Prepared for

FRASERS PROPERTY AUSTRALIA

Traffic Impact Assessment

Edmondson Park Frasers Town Centre
Residential Precinct 1 – DA

Ref: 0405r01v2
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-	11/07/2017	Draft	C.Tran	T. Lewis
1	21/09/2017	Issue I	T. Lewis	T. Lewis
2	27/11/2018	Issue II	T. Lewis	T. Lewis

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1 Introduction

1.1 Overview

Ason Group has been engaged by Frasers Property Australia (FPA) to prepare a Traffic Impact Assessment (TIA) report to support the Development Applications (DA) in relation to Edmondson Park Frasers Town Centre - Residential Precinct 1 (RP1).

The proposal forms part of the larger Edmondson Park Frasers Town Centre (EPFTC); part of the approved Concept Plan for Edmondson Park South (EPS) and the subsequent Concept Plan approved master plan (MP 10-0118 MOD 4, October 2017). It comprises of approximately 25 hectares, located to the north of Campbelltown Road and within the study area referred to as the Edmondson Park Release Area.

This application has been prepared as per the approved Concept Plan Modification 4 (MOD 4). In this regard, reference is made to the traffic study in relation to the concept approval for relevant information in relation to the transport planning for the wider Edmondson Park Frasers Town Centre.

In relation to the status of site works, roadworks and traffic infrastructure was part of the approved development application (DA-583/2017) and works are due for completion by the end of 2018. Also, at the time of preparing this report, Residential Precinct 1 (RP1) – Stage 1 – built form works (104 homes) was approved under a separate development application (DA-779/2017).

A Site Context figure is presented in **Figure 1**, which provides an appreciation of the EPFTC and its location within the greater EPS which itself forms part of the South West Growth Centre (SWGC).

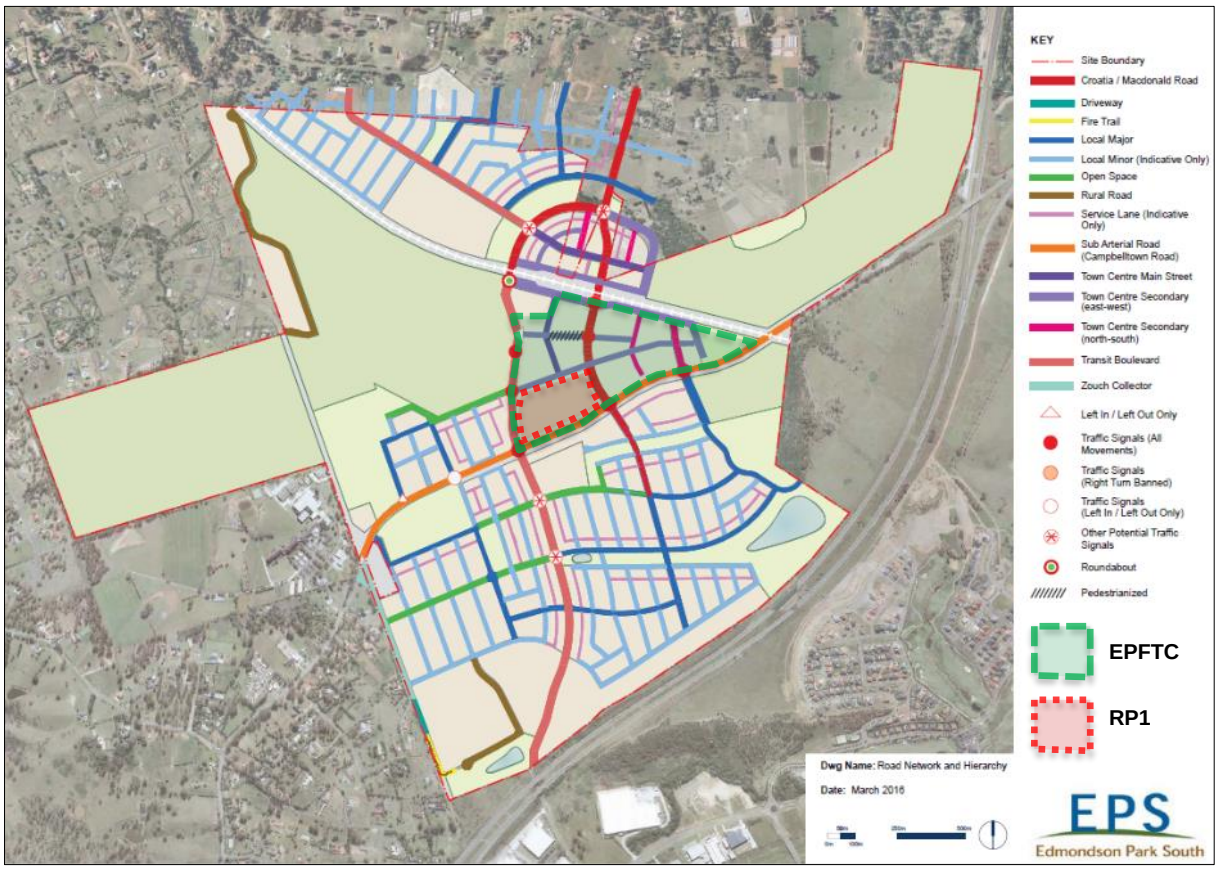

Figure 1: Site Context

RP1 is expected to yield a total of 348 medium density residential units. The built form will be staged and, accordingly, subject to individual Development Applications (DAs). The first DA relates to the civil and services infrastructure works, including future public roads servicing RP1. This report focuses on the cumulative impact of the 348 unit developments overall. Notwithstanding, consideration is also given to the likely staging implications of the developing precinct.

In preparing this TIA, Ason Group has referenced key planning documents, these include:

- Edmondson Park South Development Control Plan 2012 (EPS DCP)
- Liverpool Development Control Plan 2018 (LDCP 2008)
- Ason Group, Traffic Impact Assessment Report – Edmondson Park Frasers Town Centre – Section 75W Modification, dated 05 February 2017
- JBA, Edmondson Park Frasers Town Centre Design Guidelines, dated November 2016.

This TIA also references general access, traffic and parking guidelines, including:

- RMS Guide to Traffic Generating Developments (RMS Guide)
- Australian Standard 2890.1: Parking Facilities – Off Street Car Parking (AS 2890.1)
- Australian Standard 2890.2: Parking Facilities – Off Street Commercial Vehicle Facilities (AS 2890.2)
- Australian Standard 2890.3: Parking Facilities – Off Street Parking for People with Disabilities (AS 2890.6)

1.2 Report Structure

The report is structured as follows:

- Section 2 describes the existing and planned public transport, pedestrian and cycling links
- Section 3 provides a summary of the proposed development
- Section 4 outlines the parking requirements applicable to the proposed development
- Section 5 assesses the traffic impacts of the development including the Precincts' projected trip generation
- Section 6 discusses the site access and internal design aspects of the development; and
- Section 7 provides a summary of the key conclusions.

2 Site and Location

2.1 Site Context

Edmondson Park is approximately 8 kilometres southwest from the Liverpool CBD and approximately 34 kilometres from the Sydney CBD. The overall EPS Concept Plan area is located within both Liverpool Council and Campbelltown Council LGAs. It forms the southern sub-precinct within the Edmondson Park Release Area.

