Strategic Traffic Plan (2031)* and resolved to rename it the *Googong and Tralee Traffic Study (2031)*. Dunns Creek Road was not part of the program of recommended road network improvements indentified in the adopted study.

Nonetheless, several financial, ecological, heritage and traffic investigations on Dunns Creek Road have progressed since 2007.

In 2011 Council was successful in receiving \$4million of grant funding from the NSW Roads and Traffic Authority (now Roads & Maritime Services) for several Queanbeyan Council Road Network Projects. The objective of the \$4million funding was to progress the studies and designs of infrastructure work recommended in the *Googong and Tralee Traffic Study (2031)* as well as provide seed funding for the identification of the road corridor and related studies for Dunns Creek Road.

In 2015 Council engaged GHD to provide an updated concept design for Option 1B and Option 5 of the previous 2008 corridor study, for the section of Dunns Creek Road between Old Cooma Rod and the South Tralee development using current design standards. GHD were also required to provide an assessment on impacts on the environment, heritage, land acquisition as well as P50 and P90 cost estimates of the current work.

This report has been prepared to provide details on the history of the project, past investigations, as well as updated design, costs and impacts of Dunns Creek Road. This report is to be read in conjunction with the report prepared by GHD.

The current work has found that the proposed Dunns Creek Road project will be in excess of \$200 million to construct, will have a bridge in excess of 500m long, will reduce the connectivity of regional and local biolinks, will remove large quantities of Box-Gum Woodland and several threatened fauna species, will have potential impacts on sites of Aboriginal heritage and will require work in the ACT Government.



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# 1. Introduction and Background

#### **1.1 Introduction**

In response to anticipated increase traffic movements between newly released land developments in South Queanbeyan, Queanbeyan City Council is examining the construction of Dunns Creek Road to provide an additional access link between Tralee (Monaro Highway) and Googong (Old Cooma Road) as part of the overall road network for the southern area of Queanbeyan. The total length of the road is estimated somewhere in the order of 7.2 - 8.3 km long. These investigations commenced in 2007 and are currently still ongoing with the development options narrowing down to a point of selecting a preferred route.

The proposed road has several alternate routes all of which will be located near and through the proposed South Jerrabomberra subdivision area.

Dunns Creek Road has been included in Queanbeyan's Traffic Studies and Traffic Models to allow for the future planning of Queanbeyan's road network.

#### 1.2 Background

A review of the *Queanbeyan Residential Economic Strategy 2031* in April 2007 by the NSW Department of Planning (DoP) specified that:

"Prior to any rezoning for Googong, Tralee South, Environa and Poplars being finalised the Council is to develop a transport strategy to service the new residential and employment lands at South Jerrabomberra and Googong.

The Transport strategy shall specifically address the need and timing of Dunns Creek Arterial (including reservation of the corridor), Edwin Land Parkway, Old Cooma Road realignment and upgrades to Lanyon, Tompsitt and Tharwa roads. This shall ensure that the funding and timing of road and transport infrastructure is linked to specified thresholds of residential lot releases."

By December 2008 an addendum to the initial April 2007 review was completed and issued by DoP. This addendum did not specify any particular need to focus on Dunns Creek Road but instead required Council to develop a more generalised investigation into transport infrastructure works. It stated that:

"Prior to the finalisation of any rezoning of lands identified in the Strategy Map, the Council is to finalise a transport strategy to service the new residential and employment areas. The transport strategy shall specifically address the need, timing and funding (including the preparation of contributions plans) for required transport infrastructure works. When considering the infrastructure requirements for land at South Tralee, the Council shall liaise with Australian Rail Track Corporation on the future use of the rail line and requirements for any road crossings of the rail line."

As a result of the DoP requirements, Gabites Porter (now Traffic Design Group) were engaged by Council on the recommendation of the NSW Roads and Traffic Authority (now Roads & Maritime Services) to conduct a fully functioning integrated land use/transport model to analyse Queanbeyan's traffic network. This work was detailed in the *Draft Queanbeyan Strategic Traffic Plan (2031)* and was completed in 2009. The traffic study looked at over 34 combinations of road and intersection improvements to address the



network deficiencies that are likely to be experienced as a

result of the expected development growth in the Canberra-Queanbeyan region. The traffic study did not focus on reducing flows in any particular areas of the network but rather looked at the Canberra-Queanbeyan network as a whole. Proposed road and intersection improvements were identified on the basis of their ability to improve the level of service (LOS) at each location and for the overall road network to function at LOS "D" or better. Several new routes were proposed as a means of creating additional capacity thereby relieving various areas of congestion, and analysed in detail in the modelling.

