

## Issue History

File Name	Prepared by	Reviewed by	Issued by	Date	Issued to
P2296.001T Ellerton Extension Traffic Modelling Review	A.Bitzius	D.Bitzius	A.Bitzius	16 November 15	J. Watson (RMS)
P2296.002T Ellerton Extension Traffic Modelling Review	A.Bitzius	D.Bitzius	A.Bitzius	1 December 15	J. Watson (RMS)

# Ellerton Drive Extension Independent Traffic Modelling Review

## 1. INTRODUCTION

### 1.1 BACKGROUND

Queanbeyan City Council, in partnership with the Federal and NSW Governments proposes to construct a two lane single carriageway sealed road as an extension to Ellerton Drive at East Queanbeyan. This extension is proposed to connect to Old Cooma Road and Edwin Land Parkway at Karabar.

A number of traffic modelling investigations have been undertaken on behalf of Queanbeyan City Council with the results of this modelling informing the decision to undertake the proposed Ellerton Drive extension. The Ellerton Drive extension is to be implemented in conjunction with a number of other programmed infrastructure upgrades to form a 2031 traffic infrastructure plan to cater for future development growth.

The 4.6km Ellerton Drive extension is located on the eastern outskirts of the Queanbeyan Central Business District (CBD) providing a connection between the south-east and north-east of the CBD. Its purpose is to provide an alternative traffic route around Queanbeyan reducing travel times, which will enable improved active transport and urban amenity measures within the town centre. The extension will also provide for some improved connectivity around the CBD whilst also catering for forecast residential and employment growth in the southern areas.

It is understood that a proportion of the Queanbeyan community is divided over the proposed upgrade questioning the accuracy of the traffic modelling conducted to date and how the results have been interpreted. The majority of those raising concerns with the project appear to have a preference for the proposed Dunns Creek Road connection which is an east-west connection further south located between the future growth areas of Googong and South Tralee and onward to the Monaro Highway (and Canberra).

### 1.2 PURPOSE AND SCOPE

RMS, on behalf of Queanbeyan City Council, has commissioned Bitzius Consulting to conduct a review of the traffic modelling and reporting undertaken for Queanbeyan City Council which was contained in the Googong and Tralee Traffic Study 2013 (GTTS). As part of the review, Council requested that following matters be addressed, but not limited to:

- was the type of modelling used by Council appropriate?
- was the data used in the model appropriate?
- were the outcomes of the modelling reasonable?
- were the recommendations from the report sound and supported by the modelling?

The scope of this independent review focussed on the above four key questions. The last two questions were considered to be similar in nature and have been considered together within this technical note.

## 2. TRAFFIC MODELLING ASSESSMENT

### 2.1 REVIEW OF TYPE OF MODELLING CONDUCTED

The GTTS has relied upon the use of the TRACKS modelling software to inform the study recommendations. TRACKS is a well-recognised strategic transport modelling software package that is heavily used in the Illawarra, South Coast and Southern Highlands Regions.

One of the key benefits of using the TRACKS software package is that Council and RMS Wollongong staff are familiar with its use and subsequently have a heightened understanding of the interpretation of results.

The use of a strategic transport modelling software package is considered appropriate for the study objectives. Strategic transport models are typically used when new road links, road connections, or road duplications are proposed to be established at a strategic level (i.e. determining if a 2 lane road or a 4 lane road is required). Some caution should be taken however when the strategic model is being used to determine localised improvements or impacts. The strategic model can be used to assist with identifying where intersection treatments or turn bans may become necessary in the future. However this is often required to be validated closer to the period of proposed construction, based on actual traffic count data and short term traffic growth forecasts and using more localised data. Strategic transport models are constructed using strategic levels of information/data (such as a limited number of intersection counts and broad land use forecasts). More detailed data capture and traffic modelling / analysis is required to be undertaken to rely on localised recommended treatments. Subsequently any recommendations for major intersection upgrades based on strategic long term forecasts of traffic volumes should contain limitations that the recommended treatments would need to be verified closer to the year of construction (i.e. 2-5 years prior to construction).