The site subject to this application is located within the Edmondson Park Frasers Town Centre (EPFTC) site, as shown in **Figure 2** below, which is located on the northern side of Campbelltown Road within the suburb of Edmondson Park. It lies solely within the Liverpool Council LGA.

The proposed layout of future Residential Precinct 1 is presented in **Figure 3** below.

Figure 2: Edmondson Park Frasers Town Centre

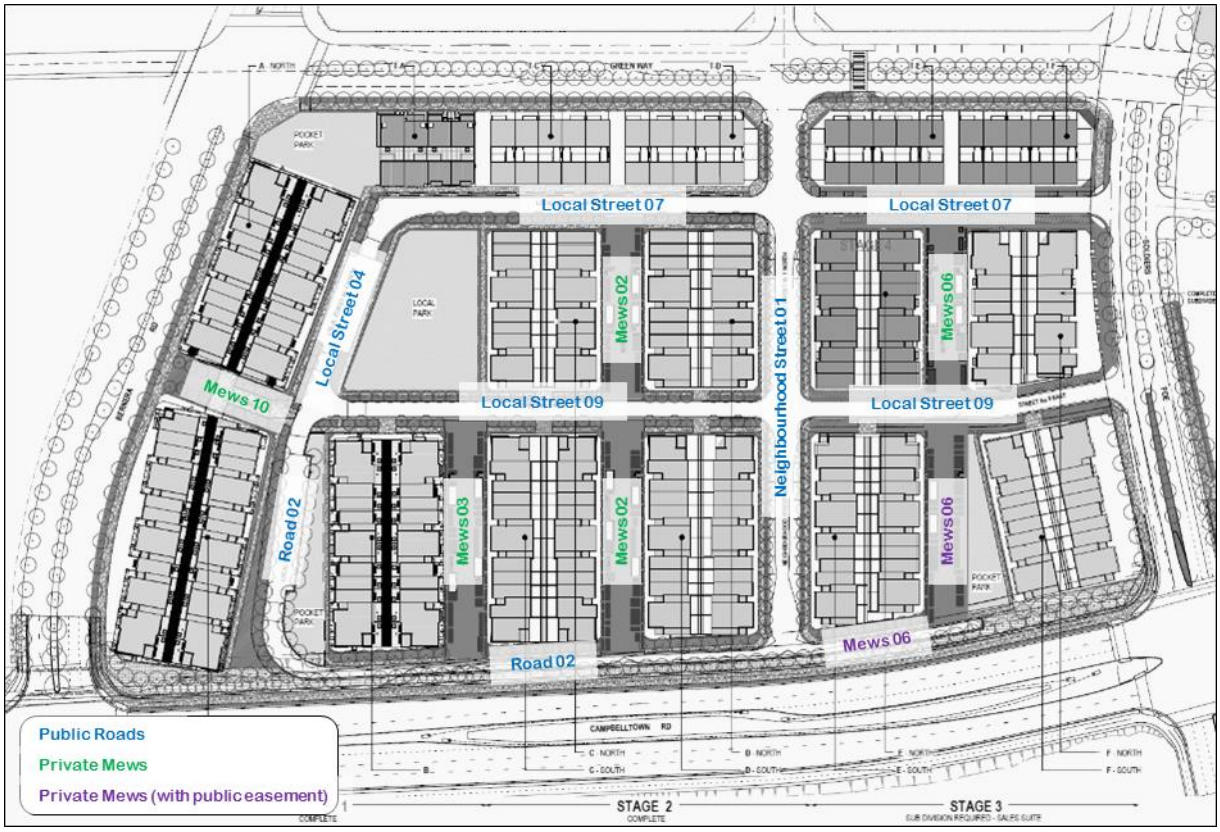

Figure 3: Residential Precinct 1 Layout

The above represents the approved Residential Precinct 1 infrastructure as per DA-583/2017 at the south-west corner of the overall EPFTC. In the short-medium term, Block E-north and Block F-North is being used as a display village for the EPFTC. The display village (Stage 0) is subject to a separate DA, approved by Council (Ref: DA-621/2016/A), on 27 June 2017, and does not form part of this application.

2.2 Built Form Development Staging

For the purposes of this report, the built form of Residential Precinct 1 (RP1) will comprise the following key stages:

- Stage 0 Display village (approved DA-621/2016/A)
- Stages 1-3 Residential townhome and terrace built form, including associated Mews and landscaping
- Stage 4 This is essentially conversion of the display village to its final form as residential townhouses

An outline of the various stages is provided in **Figure 4**. The Stage 0 display village and associated sales office is shown as the hatched blocks within the Stage 3 area.

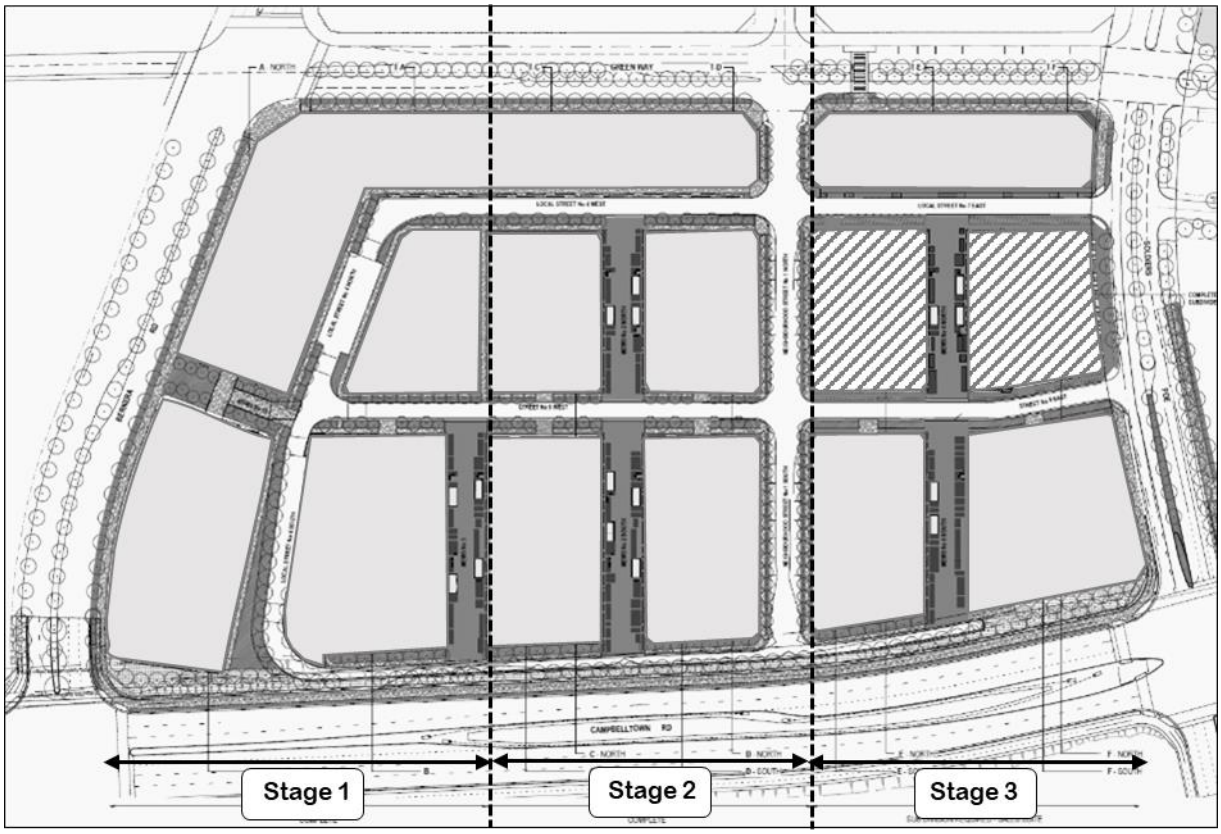

Figure 4: RP1 Staging Arrangements

A summary of the proposed development is provided in Section 3.