Results from modelling for the *Draft Queanbeyan Strategic Traffic Plan (2031)* showed that Option 05B provided the best combination of traffic improvements to the long term strategic transport plan for all of Queanbeyan. Option 05B includes Ellerton Drive Extension, the future four-laning of Old Coma Road and various intersection improvements.

Dunns Creek Road was included in several scenarios tested in this work and was seen as a useful inclusion into the road network however it was found that this road option was not required within the 2031 planning horizon that was investigated. Dunns Creek Road was not part of the program of recommended road network improvements indentified in the adopted study.

On 26 August 2009 Council adopted the *Draft Queanbeyan Strategic Traffic Plan (2031)* and resolved to rename it the *Googong and Tralee Traffic Study (2031)*. The adopted Traffic Plan did not include Dunns Creek Road.

Following the adoption of the Traffic Plan, Council received an offer from the Village Building Company (VBC) in 2009 to provide funding towards land acquisition, design and the subsequent construction of Dunns Creek Road as follows:

- 50% of the cost of Dunns Creek Road between the Monaro Highway and Old Cooma Road up to an amount of \$31.4 million,
- 331/3% of improvements to Monaro Highway within the ACT up to an amount of \$6.6 million.

The above offer was subject to Council securing funds from State and Federal Governments for the balance of the cost to construct Dunns Creek Road. Council accepted this offer.

In 2011 Council received \$4 million in grant funding from the NSW Government (administered by the Roads & Maritime Services) for the design and environmental works relating to Ellerton Drive Extension, further stages of Old Cooma Road, upgrade of 13 intersections as well as seed funding for Dunns Creek Road corridor identification and related studies. The Council Delivery Program 2013-2017 adopted by Council on 26 June 2013 allocated \$1.5 million for preliminary design and environmental work for Dunns Creek Road. This allocation was considered sensible at the time given the offer made by VBC.

In 2013 DoP handed down a decision to preclude any residential development within the 20 ANEF noise contour. This decision resulted in the reduction of the South Jerrabomberra development by about 46% and subsequently led to VBC withdrawing their offer detailed above for the time being.

Assuming that construction of Dunns Creek Road is deferred to the long term (+25years), any environmental approval obtained now and any design work completed now would be out of date. Environmental approvals generally expire after 5years and road design standards will certainly over a long timeframe. Spending \$1.5million on these activities was difficult to justify as the project would require significant rework and additional costs to complete again in the future. It was however seen appropriate to continue work to identify a potential route for the road that would be subject to future design and environmental approvals. This work did not require a large budget to complete.



On 24 July 2013 Council resolved that the allocation from the RMS Grant for Dunns Creek Road be reduced to \$300,000 and that the following work be completed:

a) Prepare a concept design with centreline and typical cross sections for a route that best satisfies current road design requirements,

b) Undertake a preliminary assessment of the environmental impacts of this route and estimate potential environmental offset requirements,

c) Undertake a preliminary assessment of potential land acquisition requirements of the proposed route, and

d) Review current cost estimates.

The work detailed above is the subject of this report.

# 2. Previous Work

#### 2.1 Previous Studies/Reports

The following studies and reports have been completed since 2007:

- October 2007 Report for Dunns Creek Road Corridor Study and Alignment Planning – Preliminary Alignment Options Report (prepared by GHD),
- January 2009 Report for Dunns Creek Road Investigations Ecological and Heritage Investigations (prepared by GHD),
- February 2009 Report for South Queanbeyan Roads Cost Estimate (prepared by GHD),
- July 2009 Report for Dunns Creek Road Alignment Study Flora and Fauna Constraints of Option 1B and Option 5 (prepared by GHD),
- December 2014 Queanbeyan City Council TRACKS model South Jerrabomberra & Queanbeyan Traffic Analysis 2014 – Part 4a Dunns Creek Analysis Report (prepared by TDG).

Information from several of these studies has been used to develop the *Dunns Creek Road Corridor Study and Alignment Planning Preliminary design Update for Preferred Options July 2015* (Appendix C) report prepared by GHD.

