

TRAFFIC IMPACT ASSESSMENT

Stage 14, Caerleon Estate

PREPARED FOR:

Caerleon Mudgee Pty Ltd C/- Davis Stack

REFERENCE:

0529r01v04

DATE:

17/03/2022



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1. Introduction

1.1. Overview

PDC Consultants has been commissioned by Caerleon Mudgee Pty Ltd C/- Davis Stack to undertake a Traffic Impact Assessment (TIA) of a Development Application (DA) for a proposed residential subdivision ("the subdivision"), forming Stage 14 of the broader Caerleon Estate development, comprising:

- 237 low density residential lots.
- Proposed new internal local road network serving the residential lots.
- Connections to the existing road network at Hill End Road and Fairydale Lane via proposed internal local roads delivered as part of earlier and later stages of the Caerleon Estate.

Given the DA proposes the subdivision of land with more than 200 allotments, the DA is required to be referred to Transport for NSW (TfNSW) under the provisions of the State Environmental Planning Policy (Transport and Infrastructure) 2021.

The site is located within the Mid-Western Regional Council (Council) local government area and has therefore been assessed in accordance with Mid-Western Regional Local Environmental Plan 2012 and Development Control Plan 2013. In addition, the site falls within the land covered by Appendix C Caerleon DCP 4 of the Mid-Western Regional Development Control Plan and has thus also been assessed against the Caerleon DCP.

1.2. Background

A TIA was undertaken in 2012 by Traffix (Traffix 2012) of the proposed rezoning of the Caerleon Estate. This considered the development in its entirety, assuming an upper limit total of 1,400 residential dwellings and provision of a small 'activity centre' to service the residential population.

Traffix 2012 has been used as a foundational study within which context the assessment within this TIA has been developed. The comprehensiveness of assessment of traffic impacts on the local and broader road network in Traffix 2012 has rendered wholesale reassessment of traffic impacts unnecessary in this TIA; further details are provided in Section 7.

1.3. Structure of this Report

This report documents the findings of our investigations in relation to the anticipated traffic and parking impacts of the proposed development and should be read in the context of the Statement of Environmental Effects, prepared separately. The remainder of this report is structured as follows:

- Section 2: Describes the site and existing traffic and parking conditions in the locality.
- Section 3: Assesses the proposed future transport network conditions near the site.



- Section 4: Describes the proposed development.
- Section 5: Assesses the proposed parking requirements of the development.
- Section 6: Assesses the proposed road network conditions of the development.
- Section 7: Assesses the traffic impacts of the development.
- Section 8: Presents the overall study conclusions.

1.4. References

In preparing this report, reference has been made to the following guidelines / standards and reports:

- State Environmental Planning Policy (Transport and Infrastructure) 2021 (SEPP Transport & Infrastructure 2021).
- Mid-Western Regional Local Environmental Plan 2012 (MLEP).
- Mid-Western Regional Development Control Plan 2013 (MDCP).
- Caerleon Development Control Plan 2012 (CDCP).
- Traffic Impact Assessment, Caerleon Rezoning, Mudgee, Traffix 2012 (Traffix 2012).
- 16 Regional Cities Services Improvement Program, Transport for NSW website (16 Cities Program).
- Planning for Bush Fire Protection, NSW Rural Fire Service (RFS) November 2019 (PBP).
- Austroads Guide to Road Design Part 4: Intersections and Crossings General (AGRD04-17).
- Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections (AGRD04A-17).
- RMS Guide to Traffic Generating Development 2002 (RMS Guide).
- RMS Technical Direction TDT 2013/04a Guide to Traffic Generating Developments, Updated Traffic Surveys (RMS Guide Update).



2. Existing Conditions

2.1. Location and Site

The Caerleon Estate covers a total area of some 310 hectares (ha), of which the subject Stage 14 subdivision comprises some 34 ha and is located in the Central West of NSW approximately 3-4 kilometres north-west of Mudgee Railway Station.

The Caerleon Estate is bound by the Gwabegar Railway Line to the east, Hill End Road to the north, existing residential development to the south-east, and rural environmental management land to the south and west. Stage 14 is sited centrally within the Caerleon Estate and is bound by earlier development stages (12 and 13) to the north, public recreation zoned land around Hone Creek to the east, and future rural residential land uses to the south and west.

The subdivision is illustrated by the proposed masterplan, prepared by Premise, in **Figure 1** (also provided as **Appendix A**).



Figure 1: Proposed Subdivision Masterplan

Land upon which the subdivision is proposed is primarily rural bushland; however, it is zoned for general residential (R1) use in line with the proposal.



