MEMORANDUM

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6 February 2017

Frasers Property Australia

Attention: **Simon Twiggs**

RE: **Edmondson Park Frasers Town Centre - Section 75W - Response to Agency Submissions**

Dear Simon,

This memorandum is in response to Transport for NSW letter dated 4 November 2016 in relation to the Edmondson Park Town Centre South Concept Plan. A summary of the TfNSW comments, recommendations and our relevant responses is provided in the attached table.

Furthermore, reference should also be made to the updated traffic report dated February 2017 which includes updated traffic modelling undertaken by Aecom in response to the various agency comments.

We trust the above is of assistance and please contact the undersigned should you have any queries or require further information in relation to the above.

Yours sincerely,

Tim Lewis
Principal Traffic Engineer – Ason Group
Email: tim.lewis@asongroup.com.au

Item	Issue	TfNSW Recommendation	Response
	Integration with Campbelltown Road Upgrade		
1	A section of Campbelltown Road adjacent to this development will be upgraded by Roads and Maritime in the second half of 2017 (subject to availability of funding). The detailed road design plans for this road upgrade are currently being finalised by Roads and Maritime with the construction tender scheduled to be undertaken in the first half of 2017. It is imperative that the higher dwelling yields and changes to the road network and other proposals put forward by the proponent do not have a detrimental impact on the construction schedule and allocated budget for the upgrade of this section of Campbelltown Road. It is noted that the traffic report submitted with the application notes that changes are likely to be necessary to the Campbelltown Road intersection arrangements, as a direct result of the proposed amendments (increase in yield and road network changes), but can be addressed post approval of the subject application. Deferral of identifying the necessary changes to the intersection treatments on Campbelltown Road to the post approval phase of the application is not supported, as this may pose risks to the construction timetable for the Campbelltown Road upgrade. As part of the above process in identifying the necessary amendments to the intersection arrangements on Campbelltown Road, the updated mesoscopic modelling (including findings) submitted with the application will be independently peer reviewed by Roads and Maritime.	The proponent should consider the other issues raised in this submission and develop a revised Traffic Impact Assessment. Following that work TfNSW would meet with the proponent to discuss and identify the course of action to address any impacts the proposal may have on the Campbelltown Road Upgrade.	A revised traffic report has been prepared which outlines the changes required to Campbelltown Road intersections. Changes are consistent with the previous traffic report for the 2026 scenario which coincides with Stage 1 of the Campbelltown Road Upgrade works. Additional sensitivity modelling of the 2036 scenario has also been included as part of the revised Aecom report to confirm what changes may be required to the long-term plans for Campbelltown Road. At the intersections of Campbelltown Rd / Bernera Rd, these changes include: - Extension of the right turn bay on the northern approach - Changing the median through lane on the southern approach to a right turn lane - Additional right turn lane on the western approach of Campbelltown Rd

	Approach to population in traffic modelling		
2	Page 9 of the Traffic Impact Assessment describes the concept plan modification as increasing the original 912 dwellings (in the town centre) by a further 972 dwellings taking the total number of dwellings in the town centre to 1884 and the dwellings in the wider Edmondson Park South Precinct from 3,530 dwellings to 4,502 dwellings. The Traffic Modelling Report (page 3) appears to make different assumptions stating: *"To maintain the overall balance of residential dwellings within the approved limit of Edmondson Park South project the increase of residential dwellings within the EPTC (Edmondson Park Frasers Town Centre) is offset by proportional (sic) reducing the residential dwellings in the areas surrounding the EPTC.* It appears the traffic modellers have assumed an overall precinct size of circa 3530 dwellings assuming less growth will be permitted to occur in the wider Edmondson Park South Precinct to balance out the additional development in the EPTC.	TfNSW seeks clarification as to whether the number of dwellings in the overall Edmondson South Precinct is now assumed to be 4,502 dwellings as detailed on page 9 of the TIA or circa 3530 as described in page 3 of the Traffic Modelling report. If 4,502 dwellings are proposed (as assumed) then an addendum traffic modelling report should be produced and submitted for RMS/TfNSW review. Any re-submitted reports submitted to TfNSW should include a copy of the 2010 TMAP which is heavily referenced but not included as an attachment in the proponent's application	The Aecom Traffic Modelling Report has been updated to reflect the increased yield.
	Approach to full development and traffic modelling		
3	Campbelltown Road is a State Road. Page 8 of the TIA advises that full development is assumed to be by future year 2026. The accepted approach to significant developments impacting the State Road network is full development plus 10 years. The modelling report does not take a full development + 10 years approach instead reporting on the impacts at the time of full development in 2026.	An addendum modelling report is produced for all intersections crossing Campbelltown Road (i.e. intersections numbered 1 (Campbelltown Road and Bernera Road), 2 (Campbelltown Road and Soldiers Parade), 3 (Campbelltown Road and East Town Centre Street) for future years 2036 not 2026 AM and PM peaks. The growth rate used should be clearly identified and discussed.	The updated Traffic Modelling Report prepared by Aecom in relation to Section75W has been revised to include further SIDRA modelling of a 2036 scenario for key intersections along Campbelltown Road. In this regard, a background growth rate of 1.1 per cent per annum has been adopted for based on the comparison of RMS EMME/2 traffic forecasts between 2026 and 2036. Refer to Item 1 regarding commentary on changes required to current Campbelltown Road planned intersections.

	Bernera Road - Design		
4	Under Sydney's Bus Future, Bernera Road has been identified as a strong candidate road for the Growth Centre Rapid route: Liverpool — Campbelltown via Leppington and Oran Park. The road network for rapid bus routes should be two lanes in each direction. This is allowed for in the design for Bernera Road Bridge (current line marking notwithstanding) which is 25 metres wide and it is important that adequate lane width for rapid bus services is carried through for the remainder of Bernera Road. Accordingly there is broad agreement to the cross section proposed for Bernera Road asdepicted on page 27 of the Urban Design Report. However, the cross section wouldneed to be modified to show two 3.5 metre lane widths with no parking for the length of Bernea Road. An amended indicative cross section reflecting these principles should bedeveloped as part of the response to submissions.	The proponent should develop an amended cross section of Bernera Road showing two 3.5 metre lanes clearly marked as no kerbside parking. Investigate road network designs which prioritise bus operations along the retail and commercial hub of Bernera Road. The potential for median strip access to bus operations should be preserved. This would support the initial TMAP measures of providing future residents with convenient public transport services that are prioritised in the precinct to reduce travel times (Edmondson Park South TMAP 2010).The proponent is conditioned to work RMS and TfNSW in developing an optimal design for Bernera Road including bus priority and potentially traffic light placement subject to a letter of confirmation.	Current civil engineering plans note 3.5 metre lanes along Bernera Road and, as such, the plans make provision for future rapid bus routes should these be provided in the future. Bernera Road will ultimately be a Council asset upon dedication back to Council. Accordingly, parking restrictions on Bernera Road shall be a matter for Council. Notwithstanding, it is expected that No Parking or No Stopping restrictions would apply along the length of Bernera Road.
	Travel Planning		
5	**Prior to Occupation** A Travel Plan should be prepared for the development to minimise the transport impact. The plan must be submitted to and endorsed by TfNSW prior to the issue of the first Occupation certificate. The Travel Plan should include: • Base line transport date including the assumed travel patterns • Objectives and targets — based on promote, encourage and support the alternatives to single occupant private vehicle trips at peak periods through the use of more efficient car use, active and public transport • Program of measures including increase active transport use, encourage public transport use, reduce single occupancy vehicle trips, reduce the need to travel and promotion. Under the measures specific actions need to be identified to support the assumed travel patterns and objectives including timing. • Identify the Governance to deliver the Travel Plan including Monitor and Evaluation • Establish Monitor and Evaluation process including an Annual Travel Survey. **Post Occupation** The development occupier shall undertake a review of the Travel Plan including a travel survey on the 1, 3 and 5 year anniversary of issue of the final Occupation certificate. It should be determined if the assumed travel patterns are occurring and the objectives are being met and whether any actions need to be adjusted to meet the objectives. Travel Plan Reports with an updated Travel Plan shall be prepared and submitted to TfNSW for review.	In recognition of the denser town centre development the proponent should develop prior and post occupation travel plans are described.	Noted. Sustainable transport plans can form a condition of future development applications.

	Development near rail corridor		
6	Clause 86 of the State Environmental Planning Policy (Infrastructure) includes requirements relating to development within 25 metres horizontal distance of a railcorridor to protect the safety and/or structural integrity of rail infrastructure facilities. Theproponent must check whether any part of their proposed development is within 25metres of the South West Rail Link. Prior to the commencement of any construction associated with this concept planmodification the proponent should submit a report to Sydney Trains for reviewdemonstrating how the proposed development will comply with the Department ofPlanning's document title "Development Near Rail Corridors and Busy Roads — InterimGuidelines". This assessment is also to assess the likely impact of airborne noise, groundborne noise and vibration from present and future rail operations. In addition, noise and vibration effects arising from the future construction activities of therailway corridor at this location on the already completed development buildings. The Applicant should refer to relevant current noise and vibration information from SydneyTrains in order to test that the internal noise criteria and recommended noise controlmeasures remain valid. The Applicant must incorporate in the development all themeasures recommended in the report to control that risk. Appropriate acoustic measures must be taken to ensure that the following LAeq levels are not exceeded: (a) in any bedroom in the building-35 dB(A) at any time between 10.00 pmand 7.00 am, (b) anywhere else in the building (other than a garage, kitchen, bathroom orhallway)-40 dB(A) at any time.	The proponent needs to check whether the provisions of the State Environmental Planning Policy (infrastructure) including clause 86 apply to this development. The proponent commits to developing a report for submission to Sydney Trains demonstrating how compliance with "Development Near Rail Corridors and Busy Roads - Interim Guidelines" will be achieved.	No change to this Condition is required as part of the S75W modifications. Presumably this is a matter to be addressed as part of any subsequent Development Application submission(s).
	Traffic Signals on Local Road Network		
7	It is noted a number of intersections on the local road network are proposed to be signalised, which requires approval of Roads and Maritime under Section 87 of the Roads Act, 1993. In this regard, any approval to the provision of traffic signals is subject to the following requirements being satisfied: • Submission of traffic analysis demonstrating that the provision of traffic signals complies with the warrant criteria as outlined in the Roads and Maritime Traffic Signal Design Guide — Section 2 (Warrants). • Electronic copies of the intersection modelling supporting the layout and phasing of the proposed signalised intersection	The proponent acknowledges the above requirements as part of any future application to install traffic signals in Edmondson Park South.	Noted, future traffic signal designs will include the submission of traffic analysis as outlined in the Roads and Maritime Traffic Signal Design Guide – Section 2 (Warrants) and additionally electronic copies of the intersection modelling supporting the layout and phasing of the proposed signalised intersection will be included.

	Left In/Left Out on Campbelltown Road		
8	It is noted that traffic signals are proposed on Campbelltown Road to the west of the McDonaldtown Road intersection, to facilitate left in/left out movements on CampbelltownRoad. Roads and Maritime do not support the provision of traffic signals to cater for left turnmovements as these movements do not require protection under signal control and itshould also be noted that signals at this intersection have never been endorsed by Roads and Maritime. Further, consistent with the advice provided by the former Roads and Traffic Authoritysubmission of 22 October 2010 on the master plan Concept Plan (MP10_0018), "currentpractice is the limit the number intersections along arterial roads on traffic efficiency androad safety grounds". Motorists in Edmondson Park have alternative vehicular access viathree sets of signalised intersections (McDonaldtown, East Town Centre Road and CroatiaAvenue). However, left turn movements directly off Campbelltown Road at mid-block locationswould be considered more favourably if deceleration lanes were provided for these leftturn movements.	Consistent with the former Roads and Traffic Authority submission of 22 October 2010 on the concept Plan (MP 10_0018), all vehicular movements shall be via the three approved signalised intersections on Campbelltown Road. However, consideration would be given to uncontrolled left turn movements off Campbelltown Road, subject to the provision of deceleration lane, which will require land dedication at no cost to Roads and Maritime.	Noted. All access to Campbelltown Road from the Edmondson Park Frasers Town Centre is via the 3 approved signalised intersections.
	Mesoscopic Modelling		
9	The updated Mesoscopic modelling undertaken by the applicant to incorporate the proposed higher yields and road network changes should be independently peer reviewed.	Electronic Copies of the Mesoscopic models should be forwarded to Roads and Maritime for review prior to the progression of this application.	Electronic copies of the modelling undertaken will be issued to Roads and Maritime for review.

asongroup

Prepared for

FRASERS PROPERTY AUSTRALIA

Traffic Impact Assessment Report

Edmondson Park Frasers Town Centre
Section 75W Modification

Ref: 0054r01v5
5/02/2017

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Appendices

1 Introduction

1.1 Study Objectives and Scope

Ason Group has been engaged by Frasers Property Australia (FPA) to prepare a Traffic Impact Assessment (**TIA**) relating to modifications to the approved Concept Plan for Edmondson Park South (**EPS**). Specifically, these modifications relate to the Edmondson Park Frasers Town Centre (**EPFTC**) site. The EPFTC 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. A Site Context figure is presented in **Figure 1**, which provides an appreciation of the EPS and its location within the greater Edmondson Park Release Area which itself forms part of the South West Growth Centre (**SWGC**).

