

Better Transport Futures

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Transport Planning & Engineering

Boundary Road, Medowie, NSW Proposed Rezoning for Rural Small Holdings Development



Transport and Accessibility Report

February 2010

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Document History and Status

Issue	Rev.	Issued To	Qty	Date	Reviewed/Approved
Draft	Rev01	Eureka Funds Management i Andrew Simons	1	4/9/09	CThomas / M Waugh
Final	Rev02	Eureka Funds Management- Andrew Simons	1	7/9/09	CThomas/M.Waugh
Draft	Rev03	Eureka Funds Management- Andrew Simons	1	1/2/10	CThomas/MWaugh
Final	Rev04	Eureka Funds Management- Andrew Simons	1	3/2/10	CThomas/MWaugh

Printed: 3 February 2010

Last Saved: 3 February 2010

File Name: M:\MW Pty Ltd\Active Projects\P0650 Boundary Rd, Medowie\Reports\P0650 Medowie-Boundary Rd Small Holdings Subdivision Rev04.Doc

Author: Sue McAuley

Name of Organisation: Eureka 1 Project 10 Pty Ltd

Name of Project: Proposed Small Holdings Subdivision, Boundary Rd, Medowie

Name of Document: Transport and Access Report

Document Version: Final

Project Number: P0650

1. Introduction

Better Transport Futures has been commissioned by Eureka 1 Project 10 Pty Ltd to carry out a revised transport and access review of the proposal to rezone Lots 93,94, 95 and 96 Boundary Rd to the east of Medowie Road in Medowie as rural small holdings in accordance with the Port Stephens Medowie Strategy. Whilst a subdivision layout has not been developed it is anticipated that between 300 and 350 lots can be accommodated at sizes of between 1000m² and 4000m².

The site under consideration is of the order of 127 hectares with the potential for:

- Up to 350 rural small holdings
- An ecologically sensitive area through the spine of the block of land
- No development East of the EEC,

The overall project is seen as providing a positive contribution to the ongoing redevelopment of the Medowie village as part of the Hunter Region.

This report presents the findings of a desktop investigation of the transport issues associated with the proposal and has been prepared to accompany the rezoning application to Port Stephens Council. It is structured as follows:

- **Chapter 2** outlines the existing situation in the vicinity of the subject site, including discussions on any other planned growth known within the vicinity and any known road network improvements.
- **Chapter 3** describes the access and traffic requirements of the proposal, its internal movement characteristics
- **Chapter 4** summarises the findings of this investigation, outlining conclusions and recommendations for the traffic operations of the site to support the rezoning application.

2. Existing Situation

2.1 Site Location

The site is located on a parcel of land east of Medowie Road and to the north of the existing Medowie township. It is located in the general vicinity of Medowie and covers an area in the order of 127 hectares. The site has road frontage along Boundary Road, James Road and along the Crown Road to the west. The land surrounding the site is generally rural in character, ecologically sensitive, with existing residential development to the south.

The locality is illustrated in **Figure 2-1** below.



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■ Figure 2-1 Site Location

Medowie Town Centre is located between 2.5 and 3 kms to the south of the site. It is a thriving local centre with many local facilities and schools. The Medowie Strategy was adopted by Council in March 2009. It seeks to guide development, consolidate the facilities in Medowie and increase the resident population, whilst other initiatives seek to improve employment opportunities in the broader area.

2.2 Local Road System

2.2.1 Existing Road Hierarchy

To the north of the site Medowie Road connects with the Pacific Highway. The Pacific Highway is a State Road (H10) and provides the main north-south route along the eastern coast of Australia. As such it is an important road link that carries a significant volume of traffic. It is the main arterial route through the area with the Roads and Traffic Authority (RTA) as the consent authority for this road.

Medowie Road is a Regional Main Road providing the sub arterial/collector road role through the area with Port Stephens Council as the consent authority.

Boundary Road is a local road serving 4 existing homes and State Forest areas.

2.3 Road Network Characteristics

Pacific Highway

Pacific Highway (H10) in the vicinity of Medowie provides a dual carriageway configuration to rural highway standard. It has a posted speed limit of 100 km/h outside of urban areas and has a consistent standard from Raymond Terrace to north of Karuah. The Pacific Highway forms part of the National Highway and carries a high proportion of interstate traffic between Sydney and Brisbane.