2.2. Road Network

The existing road hierarchy near the site is shown by Figure 2, with the following roads considered noteworthy:

- Castlereagh Highway: a TfNSW classified highway (HW 18) that runs in a north-west / south-east alignment to the north-east of the subdivision between Craboon to the north-west and Marrangaroo to the south-west. Near the site it comprises a single lane in each direction, with turn treatments provided at the intersection with Hill End Road and is subject to 80 km/h speed zoning restrictions.
- Hill End Road: a TfNSW main road (MR 215) that runs in a north / south direction between its intersection with Castlereagh Highway to the north of the subdivision and Sofala to the south. It is subject to 80 km/h speed zoning restrictions and carries a single lane in each direction.
- Fairydale Lane: a local road that runs in an east / west alignment to the south of the subdivision between Gladstone Street to the east and its termination at 89 Fairydale Lane to the west. Near the site it carries a single lane in each direction and is subject to 50 km/h speed zoning restrictions.

2.3. Public and Active Transport

Existing public and active transport provision near the Caerleon Estate is limited, given its current nature as a primarily rural site on the outskirts of Mudgee.

The Integrated Public Transport Service Planning Guidelines, Rural and Regional NSW, states that the walking catchment for regional bus services includes all areas within an 800-metre radius of a bus stop.

There are currently no bus services operating near the site or within the walking catchment, with the closest being routes 561 and 563 which use the Castlereagh Highway / Bell Street / Putta Bucca Road intersection, some 2.0 kilometres south of the Castlereagh Highway / Hill End Road intersection.

Mudgee Railway Station forms the nearest rail connection, some 3 – 4 kilometres away from the Caerleon Estate.

No dedicated cycle facilities are provided near the site, with the nearest being on- and off-road cycle paths in Mudgee, some 2-3 kilometres south-east of the Caerleon Estate. The current road network of Castlereagh Highway and Hill End Road are unsuitable for cycling for most other than experienced cyclists, given their higher speed environments and lack of dedicated facilities.





Figure 2: Location and Road Hierarchy Plan



2.4. Existing Traffic Conditions

AM and PM weekday intersection turn counts were undertaken on Wednesday 23rd June (3:00-6:30pm) and Thursday 24th June (6:30-9:30am) 2021, with observed peak hour AM (8:15-9:15am) and PM (3:45-4:45pm) counts provided in **Figure 3**.

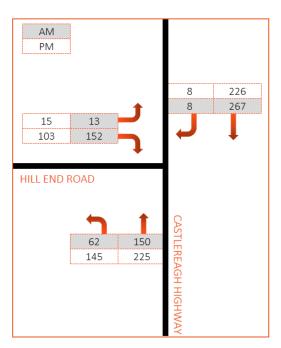


Figure 3: Existing Intersection Turn Counts

The existing intersection layout has been assessed using SIDRA Intersection 9 to identify current operational performance under existing intersection turn counts, with summary outputs for weekday AM and PM peaks provided in **Table 1**.

Table 1: Existing Intersection Performance

PEAK	V/C	AVG. DELAY (s) ¹	95% QUEUE (m)	LOS
AM	0.31	12.9	11	А
PM	0.24	12.9	7	А

¹ Average delay value presented is the maximum delay experienced by any one movement at the intersection.

Table 1 demonstrates that the intersection currently performs very well, with the highest delay of 12.9 seconds experienced on the Hill End Road right turn movement during weekday AM and PM peak periods. The intersection performs at Level of Service (LOS) A during both peaks, considered the best performance with the lowest levels of congestion.



3. Future Conditions

3.1. External Road Network

3.1.1. Castlereagh Highway / Hill End Road

The intersection of Castlereagh Highway / Hill End Road be upgraded at a time commensurate with ongoing issue of subdivision certificates for residential lots for earlier stages of the Caerleon Estate.

Under its ultimate arrangement, the intersection will comprise a full-length channelised right turn bay provided on the Castlereagh Highway (north) approach, a rural auxiliary left turn lane treatment provided on the Castlereagh Highway (south) approach, and Hill End Road widened to accommodate left and right turning vehicles side-by-side at the intersection.

Intersection capacity and safety will therefore be greatly increased, prior to delivery of the Stage 14 subdivision. This ultimate arrangement is expected to be complete prior to release of the subdivision certificate of the 248th lot of the Caerleon Estate, before delivery of Stage 14.

3.1.2. Hill End Road / Hone Creek Drive

This intersection is identified in Traffix 2012 as being the primary location at which traffic generated by the Caerleon Estate will access the existing road network.