This Section 75W Modification seeks to revise the Edmondson Parking South Concept Plan to reflect current planning for the Edmondson Park Frasers Town Centre site to reflect further design development of the town centre south of the railway line by FPA. This report addresses the relevant traffic, transport and parking implications of the modified Concept Plan.

As part of this TIA study, reference is made to the key development controls, planning documents and supporting traffic and transport assessment, including the following documents:

- Edmondson Park South Part 3A – Concept Plan Application Transport Management and Accessibility Plan (**TMAP**), prepared by AECOM, September 2010 (referred to herein as the AECOM **TMAP**).
- Edmondson Park South – Stage Significant Site Listing and Concept Plan Preferred Project Report (**PPR**), prepared by JBA Urban Planning Consultants, November 2010.
- Edmondson Park Frasers Town Centre - Section 75W Traffic Modelling Report, prepared by AECOM, February 2017 (referred to herein as the AECOM **Modelling Report**).

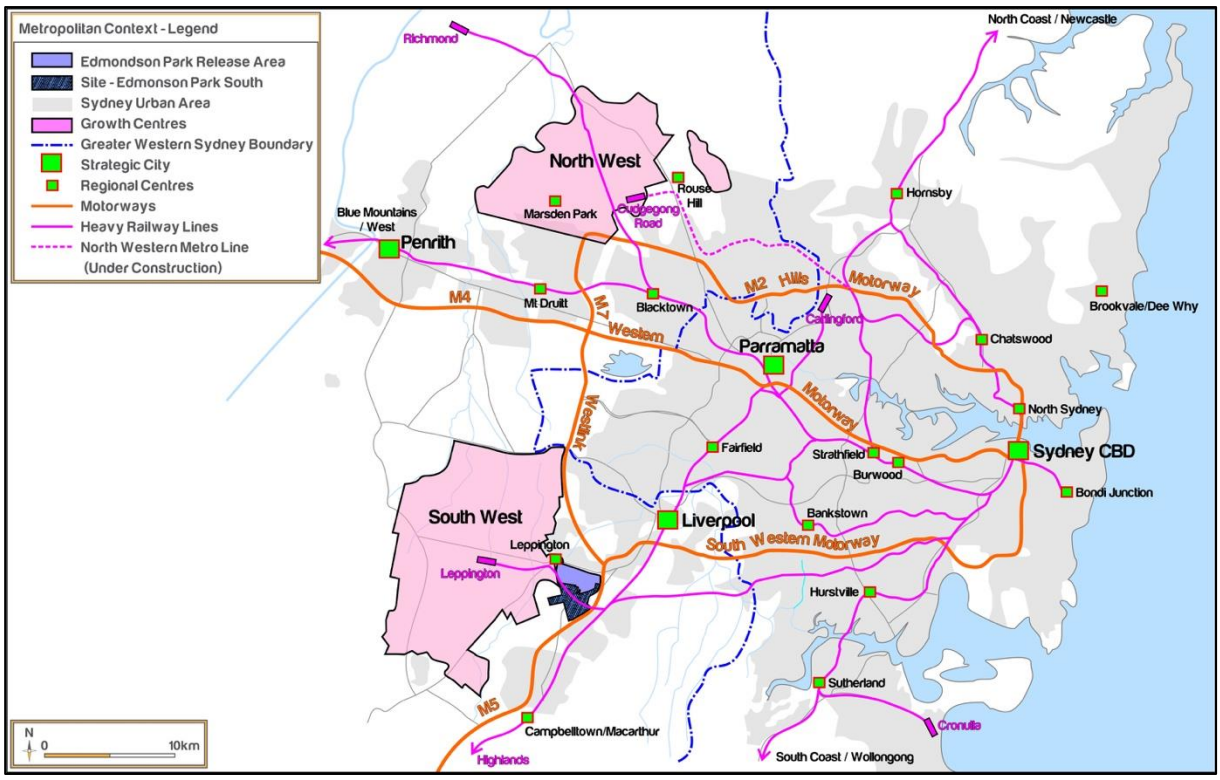


Figure 1: Site Context

1.2 Report Structure

This report is structured as follows:

- Section 2 describes the location of the site and development background.
- Section 3 provides a summary of the proposed changes to the Concept Plan.
- Section 4 outlines the car parking provisions proposed for the Edmondson Park Frasers Town Centre.
- Section 5 discusses the traffic implications associated with the revised Concept Plan including the site's projected trip generation and forecast network performance.
- Section 6 provides a summary and key conclusions.

2 Planning Context

2.1 Site Location

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 within the Edmondson Park Release Area.

The site subject to this S75W modification application is known as the Edmondson Park Frasers Town Centre site which is located on the northern side of Campbelltown Road within the suburb of Edmondson Park and lies solely within the Liverpool Council LGA. Within the context of the Edmondson Park Release Area, the Site is immediately adjacent to the new Edmondson Park train station on the South West Rail Line (SWRL), as shown in **Figure 2** below.

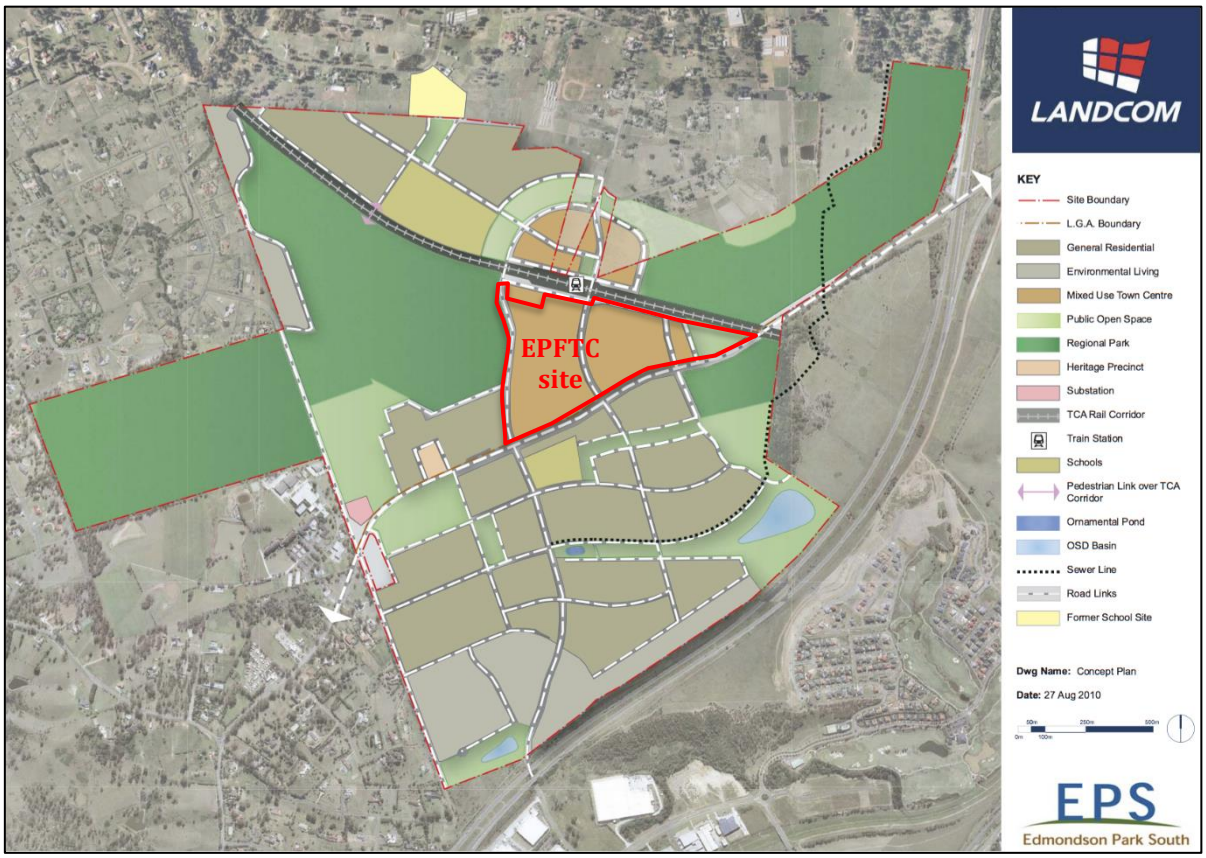


Figure 2: Original Edmondson Park South Concept Plan

2.2 Background of Concept Plan (MP10_0118)

A Concept Plan was lodged by Landcom (now UrbanGrowth NSW) in 2010 seeking approval for a mixed use residential, commercial and retail development within the Edmondson Park Release Area. A concurrent Project Application (MP 10_0119) was also lodged to develop the Stage 1 works in EPS. The initial Concept Plan, as shown in Figure 2, established the overall planning framework for the EPS site and sought to achieve the following:

- Residential development of 3,530 dwellings (with a min of 912 residential dwellings within the EPFTC southern precinct);
- Development of the Edmondson Park town centre including 35,000-45,000m^2 of retail / business / commercial floor space, including a single 'landmark development' of up to 30 metres in height within 300 metres of the Edmondson Park Station;
- Protection of approximately 150 hectares of conservation lands within regional parklands;
- Adaptive relocation of three heritage listed 'Riley Newsum' pre-fabricated cottages, within the open space network, and retention of the Ingleburn Military Precinct and Mont St Quentin Oval;
- Upgrade of Campbelltown Road with a maximum road width of 38.8 metres, and construction of three signalised intersections with Campbelltown Road;
- A temporary sales and information office and temporary signage associated with the sale of land;
- Site remediation works;
- Demolition of a number of existing buildings across the site; and
- Associated infrastructure.

The original Concept Plan was approved in 2011 by the Planning Assessment Commission (**PAC**), with the following conditions relating to further traffic and transport environmental assessments:

- Any future application which proposes additional intersections with Campbelltown Road is to be supported by a traffic analysis and is to have the concurrence of the RTA (now RMS). (Part C, Condition 1.4)
- Any future application is to address the need for the relocation of Macdonald Road, with timing to be supported by a detailed traffic assessment to RTA's satisfaction. (Part C, Condition 1.5)
- Any future application for the Edmondson Park town centre must be supported by a detailed traffic and transport study, including a micro-simulation model. This should identify appropriate bus priority measures along the proposed Main Street, and ensure integration with the transport interchange, through consultation with the Department of Transport. (Part C, Condition 1.6)

- Any future application for development within 25m of the South West Rail Link must identify and mitigate any impacts on the South West Rail Link, in consultation with the Department of Transport. (Part C, Condition 1.7)

A Revised Statement of Commitments was provided in the Preferred Project Report (**PPR**), which detailed the responsible parties to deliver and maintain infrastructure to ensure the sustainable delivery of Edmondson Park South.

2.3 Edmondson Park South TMAP (2010)

In 2010, AECOM prepared a TMAP to accompany the original Concept Plan Application in response to the Director General's Requirements (**DGR**s). The study proposed a package of active and public transport initiatives with the objective of achieving the NSW State Plan journey-to-work mode split targets for Edmondson Park South, which included:

- 28% of total journeys to work by public transport in the Sydney Metropolitan Region by 2016;
- Increase of the share of commute trips made by public transport to and from the Liverpool CBD to 20% by 2016; and
- 5% for bicycle trips of less than 10km made in the Greater Sydney region by 2016.