#### 2.2 Requirement for Dunns Creek Road

On 26 August 2009 Council adopted the *Draft Queanbeyan Strategic Traffic Plan (2031)* and resolved to rename it the *Googong and Tralee Traffic Study (2031)*. The adopted Traffic Plan did not include Dunns Creek Road. The traffic study looked at over 34 combinations of road and intersection improvements to address the network deficiencies that are likely to be experienced as a result of the expected development growth in the Canberra-Queanbeyan region. Dunns Creek Road was included in several scenarios tested in this work and was seen as a useful inclusion into the road network however it was found that this road option was not required within the 2031 planning horizon that was investigated. Dunns Creek Road was not part of the program of recommended road network improvements indentified in the adopted study.

In 2014, Queanbeyan's traffic model was updated using current census data, infrastructure programs, land use projections and traffic counts for both Queanbeyan and Canberra. As mentioned above, the program of recommended road network improvements identified in the *Googong and Tralee Traffic Study (2031)* did not include Dunns Creek Road. From the work completed on the Queanbeyan's December 2014 TRACKS model, there is still no need for Dunns Creek Road by 2031. Further analysis was then done to determine when Dunns Creek Road would be required.



### Dunns Creek Road Alignment Investigation and Cost Review

The 2014 model was then adjusted to add the remaining 434 planned households in Googong to the 2031 year model to create a 2033 future model year with a total of 5,550 households completed in the Googong development. All of ACT land use was extrapolated to the 2033 year model to be consistent. The 2033 year model did not show a worse than Level of Service "D" on Old Cooma Road. This LOS is acceptable to Council and thus it was found that Dunns Creek Road is not required by the time the planned Googong development was fully completed.

The next step of the analysis was to determine when Old Cooma Road would reach capacity and reach a failed Level of Service (LOS E). This analysis involved extrapolating ACT land use as well as add Queanbeyan employment in line with the proposed development sequencing in South Jerrabomberra. It was found that an increase of 1,710 households over the final Googong development level (ie. over the planned 5,550 households) would create a LOS E flow on Old Cooma Road. This Level of Service would be unacceptable for Council. Assuming a rate of 220 households/year (the current development rate) this equates to eight years of development growth. Therefore the initial estimate of when Old Cooma Road would drop to LOS E would be 2041.

Therefore Dunns Creek Road would be required in 2041 provided that:

- a) a further 1,710 households are developed in addition to the planned 5,550 households in Googong, and
- b) the further 1,710 households are developed in a similar rate to the current Googong development.

### **3.Current Work**

As mentioned previously, on 24 July 2013 Council resolved that the allocation from the RMS Grant for Dunns Creek Road be reduced to \$300,000 and that the following work be completed:

a) Prepare a concept design with centreline and typical cross sections for a route that best satisfies current road design requirements,

b) Undertake a preliminary assessment of the environmental impacts of this route and estimate potential environmental offset requirements,

c) Undertake a preliminary assessment of potential land acquisition requirements of the proposed route, and

d) Review current cost estimates.

#### 3.1 Eastern Portion – Old Cooma Road to South Tralee

In February 2015 GHD were engaged to:

- a. Update preliminary/concept design options 1B and Option 5 from the previous studies to connect to the new subdivision layout available for South Tralee street layout
- b. Update geometry of the western section of the alignments to be consistent with the eastern portion
- c. Determination of climbing and descending lane requirements for construction of the project as a two lane road initially to match initial traffic demand
- d. A single cycle /shared path alignment to be located adjacent to the road shoulder on the northern side
- e. Create revised road boundaries to indicate proposed resumption requirements based on the ultimate four lane configuration
- f. Preparation of P50 and P90 cost estimates for both options in their two lane configurations



g. Update the layouts to show impacts to properties, ecological community (i.e. flora and fauna) and heritage.

The GHD report did not investigate the portion of Dunns Creek Road running through South Tralee as this would be completed as part of the development. GHD's investigations also did not investigate the portion of Dunns Creek Road west of South Tralee or its connection point with the Monaro Highway. These portions are discussed later. Their report focused on the portion of Dunns Creek Road between South Tralee and Old Cooma Road.

The Dunns Creek Road Corridor Study and Alignment Planning Preliminary design Update for Preferred Options July 2015 (Appendix C) prepared by GHD investigated two alignment options. The two alignments selected to be updated as part of this report were Option 1B and Option 5 from the previous report in September 2008. Option 1B is a more northern route which connects with Old Cooma Road south of the Quarry and runs 400m south of Aspen Rise in Jerrabomberra. Option 5 is a more southern route that connects with the intersection of Old Cooma Road and Googong Road and runs 300m north of Fernleigh Park.