The Pacific Highway is the main north-south road along the coast of northern NSW. The RTA is progressively extending the dual carriageways northwards as part of the Pacific Highway program being funded by the State and Federal Governments. The Pacific Highway forms a higher speed link into Newcastle from areas to the north of Medowie which limits the popularity of Medowie Road as a through road. The intersection of the Pacific Highway with Medowie Road is a seagull island layout with full turning lanes.

Medowie Road

Medowie Road (MR518) is a regional main road through the town of Medowie. It provides the most northerly connection from the Pacific Highway through Medowie to Richardson Road and Nelson Bay Road, connecting to the Port Stephens Peninsula. It is also the most direct route from the north to Williamtown and the Newcastle Airport.

Medowie Road generally provides a single lane of travel in both directions. It is marked at 7m wide but has a 9m seal with a further 1m of unsealed shoulder on each side. Outside of the urban areas it has a posted speed limit of 100 km/h. Give Way or Stop signs control most of the intersections along the length of this road. The intersection with Richardson Road operates under roundabout control along with that of Ferndale Road in the Medowie village centre. It generally has no footways along the majority of its length, with non-sealed shoulders provided on both sides. Within the urban areas in Medowie to the south there are limited footpaths and cycle paths.



■ **Photo 1 North view along Medowie Rd, from south of the intersection with Boundary Rd**

Traffic volume data has been collected from Council records. It carries comparatively low traffic flows. Traffic data for Medowie Road, been sourced from Council reports:

North of Federation Drive	- 2970 vehicles per day two-way.
North of Ferndale Road	- 6489 vehicles per day two-way
South of Ferndale Road	- 9238 vehicles per day two-way.

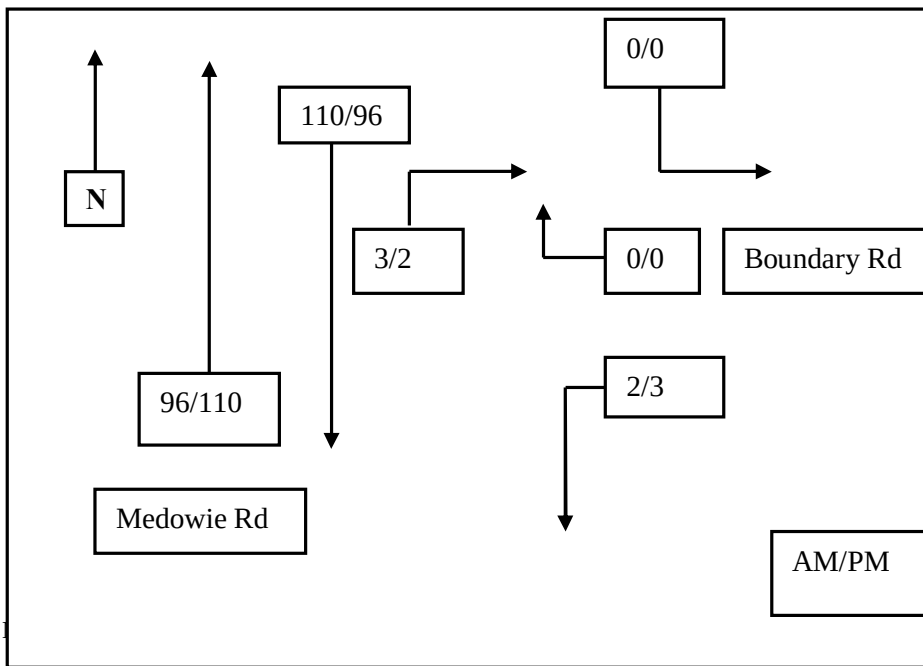
These levels of traffic reflect the busier section of Medowie Road where local traffic forms a large proportion of the vehicles using the road. **Figure 2.3** below shows the current traffic flows recorded at the intersection of Medowie Road with Boundary Road. They show a combined north and south bound traffic volume of 206 vehicles in the morning peak hour. This equates to approximately 2000 vehicles per day. From Boundary Road only the traffic generated by the limited number of residences located to the east and west of Medowie Road and between Medowie Road and the Pacific Highway use this section of Medowie Road. This residential traffic is supplemented by longer distance traffic using Medowie Road for access to regional facilities and destinations. This includes sand/gravel extraction trucks observed using Medowie Road.



■ Photo 2 Intersection of Boundary Rd and Medowie Rd looking east.