The active transport measures recommended in the TMAP included:

- Sustainable travel strategies, to include provision of marketing of public transport options and a free travel pass.
- Infrastructure improvements to provide easy pedestrian and cyclist access via a safe and efficient shared path and footpath network, a Town Centre Main Street with low traffic environment, signalised crossings along Campbelltown Road and near the school sites.
- Public transport infrastructure, including well-designed bus stops to provide safe and convenient means for the future residents to use public transport services and bus priority treatments to reduce the travel times for public transport users.
- Transport service improvements, including the implementation of a new bus service connecting the development with Liverpool via Edmondson Park Station and Town Centre.

In addition, the TMAP assessed the proposed Concept Plan road network, as shown in **Figure 3**, for 2012, 2016 and 2026 development scenarios. It should be noted that this 2016 modelled scenario envisaged approximately 1,100 residential lots would be developed in addition to 50% of the Town Centre, however this level of development has yet to occur. The results of this assessment are discussed further in Section 5 with the future intersection layouts proposed under the assessment summarised in **Figure 4**.

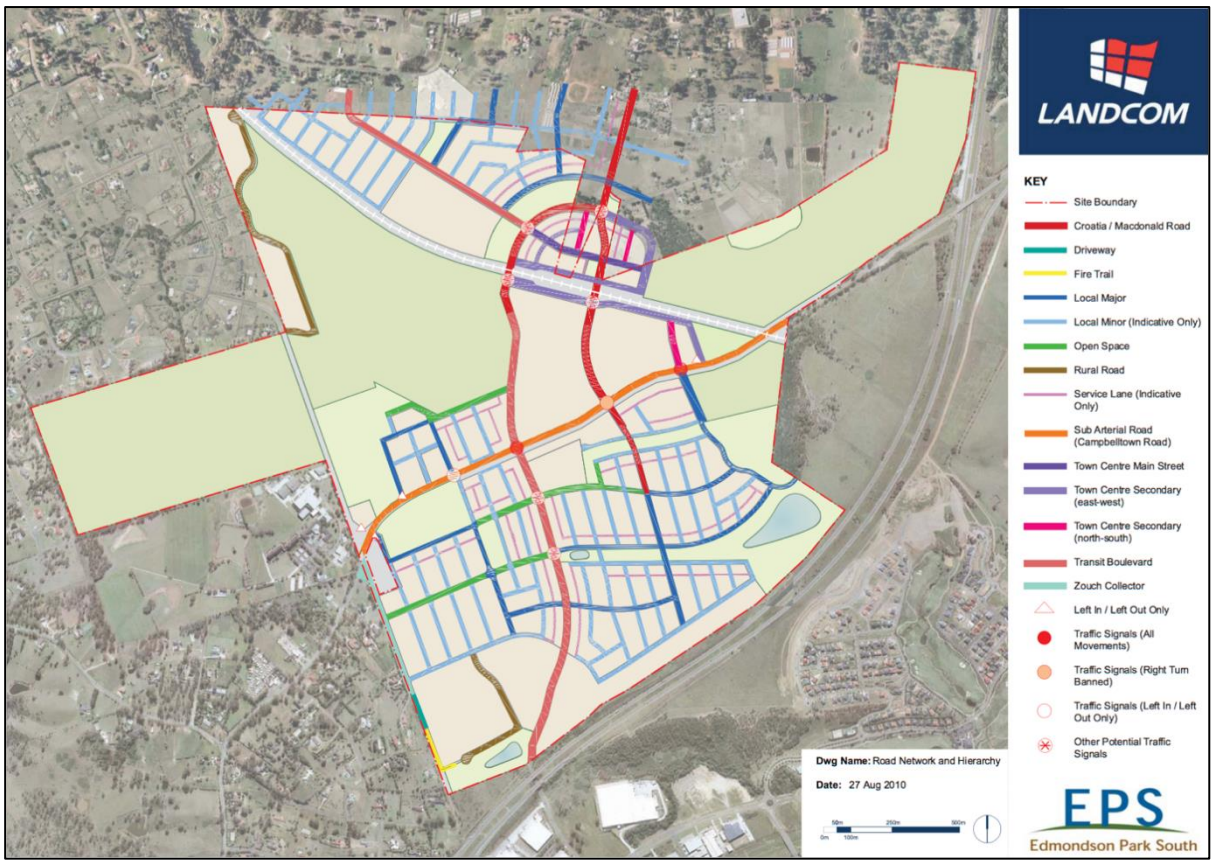


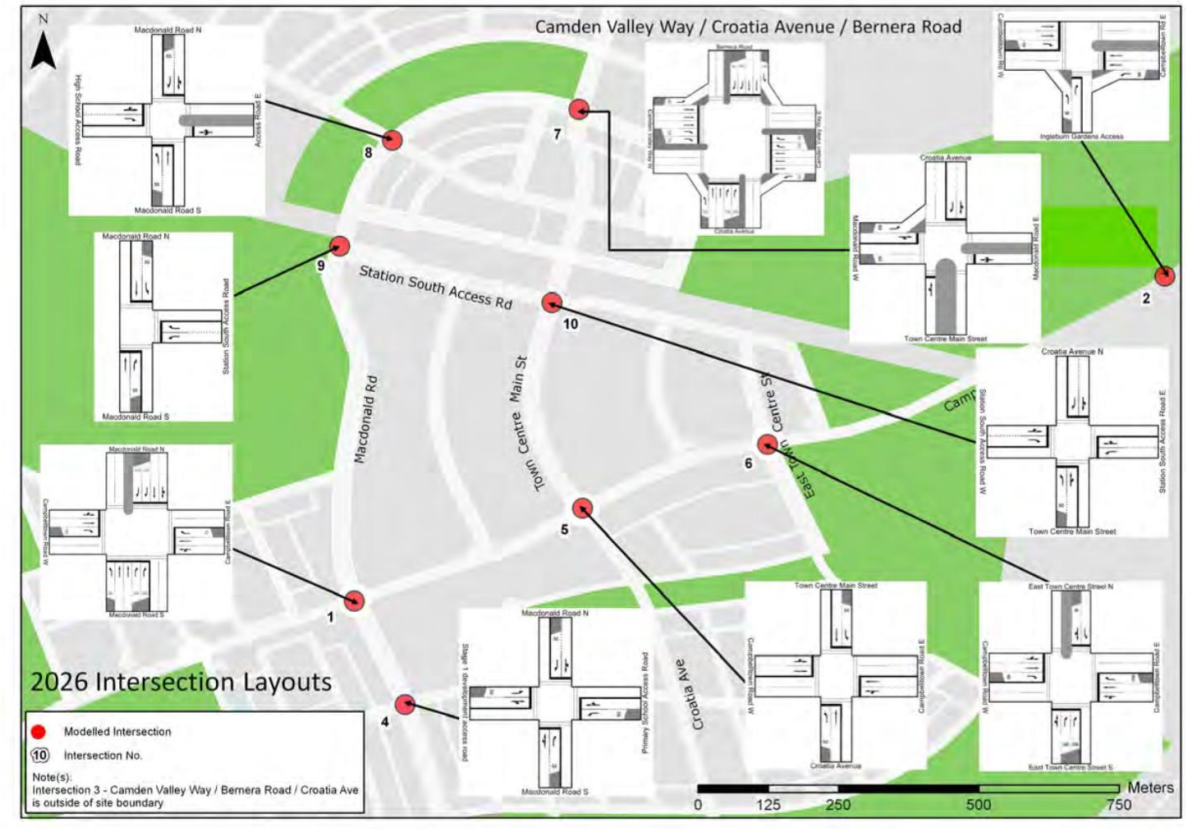
Figure 3: Original Edmondson Park South Concept Plan Road Network

2.4 Clarification of Road Name Terminology

The AECOM TMAP and Concept Plan approval refer to a number of roads in relation to the EPFTC, as shown in **Figure 4**.

For the purposes of the current S75W modification to the Concept Plan, the following changes to the road names have been adopted and referred to as such henceforth:

- Bernera Road — the town centre bypass loop road / Transit Boulevard to the west of the EPFTC connecting between Croatia Avenue / Town Centre Main Street (now Soldiers Parade) and Campbelltown Road. To the south of Campbelltown Road, this section of road is formed by the future relocation (westward) of Macdonald Road.
- Soldiers Parade — the southern extension of Croatia Avenue through to Campbelltown Road, previously referred to as the "Town Centre Main Street"
- Henderson Road — previously referred to as the "Station South Access Road"



Source: AECOM, 2010

Figure 4: TMAP Road Network and Key Intersections

2.5 TMAP Identified Road Infrastructure

The study also identified a number of road infrastructure improvements required to accommodate the development yield proposed in the original Concept Plan for the 2026 ultimate design year. These upgrades are incorporated in the TMAP road network (Figure 4) and include:

1) Relocation of Macdonald Road;
2) Construction of two bridge crossings over the South West Rail Link (SWRL);
3) Upgrade of Campbelltown Road / Macdonald Road / Bernera Road (Intersection 1) with an additional right turn lane (100m) on the southern approach of Macdonald Road;
4) Construction of a new signalised intersection – realigned Macdonald Road / Stage 1 development access road / Primary School Access Road (Intersection 4);
5) Construction of a new bus priority signalised intersection – Campbelltown Road / Soldiers Parade / Croatia Avenue (Intersection 5);
6) Construction of a new signalised intersection – Campbelltown Road / East Town Centre Street (Intersection 6);
7) Construction of a new signalised intersection – Croatia Avenue / Bernera Road / Soldiers Parade (Intersection 7);
8) Construction of a new priority controlled intersection – Bernera Road / Henderson Street (Intersection 9); and
9) Construction of a new priority controlled intersection – Soldiers Parade / Henderson Road (Intersection 10).
10) Construction of a new signalised controlled intersection – Bernera Road / High School Access Road (Intersection 8);
11) Signalisation (with bus priority) of Bernera Road / Henderson Road (Intersection 9); and
12) Signalisation (with bus priority) of Soldiers Parade / Henderson Road (Intersection 10).

Items 11 and 12 above seemingly contradict the earlier improvements identified under Item 8 and 9. However, it should be noted that the adopted Section 94 Contributions Plan for the precinct does not envisaged signals at Henderson Road with either Bernera Road and Soldiers Parade, with a roundabout currently constructed at the Bernera Road / Henderson Road intersection. Notwithstanding, signals are currently provided at the intersection of Soldiers Parade / Henderson Road.

3 Proposed S75W Modifications

3.1 Modified Concept Plan

This Section 75W Modification seeks to revise the Concept Plan to reflect current planning for the Edmondson Park Frasers Town Centre site to reflect further design development of the Concept Plan during a competitive Expression of Interest (EOI) process undertaken by UrbanGrowth NSW, with the FPA scheme as the selected entrant.

Key modifications to the Concept Plan relate to the Frasers Town Centre site and are as follows:

- Introducing a maximum Gross Floor Area (**GFA**) limit for the Frasers Town Centre Core (which corresponds with the FSR currently applicable to the site);
- Increasing the maximum building heights in the Frasers Town Centre Core;
- Increasing the approximate number of dwellings from 912 to 1884, comprising an indicative 892 dwellings in the residential precincts and 992 in the Town Centre Core with a net increase in the approximate total number of dwellings from 3,530 to 4,502 across the overall Concept Plan area;
- Revising the road network and hierarchy;
- Introducing maximum car parking rates;
- Provision of the Edmondson Park Frasers Town Centre Public Domain Plan to guide the future design of the public domain; and
- Provision of the 'Edmondson Park Frasers Town Centre Design Guidelines' to guide the detailed design of the future buildings.

The revised Concept Plan is presented in **Figure 5**, with a comparison between the previously approved and proposed land uses within the EPFTC provided in **Table 1**. The traffic and parking implications of the modified Concept Plan is covered in Section 4 and Section 5.

Table 1: Comparison between Approved and Proposed Concept Plan Land Use Assumptions

Land Use	Approved Concept Plan (2010)	Modified Concept Plan (2016)
Residential[1]	912 dwellings	1,884 dwellings
Retail	18,750 GLFA	35,000 GLFA
Commercial	15,000 GLFA	-
Medical	-	8,000 GLFA

Note: 1) 422 dwellings modelled as part of the previous Concept Plan TMAP, as outlined in the AECOM report.