This prior assessment identified intersection upgrade works necessary to satisfactorily accommodate the proposed rezoning of the Caerleon Estate as being provision of basic right and left turn treatments on the respective Hill End Road approaches, as defined by AGRD04-17 and AGRD04A-17.

It is anticipated these works will be delivered in advance of delivery of the Stage 14 subdivision, thereby ensuring safe and efficient access to the existing road network.

3.1.3. Fairydale Lane / Hone Creek Drive

The main proposed collector road, named Hone Creek Drive, through the Caerleon Estate will run in a north / south alignment from Hill End Road to Fairydale Lane. The connection to Fairydale Lane will be in the form of a priority sign-controlled T-intersection, with the collector road giving way to through movements on Fairydale Lane.

This intersection is identified in Traffix 2012 as being secondary and ancillary to the Hill End Road / Hone Creek Drive intersection in providing access to the existing road network, given the proximity of most of the residential and non-residential land uses to the north of the Caerleon Estate.

CDCP identifies that the Hone Creek Drive is proposed to be constructed in the early stages of development, or as outlined in a condition of development consent or a voluntary planning agreement.



3.2. Future Active Transport Network

CDCP outlies an indicative pedestrian and cycle network plan for the Caerleon Estate, which is provided as **Figure 4** for reference.

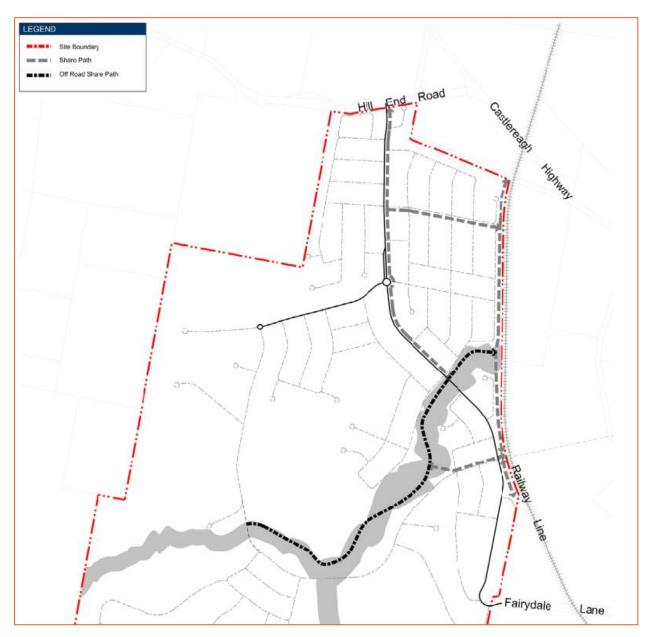


Figure 4: Indicative Pedestrian and Cycle Network

A shared pedestrian and cycle path is proposed for much of the length of the main collector road through the Caerleon Estate, being Hone Creek Drive, which will provide safe and efficient links to and from trip attractors in the development, as well as to the broader centre of Mudgee to the south. This shared path will be supported by an off-road shared path along Hone Creek, to promote recreational and outdoor activities for residents.



3.3. Future Public Transport Network

Neither MDCP nor CDCP provide information regarding future bus service enhancements to support the proposed Caerleon Estate.

The 16 Cities Program is a commitment by the NSW Government to improve public transport services throughout regional NSW. Improvements to regional bus services will aim to provide better connections to where customers need to go for work, school, health, and social and recreational benefits.

To date, no proposals have been outlined to improve public transport provision near the subdivision or the broader Mudgee and Caerleon area, with the closest cities under consideration being Bathurst, Orange, and Parkes. However, it is understood that the NSW Government plan to investigate expansion of the 16 Cities Program in future.



4. Proposed Development

A detailed description of the proposed development for which approval is now sought, is outlined in the Statement of Environmental Effects prepared separately. In summary, the DA proposes a residential subdivision comprising:

- 237 low density residential lots.
- Proposed new internal local road network serving the residential lots.
- Connections to the existing road network at Hill End Road and Fairydale Lane via proposed internal local roads delivered as part of earlier and later stages of the Caerleon Estate.

The traffic implications arising from the proposed development are discussed in Section 7. A copy of the subdivision plan (**Figure 1**), prepared by Premise, is provided as **Appendix A**.



5. Parking Requirements

CDCP does not provide car parking rates for residential dwellings, and as such MDCP has been used to determine the required car parking provision.