During the refinement of the recommended intersection treatments, other modelling tools and techniques are often adopted such as the use of SIDRA (intersection modelling package). SIDRA is often used to determine the performance of a range of intersection treatments proposed for a single intersection in isolation. SIDRA has recently been enhanced to enable the assessment of intersection treatment refinements for multiple intersections which could be beneficial for this project.

Where multiple intersections exist in close proximity it is recommended that microsimulation traffic modelling be undertaken to ascertain the required intersection treatments. For something like the Queanbeyan CBD and the surrounding intersections, it would be appropriate to consider the use of a microsimulation model (or depending on the coverage area a mesoscopic model) to determine the future year intersection requirements. Mesoscopic/microsimulation models are often used to take the traffic link volumes output from a strategic transport model as an input into a mesoscopic/microsimulation model for a smaller area. The model zone structure for a mesoscopic/microsimulation model is much more refined and is typically structured to represent in more detail the intensity of land use (existing or proposed) on a CBD block by block basis. This provides a more accurate and detailed level of assessment considered appropriate to determine specific intersection treatment requirements, whilst also considering other road safety and CBD pedestrian / cycle amenity objectives targeted.

## 2.2 WAS THE DATA USED IN THE MODEL APPROPRIATE?

### 2.2.1 Base Model Development

The base model development report and the 2011 base models were reviewed. The following key issues and positive practices were identified:

1. The aim of the study was to model the area at a macro and micro level. The use of TRACKS at the micro level is not considered appropriate to address this project need (**non-critical**: it is understood that Council is continually reviewing report recommendations at a local level, which is supported).
2. The modelling report discusses the variables and 'looseness' of the model integration with the ACT model and acknowledges however that it is 'fit for purpose'. It is agreed that it is 'fit for purpose' and the method to include ACT at this level of detail is better than not including it at all.
3. Peak periods adopted for modelling are considered appropriate.
4. Model reporting is easy to read and consistent with standard modelling practices.
5. The use of 1997 ACT Household interview surveys for trip length frequencies is considered appropriate as it is the only available information and is still considered relevant for the purpose of the assessment and can be used in lieu of not have any information at all. It is appropriate to use this data in lieu of data from other surrounds, or it even may be used as a sensitivity check against other parallel data sets. The base models have been closely validated to traffic count data which will overcome shortfalls in these data-sets. Caution however should be exercised in using the 'old' trip length distributions in 'sprawling' cities as they grow due to most of the growth being at the fringes of the urban area, generally introducing longer trips. The consequence of this is that the 'shorter than actual' trip lengths may then under-estimate traffic volumes on major, longer distance roads, such as the extension.
6. The model process adopted is consistent with standard modelling practices.
7. The base model validation in the Queanbeyan area is considered to be very good for a strategic traffic model.
8. The model study area is considered appropriate for the assessment undertaken.
9. The adoption of private trip end attraction equations from neighbouring 'like for like' catchments such as that adopted in the Illawarra, South Coast and Southern Highlands regions is considered appropriate in lieu of local parameters or data. This is common practice.
10. The base model LOS plots and volume plots mostly appear consistent with the level of queuing and delay observed during site inspections in both the AM and PM peak periods.
11. The models show Atkinson Street (north of Mowatt Street) has been modelled with 3 lanes each way. It is subsequently attracting traffic volumes higher than expected (**non-critical**: won't affect model outcomes/results).
12. The models show no signalised intersection at Yass Road / Aurora Avenue (**non-critical**: won't greatly affect model outcomes/results).
13. The models show 2 lanes each way south of Googong Road to Burra Road when only one exists (**non-critical**: won't greatly affect model outcomes/results).
14. The models show a 2 lane on-ramp from Tharwa Drive to the Monaro Highway when only 1 lane exists (**non-critical**: won't greatly affect model outcomes/results).