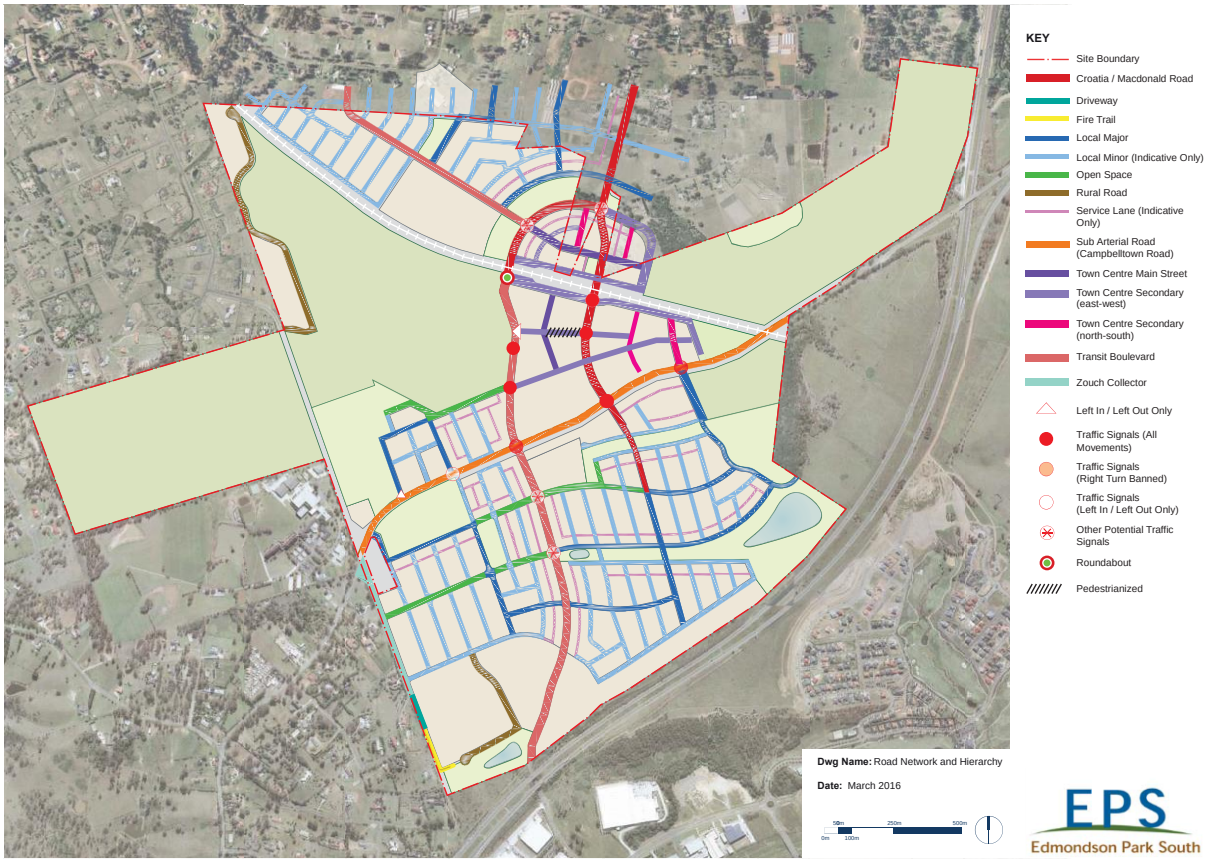


Figure 5: Proposed Concept Plan Road Network

3.2 Modifications to Concept Plan Road Network

As demonstrated in Figure 5, the proposed Concept Plan involves modifications to the layout of the road network within the EPFTC only. The remaining areas of EPS are unchanged from the previously approved Concept Plan. In this regard, the following changes to the EPFTC road network are proposed under this S75W Modification:

- Relocation of "Main Street" to within what is now the Town Centre Core to better reflect future traffic volumes anticipated to use the previously adopted Town Centre Main Street (now Soldiers Parade). This effectively changes the road hierarchy of Soldiers Parade from a main street to a collector road with an increased speed limit of 40km/h (from 25km/hr as a Main Street).
- The addition of other internal road connections, including the Greenway, Eat Street (pedestrians and cyclists only), Urban Street and associated intersections.
- New traffic signals to facilitate pedestrian movements across Soldiers Parade between the Town Centre Core and the proposed community park to the east.

- New traffic signals at the intersection of the Greenway and Bernera Road intersection.
- Removal of the easternmost left-in/left-out intersection to Campbelltown Road.
- The narrowing of Henderson Road from two lanes to one lane in both the eastbound and westbound direction resulting in the change of lane configurations for intersections along this road to reflect the constructed Edmondson Park interchange.

  (It should be noted that this change is to reflect what has been constructed by TfNSW and not infrastructure changes required or proposed by the revised EPFTC)
- Introduction of traffic signals at Bernera Road to facilitate access to the residential and retail car park within the town centre.
- Removal of No Right Turn restrictions at the intersection of Campbelltown Road / Soldiers Parade to now permit all movements (consistent with the RMS approved REF for the upgrades of Campbelltown Road.

It is expected that the detailed design of intersections and internal road network within residential sub-precincts will be assessed in further detail during subsequent Development Applications for the subdivision of land and associated infrastructure works.

3.3 Town Centre Core Access Arrangements

The currently proposed Town Centre Core vehicular access to the retail and residential basement parking and loading dock accesses as shown in the Illustrative Design Scheme are shown in **Figure 6**. This has potential implications to the operation of the road network, which has been included in the updated traffic modelling discussed in Section 5.

It is noted that the design of the access points to the basement car parks from the local road network will be subject to separate detailed assessment as part of subsequent Development Application (DA) submissions.

Figure 6: Revised Frasers Town Centre Core Access Arrangements

Source: AECOM, 2016

4 Parking Provisions

4.1 Approved Concept Plan Requirements

The approved Concept Plan does not detail car parking rates for the various land uses. The revised Statement of Commitments that accompany the S75W application include:

Item 23 - The provision of parking in the town centre will be co-ordinated and where possible shared across multiple land uses that do not have similar peak parking demands to demonstrate creation of a more walkable, liveable centre, which is not car dominated and ensure balanced access across all modes.

Item 24 - Parking provision will encourage short stay trips, with some limited long stay parking for commuters around the rail station and on the fringe of the town centre. Any on-street parking will be limited to short term, disabled and taxi parking.

It is proposed to introduce maximum parking rates for development within the Town Centre as part of this S75W Modification, which are discussed in further detail below.

4.2 Comparison with Other Council Controls

The Liverpool Council Edmondson Park South Development Control Plan 2012 does not include specific car parking rates for development within the Town Centre. Instead, the DCP refers to the following other local planning controls:

- Liverpool Development Control Plan 2008 (Liverpool LGA only); and
- Campbelltown (Sustainable) City Development Control Plan (Campbelltown LGA only)

A comparison between the relevant parking rates for the various land uses contained within the Town Centre are outlined in **Table 2**, noting that these rates are generally regarded as “minimum” requirements under each respective development control plan.

Table 2: Parking Controls within South West Sydney

Land Use	Campbelltown (Sustainable City) Development Control Plan 2014[1]	Liverpool Development Control Plan 2008[2]
Residential Land Uses		
Residential Flat Buildings		
Studio and 1 Bedroom	1.25 space per dwelling	1 space per dwelling
2 Bedroom	1.25 space per dwelling	1.5 spaces per dwelling
3 Bedroom	2.25 space per dwelling	2 spaces per dwelling
Visitors	1 per 10 dwellings	1 per 4 dwellings, or part thereof
Attached Housing		
1 Bedroom	1 space per dwelling	1 space per dwelling
2 Bedroom	1 space per dwelling	1.5 spaces per dwelling
3-4 Bedroom	1 space per dwelling	2 spaces per dwelling
Visitors	1 per 2 dwellings	1 per 4 dwellings, or part thereof
Non Residential Land Uses		
Retail	1 space per 25m^2 for ground level 1 space per 35m^2 for upper levels	Business Zones: < 12,000m^2 LFA: 1 space per 20m^2 12,000 - 30,000m^2: 1 space per 25m^2 > 30,000m^2 LFA: 1 space per 30m^2
Food and Drink Premises / Restaurant	1 space per 25m^2 for ground level 1 space per 35m^2 for upper levels	1 space per 20m^2 LFA
Medical	1 space per 25m^2 for ground level 1 space per 35m^2 for upper levels	1 space per 25^2 LFA
Office	1 space per 25m^2 for ground level 1 space per 35m^2 for upper levels	1 space per 35m^2 LFA
Cinema (Entertainment Facility)	1 space per 25m^2 GFA for indoor facility	Greater of: 1 space per 10m^2 LFA, or 1 space per 6 seats
Gym	1 space per 25m^2 GFA for indoor facility	1 space per 22m^2 LFA
Child Care	1 space per 4 children	1 space per 35m^2 LFA

[1] Section 5.4.4, Section 3.9.2, Table 6.4.1 of the Campbelltown (Sustainable) Development Control Plan 2014

[2] Table 13 of the Liverpool Development Control Plan 2008 – Part 1

4.3 Proposed "Maximum" Parking Rates

The proposed parking rates have been developed having regard for Liverpool Council's key objectives in relation to car parking including:

- To ensure adequate car parking spaces and service facilities are conveniently located on site to satisfy the reasonable demand created by the development
- To ensure the provision of the appropriate car parking depending on location; and
- To ensure that car parking does not interfere unreasonably with the amenity of the neighbourhood.

A key element of these objectives is to cater for the 'reasonable demand' associated with new developments. In this regard, the Concept Plan seeks to restrain parking demands where possible, consistent with State Planning Policy. Having regard for this, the modified Concept Plan proposes to introduce maximum parking rates, as presented in **Table 3**.

Table 3: Proposed Concept Plan Parking Rates

Land Use	Maximum Parking Rate
Residential Flat Buildings	
Studio and 1 Bedroom Dwellings	1 space per dwelling
2 Bedroom Dwellings	1.2 space per dwelling
3 Bedroom Dwellings	2 spaces per dwelling
Visitors	1 space per 10 dwellings
Multi-dwelling and Attached Housing	
1-2 Bedroom Dwellings	1 space per dwelling
3-4 Bedroom Dwellings	2 spaces per dwelling
Visitors	Provided on-street within the Mews
Other Uses	
Major Retail (Supermarket, DDS, etc.)	4.1 spaces per 100m^2 GLFA
All other retail, commercial, medical, cinema and entertainment uses	4.1 spaces per 100m^2 GLFA
Child Care	1 space per 10 children and 1 space per 2 staff members
Gym	3 spaces per 100m^2 GLFA

Note: Any use not prescribed above is to be provided in accordance with the RMS Guide to Traffic Generating Developments

The maximum permissible car parking rates for residents have been set to reflect car ownership levels within south-western Sydney and to prevent undesirable overflow of resident demands onto surrounding street. The rates will however still encourage reduced car ownership levels through the restriction of excessive car parking provisions and hence meet the overall objectives of Transit Oriented Developments (TOD's) and Council's objectives.

Residential visitor car parking rates are also restrained to acknowledge some potential sharing of parking spaces with other uses for which peak times may not coincide. Furthermore, a visitor parking rate of 1 space per 10 units is consistent with Liverpool Council's rate for residential development within the Liverpool City Centre.

The retail and non-residential parking rates proposed generally reflect the provisions recommended under the RMS *Guide to Traffic Generating Developments* (2002). In this regard, compliance with this guideline is recommended as it will ensure that the non-residential land uses are accommodated off-street with minimal impact on the amenity within the future residential precincts. The adoption of the maximum rates however reflects the site's location with respect to public transport and the restriction on the provision of parking in excess of future demands.

The proposed car parking rates are therefore considered appropriate for adoption as the maximum permissible parking rates for the Town Centre and acknowledges the intent of Transit Oriented Developments. Any variation to the above maximum rates will be required to be supported by a traffic study.

4.4 Bicycle Parking

In addition to the above, minimum bicycle parking rates are also proposed as part of the Modified Concept Plan noting that the Liverpool DCP does not require bicycle parking for developments outside of the City Centre. The objective of the bicycle parking rates is to assist in the achievement of the 5% modal split to bicycles for trips less than 10km within the Greater Sydney region, as outlined in the TMAP.

To achieve this, the provision of minimum bicycle parking rates will ensure there is sufficient space available for future residents, staff and visitors to store their bicycles in a convenient location. In this regard, **Table 4** provides a summary of the proposed bicycle parking rates sought for the Frasers Town Centre.