■ Photo 3 General view of Boundary Rd east of Medowie Rd.



■ **Figure 2-2 Existing Peak Hour Traffic Flows, BTF- August 2009**

Boundary Road.

Boundary Rd, east of Medowie Rd is an unsealed road, between 4.5m and 5m wide serving 4 existing residences and a large area of State Forest. It extends across Medowie Road to the west where parts have been sealed to service residences. The two sections of Boundary Road, east and west of Medowie Road have been staggered to eliminate a four way cross roads intersection. The two intersections are approximately 40m apart and operate as two separate T intersections. Refer **Photo 1**.

James Road

James Road is an unsealed road approximately 4.5m wide located along the north side of the site to be rezoned. It services a few properties and forest areas. A traffic count was not undertaken on this road.

Crown “Paper” Road

Along the western boundary of Lot 93 is a Crown “Paper” Road which has never been adopted. This is an unsealed road used for forest access. No counts of vehicle use of the road are available.

2.4 Existing pedestrian, cyclist and public transport facilities

There are no pedestrian or cyclist facilities in the Boundary Road area. None of the residential roads to the south or west of Boundary Road have any footpaths provided. The nearest footpath is located at the intersection with Federation Drive, some 700m to the south.

There is one public transport service in the Medowie area; Bus Route 135 linking Medowie from Raymond Terrace to Stockton via Fern Bay. In this area it uses Federation Drive, and Fisher Road. This service is located within 300m walk of the proposed rezoned land. There is, however, no public pedestrian access from

Medowie Road to Fisher Road in this area, consequently pedestrians will be required to walk over 700m to access the existing bus service.

2.5 Other Developments

At this stage there are no other developments proposed in the Boundary Road area. There are a number of proposed in-fill developments proposed as part of the Medowie Strategy in the Town Centre of Medowie, however, these are unlikely to impact on traffic characteristics in the Boundary Road area.

3. Proposed Land Use Plan

3.1 The Proposal

Medowie is recognised in the regional strategy for the Lower Hunter Region as one of seven major Greenfield release areas. The Medowie Strategy has been adopted by Council and sets the framework for integrated and sustainable growth and development of large parts of the central and southern sections of Medowie. No specific guidelines for the development of this part of Medowie are included in the Strategy, however, the ecological sensitivity of this area has guided the design of the Land Use Plan presented for the rezoned area.

The Land Use Plan for the site features ecologically sensitive design principles integrating a community of small holdings with existing forest area. The total site area is some 127 hectares. The Land Use Plan could accommodate up to 350 rural small holdings. This would be a mix of sizes ranging from 1000m to 4000m². No other land uses such as retail, recreational or commercial facilities are proposed as part of this Plan.

The site is well located approximately 2.5km north of the existing Medowie centre with direct access from Medowie Road, via Boundary Road. The site will be part of the growth of Medowie, relying on and supporting facilities such as retail, recreational and commercial activities planned within the existing Medowie town centre.

3.2 Development Staging

A Land Use Plan for the development of the rezoned area is illustrated in **Appendix A** to this Report. There is potential for this to be developed in five stages, each stage comprising approximately 60 lots. The road network would also be upgraded in stages to provide sealed access to each stage, with Boundary Road sealed in the first stages and James Road sealed in the last stages.

3.3 Trip Generation

The trip generation has been assessed using the rates available from the standard RTA guidelines for Traffic Generating Developments. These Guidelines indicate a range of traffic generation rates depending on the type of land use activities. The RTA guidelines provide advice on the critical movement periods during the morning and afternoon peak periods as well as daily traffic flows. The rates do not include a specific rate for rural residential developments and assumes the same rate as for urban dwelling houses of 9 daily vehicle trips with .85 trips per dwelling per peak hour.

Based on 350 lots this equates to 3150 vehicles per day being generated by the proposal, with in the order of 298 generated during the peak hour.

3.4 Traffic Distribution and Assignment

It is considered that the traffic to and from the development would be heavily biased to the south, either contained within Medowie or travelling on to locations such as Raymond Terrace or Newcastle. For the purposes of this assessment, the following trip distribution has been assumed:

South via Medowie Road i	90%
North via Medowie Road ii	10%

This directional split could vary, dependant upon new development in the area (Karuah for example) over the timeframe of the regional strategy (up to 25 years).