15. The models show that the Monaro Highway (northbound) at Lanyon Drive is coded with 3 lanes each way when 2 lanes exist. Should have been coded as a 'seagull' with slip lanes as three through lanes are currently modelled on this section. (**non-critical**: won't greatly affect model outcomes/results).
16. The AM right turn volumes at Lanyon Drive seem high at Canberra Avenue relative to the east-west Canberra Avenue movements compared to site observations (**non-critical**: won't greatly affect model outcomes/results).
17. The models reviewed coded the Pialligo Avenue/Oak Estate Road as a standard T, when a seagull type intersection exists. It possibly will need a further upgrade in the future to assist with its safe and efficient operations. Site observations showed a large volume of traffic turning off at this intersection. (**non-critical**: won't greatly affect model outcomes/results).
18. Whilst the zoning system adopted for the Queanbeyan CBD area is very detailed and somewhat reduces the coarseness that is typically associated with a strategic model, the CBD model zones appear to be loaded to the network without consideration of the actual car park locations. There may be benefits in consolidating some of the zones to reflect the major car park access points to better replicate localised intersection impacts within the CBD (**non-critical**: won't greatly affect model outcomes/results).
19. The signalisation of northbound traffic on the Monaro Highway at Mugga Lane is not included in the models and is a capacity inhibitor on that corridor (**non-critical**: won't greatly affect model outcomes/results as other model changes have been made to reflect the performance of the corridor to match base model validation criteria).
20. The Monaro Highway is coded as a 70kph road whilst future models at 80kph (**non-critical**: won't greatly affect model outcomes/results).
21. Lanyon Drive near Canberra Avenue is coded as a 60kph road when it is 70kph (**non-critical**: won't affect model outcomes/results).
22. Canberra Avenue for most of its length within Queanbeyan has the incorrect Link Type applied. That is, 70kph is generally applied when it ranges from 80kph to 60kph (**non-critical**: won't greatly affect model outcomes/results).
23. Norse Road has been coded as a 70kph road when it is 60kph (**non-critical**: won't affect model outcomes/results).
24. Pialligo Avenue has been coded as a 90kph road whereas it is 100kph reducing to 80kph. It is recommended that the Link Types adopted be reviewed (**non-critical**: won't greatly affect model outcomes/results).
25. Use of attractiveness factors has been noticed and these vary between 2011 and 2031 models. The use of attractiveness factors should only be used where sound reasoning exists and explanation of the changes should be requested (**non-critical** – only used at a couple of locations where the impact from their removal won't affect the final outcome).

### 2.2.2 Future Year Models

The majority of the above issues raised in the base year models were carried through to the future year models. In addition to the issues identified in the base year models the following issues were identified with regard to the 2031 AM/PM models audited:

26. It is unclear if select link analysis and difference plots were prepared to understand if the trip origin-destination markets using the extension in the modelled area are intuitively reasonable (**non-critical** – however would add model process robustness).

27. The model coding for the four-way roundabout proposed at the northern entry to Googong appears unconventional operationally and should be checked (**non-critical** – won't affect the final outcome).
28. The intersection upgrade recommendations (including turn bans) reported should be treated with caution as they are being derived from a strategic traffic model. It would be preferred if the report had a disclaimer that qualified that the need and timing for intersection upgrades are progressively reviewed and checked against localised traffic counts at the intersection to ensure the recommended treatments remain relevant (**non-critical**: it is understood that Council is continually reviewing the report recommendations at a local level, which is supported).
29. The trip generation out of Googong to Old Cooma Road in 2031 was modelled as 2,867 trips (AM) and 3,556 (PM). Following the latest RMS guide to trip generation the trip rates per dwelling are 0.71 (AM) and 0.78 (PM) resulting in 3,905 trips (AM) and 4,290 (PM). The RMS Guide states the following in relation to the derivation of these trip rates: *'The above rates do not include trips made internal to the subdivision, which may add up to an additional 25%'*. Further justification on the trip generation should be sought to address the above. It should be noted that background traffic appears to be consistently growing at approximately 1.2% per annum, which is similar to the Queanbeyan / ACT population growth trends – 1.6% per annum (refer attached summary). The modelling undertaken has applied a total background growth of approximately 3% per annum. All of the above suggests that the forecast increase in background traffic may have been over-estimated and/or the rate of growth over-estimated (i.e. forecasts are more representative of a 2041/2051 background traffic scenario) and the development traffic from Googong may have been under-estimated. It is possible that assumptions have been made relating to increased levels of assumed trip internalisation within Googong, but this should be clarified within the model reporting with additional detail provided (**non-critical**: won't greatly affect model outcomes/results).
30. Future year modelling is showing the new Ellerton Drive extension to carry very directional flows with 550-800 vph and 150-200vph in the opposite direction. The low volume of traffic experienced in the counter-peak direction is consistent with many radial roads within Queanbeyan where peak traffic movements are very directional.