Table 4: Proposed Bicycle Parking Rates

Land Use	Bicycle Parking Rate (Minimum)	Notes
Residential Flat Buildings	1 space per dwelling	Can be provided within a storage cage allocated to that residential dwelling or within a shared facility.
Multi-dwelling and Attached Housing	No specific requirement	Assumes adequate space is provided in the dwelling, storage or parking area.
Non-residential Uses (Staff and Visitors)	1 space per 500m^2 of GFA	

The above rates are to be provided as a minimum requirement for future development within the Town Centre South. Provision of additional bicycle parking for non-residential uses may be desirable.

5 Traffic Assessment

5.1 Background and Scope

As mentioned in Section 2.3, AECOM previously prepared a TMAP for Edmondson Park South in 2010 which formed part of the original Concept Plan submission. A spreadsheet model was used to analyse the trip generation, trip distribution and traffic assignment characteristics of associated land uses within Edmondson Park South. SIDRA modelling was then used to assess the impacts and determine the layout of key intersections within EPS. Subsequently, micro-simulation (VISSIM) modelling was undertaken by AECOM, on behalf of UrbanGrowth NSW, to refine the infrastructure requirements and layout of intersections within the EPFTC and Edmondson Park Station interchange. This modelling was undertaken in consultation with Liverpool Council, Transport for NSW (**TfNSW**) and Roads and Maritime Services (**RMS**).

Having regard for the above, AECOM have been commissioned by Frasers Property Australia to undertake revised micro-simulation traffic modelling to reflect the revised master plan for the EPFTC and to satisfy Condition 1.6 (Part C) of the Concept Plan approval. This modelling has been undertaken to support the proposed modifications to the Concept Plan and justify the increased residential density now sought in close proximity to Edmondson Park Station.

A copy of the AECOM Modelling Report is included in **Appendix B**, with a summary of the findings provided below.

5.2 Traffic Generation & Future Traffic Impacts

5.2.1 Trip Generation

The future traffic generation associated with the proposed Edmondson Park South development yield is summarised in Table 5 which provides a comparison of the 2010 and 2016 trip generation assumptions for the EPFTC.

Table 5 demonstrates that the trips generated by the revised development yields are higher than adopted under the original Concept Plan. The revised traffic model adopts these increased traffic volumes when assessing the future performance of the surrounding road network discussed below.

Table 5: Adopted Traffic Generation Assumptions

Land Use	2010		2016	
	AM Peak	PM Peak	AM Peak	PM Peak
Residential Use	2,006	2,006	2,673	2,673
Retail Use	375	885	700	1,288
Commercial Use	300	300	-	-
Medical Use	-	-	30	40
School Use	1,000	0	1,000	0
Total	3,681	3,191	4,403	4,403

5.2.2 Future Road Network Performance

The micro-simulation model has been revised for the 2026 (full development) AM and PM peak period scenarios. The mid-block traffic volumes within the road network are summarised below and demonstrates the minimal change in actual volumes as a consequence of the Modification. The future mid-block volumes and the corresponding locations are provided in **Table 6.**

Figure 7: Revised Town Centre Core Access Arrangements

Table 6: Comparison of 2026 Mid-Block Traffic Volumes

Location		Previous (2010) Assumptions		Revised (2017) Assumptions	
		AM Peak	PM Peak	AM Peak	PM Peak
1. Bernera Road (south of Henderson Road)	Northbound	920	430	730	420
	Southbound	380	800	520	810
2. Bernera Road (north of Campbelltown Road)	Northbound	880	540	780	630
	Southbound	430	730	490	1,080
3. Soldiers Parade (south of Henderson Road)	Northbound	170	180	250	230
	Southbound	280	330	140	150
4. Soldiers Parade (north of Campbelltown Road)	Northbound	250	300	210	580
	Southbound	240	380	330	180
5. Town Centre East (north of Campbelltown Road)	Northbound	180	240	120	240
	Southbound	200	60	290	70

It is demonstrated in Table 6 that the actual increases in traffic volumes are minimal in actual terms and indeed are within the appropriate limits for collector road functions as outlined in the RMS Guide.

The future operation of the key intersections are presented in Table 7. Intersection numbering is as per the original Concept Plan traffic report for ease of reference.

Table 7: AECOM 2026 Modelling Scenarios

Intersection	Period	Average Delay (sec)	Level of Service (LoS)
Campbelltown Road / Bernera Road (Intersection 1)	AM Peak	52.1	D
	PM Peak	44.8	D
Campbelltown Rd / Soldiers Parade (Intersection 5)	AM Peak	31.1	C
	PM Peak	42.3	C
Campbelltown Rd / East Town Centre Street (Intersection 6)	AM Peak	28.8	C
	PM Peak	38.0	C
Bernera Road / Primary School South (Intersection 4)	AM Peak	10.4	A
	PM Peak	14.8	B
Bernera Road / Soldiers Parade (Intersection 7)	AM Peak	23.4	B
	PM Peak	13.7	A
Bernera Road / High School North (Intersection 8)	AM Peak	49.2	D
	PM Peak	28.4	B
Bernera Road / Henderson Road	AM Peak	30.1	C
	PM Peak	32.5	C
Soldiers Parade / Henderson Road	AM Peak	44.0	D
	PM Peak	42.2	C

It can be seen from above that all intersections will continue to perform with acceptable Levels of Service and delays during all peak periods. In this regard, the proposed modifications to the indicative development yield and road network are supportable.

Reference should be made to the AECOM report, included in Appendix B, for further details in relation to the traffic impacts of the development at specific intersections.

Additional SIDRA modelling of a 2036 scenario at key intersections along Campbelltown Road has also been undertaken by AECOM. This sensitivity modelling includes additional background traffic growth on the road network to coincide with the long term (2036) plans for the Campbelltown Road Upgrade works which includes provision of an additional lanes in either direction (from 2 lanes in 2026 to 3 lanes in 2036). A summary of the intersection performances is presented below.

Table 8: AECOM 2036 SIDRA Modelling Results

Intersection	2036 Peak hour	Ave Delay (sec)	Overall Level of Service (LoS)
1. Campbelltown Road / Bernera Road	AM	105.1	F
	PM	74.5	F
	AM UPGRADE	47.9	D
	PM UPGRADE	56.0	D
2. Campbelltown Road / Soldiers Parade	AM	27.4	B
	PM	40.4	C
3. Campbelltown Road / East Town Centre Street	AM	29.5	C
	PM	29.0	C

The above demonstrates an acceptable Level of Service is achieved at the key Campbelltown Road intersections subject to the following additional works to the Campbelltown Road / Bernera Road intersection:

- Extension of the right turn bay on the northern approach (from 75 to 100 metres),
- Provision of an additional right turn bay on the western approach
- Changing the median through lane to a right lane on the southern approach.

5.3 Implications of Road Network Changes

As a consequence of the proposed modification to the land use and road network functions, the following impacts on the road network has been identified:

- Campbelltown Road is the major east-west connector bypassing the EPFTC. No significant change is anticipated to the overall function of Campbelltown Road from the network changes identified.
- Bernera Road is the major north-south connector bypassing the EPFTC. The introduction of car park accesses on Bernera Road may increase traffic on this route.
- Greenway will form the major east-west route in the EPFTC. The introduction of this route will decrease traffic demand along alternative routes such as Henderson Road and provides access to the EPFTC retail core and residential areas. The road also provides connection to the town centre roads Main Street.
- Soldiers Parade will form the major north-south route in the EPFTC. The addition of retail, residential and dock accesses will likely increase traffic demand on the road as a result.

- Henderson Road provides an east-west connection at the north of the EPFTC, with access to the Edmondson Park Train Station and kiss and ride zones. The narrowing of the road from two lanes to one lane in each direction (as per constructed by TfNSW) will likely encourage less traffic to use the road as a through route into the residential and retail areas of the town centre.
- The easternmost left-in/left-out intersection to Campbelltown Road envisaged under the original Concept Plan is no longer proposed to prevent unnecessary vehicular traffic from using local residential streets to travel northeast along Campbelltown Road. Removal of this intersection will marginally increase traffic volumes at the intersection of Campbelltown Road / Eastern Town Centre, however the revised modelling indicates that this can readily be accommodated. Pedestrian and cycle connectivity will still be maintained in the vicinity of previous intersection between the Regional Park.

It is evident that whilst the proposal will result in additional trips as a consequence of the modification, these impacts are moderate and have no material impact on the operation of key intersections or road capacities. Accordingly, the modification is considered supportable on traffic planning grounds.

6 Conclusions

In summary:

- The revised Concept Plan has been prepared to reflect changes in response to a competitive process undertaken by UrbanGrowth NSW. From a traffic perspective, key changes include further refinement of the local road network in addition to changes to the indicative development yield proposed for the Town Centre.
- As part of the changes, introduction of site specific "maximum" parking rates are sought to provide direction for subsequent Development Applications. These are set as "maximum" rates with the intent to achieve the objectives of the original Concept Plan which sought to restrain parking demands within the Edmondson Park South Town Centre.

Land Use	Maximum Parking Rate
Residential Flat Buildings	
Studio and 1 Bedroom Dwellings	1 space per dwelling
2 Bedroom Dwellings	1.2 space per dwelling
3 Bedroom Dwellings	2 spaces per dwelling
Visitors	1 space per 10 dwellings
Multi-dwelling and Attached Housing	
1 Bedroom Dwellings	1 space per dwelling
2 Bedroom Dwelling	1.2 space per dwelling
3-4 Bedroom Dwellings	2 spaces per dwelling
Visitors	Provided on-street within the Mews
Other Uses	
Major Retail (Supermarket, DDS, etc.)	4.1 spaces per 100m^2 GLFA
All other retail, commercial, medical, cinema and entertainment uses	4.1 spaces per 100m^2 GLFA
Child Care	1 space per 10 children and 1 space per 2 staff members
Gym	3 spaces per 100m^2 GLFA

Note: Any use not prescribed above is to be provided in accordance with the RMS *Guide to Traffic Generating Developments*

- Similarly, minimum bicycle parking rate are now sought for the Frasers Town Centre to ensure sufficient space is made for the provision of appropriate bicycle parking facilities.

Land Use	Bicycle Parking Rate (Minimum)	Notes
Residential Flat Buildings	1 space per dwelling	Can be provided within a storage cage allocated to that residential dwelling or within a shared facility.
Multi-dwelling and Attached Housing	No specific requirement	Assumes adequate space is provided in the dwelling, storage or parking area.
Non-residential Uses (Staff and Visitors)	1 space per 500m^2 of GFA	

- A number of changes are proposed to the road network planned within the Frasers Town Centre. These changes include modifications to the intersection arrangements with Campbelltown Road in addition to further refinement of the internal road network serving the Town Centre.
- AECOM have prepared updated micro-simulation (VISSIM) modelling to reflect these changes and also incorporates the increase in traffic generation arising from the proposed changes to the indicative development yield. The modelling indicated that this increased traffic generation can readily be accommodated by the proposed road network, with all intersections operating with a Level of Service D or better during peak periods. The majority of key intersections modelled will operate at Level of Service A or B.
- A comparison between Level of Service for the approved and modified scheme for relevant intersections is included in the AECOM modelling report in Appendix B.
- Any proposed changes to the signalised intersection arrangements with Campbelltown Road will ultimately require RMS approval. Notwithstanding, this is a matter for detailed design and further consultation with RMS can be undertaken following approval of the proposed modifications to the overall Concept Plan. The revised modelling indicates that the changes will still provide a satisfactory intersection Level of Service at all intersections and therefore supportable.

In summary, the proposed changes to the Concept Plan are considered supportable from a traffic and parking perspective.

A response to the relevant Traffic and transport requirements of the approved Concept Plan is provided in **Table 9** below.