For the purpose of this assessment the following assumptions have been made in relation to trip distribution and assignment:

Peak Directional Split:

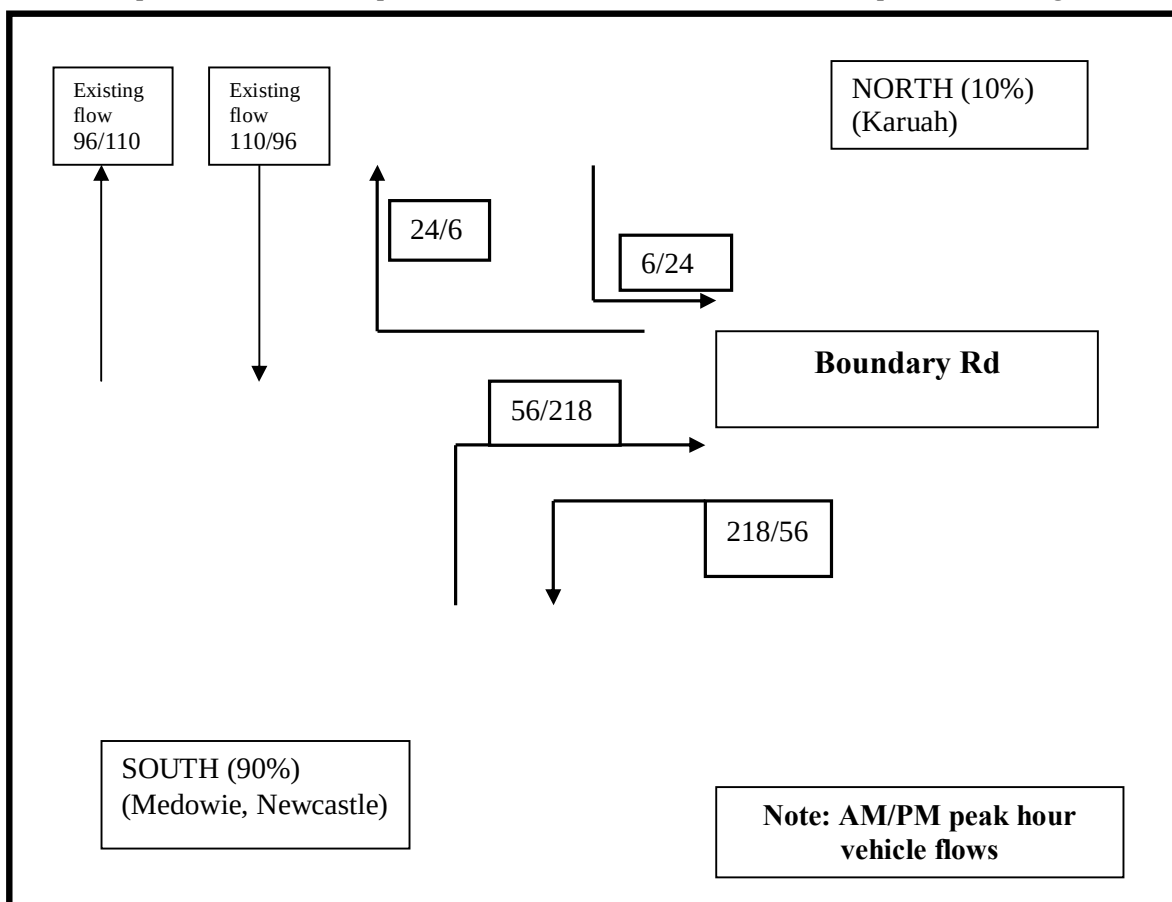
- 80% out AM, 20% in AM
- 80% in PM, 20% out PM

Peak Assignment

- 10 % N (Karuah and beyond)
- 90% S (Medowie and beyond)

3.5 Future Development Traffic Flows

The future possible total development flows based on this distribution are presented in Figure 3-1 below:



■ **Figure 3-1 Potential Future Flows. Medowie Rd/Boundary Rd**

3.6 Road Access Requirements

A key factor in the planning of any new development is access and the capacity of the surrounding road system. The Land Use plan proposal provides for one key access to the external road system at the existing intersection of Boundary Road with Medowie Road. It is recognised as part of the development that the intersection with Medowie Road will need to be designed to cater for this level of movement to ensure access and egress to the site is satisfactory as well as road conditions for existing road users remains satisfactory.