### 2.3 WERE THE OUTCOMES/RECOMMENDATIONS OF THE MODELLING REASONABLY REPRESENTED BY THE MODELLING?

The following key points summarise the validity of the modelling in relation to the final recommended outcomes:

31. It is agreed that Dunns Creek Road appears to be a good project in the longer term once Googong is fully occupied and the east-west demands at the lower end of the study area increase. However this finding would be subject to understanding if any downstream ramifications were to result from this new road connection.
32. Through site inspections, it is apparent that the short term focus should be on providing intersection capacity and pedestrian amenity improvements rather than major infrastructure projects. The Ellerton Drive extension sets the framework to allow these other improvements to occur with a very workable road network structure plan in place.
33. The Ellerton Drive extension provides a corridor that can accommodate trucks with fewer urban amenity impacts. It is clear through the site inspections that truck / alternative corridors are of high importance to protect the amenity of the CBD based on the existing provision of sign-posted truck / alternative routes.
34. The Dunns Creek Road connection effectively primarily provides "residential land use to residential land use" road connections which typically have little trip relations between each other. Whilst some demand exists from the southern areas of Canberra into the southern areas of Queanbeyan (and vice

- versa), the magnitude of such demand is not believed to warrant the Dunns Creek Road connection to be provided as a high priority. The report recommendations to retain the corridor for a likely 2041 timeframe when Googong is forecast to be fully occupied are supported. However, this should be re-investigated prior to placing any additional level of commitment to what has currently been stated.
35. The Old Cooma Road upgrade to four lanes between Googong and Edwin Land Parkway (in addition to the Ellerton Drive extension) provides good connections between the Googong Land Release (a major contributor to the associated infrastructure), to key employment land clusters within Queanbeyan local government area, and to the existing surrounding arterial road network. It also provides good local connections for local residents wishing to access schools and other social / recreational uses, proposed as part of the Googong Land Release, providing effective integration and self-containment within the Queanbeyan LGA, which is supported. The proposed upgrade also supports the reduction of truck movements within the City Centre and aligns with both Queanbeyan and ACT longer term land use strategies (i.e. the employment lands proposed at and around the Airport). The Majura Parkway road extension provides more direct access via Pialligo Avenue to Queanbeyan CBD).
  36. Queanbeyan Council / RMS should further petition the ACT government for an improved connection of Pialligo Avenue between the airport and Queanbeyan.
  37. The incremental assessment adopted to ascertain the staging of infrastructure is considered appropriate. The findings of the incremental assessment are also logical with the local Googong development likely to generate and attracts trips to/from Queanbeyan City Centre. In addition, the restricted options for access to the CBD between these two significant trip generators/attractors, require the need for an alternative route to support the outcomes desired within the CBD. Any significant increase in traffic on Old Cooma Road will affect the amenity and road safety on this road section. In this regard the proposed project is supported in line with the study recommendations.
  38. The Ellerton Drive extension should not be postponed on the basis that site observations suggest timelines for many of the upgrades appear to be earlier than would appear to be necessitated. The project will be required within the early stages of the Googong development and the fact that funds have been secured, and planning agreements are in place, supports the timing for the project. In fact, construction will enable Council to move forward on implementing the CBD masterplan-related projects (as funds permit).
  39. Whilst the implementation of Dunns Creek Road is seen to take some pressure off Edwin Land Parkway (within the modelling), the volumes on Edwin Land Parkway are not considered significant for its road environment. In addition, the modelling has not looked beyond the 2031 design horizon to understand what downstream infrastructure needs are required within ACT to support any subsequent impacts. Upgrades to the Monaro Highway are likely to need to begin to focus on grade-separated interchanges which are much more costly than the duplication of the Pialligo Avenue is likely to offer. The implementation of Dunns Creek Road should be retained as a long term initiative only and reviewed over time for its feasibility. It may be more appropriate to consider the provision of local 'internal' connections in lieu of an arterial standard road (for example, local extensions at Old Cooma Road, Cavanagh Drive, Fernleigh Drive, etc as development progresses).
  40. The access strategy to effectively provide an alternative route around the Queanbeyan CBD, will increase the ability for Council to better manage existing road space allocation within the CBD, to achieve the desired outcomes of the CBD Masterplan (such as improved pedestrian, cycle and parking amenity). This is a major non-tangible benefit of the project.
  41. The provision of the Ellerton Drive extension not only addresses the needs of the Googong Land Release impacts but also provides opportunity to increasingly implement the CBD Masterplan.
  42. The statement within the TDG reporting that average trip lengths reduce as land use densities increase is a very relevant point in this study and is supported.