Table 9: Concept Plan Traffic and Transport Requirements Commentary

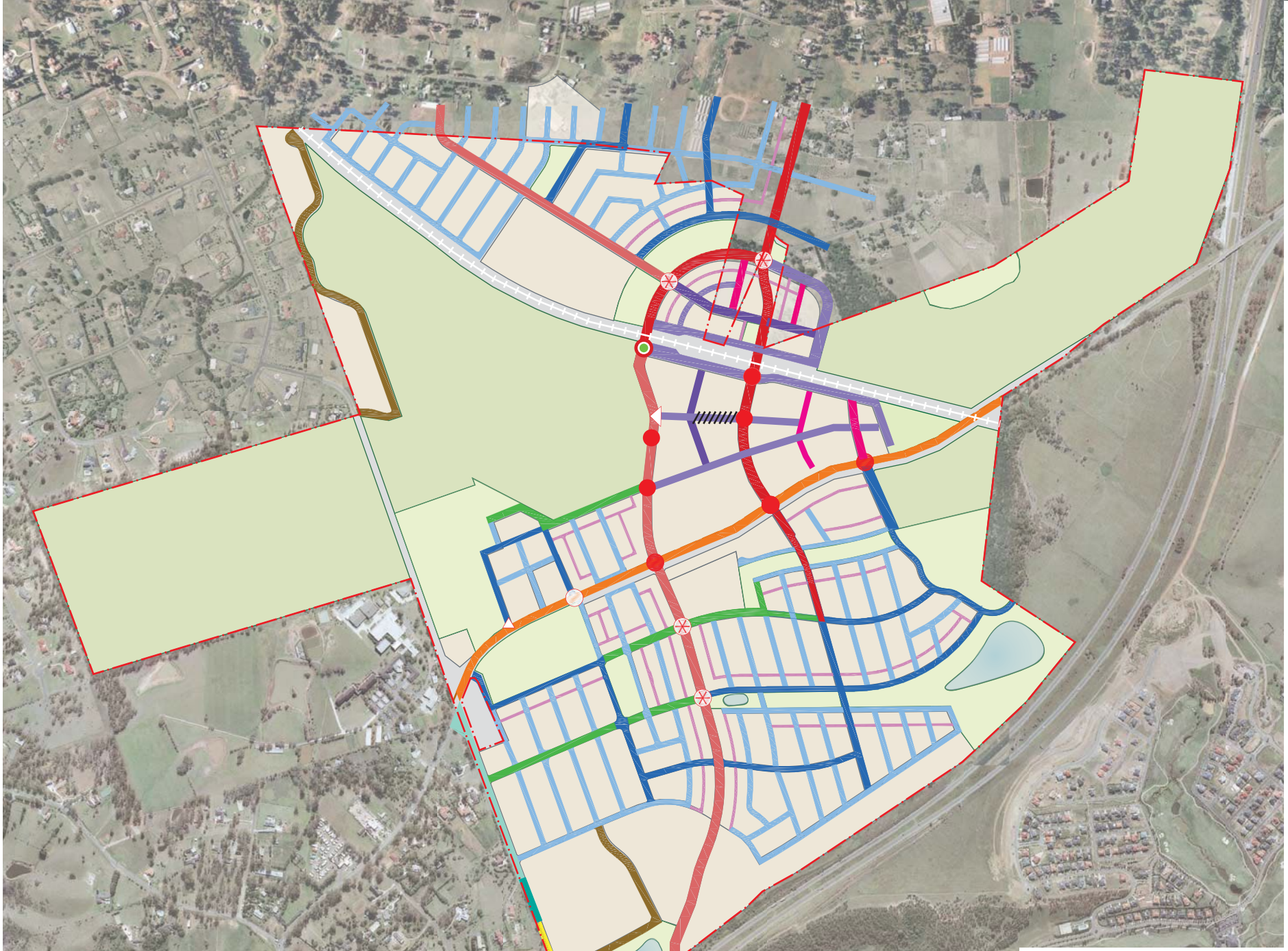
Item No.	Approved Concept Plan Condition	Response
Part B		
1.3	The final design of Campbelltown Road, including any reduced road width (less than 38.8m) and kerbside parking, is to be determined through the detailed design being carried out by RTA in consultation with the Department and in accordance with the requirements of Part B, condition 1.6. The final design should fully explore opportunities to provide at grade pedestrian access across Campbelltown Road in the vicinity of the Mont St Quentin Oval and the Ingleburn Military Heritage Precinct.	Detailed design of Campbelltown Road is currently being prepared by RMS. Current intersection concept plans identify at-grade signalised pedestrian crossings on all approaches. The section of Campbelltown Road in the vicinity of the Mont St Quentin Oval and Ingleburn Military Heritage Precinct are unaffected by this S75W Modification.
1.4	Prior to undertaking works on Campbelltown Road the applicant must enter into a Works Authorisation Deed with RTA for the proposed works. All works on Campbelltown Road are to be designed and constructed to RTA requirements. All intersection approaches on Campbelltown Road are to provide a single 100m long right turn storage bay and must operate with double overlap diamond phasing. Campbelltown Road is infrastructure to be funded through the Growth Centres special infrastructure contribution area (SIC) levy. The proponent must pay the required SIC levy or alternatively may enter into an agreement for the provision of material public benefit in lieu of payment of the SIC levy, or any component thereof, for the construction and dedication of road widening along Campbelltown Road.	Detailed design of Campbelltown Road is currently being undertaken by RMS. The proposed S75W includes a number of proposed changes to traffic lanes on approach to key intersections with Campbelltown Road from that currently being considered by RMS. Detailed design of Campbelltown Road has not yet been completed and, hence, the above will need to be incorporated into the design, prior finalisation. It is expected that approval of this S75W modification would be subject to concurrence from RMS in relation to these changes. Notwithstanding, it is evident from the AECOM Modelling Report that the proposed changes to the intersections with Campbelltown Road are supportable in terms of future road network performance.
Part C		
1.4	Any future application which proposes additional intersections with Campbelltown Road is to be supported by a traffic analysis and is to have the concurrence of the RTA.	Additional intersections to Campbelltown Road are not proposed. Indeed, the proposed modifications to the Concept Plan seek to reduce the number of intersections with Campbelltown Road by removing the easternmost left-in, left-out intersection.
1.5	Any future application is to address the need for the relocation of Macdonald Road, with timing to be supported by a detailed traffic assessment to RTA's satisfaction.	No changes to the previously adopted relocation of Macdonald Road is proposed as part of the subject S75W modifications.
1.6	Any future application for the Edmondson Park town centre must be supported by a detailed traffic and transport study, including a micro-simulation model. This should identify appropriate bus priority measures along the proposed Main Street, and ensure integration with the transport interchange, through consultation with the Department of Transport.	An updated micro-simulation (VISSIM) model has been prepared by AECOM and a copy of the associated modelling report is included as an appendix to this report. This model can be submitted to RMS / DoP should this be required. Having regard for the above and provided any future application is generally consistent with this revised Concept Plan, this Condition is no longer required.

Item No.	Approved Concept Plan Condition	Response
1.7	Any future application for development within 25m of the South West Rail Link must identify and mitigate impacts of the South West Rail Link, in consultation with Department of Transport.	No change to this Condition is required as part of the S75W modifications. Presumably this is a matter to be addressed as part of any subsequent Development Application submission(s).
1.8	The subsequent subdivision application within each Council area must include an offer to enter into a voluntary planning agreement for payment of local infrastructure contributions, with the details of the contributions, and the nature of any land dedications or works in kind to be negotiated with the relevant Council.	Noted.

It is therefore concluded that the modifications to the Edmondson Park Concept Plan is supportable on traffic planning grounds.

Appendix A

Proposed Concept Plan



KEY

- Site Boundary
- Croatia / Macdonald Road
- Driveway
- Fire Trail
- Local Major
- Local Minor (Indicative Only)
- Open Space
- Rural Road
- Service Lane (Indicative Only)
- Sub Arterial Road (Campbelltown Road)
- Town Centre Main Street
- Town Centre Secondary (east-west)
- Town Centre Secondary (north-south)
- Transit Boulevard
- Zouch Collector
- Left In / Left Out Only
- Traffic Signals (All Movements)
- Traffic Signals (Right Turn Banned)
- Traffic Signals (Left In / Left Out Only)
- Other Potential Traffic Signals
- Roundabout
- Pedestrianized

Dwg Name: Road Network and Hierarchy

Date: March 2016

0m 50m 100m 250m 500m

EPS
Edmondson Park South

Appendix B

AECOM Modelling Report

AECOM

Frasers Property Australia Residential
Edmondson Park Pty Limited
02-Feb-2017

Edmondson Park Frasers Town Centre

Section 75W Traffic Modelling Report

Revision E – 02-Feb-2017
Prepared for – Frasers Property Australia Residential Edmondson Park Pty Limited – ABN: 107 356 650

Edmondson Park Frasers Town Centre

Section 75W Traffic Modelling Report

Client: Frasers Property Australia Residential Edmondson Park Pty Limited

ABN: 107 356 650

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02-Feb-2017

Job No.: 60445762

AECOM in Australia and New Zealand is certified to ISO9001, ISO14001 AS/NZS4801 and OHSAS18001.

Quality Information

Document Edmondson Park Frasers Town Centre

Ref 60445762

Date 02-Feb-2017

Prepared by Yanni Huang | Ben Midgley

Reviewed by Marcel Cruz

Revision History

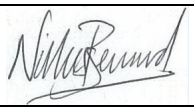
Rev	Revision Date	Details	Authorised	
			Name/Position	Signature
A	24-Feb-2016	Draft Report	Andy Yung	Original signed
B	26-Feb-2016	Revised Draft Report	Andy Yung	Original signed
C	17-Mar-2016	Final Report	Andy Yung Associate Director, Transport Advisory	Original signed
D	16-Dec-2016	Revised Final Report	Nick Bernard Principal, Transport Advisory	Original signed
E	02-Feb-2017	Revised Final Report	Nick Bernard Principal, Transport Advisory	

Table of Contents

1.0 Introduction

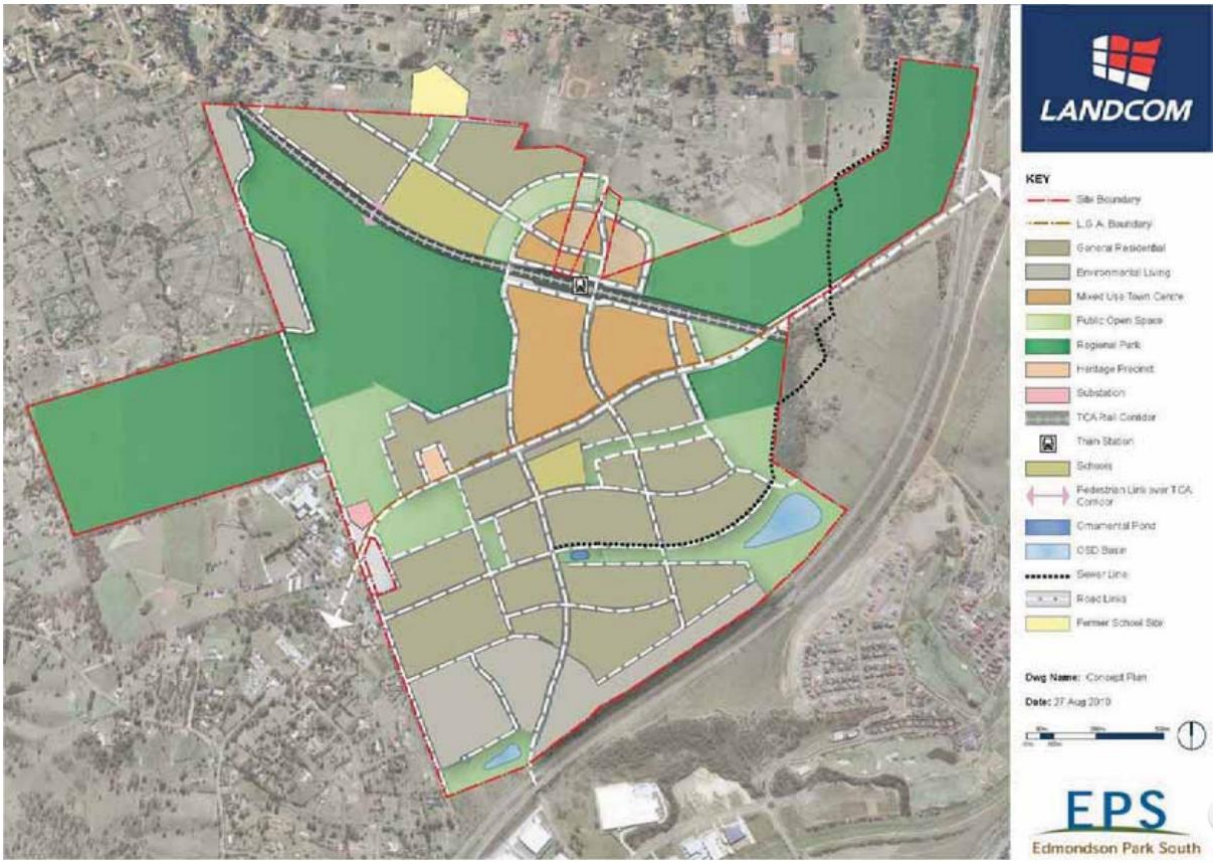
1.1 Background

AECOM has been commissioned by Frasers Property to undertake additional traffic modelling to support the development of the revised Master Plan for the Edmondson Park Frasers Town Centre (EPFTC) and to confirm that the road network proposed since the approved Part 3A Concept Plan Application will support the revised land uses. This traffic modelling report will form part of the Traffic and Transport Assessment prepared by Ason Group, in support of a Section 75W application for proposed changes for the EPFTC.