Observations on site show that there are little if any delays for through traffic movements along Medowie Road at its intersection with Boundary Road. Traffic entering or exiting the side roads also suffer from minimal delay, with the majority of the delay only caused by drivers having to slow down and negotiate the intersections.

Table 4.1 from Austroads Part 5 Intersections at Grade provides advice on intersection operation (reproduced below). Where these limits are not met, traffic effectively does not suffer from any delay.

Table 4.1 — Intersection Capacity - Uninterrupted Flow Conditions

Major Road Type ¹	Major Road Flow (vph) ²	Minor Road Flow (vph) ³
Two-lane	400	250
	500	200
	650	100
Four-lane	1000	100
	1500	50
	2000	25

It can be seen that for the current traffic flows, these limits are not met therefore capacity modelling is not required at the intersections of Medowie Road and Boundary Road for the existing situation. Based on the Table above the traffic volumes on Medowie Road could double before there is a need to undertake capacity modelling.

By applying the above and assessing intersection capacity based on approach lane capacity the existing number of approach lanes (one in each direction) is considered satisfactory. However, using capacity analysis, it is evident that as traffic volume increases during the evening peak hour, there may be some minor delays to vehicles turning right into Boundary Road, and they may have to wait momentarily in the centre of the road to turn. This is not a major issue at this stage with only up to an 8 second delay being forecast by the analysis, however, this is a 100kph zone with a proportion of the traffic being heavy trucks and it is advised the intersection should be upgraded to provide a right turn lane at Boundary Road east.

3.7 Pedestrian and Cyclist Access

The design and provision of pedestrian and cyclist facilities will need to be determined in consultation with Council, and incorporate the design parameters established by Council. This will include designs and provisions determined by Council as part of their preparation of pedestrian and cycle plans within the overall Medowie Town Area as part of the planning process.

Current pedestrian and cyclist facilities in the vicinity of the site are very limited, due to the limited amount of development within the surrounding area. There are currently no footpaths on the surrounding roads; specifically there are no footpaths on Medowie Road in this area. The nearest pedestrian facility is provided at Federation Drive, over 500m away.

As part of the development of the site, pedestrian and cyclist links need to be considered and provided for from the beginning of the development linking to the growing Medowie centre to the south. As the site is essentially a green site, the provision of pedestrian and cycle routes from the beginning of the development is highly desirable, so as to act as a positive encouragement to the use of these facilities as well as ease of construction. The basic principles of any pedestrian and cyclist network should be the provision of links connecting to existing facilities such as the centre of Medowie, schools, shops, public transport etc

The current Land Use Plan does not include road layout details therefore no details of road widths, footpaths or specific cycle paths are available at this stage, however, footpaths and dedicated cycling facilities are not generally required in rural residential developments due to the low traffic flows. Traffic volumes in these developments are generally low enough for pedestrians and cyclists to use the road network. Based on the assumption the proposed road layout will be a very permeable road network with no cul de sacs, the traffic can be expected to be evenly distributed with only Boundary Road carrying more than 1000vpd. Consequently all roads will be suitable for pedestrian and cyclist use. Allowance will be made for a footpath on Boundary Road to link into any future footpaths on Medowie Road should they be constructed.

Similarly Boundary Road will be designed to allow cyclist access to Medowie Road. This area of Medowie is largely level terrain and conducive to cycling with many destinations being within cycling distance. This recognises that cycling is an important means of transport, and not only a recreational activity.

3.8 Site Road Layout and Access Arrangements

The Land Use plan focuses on the one key route in and out of the site, with Boundary Road being the Collector Road for the subdivision, all other roads being Local Roads.

The intersection of Boundary Road with Medowie Road will be designed in accordance with Council and RTA road design guidelines. It will allow adequate capacity for the forecast levels of traffic generation based on the directional and assignment splits outlined in Section 3.4. For the above directional and assignment splits a single access point operating under Give Way control will be satisfactory for the intersection capacity required for the development.

By applying the above and assessing intersection capacity based on approach lane capacity, the existing number of approach lanes (one in each direction) is considered satisfactory.

The internal road layout and alignment will be developed to provide an environment that encourages low speed vehicle movement, improving overall safety and enhancing the environmental amenity for the residents.

The Land Use Plan does not require nor make provision for traffic from the development to use James Road to access Medowie Road. The proposal includes the sealing of James Road along the subdivision frontage but not between the development and Medowie Road. Traffic would use the Crown Road to access Boundary Road and then Medowie Road.