The design speed adopted for this report was maintained at 80km/h. The maximum grade for both options was maintained at 9%. Lane widths were 3.5 wide, shoulders were 2.5m wide, verges were 1.0m wide, a 2.5m shared path was included and a 3m gutter was also included. To work out the required four lane corridor a 6m wide median was included. Climbing lanes were considered at either end of the eastern portion (ie. near Old Cooma Road and South Tralee). Drainage design was developed based on 100 year average events.

The bridge lengths adopted are:

- Option 1B 550m
- Option 5 530m.

#### 3.1.1 Cost

The P50/P90 cost estimate for each Option between Old Cooma Road and South Tralee is as follows:

Option 1B:

- P50 estimate \$181M (including 39% contingency)
- P90 estimate \$205M (including 58% contingency)

Option 5:

- P50 estimate \$169M (including 40% contingency)
- P90 estimate \$192M (including 59% contingency).

#### 3.1.2 Ecological Constraints

GHD completed an ecological constraints assessment of Option 1B and Option 5 for Council in 2009 (refer to *Report for Dunns Creek Road Alignment Study Flora and Fauna Constraints of Option 1B and Option 5*, July 2009). Table 1 summarises the ecological impacts that are known. Option 5 has the largest area of Box-Gum Woodland and would likely result in direct impacts to more species known to occur in the alignments, including threatened flora. Both alignments will reduce the connectivity of both the regional biolink and the local biolink.



Constraint type	Option 1B	Option 5
Ecological constraints		
Box Gum Woodland (TSC Act)	Removal of about 17.7 hectares of the community	Removal of about 24.5 hectares of the community
Box-Gum Woodland (EPBC Act)	Removal of about 7.2 hectares of the community	Removal of about 16.9 hectares of the community
Threatened flora		Removal of known habitat for Hoary Sunray and Silky Swainson-pea.
Threatened fauna	Removal of known habitat for Brown Treecreeper, Diamond Firetail, Hooded Robin, Speckled Warbler, Golden Sun Moth and Pink-tailed Worm-lizard	Removal of known habitat for Brown Treecreeper, Diamond Firetail, Hooded Robin, Gang-gang Cockatoo, Golden Sun Moth, Pink-tailed Worm- lizard and Speckled Warbler

#### Table 1 Summary of ecological impacts known to occur



#### Figure 1 - Biolinks

The entire Dunns Creek area outside of South Tralee is environmentally sensitive. Further species may be detected with targeted and intensive survey effort. Both options may have significant impact on threatened species and ecological communities and would require a Species Impact Statement. Both options would require biodiversity offsets for NSW and Commonwealth listed species and require both ecosystem and species credits for the offset.



Option 5 is likely to require greater biodiversity offset than Option 1B due to it having the largest area of Box-Gum Woodland removed and it having more direct impacts to more species known to occur in the alignment, including threatened flora.

A Species Impact Statement (SIS) report will take approximately a year to prepare however the environmental approval from Office of Environment and Heritage (OEH), is generally only valid for 5 years. Therefore expending funds on further Environmental Studies at this time is considered to be inappropriate as the road is not required any earlier than 2041.



Figure 2 – Ecological and Heritage Constraints

#### 3.1.3 Heritage Constraints

A number of potential archaeological deposits (PADs) have been recorded in previous work for GHD. The alignment options occur on the boundary of these PADs as outlined below and in Figure 2:

- Option 1B PAD on southern boundary of the central section
- Option 5 PAD on the northern boundary of the central section

In addition, the following was found along Option 1B. Two sites of Aboriginal cultural heritage material were identified. The first was an isolated find and the second was a low density artefact scatter located on a small terrace adjacent to Jerrabomberra Creek. Both sites are small spatially and the numbers of artefacts present are of low density. Surveys undertaken by other archaeological studies identified three other aboriginal sites.

All of the options impact sites of Aboriginal heritage and are likely to require and Aboriginal Heritage Impact Permit (AHIP) under section 90A of *the National Parks and Wildlife Act 1974*.



#### 3.2 Western Portion – South Tralee to Monaro Highway

The proposed route and alignment of Dunns Creek Road through South Tralee and onto the Monaro Highway has been discussed for some time with no full agreement reached. There are two options through South Tralee and two connection options to the Monaro Highway through either Isabella Drive or Sheppard Street.