2.3 Planned Road Network

2.3.1 Road Hierarchy

Surrounding roads of particular interest include:

- Campbelltown Road — a Classified arterial road that traverse in an east-west direction to the south of the site. It currently carries an annual average daily traffic (AADT) in the order of 15,350 vehicles per day (two-way). Traffic volumes during the weekday morning and evening peak periods are in the order 1,450 and 1,475 vehicles per hour (veh/hr), respectively.
- Bernera Road — the future primary north-south vehicular connector road that traverses the western edge of the Frasers Town Centre area, effectively by-passing the Town Centre Core. It is proposed to form a major

	signalised intersection with Campbelltown Road at the south-west corner of RP1.
▪ Soldiers Parade	a secondary north-south connection that traverses through the Edmondson Park Frasers Town Centre and separates the Town Centre Core and RP1 from the remaining residential precincts to the east. It currently forms signalised intersection with Henderson Parade and an unsignalised intersection with Campbelltown Road to the south. It carries an AADT of 3,925 veh/day (two-way). Weekday peak hourly volumes are in the order of 5000 and 400 veh/hr, respectively. Additional signals are envisaged under the Concept Plan (as modified) at Campbelltown Road, Urban Street and Bernera Road intersections. A median is to be provided in Soldiers Parade such that the long-term access to/from RP1 will be restricted to left-in/left-out only. Right turn entry from Soldiers Parade will require the use of Greenway to access Neighbourhood Street No. 1, however vehicles will also be able to access RP1 from the north via Bernera Road and the Greenway.
▪ Greenway	a proposed local collector road that traverses the centre of the EPFTC. It will form a signalised intersection with Bernera Road and a priority (Give Way) controlled intersection with Soldiers Parade. Access to RP1, via Neighbourhood Street No. 1 shall be restricted with left-in/left-out movements. Right turns into RP1 shall also be provided with a right turn storage lane, however no right turns will be permitted to/from Main Street or out of Neighbourhood Street No. 1. All access to RP1 shall be provided via Neighbourhood Street No. 1 until such time as Local Street 7 and 9 are opened for general traffic use.
▪ Neighbourhood Street 1	a proposed local road that forms the primary north-south spine road of RP1.
▪ Local Street 7 & 9	proposed local roads that traverse RP1 in an east-west direction. These roads provide access to the central residential Blocks (B, C, D, E & F) within RP1.
▪ Local Street 4	a local road that runs north-south between the western ends of Local Street 7 and Local Street 9.
▪ Road 2	a local service road (similar to a Crescent) that runs one-way (eastbound) from Local Street 9 to Neighbourhood Street 1.

▪ Mews	the proposed Mews are private roads which provide a notional street address to the RP1 townhomes in addition to catering for the residential visitor parking demands arising from the development.

2.4 Public Transport Services

2.4.1 Current Mode Share

Given the relatively greenfield nature of the site, there is little data in relation to current mode share for the subject site which lies immediately to the south of the Edmondson Park Station.

2.4.2 Rail Services

The site lies immediately to the south of the Edmondson Park Station which provided regular services on the T2 Inner West and South Line.

Figure 5: Sydney Trains Network Map

2.4.3 Bus Services

A bus interchange is provided at Edmondson Park Station immediately to the north of the site which is serviced by the Interline 869 route which provides services between Liverpool and Ingleburn.

It is anticipated that additional bus services may be provided in the future as a result of the substantial development envisaged for the area and the South West Growth Centre more generally.