43. Understanding the ACT infrastructure implementation strategy and land use strategy is a critical component of determining the staging and viability of the longer term options (i.e. Dunns Creek Road or Northern Bypass or other link strategies). It is recommended that ongoing dialogue is maintained with the ACT to manage cross-border access issues. Based on the current public information available, it is probable that an upgrade to the Pialligo Highway is a logical medium term project.
44. Oaks Estate Road was observed to be well-used. Its role in the network has not been discussed in much detail across the options tested. The future use of this corridor should be given greater consideration with future testing.
45. The proposed Northern Bypass appears to have lost traction through the process. It is understood that the corridor's terrain is challenging, however, similar to the Dunns Creek Road corridor, it would appear appropriate to be retained for planning purposes as a potential longer term strategy.

### 3. CONCLUDING REMARKS

RMS, on behalf of Queanbeyan City Council, commissioned Bitzios Consulting to conduct a review of the traffic modelling and reporting undertaken for Queanbeyan City Council which resulted in the Googong and Tralee Traffic Study 2013 (GTTS). As part of the review, Council requested that following matters be addressed, but not limited to:

- was the type of modelling used by Council appropriate?
- was the data used in the model appropriate?
- were the outcomes of the modelling reasonable?
- were the recommendations from the report sound and supported by the modelling?

The traffic reports made publicly available along with the 2011 and 2031 TRACKS models were reviewed in detail. Whilst a number of minor issues have been identified through the modelling review, the processes adopted by TDG are consistent with standard strategic modelling practices. Furthermore, the interpretation of the modelling results appears logical and consistent with observations during the site inspections. The recommendations from the modelling conducted are considered to be appropriate.

The minor (non-critical) issues listed within this audit should be incorporated into future model option testing / review updates.