On 22 September 2014, the Council received a letter from the Director General of The ACT Government Environment and Planning stating that the ACT Government does not endorse Sheppard Street as a longer term access point to South Tralee, particularly due to safety concerns arising from the exposure of residential traffic to industrial traffic. Further adding that it is now timely for Sheppard Street connection to be discontinued and focus on moving forward with South Tralee.

However at the Ordinary Council meeting of 25<sup>th</sup> March 2015, Council resolved:

- 1. That Council as a priority, provide funding for and begin work on the Dunns Creek Road Corridor identification, acquisition, Design and Environmental work.
- 2. Council notes that Sheppard Street is Queanbeyan City Council's preferred primary access into the Australian Capital Territory (ACT) and as such Dunns Creek Road is to be directly connected to Sheppard Street.
- 3. Council also notes that a proposed connection from Dunns Creek Road to Isabella Drive would be a useful future access into the ACT as the volume of traffic increases in the future in line with the growth progression of the Googong development.

Work on Point 1 of the resolution had already commenced with the engagement of GHD to investigate the eastern portion of Dunns Creek Road in February 2015. As a result of Point 2 of the resolution Council appointed delegates to attend meetings with the ACT Government to further discuss Council's position on a Sheppard Street connection. These discussions are ongoing. Point 3 has been considered in the analysis of route options for the entire length of Dunns Creek Road.

Without a firm decision on the alignment for the western portion of Dunns Creek Road an analysis of all possible options has been included in this report to provide an indication of the likely cost and impacts of Dunns Creek Road.

# 4. Analysis of Route Options

The scope of the investigation is as follows:

- 1) Utilise the latest GHD report *Dunns Creek Road Corridor Study and Alignment Planning Preliminary Design Update for Preferred Options July 2015* for the cost and impacts of the portion between South Tralee and Old Cooma Road.
- Incorporate the latest cost estimates for Dunns Creek Road through the South Tralee development supplied by The Village Building Co and convert this cost estimate in the order of a P50 and P90 cost estimate.
- 3) Compare the proposed alignments for the proposed Dunns Creek Road taking all the known constraints to date into consideration.



#### 4.1 Comparison of Alignment Options

The latest proposals for Dunns Creek Road span six different possible alignments as listed below:

- Alignment A Sheppard Street through South Tralee and Option 1B configuration This Configuration travels along Sheppard St (Cyan) then utilises the existing Council approved road corridor shown in Dark Green (Northern Entry Road 34m wide) and then Dark Blue (Dunns Creek Road east-west 29m Wide) then light blue until it hits the red section of option 1B all the way to Old Cooma Road
- 2) Alignment B Sheppard Street through South Tralee and Option 5 configuration This Configuration travels along Sheppard St (Cyan) then utilises the existing Council approved road corridor shown in Dark Green (Northern Entry Road 34m wide) and then Dark Blue (Dunns Creek Road east-west 29m Wide) then light blue all the way to Old Cooma Road.
- 3) Alignment C Sheppard Street around South Tralee and Option 1B configuration This Configuration travels along Sheppard St (Cyan) then utilises the existing Council approved road corridor shown in Light Green (Dunns Ck Connection to Sheppard 29m wide) joining to the light blue until it hits the red section of option 1B all the way to Old Cooma Road.
- 4) Alignment D Sheppard Street around South Tralee and Option 5 configuration. This Configuration travels along Sheppard St (Cyan) then utilises the existing Council approved road corridor shown in Light Green (Dunns Ck Connection to Sheppard 29m wide) joining to then light blue all the way to Old Cooma Road.
- 5) Alignment E Isabella Drive through South Tralee and Option 1B configuration This Configuration travels along Isabella Dr (Magenta) then utilises the existing Council approved road corridor shown in Pink (Southern Entry Road 34m wide) and then Dark Blue (Dunns Creek Road east-west 29m Wide) then light blue until it hits the red section of option 1B all the way to Old Cooma Road.
- 6) Alignment F Isabella Drive through South Tralee and Option 5 configuration This Configuration travels along Isabella Dr (Magenta) then utilises the existing Council approved road corridor shown in Pink (Southern Entry Road 34m wide) and then Dark Blue (Dunns Creek Road east-west 29m Wide) then light blue all the way to Old Cooma Road.