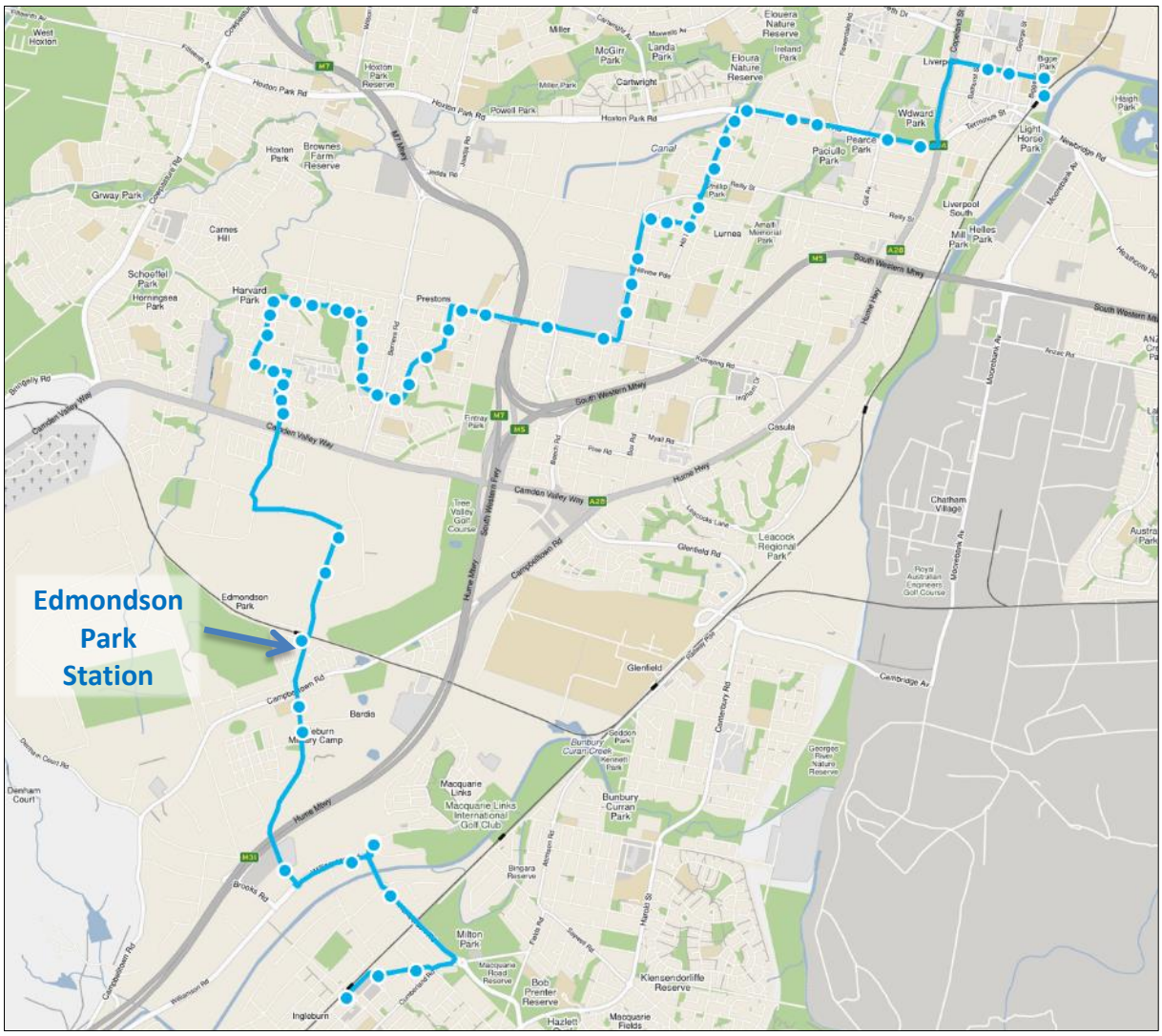

Figure 6: Existing Bus Services (Route 869)

2.5 Active Transport Connections

A shared pedestrian and cyclist path is provided along the western side of Soldiers Parade. Footpaths are provided on both sides of Henderson Parade.

The future key pedestrian and bicycle connections are presented in **Figure 7** and **Figure 8**, respectively.

It should be noted that the detailed location and nature of pedestrian crossing locations shall be subject to a separate DA in relation to the precinct-wide infrastructure.

Figure 7: Future Pedestrian Connectivity (EPFTC S75W)

Figure_1.36. Cycle Plan

Figure 8: Future Cyclist Connectivity (EPFTC S75W)

3 Overview of Proposal

A detailed description of the proposed development is included in the Statement of Environmental Effects, prepared separately by JBA.

This report primarily relates to the approved civil and infrastructure DA for RP1. However, to inform assessment of thse precinct-wide works, this report encompasses the impact of all future built form Residential Precinct 1 DAs, with a future development yield of 348 townhome and terrace units. In this regard, this report is intended to also cover these future built form DAs as a single encompassing RP1 master plan traffic report.

In summary, RP1 comprises:

- Construction of new public roads, including:
  - Neighbourhood Street No. 1
  - Road 2
  - Local Street No. 4
  - Local Street No. 7; and
  - Local Street No. 9.
- Services (electrical, gas, water and sewer etc.) connections for the Precinct
- Provision of local parks and other landscaping works with the future public environment.
- Construction of 348 residential units with a mix of ‘townhome’ and terrace style dwellings.

Reference should also be made to the plans prepared by Group GSA and Hassell, which are submitted separately.

4 Parking Requirements

4.1 Car Parking

4.1.1 Parking Requirements

The approved Concept Plan (including S75W modifications) requires car parking for medium density residential development to be provided at the following rates for “Multi-dwelling and Attached Housing”:

- 1 space per 1 – 2 bedroom dwelling
- 2 spaces per 3 - 4 bedroom dwelling; and
- Visitor spaces provided on-street within the Mews

4.1.2 Accessible Parking

Each “universal” apartment is to be provided with an ‘adaptable’ parking space designed in accordance with AS4299.

4.1.3 Visitor Parking

Visitor parking is provided on-street and within Mews in accordance to the Design Guidelines.

4.1.4 Car Parking Provisions

Details regarding numerical compliance with the above car parking requirements is provided within the Statement of Environmental Effect, prepared by JBA, for respective built form stages.

4.2 Servicing

All servicing, including waste collection will occur on-street from the Mews and/or local roads. In this regard, bins will be transferred by residents to and from the kerbside for collection.

5 Traffic Assessment

5.1 Traffic Generation

The Roads and Maritime Services (RMS) *Guide to Traffic Generating Developments* (RMS Guide) recommends traffic generation rates for 'medium density residential flat buildings' at the following rates:

- Up to 2 bedrooms 0.4-0.5 veh/hr per dwelling 4-5 veh/day per dwelling
- 3 or more bedrooms 0.5-0.65 veh/hr per dwelling 5-6.5 veh/day per dwelling

Residential Precinct 1 comprises a total of 348 residential units and is accordingly expected to generate in the order of 200 vehicle trips per hour during peak periods, as summarised in Table 1.

Table 1: RP1 - Traffic Generation Summary

Dwelling Type (No. of Bedrooms)	No. of Units[1]	Peak Hour		Daily Traffic	
		Generation Rate	Traffic (two-way)	Generation Rate	Traffic (two-way)
1	80	0.4 veh/hr/unit	32	4 veh/day/unit	320
2	57	0.5 veh/hr/unit	29	5 veh/day/unit	285
3	188	0.65 veh/hr/unit	122	6.5 veh/day/unit	1,222
4	23	0.65 veh/hr/unit	15	6.5 veh/day/unit	150
TOTAL	348		198		1,977

Note 1) Unit mix is indicative and will be subject to further refinement during respective built form DAs.

Minor changes to unit numbers of bedroom mix will not have a significant impact to the conclusions of this traffic assessment having regard for the discussion in Section 5.2, with the S75W modelling higher volumes for the Precinct than indicated by the above figures.

5.2 Traffic Impacts

Precinct-wide modelling undertaken by Aecom (included as part of the S75W submission) adopted a first-principles assessment of traffic generation in relation to the residential uses within the EPS. This first principles methodology resulted in a trip generation rate of 0.64 peak hourly trips per dwelling. On this basis, the modelling undertaken in support of the S75W submission assumed a traffic generation of 223 vehicles per hour associated with RP1.

Accordingly, the traffic generated by the development has been accounted for in the previous traffic modelling undertaken to determine the road infrastructure requirements of the wider EPFTC area. Therefore, additional traffic modelling is not necessary in relation to RP1 DA submissions.

5.3 Staging Implications

Prior to occupancy of the proposed RP1 dwellings, it is expected that the following public roads (as a minimum) shall be constructed:

1. Bernera Road; between Greenway and Campbelltown Road (Note: as part of the Campbelltown Road upgrade works, RMS shall be responsible for construction of the Bernera Road / Campbelltown Road signals and approximately 15-20 metres of Bernera Road to north)
2. Greenway; between Bernera Road and Soldiers Parade
3. Neighbourhood Street 1, Local Streets 4, 7 and 9 and other proposed public roads (Road 2).

The above roads will be required to provide full connectivity to RP1 as an interim arrangement prior to completion of all surrounding public roads.

It should be noted that 1 & 2 above other than the Campbelltown Road and associated infrastructure works - being undertaken separately by Roads and Maritime (RMS) - are part of the approved DA-1260/2016 works as presented in **Figure 9**. It is anticipated that Bernera Road will be constructed along its full length between Campbelltown Road and Henderson Parade and thus provide interim connectivity to the north along Soldiers Parade.

These connections will provide sufficient connectivity such that the future traffic generated by RP1 can be readily accommodated. Indeed, the future signals at the intersection of Bernera Road / Campbelltown Road are being designed having regard for the cumulative traffic generated by the overall Edmondson Park South development area noting that these works are being undertaken by RMS. Accordingly, these and other intersections shall be overdesigned during preliminary stages of construction when full development traffic volumes are yet to be realised.