Clause 5.1 of MDCP requires that residential dwellings provide car parking at:

 2 spaces per dwelling – 1 space to be a garage, 1 space may be provided in a stacked arrangement in front of the garage provided that the space is contained wholly within the site.

The proposed residential lots within the subdivision will meet the MDCP car parking requirements, ensuring satisfactory on-site provision is made with no reliance upon on-street car parking. Car parking will be accessed via residential local streets, as defined by Table 1 of CDCP.

In addition to on-site car parking, Table 2 of CDCP notes typical cross sections for almost all roads within the Caerleon Estate, except for laneways, will permit on-street parallel car parking, either on one or both sides.

CDCP also requires that 60-degree angles rear-to-kerb parking bays are to be provided within, and on both sides of, the carriageway of Neighbourhood Centre Road, a section of Hone Creek Drive to the north of the subdivision.

As such, car parking provision throughout the subdivision is expected to be plentiful and capable of accommodating demands generated by residents.



6. Proposed Road Network

A new road network internal to Caerleon Estate is proposed to serve the entire development, including the Stage 14 subdivision, and provide access to the broader road network. The indicative street hierarchy is illustrated in CDCP, which is provided as **Figure 5** for reference. Road design will be generally in accordance with the descriptions and standards outlined in Tables 1 & 2 of CDCP.

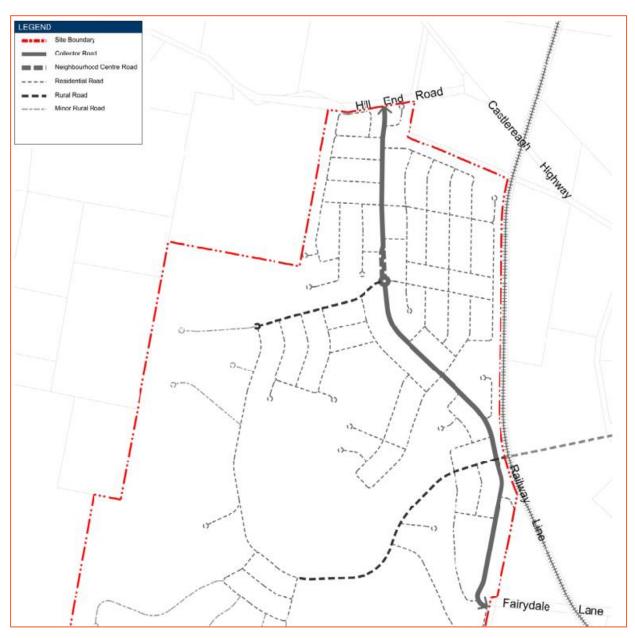


Figure 5: Caerleon Estate Indicative Street Hierarchy



The Stage 14 subdivision has the residential collector street of Hone Creek Drive passing in a north / south alignment through the subdivision, to its east. All other roads within the subdivision, illustrated by **Figure 5**, are proposed as a variety of classifications befitting their intended purpose, being residential collector streets, residential local streets, minor access streets with cul-de-sacs, or rural roads.

The typical cross-sectional information of the roads proposed within the subdivision are identified by Table 2 of CDCP, with typical cross sections illustrated by **Figure 6**.

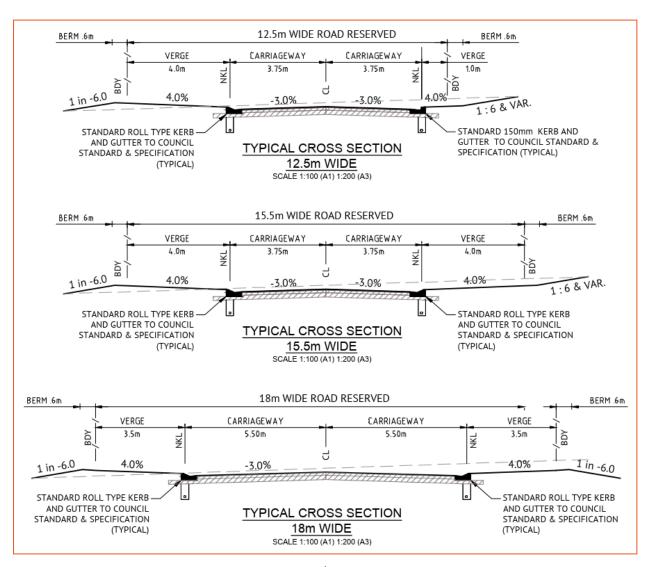


Figure 6: Typical Cross Sections

The proposed local roads will connect to the new internal road network being developed for earlier stages of the Caerleon Estate to the north, via Hone Creek Drive. Upon completion of the Caerleon Estate, residents of the subdivision will be able to access the existing road network either to the north at Hill End Road, or to the south at Fairydale Lane, each via Hone Creek Drive.