The unsealed section of James Road between the site and Medowie Road would remain unsealed. It could either remain open to service existing traffic or may be closed and the traffic could be re-directed via Boundary Road on to Medowie Road.

The Crown (Paper) Road between James Road and Boundary Road will also be sealed for its full length to provide access to the rezoned area.

3.9 Public Transport

Public transport in the vicinity of the site is very limited, mainly due to the low existing residential and commercial development within the vicinity of the subject site. There is an opportunity for longer term improvements to the public transport in this area to provide an improved service utilising an extension of the existing bus services for the Medowie area. Discussions with Council and existing public transport providers within the vicinity of the site are required to determine priorities and opportunities to tie-in with existing facilities.

4. Road Network Planning

4.1 Intersection Operations

The intersection of Boundary Road with Medowie Road will provide the main site access point. This intersection operating with Give Way control will be capable of providing a very good access level of service.

From the preliminary analysis of the future total traffic flows associated with the site, the development will be able to be catered for within the existing capacity of Medowie Road with the upgraded intersection control at the site access. For safety reasons it is recommended the intersection be upgraded with a right turn lane provided for traffic turning right into Boundary Road, this would be similar in design to the existing intersection of Medowie Road with Kindlebark Drive.

Photos 4 and 5 below show the good visibility north and south from the intersection. This is adequate for this location.



■ **Photo 4 Visibility from Boundary Road, southwards along Medowie Road**



■ **Photo 5 Visibility from Boundary Road, northwards along Medowie Road**

The design of the T intersection for this development would not preclude others upgrading it to a roundabout in the future. In the longer term if other development in the area changes or increases the current traffic patterns using Boundary Road east and west of Medowie Road the opportunity to construct a roundabout to service both intersection exists.

4.2 Road Network Planning

The predicted peak traffic flow of about 3150 vehicle trips per day from the development is able to be catered for within the existing road network, even allowing for growth in the background traffic levels of traffic of 3% per annum for 10 years on Medowie Road. The base traffic load of around 200 vehicles per hour (two-way) would only grow to around 260 vehicles per hour, and with the forecast southbound peak traffic flow in the order of 160 vehicles per hour the total traffic volume is well within the technical capacity of 900 vehicles per hour per lane adopted by Austroads for capacity analysis.

4.3 Internal Road Network

The internal road network will be designed to minimise traffic volumes on each link and provide a legible network for all users. Final designs will be in accordance with Council design requirements.

5. Summary and Conclusions

The following summarises the key findings and conclusions drawn from the review of the transport and access issues associated with the rezoning of Lots 93-96 Boundary Road, Medowie, from rural into rural residential lots:

The area proposed to be rezoned is located to the east of Medowie Road in Medowie to the north of Boundary Road. It comprises approximately 127 hectares of rural land.

The proposed rezoned area could accommodate up to 350 rural small holding lots. Access to the residential area will be via a single access on Medowie Road at the location of the existing Boundary Road intersection. This intersection will require upgrading for this development with the construction of a right turn lane into Boundary Road.

- Existing traffic flows along Medowie Road are low (in the order of 2,000vpd) and well within acceptable limits. Previous advice from Council indicates that whilst there has been some increase in daily flows since Medowie Road has been sealed along its full length, the current daily traffic flows are not expected to increase beyond some 2,200 vehicles per day.
- The development will have a single vehicle access on Medowie Road and it can be seen that the additional traffic generated by the development will significantly increase the daily traffic flows on this road when compared with its current flows however is still well within the capacity of this road.
- An initial assessment has been completed to determine the impact of this additional traffic on Medowie Road and it is considered that the existing carriageway width is adequate to cater for this additional traffic.
- An initial assessment has been completed for the proposed single access to the site and it is considered that the expected traffic flows associated with a development of up to 350 lots could be accommodated via a single vehicle access under give way control. It is recommended the intersection be upgraded to provide a right turn lane into Boundary Road.
- The location and extent of pedestrian, cycling and public transport facilities within the development should be discussed with Council to ensure concurrence with the Council's longer term strategies for the Medowie area

It can be seen that the proposed development will not have a major impact upon the local road network, and that it can be managed with minor upgrade to the adjacent road infrastructure.

Appendix A Land Use Plan