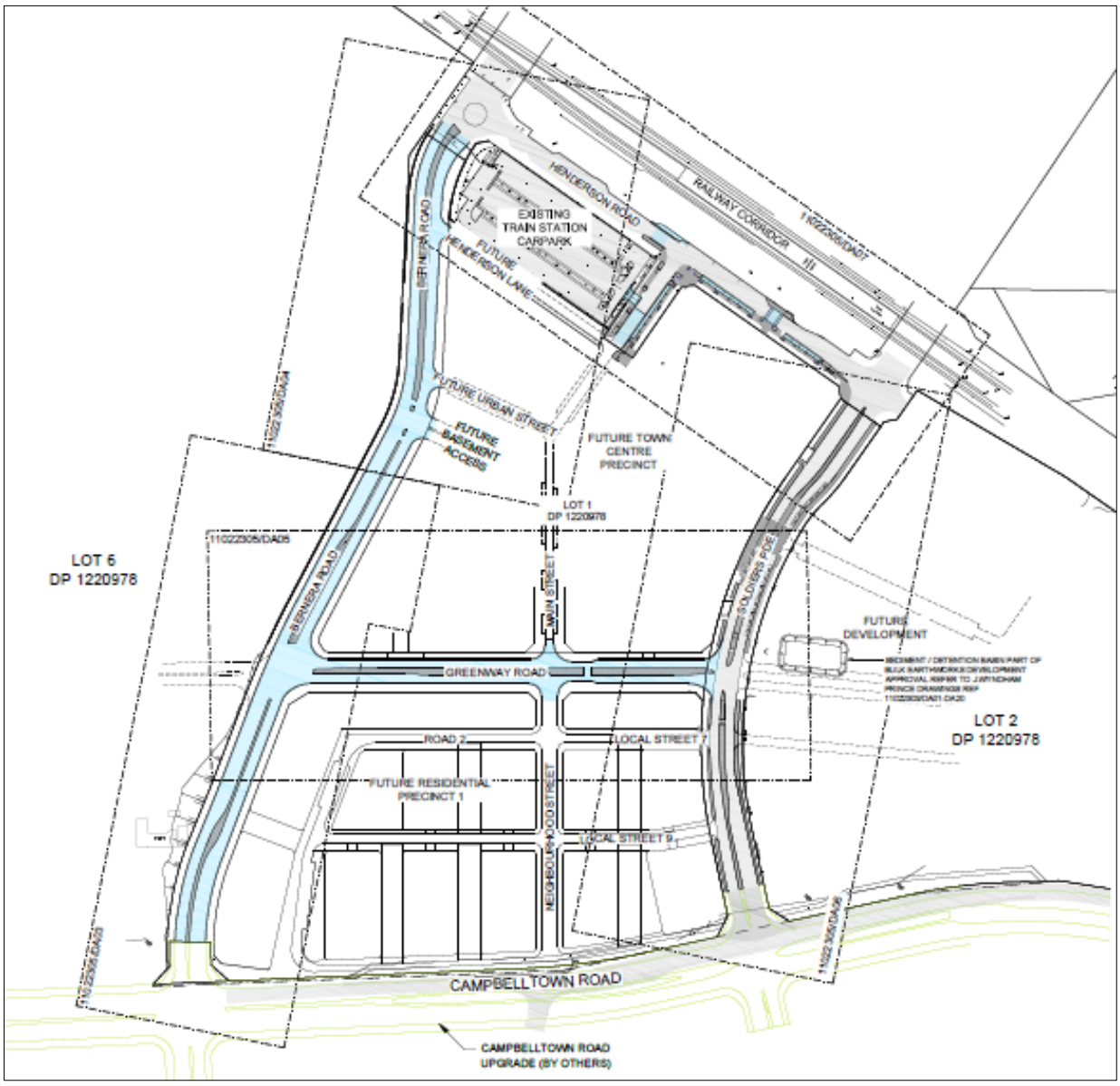

Figure 9: Preliminary Infrastructure Works (subject to separate DA – for information only)

5.4 Construction Impacts

A detailed Construction Traffic Management Plan (CTMP) is expected to be prepared following development approval, once a construction contract has been awarded.

Construction access will depend upon the available roads at the time of construction. Campbelltown Road is a Classified RMS road and therefore expected to be subject to access restrictions. The construction and residential access routes for each stage are shown in the figures below. It is expected that construction access to RP1 – Stage 1 will be provided via Greenway, which should be completed prior to the commencement of RP1 construction.

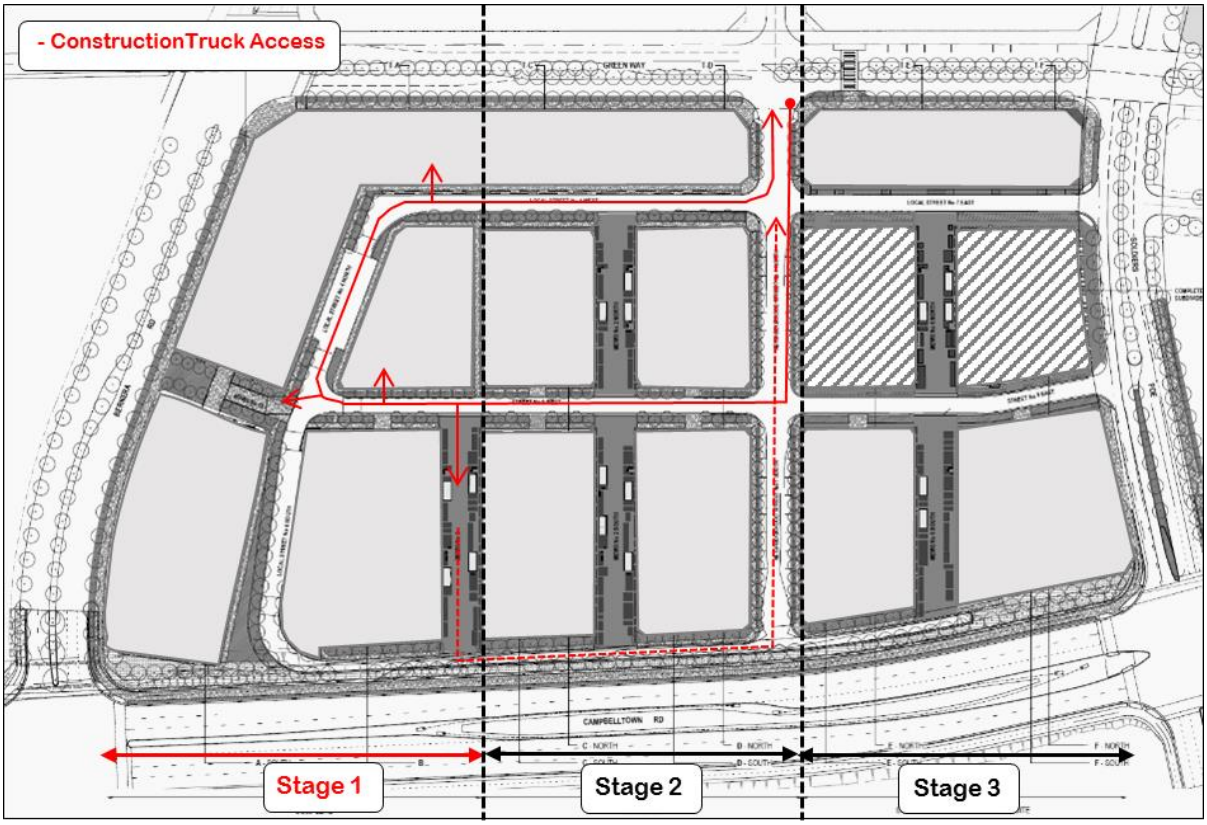

Figure 10: Construction Access Routes – Stage 1

Prior to completion it is expected that the future Mews can be used to facilitate construction deliveries whilst minimising the number of reversing movements required. In the event that reversing movements are required, then these would be undertaken under supervision of an accredited Traffic Controller.