All intersections within the subdivision are expected to comprise priority sign-controlled intersections, given the relatively low traffic volumes each will accommodate. All residential and minor access streets within the subdivision would be expected to be subject to 50 km/h posted speed restrictions.

Turning head cul-de-sacs will be designed in accordance with Council's requirements and PBP.



7. Traffic Impacts

7.1. Overview

As discussed in Section 1.2, the traffic impacts of the entire Caerleon Estate were assessed in Traffix 2012, which considered trips generated by all proposed land uses and their impacts on the surrounding road network.

The assumptions adopted in this assessment remain generally valid, with no significant modification to the proposed upper limit number of residential lots or non-residential area. As such, comprehensive traffic modelling assessment of the surrounding road network has not been redone as part of this TIA.

It is noted that such assessment would require consideration of all other stages of the Caerleon Estate development, which are not the subject of this DA, to identify cumulative impacts on the surrounding road network at the time the Stage 14 subdivision is operational. As such, this would essentially replicate assessment undertaken in Traffix 2012 and is considered unnecessary.

Nevertheless, trip generation of the subdivision has been identified in the following sections, with the impacts to the surrounding road network discussed qualitatively.

7.2. Trip Generation

In determining anticipated traffic generation of the subdivision, the RMS Guide Update recommends application of a peak period traffic generation rate for low density dwellings in regional NSW of 0.71 trips / dwelling / hour during the AM peak and 0.78 trips / dwelling / hour during the PM peak. Application of these rates to the 237 residential lots proposed results in the following peak period traffic generation:

- 168 vehicle trips / hour (33 in, 135 out), during the AM peak period.
- 185 vehicle trips / hour (111 in, 74 out), during the PM peak period.

The above assumes a 20% inbound and 80% outbound split during the AM peak period, noting that residents would typically leave for work in the morning, and a 60% inbound and 40% outbound split during the PM peak, in line with Traffix 2012.

Not all these trips are external to the Caerleon Estate development. The RMS Guide recommends up to 25% of trips may be considered 'internal' trips, representing trips to local retail centres, child care centres, or social visits. For consistency with Traffix 2012, a 12.5% discount for internal trips is considered suitable, resulting in the following total external trip generation:

- 147 vehicle trips / hour (29 in, 118 out), during the AM peak period.
- 162 vehicle trips / hour (97 in, 65 out), during the PM peak period.



7.3. Traffic Impacts

Adopting a worst-case assumption of all trips generated by the subdivision using a single intersection to access the existing road network, the peak total number of additional trips using said intersection would be during the PM peak hour, at a rate of 2-3 vehicles per minute.

These vehicles would comprise in and outbound trips, and thus the rate at which vehicles generated by the subdivision would arrive at any given approach to the intersection would be 1-2 vehicles per minute.

Once internal to the subdivision, these vehicles would disperse over a network of local residential streets, thereby spreading the impacts across the Caerleon Estate and ensuring the internal road network can accommodate the trips generated.

Per Section 3.1, suitable intersection arrangements have been identified and proposed for the key external intersections at which trips generated by the subdivision would access the existing road network. These intersections are therefore expected to operate safely and efficiently upon completion of the Stage 14 subdivision.

Internal subdivision intersection layouts will be developed further following submission of the DA, ensuring safe and efficient design to all relevant standards and guidelines.



8. Conclusion

In summary:

- PDC Consultants has been commissioned by Caerleon Mudgee Pty Ltd C/- Davis Stack to undertake a traffic impact assessment for a proposed residential subdivision of some 237 residential lots being delivered during Stage 14 of the broader Caerleon Estate.
- The subject subdivision gains access to the existing local road network via a proposed internal road network to the north and south, being delivered as part of earlier and later subdivision stages, respectively. The subdivision will be served by a network of local residential and collector streets, providing access between residential lots, local centres, and the broader road network.
- Given the existing performance of the Castlereagh Highway / Hill End Road intersection is excellent and comprehensive traffic assessment has been undertaken during stages of the Caerleon Estate development, no further detailed traffic analysis of the subject subdivision has been undertaken within this TIA.
- Nevertheless, traffic impacts arising from the Stage 14 subdivision are expected to be minimal, in the context of the route choices available and external road network upgrades being delivered to facilitate the broader Caerleon Estate.

It is therefore concluded that the proposed subdivision is supportable on traffic planning grounds.



Appendix A