AECOM had previously prepared a Transport Management and Accessibility Plan (TMAP) for the Edmondson Park South Precinct on behalf of UrbanGrowth NSW in September 2010, as part of the Part 3A Concept Plan Application. The EPFTC was considered and assessed as part of the Edmondson Park South Precinct.

A bespoke spreadsheet model was set up to analyse the trip generation and distribution of traffic associated with the Precinct. Localised traffic models (SIDRA) were used to assess and determine the requirements of the layout of the critical intersections including those on Campbelltown Road. The Part 3A Concept Plan Application and the TMAP was approved by the Department of Planning and Infrastructure in August 2011.

Figure 1 Original concept plan



Source: Landcom, 2014

After the approval of the TMAP, UrbanGrowth NSW engaged AECOM to further consider the requirements and layout of intersections within the EPFTC precinct surrounding the Town Centre and the station interchange. In consultation with Liverpool City Council, Transport for NSW and Roads and Maritime Services, additional traffic modelling was conducted using a microsimulation tool (VISSIM) to determine key intersection layouts in the vicinity of the EPFTC and Edmondson Park Station.

The VISSIM model was developed based on traffic forecasts estimated by the TMAP with some minor changes to network assumptions. The extent of the VISSIM model is shown in **Figure 2**. The future year traffic volumes adopted for this assessment were based on the TMAP as well as the VISSIM model.

Figure 2 EPFTC VISSIM model extent

Source: AECOM, 2013

AECOM had also been engaged by Roads and Maritime Services to prepare the *Campbelltown Road Upgrade REF: Traffic and Transport Modelling Assessment (AECOM, 2013)*. The purpose of the study was to assess the following elements:

- Operational performance of the key intersections and road network including the ultimate intersection footprint required to cater for the expected traffic growth in the area.
- Operational impacts to property access, freight transport, public transport, pedestrians and cyclists.
- Preliminary construction traffic assessment.

1.2 Purpose and scope

In 2015, Frasers Property purchased the EPFTC from UrbanGrowth NSW – the area of EPFTC is shown by the blue boundary in **Figure 3**, principally between Campbelltown Road and the South West Rail Link. Emerging new land use assumptions and revised town centre layout and associated car park access locations have been further developed by Frasers Property as part of the development of a revised EPFTC Master Plan. As such, further traffic modelling is required to support the revised Master Plan submission of the EPFTC. AECOM has subsequently updated the previously developed VISSIM traffic model.

The purpose of this report is to document the proposed land use and street network change assumptions in the VISSIM model and to confirm, through further modelling, that the road network proposed in the revised EPFTC Master Plan will support the revised land uses.

The following modelling assessment has been undertaken as part of this study:

- VISSIM modelling to assess the impacts of the proposed modifications to the EPFTC in 2026 on the surrounding road network.
- SIDRA modelling of intersections along Campbelltown Road (within the study area) for the future year of 2036. The purpose of this sensitivity analysis is to assess the impacts of the proposed modifications at full development plus 10 years on the State Road.

Figure 3 EPFTC Study Area

Source: Department of Planning & Environment, 2016

2.0 Land use assumptions

2.1 Original TMAP and previous VISSIM modelling

Edmondson Park South comprises an area of approximately 413 hectares and forms part of the larger Edmondson Park Release Area precinct within the South West Growth Centre. It is located to the north-west of the M5 Motorway and lies approximately 40km to the south west of Sydney CBD. About 260 hectares of the site is located within the Liverpool LGA and about 153 hectares is located within the Campbelltown LGA.

The Edmondson Park South Part 3A TMAP provided an assessment of the traffic impact and transport accessibility issues related to the proposed Edmondson Park South development. Within the original TMAP were land use assumptions that informed the traffic modelling process. The main land use assumptions were:

- 3,317 dwellings in the wider precinct of Edmondson Park South and the town centre, with 253 dwellings in the town centre core and 169 dwellings in the wider town centre (422 residential dwellings were considered in the EPFTC area currently owned by Frasers Property);
- 33,750 m^2 GLFA of retail, business and commercial floor space; and
- 500 students at the proposed primary school located in the wider town centre.

The assignment of these trips can be categorised into internal trips within the Edmondson Park South road network and external trips to and from 'external zones' outside of the modelled road network, broadly to the north, south, east and west of the precinct. Internal distribution was informed through assumed land use within Edmondson Park South, while external distribution was based on future employment forecasts, using LGAs with major employment centres in south western and western Sydney.

2.2 Revised EPFTC Master Plan

The revised EPFTC Master Plan incorporates the following land use assumptions:

- 992 dwellings in the EPFTC core (north-western quadrant) and 892 dwellings in the wider EPFTC area;
- 35,000 m^2 GLFA of retail; and
- 8,000 m^2 GLFA of medical use.

The number of dwellings within the Edmondson South Precinct, but outside the EPFTC, were adjusted to be consistent with the total number of dwellings in the approved Concept Plan (refer to **Figure 4**). A comparison of the previous and revised land use assumptions for the EPFTC is presented in **Table 1**.

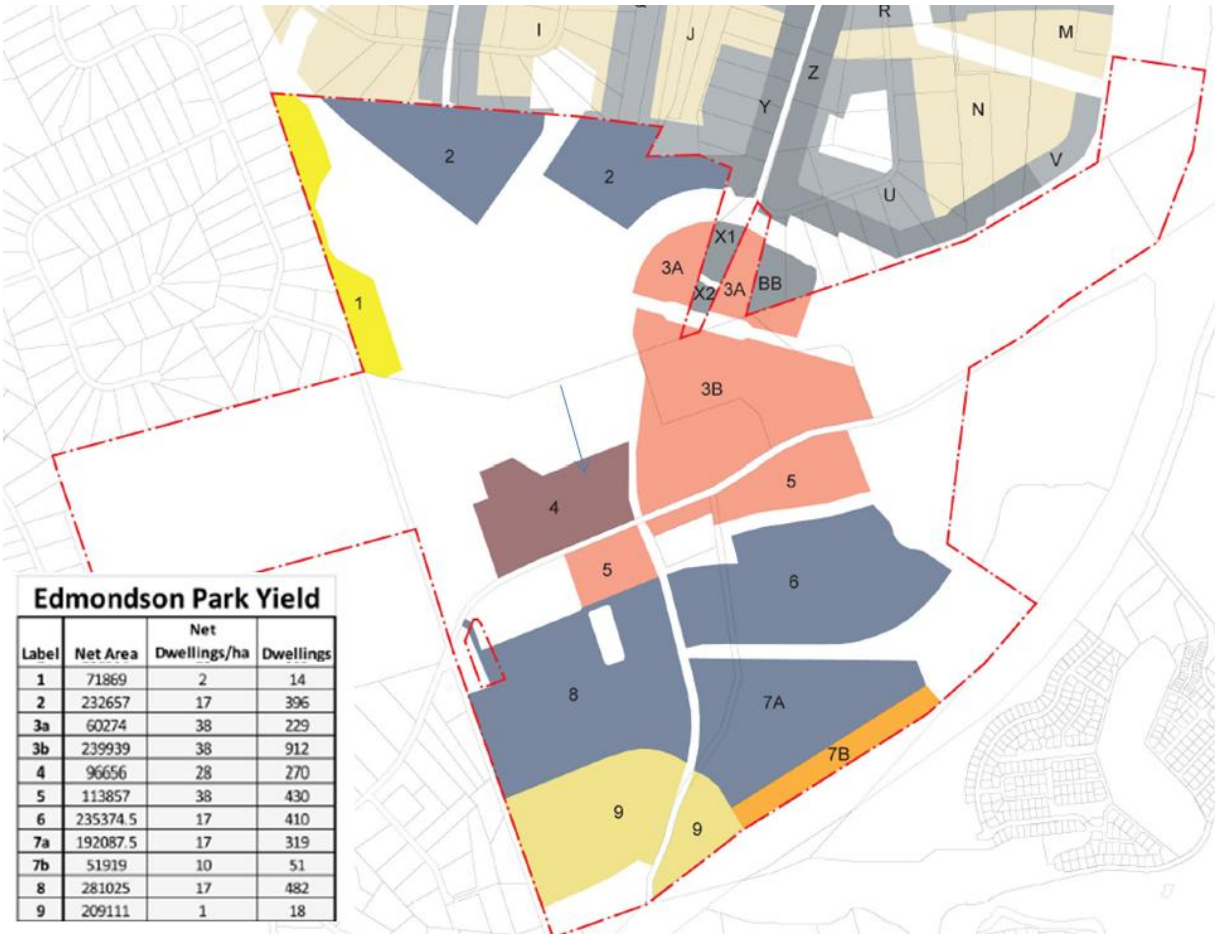
Table 1 Comparison of previous and revised EPFTC land use assumptions

Land Use	Previous assumptions	Revised assumptions
Residential Use	422 dwellings*	1,884 dwellings
Retail Use	18,750 GLFA	35,000 GLFA
Commercial Use	15,000 GLFA	-
Medical Use	-	8,000 GLFA
School Use	500 students	500 students

Source: AECOM, 2016

*- It should be noted that a minimum of 912 residential dwellings were approved in the Town Centre Core. The 422 dwellings quoted here were originally modelled in the TMAP.

Figure 4 Original proposed yield



Edmondson Park Yield

Label	Net Area	Net Dwellings/ha	Dwellings
1	71869	2	14
2	232657	17	396
3a	60274	38	229
3b	239939	38	912
4	96656	28	270
5	113857	38	430
6	235374.5	17	410
7a	192087.5	17	319
7b	51919	10	51
8	281025	17	482
9	209111	1	18

2.3 Implications of land use changes

As a result of the changes discussed in the previous section, the trip generation and distribution for Edmondson Park South have changed. The implications for each of these are detailed in the following sections.

2.3.1 Trip Generation

Table 2 shows the implication of the land use changes on the overall trip generation for Edmondson Park South. It should be noted that all trip rates that were adopted and approved in the TMAP were retained except:

- Retail rates were reduced – 4.6 trips / 100m² GLFA (for Thursday PM peak hour), according to the RMS Trip generation guide due to the increase in retail areas.
- Medical trip generation rates were determined based on:
  - Referencing nearby private hospitals, a bed/GLFA ratio was calculated to be 0.009. This yields approximately 75 beds for the 8,000 GLFA of medical use;
  - Medical (AM peak) – using RMS Traffic Generation Guideline for private hospitals -12.41 + 0.57*Beds trips; and
  - Medical (PM peak) – using RMS Traffic Generation Guideline for private hospitals -11.96 + 0.69*Beds trips.

Table 2 Comparison of previous and revised Edmondson Park South trip generation

Land Use	Previous assumptions		Revised assumptions	
	AM Peak	PM Peak	AM Peak	PM Peak
Residential Use	2,006	2,006	2,673	2,673
Retail Use	375	885	700	1,288
Commercial Use	300	300	-	-
Medical Use	-	-	30	40
School Use	1,000	0	1,000	0
All Land Use	**3,681**	**3,191**	**4,403**	**4,001**

Source: AECOM, 2016

The trips generated by the development are slightly higher in the revised Master Plan, with 722 more trips in the morning peak and 810 more trips in the evening peak. This increase is largely caused by the increase in residential dwellings and retail land use, though slightly offset by the decrease in commercial land use.

2.3.2 Trip Distribution – external retail, commercial & medical

In light of more detailed forecast retail catchment of the EPFTC prepared by Frasers Property, the distribution of the retail, commercial and medical trips of the town centre to / from the external network was updated to reflect where retail customers are most likely to be generated. A comparison of the previously adopted and revised 2026 distribution is shown in **Table 3**.

Table 3 Comparison of previous and revised EPFTC external retail, commercial & medical distribution assumptions

External Road Network Direction	Previous assumptions	Revised assumptions
North	27%	67%
East	59%	5%
South	9%	7%
West	5%	21%

Source: AECOM, 2016

The trip distribution for all other land uses in the internal and external network remained the same as the original TMAP modelling. The new external retail, commercial & medical distribution for the EPFTC will affect the volume of vehicles on routes taken to and from the town centre. A comparison of the previous and revised trips by external zone is shown in **Table 4**.