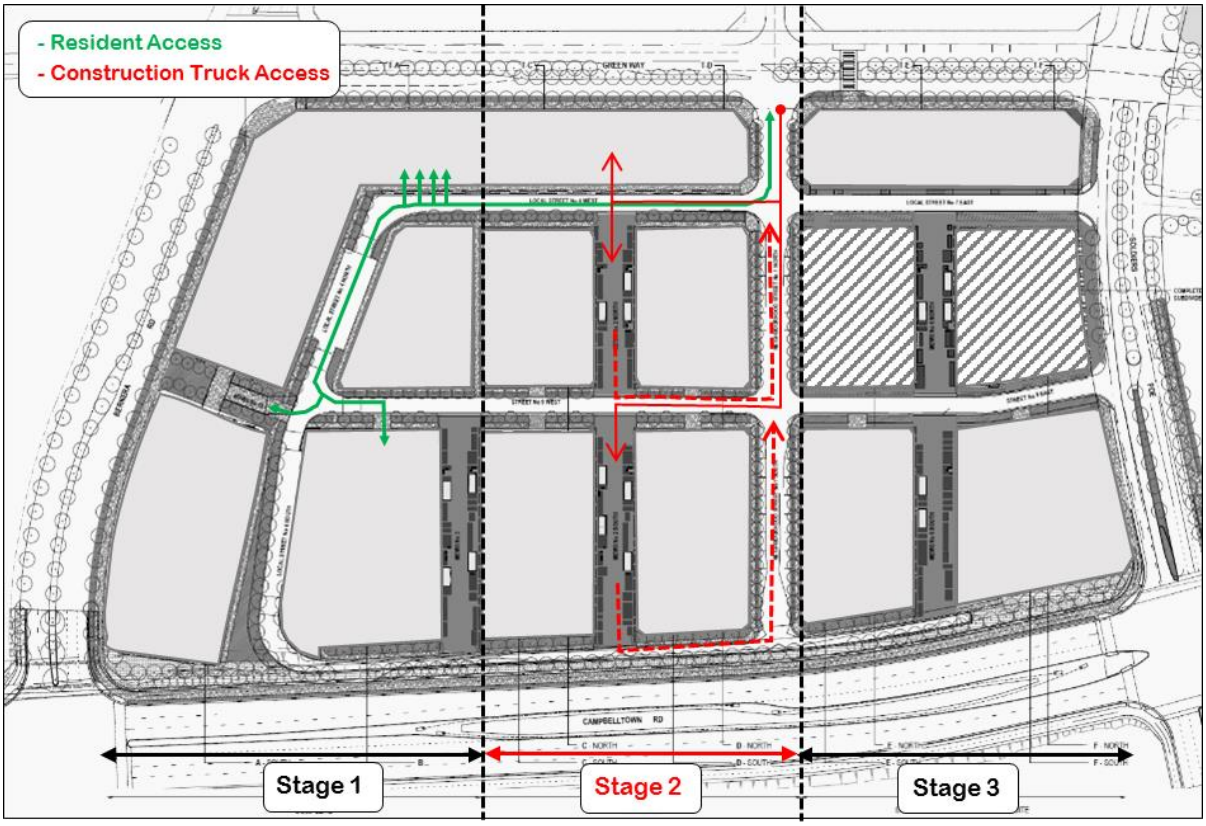

Figure 11: Construction Access Routes – Stage 2

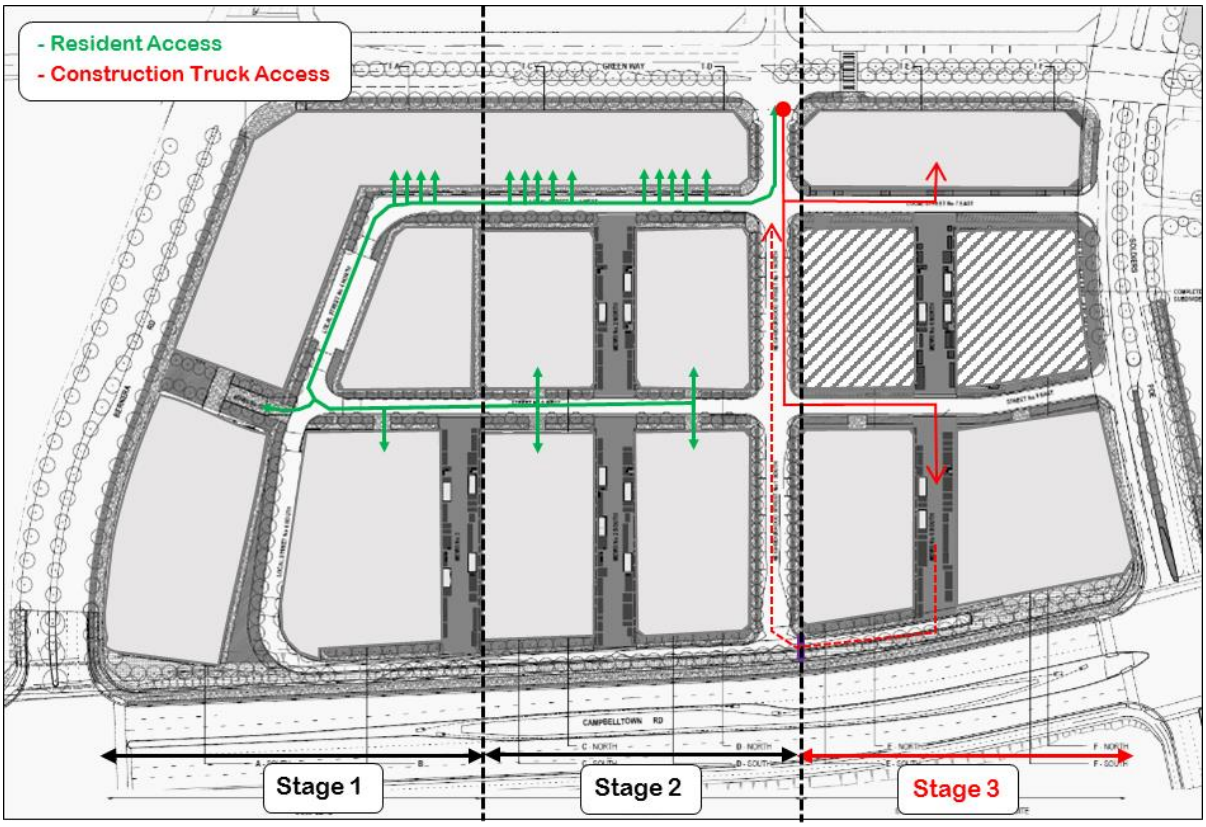

Figure 12: Construction Access Routes – Stage 3

6 Site Access & Internal Design

6.1 Relevant Design Standards

The site access and off-street car parking areas (and access thereto) shall be designed to comply with the following relevant Australian Standards:

- AS2890.1 for off-street car parking areas;
- AS2890.2 for commercial vehicle loading areas;
- AS2890.3 for bicycle parking; and
- AS2890.6 for accessible (disabled) parking.