Figure 3 shows the different options for the proposed Dunns creek alignments as described above.







The P50/P90 cost estimate for each Option is as follows:

- 1) Alignment A Sheppard Street through South Tralee and Option 1B configuration
  - i) P50 estimate \$218M (including 39% contingency)
  - ii) P90 estimate \$247M (including 58% contingency)
- 2) Alignment B Sheppard Street through South Tralee and Option 5 configuration
   i) P50 estimate \$207M (including 39% contingency)
  - ii) P90 estimate \$236M (including 58% contingency)
- 3) Alignment C Sheppard Street around South Tralee and Option 1B configuration
  - i) P50 estimate \$210M (including 39% contingency)ii) P90 estimate \$238M (including 58% contingency)
- 4) Alignment D Sheppard Street around South Tralee and Option 5 configuration.
  - i) P50 estimate \$200M (including 39% contingency)
  - ii) P90 estimate \$228M (including 58% contingency)
- 5) Alignment E Isabella Drive through South Tralee and Option 1B configuration i) P50 estimate \$223M (including 39% contingency)
  - ii) P90 estimate \$252M (including 58% contingency)
- 6) Alignment F Isabella Drive through South Tralee and Option 5 configuration
  - i) P50 estimate \$212M (including 39% contingency)
  - ii) P90 estimate \$241M (including 58% contingency)

These cost estimates are broken down into more detail in Appendix A.

Appendix B contains a table comparing the impacts and constraints of the proposed road.

# 5.Conclusion

Although some alignment options are cheaper than others, they can also have a higher cost to the environment. Higher impacts on the environment will likely result in the need to find and purchase offset lands. This would add to the risk and cost of the project. Council could be responsible for identifying over 200ha of offset land for Dunns Creek Road. This would need to be confirmed closer to the construction timeframe of Dunns Creek Road.

All alignment options will have:

- 1. estimated construction costs in excess of \$200 million
- 2. bridges in excess of 500m long
- 3. reduced teh connectivity of the regional and local biolinks
- 4. impacted on large quantities of Box-Gum Woodland and several threatened fauna species
- 5. heritage impacts
- 6. work in the ACT Government.





Dunns Creek Preliminary Options Estimated Cost - June 2015

o Dunns Creek	RMS P30 ("Safe Contingency)		Ĩ					Ì	\$36,071,400			\$10,000,000	\$205,150,000	\$241,221,400
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sppard St then th Ros	at Estimate RM		25 000/125'6	1						29,669,043 511	36,520,293 \$1			56,047,293 \$2
Estimated Cost Sh	0 59.110,000 54.567,000 54.667,000 54.667,000	52,800,000	000/005/05	Estimated Cost 59,110,000 51,667,000 51,820,000 512,097,000	\$22,100,000 \$14,197,000	Estimated Cost \$13,300,000 \$1,490,000 \$14,990,000	\$2,800,000	000'040'55	\$22,830,000	5 052758795 15 Eb0/699/6215	\$136,520,293	\$122,844,650 \$6,423,750	006/892/621\$	\$1
Location	Maute (Calibre & VBC Entimate) Snepparts (Calibre & VBC Entimate) Sneppart Street Connection - ACT works Sneppart Street Connection - NGW works Sub-toda' - Sneppart Street	Dumis Creek Road (East - West)	Northern Entry Road (Dunns - Sneppard) Jub-total - Sheppard Street Option	ThALE (calibre /92 Estimate & Counci) Sheppard Street Connection - ACT works Sheppard Street Connection - VGW works Sheppard Street Connection to Thelee Boy Loo-Hole - Sheppard Street	Dums Creek connection to Sheppard St. kub-total - Sheppard Street Option	Raute (caibre & VBC Estimate) ssoeils Drive Connection - ACT works ssoeils Drive Connection - NSV works sub-total - issteallo Street	Dunns Creek Road (East - West)	Southern Entry Road (Dunns - Isabella)	Sub-total -Isabella Drive Option	Dunns Creek (GHD & Council Estimate) Dunns Creek Road (Option 1.0) Estimated Environmental Officet 60.9ha*1.6 etios 365.4ha	Sub-total - Dunns Creek (Option 1b)	Dunns Creek Road (Option 5) Estimated Environmental Offset 37 Jns <sup>1</sup> 2:6 stio= 542 Sha	sub-total - Dunns Creek (Option 5)	Totels