## ATTACHMENT A

### HISTORICAL GROWTH RATE SUMMARY

### Historical Growth Rate Summary

YEAR	ROAD	LOCATION	ADT	Growth (%pa)
2004	BUNGENDORE Rd.	Atkinson St. - Bridge / TOTAL traffic	20680	
2014	BUNGENDORE Rd.	Bridge - Atkinson St/ TOTAL traffic	20848	0.081%
1999	CANBERRA Ave.	Kealman Rd. - Lanyon Dr./ TOTAL - EST	8070	
2012	CANBERRA Ave.	Kealman Rd. - Lanyon Dr./ TOTAL - EST	9926	1.605%
1999	CANBERRA Ave.	Lanyon Dr. - Kealman Rd./ TOTAL - WST	9030	
2012	CANBERRA Ave.	Lanyon Dr. - Kealman Rd./ TOTAL - WST	10764	1.360%
2004	CANBERRA Ave.	Tharwa Rd. - Lanyon Dr./ TOTAL - WST	12080	
2011	CANBERRA Ave.	Tharwa Rd. - Lanyon Dr./ TOTAL - WST	12440	0.420%
2012	COOMA Rd.	Barracks Flat Dr. - Candlebark Rd. / TOTAL	6503	
2015	COOMA Rd.	Barracks Flat Dr. - Candlebark Rd. / TOTAL	9175	12.158%
2004	COOMA St.	#114s_Alanbar St. - Pindari Cresc./ STH bound.	5370	
2015	COOMA St.	#114s_Alanbar St. - Pindari Cresc./ STH bound.	6653	1.967%
1999	COOMA St.	Isabella St. - Lowe St / Total traffic	13240	
2015	COOMA St.	Isabella St. - Lowe St / Total traffic	16261	1.293%
2005	CRAWFORD St.	#257_Rutledge St. - Monaro St/ TOTAL traffic	6600	
2013	CRAWFORD St.	#257_Rutledge St. - Monaro St/ TOTAL traffic	7382	1.410%
2001	FARRER Pl.	#41_Lowe St - Cameron Rd./ TOTAL WST.	11990	
2014	FARRER Pl.	#41_Lowe St - Cameron Rd./ TOTAL WST.	10452	-1.050%
2001	FARRER Pl.	#48_Campbell St. - Lowe St/ TOTAL EST.	10090	
2014	FARRER Pl.	#48_Campbell St. - Lowe St/ TOTAL EST.	9996	-0.072%
2000	JERRABOMBERRA Pkwy	Entry - Brudenell Dr. / TOTAL traffic	9320	
2015	JERRABOMBERRA Pkwy	Entry - Brudenell Dr. / TOTAL traffic	11511	1.418%
2003	LANYON Dr.	ACT Border - Tomsitt Dr. / TOTAL traffic	20050	
2008	LANYON Dr.	ACT Border - Tomsitt Dr. / TOTAL traffic	21811	1.698%
2004	LIMESTONE Dr.	R'About - Entry/Exit to shops / TOTAL traffic	7530	
2015	LIMESTONE Dr.	R'About - Entry/Exit to shops / TOTAL traffic	7782	0.300%
2002	LOWE St.	Opp. School/ Cooma St. - Monaro St / TOTAL	9290	
2012	LOWE St.	Opp. School/ Cooma St. - Monaro St / TOTAL	7900	-1.608%
2001	RUTLEDGE St.	#6_Lowe St - Carpark Entry / TOTAL traffic	8430	
2013	RUTLEDGE St.	#6_Lowe St - Carpark Entry / TOTAL traffic	9886	1.337%
2004	SOUTHBAR Rd.	Lanyon Dr. - Wilson St/ TOTAL	8730	
2014	SOUTHBAR Rd.	Lanyon Dr. - Wilson St/ TOTAL	8552	-0.206%
2004	SOUTHBAR Rd.	Nth. Terrace - Tharwa Rd./ TOTAL traffic	9040	
2014	SOUTHBAR Rd.	Nth. Terrace - Tharwa Rd./ TOTAL traffic	8660	-0.429%
2004	SOUTHBAR Rd.	Tharwa Rd. - Kinsella St/ TOTAL traffic	7960	
2014	SOUTHBAR Rd.	Tharwa Rd. - Kinsella St/ TOTAL traffic	6539	-1.947%
2000	TOMPSITT Dr.	Lanyon Dr. - Jerrabomberra / TOTAL traffic	10880	
2008	TOMPSITT Dr.	Lanyon Dr. - Jerrabomberra / TOTAL traffic	12839	2.091%
2006	URIARRA Rd.	#163_Rail Bridge - Kendall Ave Nrth./ TOTAL	10476	
2014	URIARRA Rd.	#163_Rail Bridge - Kendall Ave Nrth./ TOTAL	12392	2.122%
2001	YASS Rd.	#18_Thuralilly St. - Mulloon St/ STH - TOTAL	5780	
2015	YASS Rd.	#18_Thuralilly St. - Mulloon St/ STH - TOTAL	6454	0.791%
2001	YASS Rd.	ACT border - Rail bridge / TOTAL traffic	11220	
2014	YASS Rd.	ACT border - Rail bridge / TOTAL traffic	14821	2.164%
2001	YASS Rd.	Mulloon St. - Thuralilly St/ TOTAL NTH.	5840	
2015	YASS Rd.	Mulloon St. - Thuralilly St/ TOTAL NTH.	6318	0.564%
		Average Growth Rate		1.194%
2003			327357	
2013		ACT POPULATION	381488	1.542%
2001			32382	
2011		Queanbeyan population	37991	1.610%