The proposed off-street car parking areas have been designed having regard for the above and are discussed in further detail below.

6.2 Site Access Arrangements

6.2.1 Long Term RP1 Access Arrangements

Access to RP1 generally shall be provided via:

- Soldiers Parade intersections with Local Street 7 and Local Street 9 (operating as left-in/left-out); and
- Greenway via Neighbourhood Street 1. No right turns will be permitted out of Neighbourhood Street 1 due to the median within Greenway. However, left-in/right-in and left-out movements shall be available.

This is further shown in Figure 15.

6.2.2 Interim Access Arrangements

All access to RP1 shall be provided via Neighbourhood Street 1 until such time as Local Street 7 and Local Street 9 are opened for general traffic use. Mews 06 will not be constructed as part of Stage 1 and therefore the ability to recirculate from the southern end of Neighbourhood Street No. 01 will not be available until completion of Stage 3. As such, it is proposed to restrict movements within Neighbourhood Street 1 to one-way (northbound) until such time as Mews 6 is available for recirculation.

In this regard, the access arrangements are outlined in the figures below highlighting the internal two-way and one-way circulation roads within the site for each phases. The phases are defined as follows:

- Phase A: initial access arrangements limiting traffic past the display village
- Phase B: interim access arrangements prior to completion of Stage 3
- Phase C: (long-term) access arrangements after completion of Stage 3

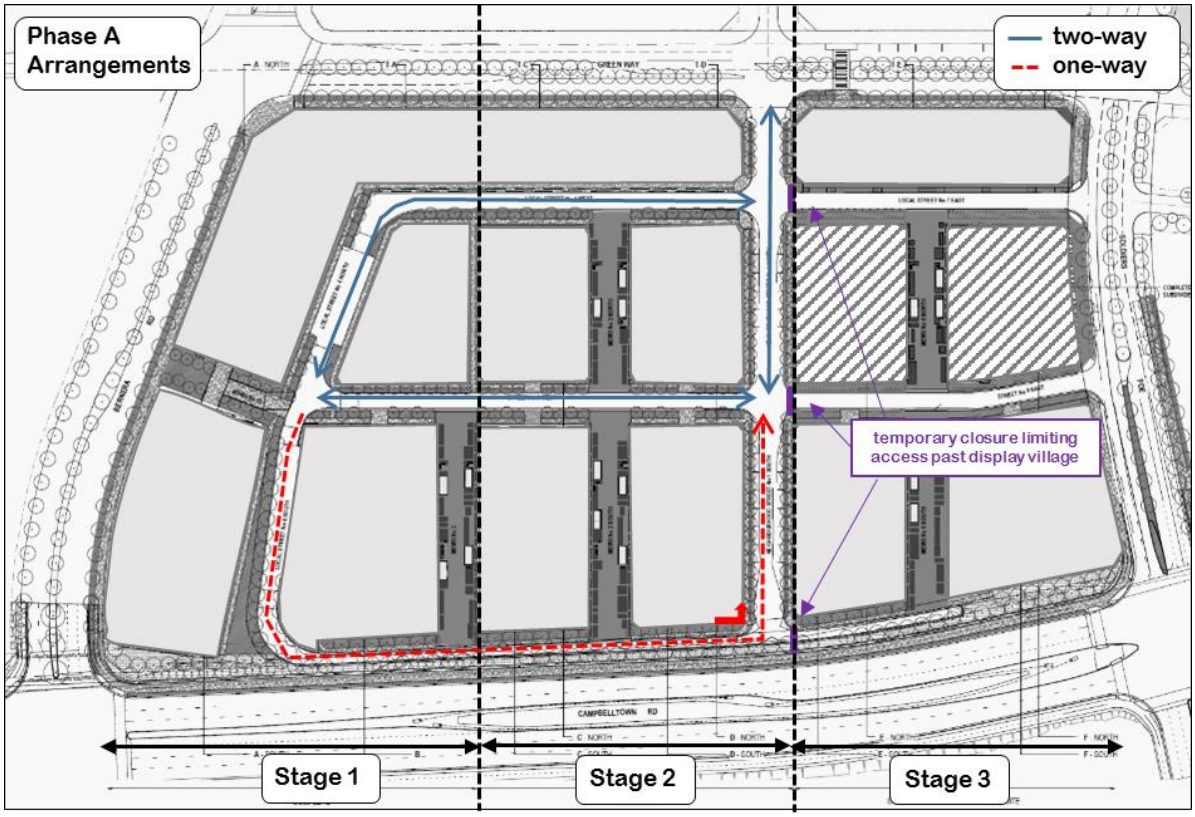

Figure 13: Road Network Plan (Phase A)