### Dunns Creek Road Alignment Investigation and Cost Review

APPENDIX A - Dunns Creek Preliminary Options Estimated Cost -June 2015

	Algnment A Sheppard St - Through Tralee -	Algnment B Sheppard St - Through Tralee -	Alignment C Shepperd St - Around	Algnment D Sheppard St - Around	Algnment E Isabella Dr - Through	Alignment F Isabella Dr - Through
Item	Option 1B	Option 5	Tralee - Option 1B	Tralee - Option 5	Tralee - Option 1B	Tralee - Option 5
Renking in Construction Cost	5	2	3	1	6	4
Construction Cost Estimate	\$247M	\$236M	\$238M	\$228M	\$252M	\$241M
Bridge Length Over Jerra Creek	250m	530m	550m	530m	250m	530m
Overall Travel Distance	gual	Shorter	Shorter	Shortest	Longest	Long
Amount of Work in ACT	Least	Least	Le ast	Least	Nost	Most
Bridge over Railway	say	Yes	Yes	Yes	Yes	Yes
Shared Travel with Residents	Average	Average	Least	Least	Most	Most
Desire Line with Googong Rd	No	Yes	No	Yes	Mna	Yes
No. Intersections on Old Coome Rd (Googang Rd, New)	2	1	2	1	2	1
Stree tighting Estimate	Average	Average	Average	Least	tsow	Average
Expected Maintenance Cost	Average	Average	Average	15क म्	15OW	Average
Land Purchase (Traiee to Old Cooma Rd)	42, 29 ha	40.34ha	42.29 ha	40.34 ha	42.29 ha	40.34 ha
Land Purchase (Through/Around Tratee)	Subject to negotistions w	vith developer, expect simi	lar land purchase for the wir Road routes but full width	bening of roads within prop	osed subdivision, longer ver	sus shorter Durins Creek
Heritage Impacts	PAD, isolated find and artefact scatter. Three undescribed sites	PAD	P.A.D./ Isolated find and artefact scatter. Three undescribed sites	DAD	P.A.D., isolated find and artefact scatter. Three undescribed sites	GVd
Impacts Biolinks	Sey	Yes	Yes	Yes	Sey	Yes
Overall Disturbed Area	Average	Smarlest	Largest	Larger	Average	Average
TSC Box-Gum Woodland Removed - Eastern Portion Only	17.7ha	24.5 ha	17.7ha	24.5ha	17.7ha	24.5ha
EPBC Box-Gum Woodland Removed Eastern Portion Only	7.Zha	16.9ha	7.2ha	16.9ha	e 12.7	16.9ha
Known Threate red Flora Impacts Eastern Portion Only	Not identified	Sirky Swainson-pea and habitat for Hoary Sunray	Not I de mitted	Sirky Swainson-pea and habitat for Hoary Sunray	Not identified	Sinky Swainson-pea and habitat for Hoary Sunray
Known Threate ned Fauna Impacts Eastern Portion Only	Removal of known habitat for Brown Treecteeper, Damond Firetal, Golden Sun Moth, Hoode Arohn, Plink-tailed Worm-fizer d and Speckled Warbler	Removal of known habitat for Brown Treestreeper, Diamond Firetal, Golden Sun Moth, Hooded Robin, Pink-tailed Worm-lizard, Specield Warther and Gang-gang Cockatoo	Removal of known habitat for Brown Treecree per, Damond Fretall, Golden, Sun Moth, Hooded Robin, Pink-tailed Worm-fizard and Spectold Warhler	Removal of known habitat for Brown Treecreeper, Diarnond Firetai, Golden Sun Moth, Hooded Robin, Pirk-Tailed Worm-Itzard, Specield Warther and Gang-gang Cockatoo	Removal of known habitat for Brown Treecteeper, Da mond Firetal, Golden Sun Moth, Hoode Alobn, Plink-tailed Worm-Eard and Speckled Wathler	Removal of known habitat for Brown Treecreeper, Diamond Firetall, Golden Sun Moth, Hooded Robin, Pirk-taled Worm-Izard, Speolied Warfber and Gang-gang Cockatoo

### APPENDIX B - Dunns Creek Preliminary Options Comparison Sheet - June 2015



APPENDIX C - GHD report - Dunns Creek Road Corridor Study and Alignment Planning Preliminary Design Update for Preferred Options July 2015.