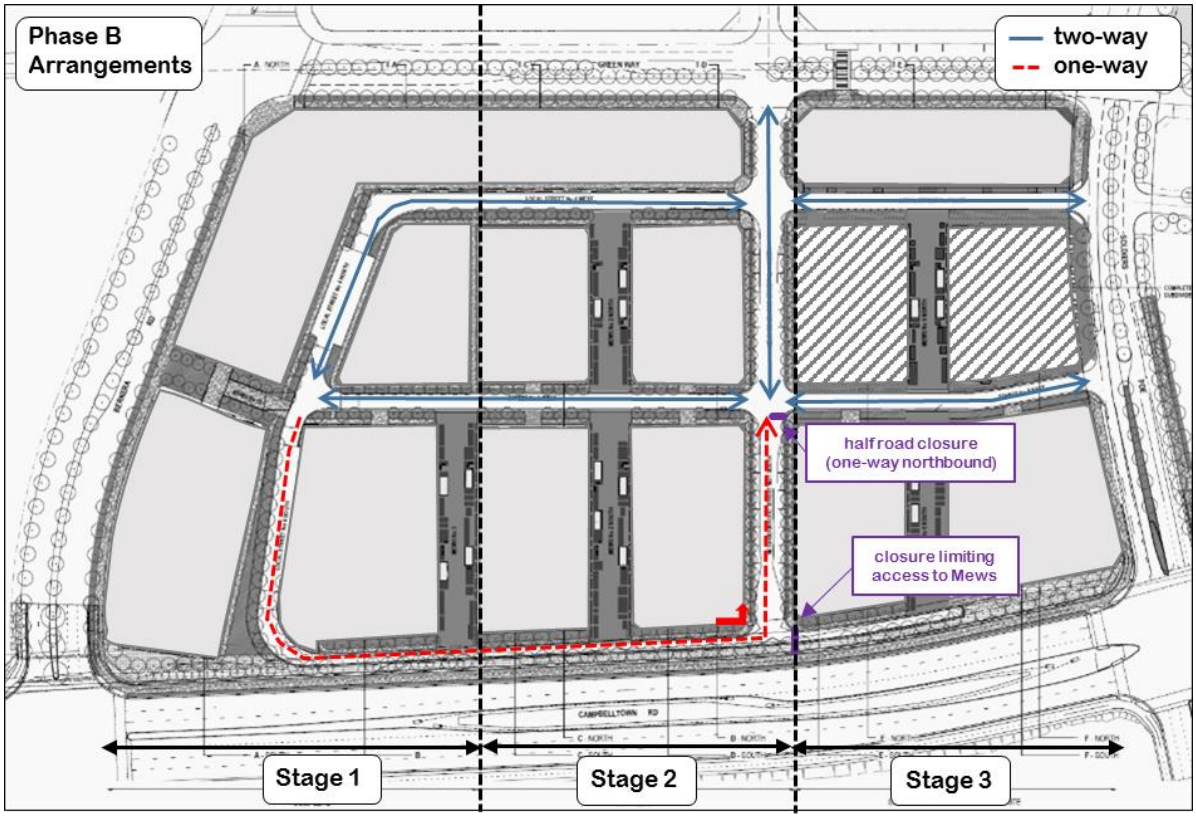

Figure 14: Road Network Plan (Phase B)

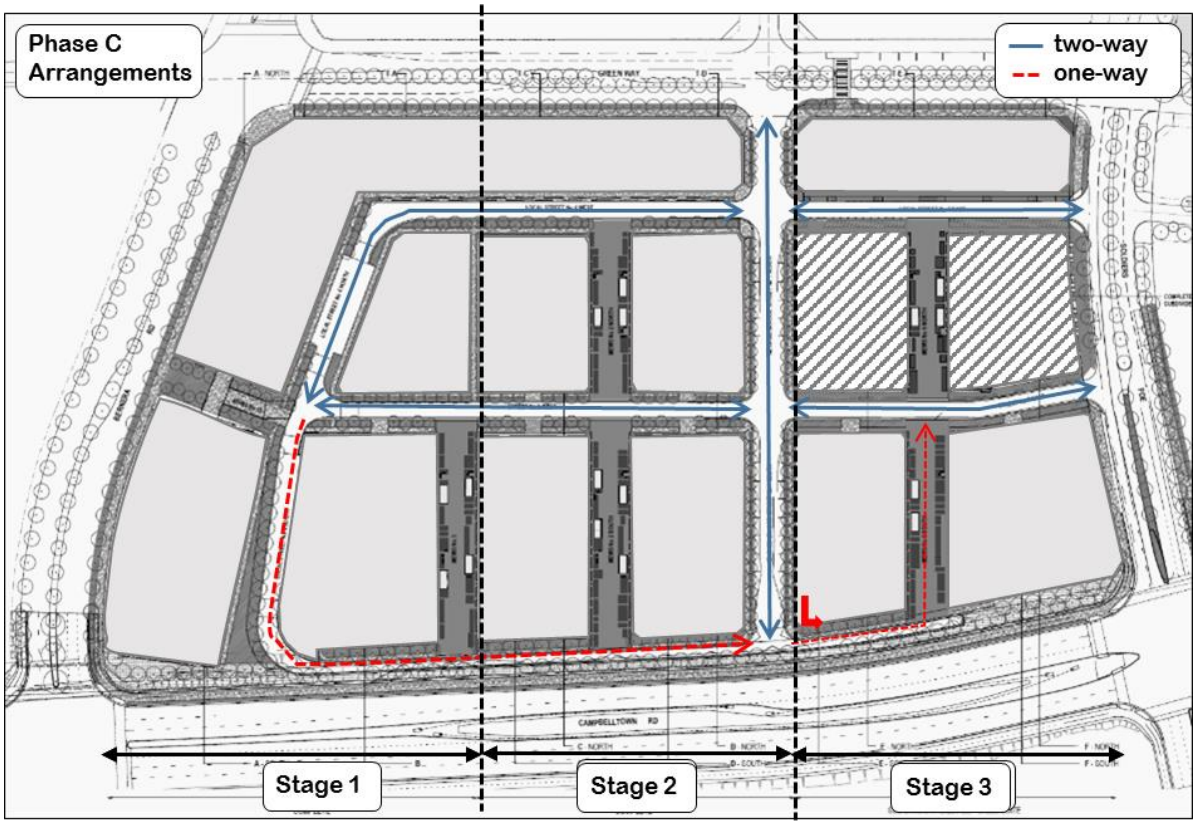

Figure 15: Road Network Plan (Phase C)

Reference should be made to the signage and line-marking plans prepared by J. Wyndham Prince which outline the required signage to support the interim one-way arrangements for the southern section of Neighbourhood Street 1.

6.3 Internal Design Commentary

The site access and internal car park and loading arrangements shall generally be designed having regard for the above Standards, with the following considered noteworthy:

- The proposed roads and site access locations are generally consistent with the approved DA-583/2017.
- Reference should be made to the swept paths prepared separately by J. Wyndham Prince demonstrating circulation by waste collection vehicles on the internal road network.
- No turning head is provided at the southern end of Neighbourhood Street 1. Accordingly, an easement shall be created over Mews 6 South so that the general public can recirculate.
- Off-street car parking areas are for exclusive use by residents, with all spaces provided as 'allocated' parking. Accordingly, turning bays are not required within the off-street car park areas.
- Dead-end aisles are to be provided with a 1.0 metre aisle extension in accordance with Figure 2.3 of AS2890.1;

In summary, the proposed access and internal design is generally considered supportable and the development will operate safely and efficiently subject to the above.

7 Conclusions

The key findings of this Traffic Impact Assessment are:

- This report encompasses the impact of all future built form DAs of Edmondson Park Frasers Town Centre – Residential Precinct 1 (RP1). It forms part of a larger development known as the Edmondson Park South (EPS) development area. Separate Development Applications will be submitted to Council in relation to the balance of the Edmondson Park Frasers Town Centre, including precinct-wide infrastructure, external to RP1.
- A total of 348 residential units are envisaged for RP1.
- RP1 development will generate the following traffic volumes upon completion:
  - 198 veh/hr during morning and evening peak periods; and
  - 1,977 vehicle trips per day.
- This traffic is accounted for in the traffic modelling undertaken in support of the approved Concept Plan (MP 10-0118 MOD 4) submission and, accordingly, additional traffic modelling in support of RP1 sub-stages is considered unnecessary.
- It is assumed that Council will impose a standard condition of consent requiring compliance with these Standards (AS2890 series) such that any minor changes to the plans required (if any) can be undertaken as part of detailed Construction Certificate documentation. In this regard, it is emphasised that the design of internal roads and accesses is generally in accordance with the approved DA-583/2017 and will therefore achieve a suitable level of operational safety and efficiency.

In summary, the Proposal is supportable on traffic planning grounds and will not result in any adverse impacts on the surrounding road network or the availability of on-street parking.