Table 4 Comparison of previous and revised EPFTC external retail, commercial & medical trips

External Road Network Zone	Previous assumptions				Revised assumptions			
	Entering (veh)		Exiting (veh)		Entering (veh)		Exiting (veh)	
	AM	PM	AM	PM	AM	PM	AM	PM
North	48	95	11	8	96	229	0	0
East	104	207	24	18	7	16	0	0
South	16	32	4	3	10	25	0	0
West	9	17	2	2	30	72	0	0

Source: AECOM, 2016

In the revised plan, there is a notable decrease in vehicles travelling from the east, which have been redistributed to travelling from the north and west. This is reflected in increased volumes on Bernera Road as well as more vehicles travelling eastbound and fewer westbound on Campbelltown Road. There is also a decrease in the number of external vehicles exiting the EPFTC as a result of these trips being linked to internal trips within the precinct.

3.0 Network and modelling assumptions

3.1 Introduction

To assess the impact of the proposed concept plan modification, the following modelling assessments were undertaken:

- VISSIM modelling:

  The land use and network changes described in the report were reflected in the VISSIM modelling. The models were re-run for the 2026 AM and PM peaks and the revised modelling outputs were then compared to the original TMAP assessment results. This comparison aims to confirm that the changes do not have any adverse impacts to the operations of the EPFTC and surrounding road network.

- SIDRA modelling

  Intersections along Campbelltown Road have been assessed as part of a sensitivity analysis to understand the impacts of the full development plus 10 years on the RMS State Road. The intersections were assessed for the 2036 AM and PM peaks.

3.2 2026 VISSIM – Revised Road Network

3.2.1 Original TMAP and previous VISSIM Modelling

To assess traffic impacts of the Edmondson Park South concept plan on the local road network, the original TMAP included network modelling in both the microsimulation package VISSIM, as well as detailed intersection performances using SIDRA Intersections.

The following key intersections were assessed in both the SIDRA and VISSIM models:

1) Campbelltown Road / Bernera Road (formerly Campbelltown Road / Macdonald Road);
2) Campbelltown Road / Soldiers Parade (formerly Campbelltown Road / Town Centre Main Street);
3) Campbelltown Road / East Town Centre Street;
4) Bernera Road / Primary School South (formerly Macdonald Road / Primary School Access Road);
5) Bernera Road / Soldiers Parade (formerly Croatia Avenue / Macdonald Road / Town Centre Main Street);
6) Bernera Road / High School North (formerly Macdonald Road / High School Access Road);
7) Bernera Road / Henderson Road (formerly Macdonald Road / Station South Access Road); and
8) Soldiers Parade / Henderson Road (formerly Croatia Avenue / Station South Access Road).

The extent of the VISSIM network is bordered roughly by Croatia Avenue to the north and Macdonald Road to the south. The model extent is illustrated in **Figure 5** with intersections labelled in the sequence listed above.

Figure 5 Original Edmondson Park VISSIM Model

Source: AECOM, 2016

3.2.2 Revised EPFTC Master Plan

The revised EPFTC Master Plan introduced several network changes which were included in the revised VISSIM network. These included a more fine-grained street network, changes in signal locations, the addition and removal of lanes for some roads, and the modification of permitted movements and lane configuration at intersections.

The revised VISSIM model is shown in **Figure 6** and **Figure 7**. Significant changes when compared to the original modelling include:

- Changing of road hierarchy for Soldiers Parade from a main street to a collector road with an increased speed limit from 25km/hr to 40km/hr;
- Narrowing of Henderson Road from two lanes to one lane in both the eastbound and westbound direction, resulting in the change of lane configurations for intersections along this road to reflect the constructed Edmondson Park Station interchange (It should be noted that this is not infrastructure changes proposed by the revised EPFTC Master Plan – these are modelling network changes to reflect what has been constructed by Transport for New South Wales); and
- Reconfiguration of the southern approach of the Eastern Town Centre Road at Campbelltown Road traffic signals to two lanes.

Figure 6 Revised EPFTC Layout

Source: AECOM, 2016

Figure 7 Revised Edmondson Park VISSIM Model

Source: AECOM, 2017

3.2.3 Implications of Road Network Changes

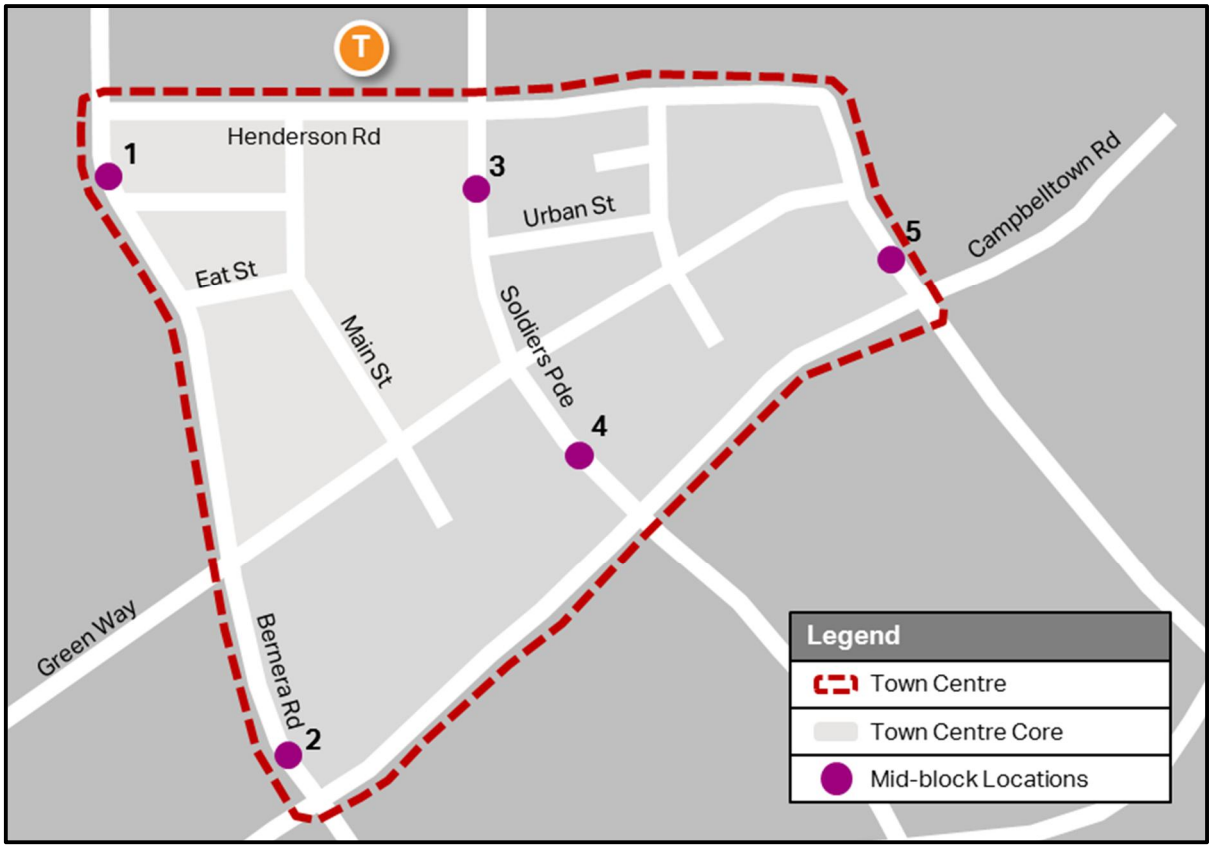
As a result of the changes outlined in the previous section, the distribution of traffic on key sections of the road network can be expected to change. **Table 5** shows a comparison of the 2026 mid-block traffic at key locations in and around the EPFTC, illustrated in **Figure 8**.

Table 5 Comparison of previous and revised EPFTC 2026 mid-block traffic

Location		Previous assumptions		Revised assumptions	
		AM Peak	PM Peak	AM Peak	PM Peak
1. Bernera Road south of Henderson Road	Northbound	920	430	730	420
	Southbound	380	800	520	810
2. Bernera Road north of Campbelltown Road	Northbound	880	540	780	630
	Southbound	430	730	490	1,080
3. Soldiers Parade south of Henderson Road	Northbound	170	180	250	230
	Southbound	280	330	140	150
4. Soldiers Parade north of Campbelltown Road	Northbound	250	300	210	580
	Southbound	240	380	330	180
5. Town Centre East north of Campbelltown Road	Northbound	180	240	120	240
	Southbound	200	60	290	70

Source: AECOM, 2017

Figure 8 EPFTC Mid-block Locations



Source: AECOM, 2016

The implications of the road network changes are outlined in the following sections.

3.2.3.1 Campbelltown Road

Campbelltown Road is the major east-west connector bypassing the EPFTC. No significant change is anticipated to the overall function of Campbelltown Road from the network changes identified.

3.2.3.2 Bernera Road

Bernera Road is one of the major north-south connector bypassing the EPFTC. The introduction of car park accesses on Bernera Road may increase traffic on this route. Soldiers Parade and Bernera Road are two competing north-south routes in the EPFTC.

3.2.3.3 Green Way

Green Way will form the major east-west route in the EPFTC. The introduction of this route will decrease traffic demand along alternative routes such as Henderson Road and provides access to the EPFTC retail core and residential areas. The road also provides connection to the town centre roads and directly linked to Main Street.

3.2.3.4 Soldiers Parade

Soldiers Parade is another major north-south route in the EPFTC. The addition of retail, residential and dock accesses will likely increase traffic demand on the road as a result. Soldiers Parade and Bernera Road are two competing north-south routes in the EPFTC.

3.2.3.5 Henderson Road

Henderson Road provides an east-west connection at the north of the EPFTC, with access to the Edmondson Park Train Station and kiss and ride zones. The narrowing of the road from two lanes to one lane in each direction (as per constructed by TfNSW) will likely encourage less traffic to use the road as a through route into the residential and retail areas of the town centre.

3.3 2036 modelling assumptions

3.3.1 Background traffic growth

To determine the future 2036 traffic demand along Campbelltown Road, a growth rate of 1.1 per cent per annum was applied. This growth rate was identified in the *Campbelltown Road Upgrade REF: Traffic and Transport Modelling Assessment* (AECOM, 2013) based on a comparison of RMS EMME/2 traffic forecasts between 2026 and 2036.

Table 6

Table 6 Comparison of EPFTC 2026 and 2036 mid-block traffic

Location		AM Peak		PM Peak	
		2026	2036	2026	2036
1. Bernera Road south of Henderson Road	Northbound	730	780	420	460
	Southbound	520	560	810	890
2. Bernera Road north of Campbelltown Road	Northbound	780	830	630	670
	Southbound	490	530	1,080	1,150
3. Soldiers Parade south of Henderson Road	Northbound	250	270	230	290
	Southbound	140	170	150	150
4. Soldiers Parade north of Campbelltown Road	Northbound	210	230	580	640
	Southbound	330	360	180	180
5. Town Centre East north of Campbelltown Road	Northbound	120	130	240	270
	Southbound	290	320	70	70

Source: AECOM, 2017

3.3.2 Campbelltown Road intersection layouts

Intersections along Campbelltown Road have been assessed for the future year of 2036 to determine the impacts of the development on the State Road. The intersections along Campbelltown Road, within the study area include:

- Campbelltown Road / Bernera Road
- Campbelltown Road / Soldiers Road
- Campbelltown Road / East Town Centre Street.

As identified in the *Campbelltown Road Upgrade REF: Traffic and Transport Modelling Assessment* (AECOM, 2013), the three intersections above require three lanes in each direction to meet the 2036 traffic forecasts during the AM and PM peak.

As part of this assessment, the Campbelltown Road approaches to these intersections were assessed with three lanes in each direction. While the *Campbelltown Road Upgrade REF: Traffic and Transport Modelling Assessment* (AECOM, 2013) noted that the approaches on Bernera Road, Soldiers Road and East Town Centre Street would require two lanes, these approaches were configured and modelled as determined in the VISSIM model. In addition, the turning bay lengths on the Campbelltown Road approaches were lengthened to be the greater of that specified in the *Campbelltown Road Upgrade REF: Traffic and Transport Modelling Assessment* (AECOM, 2013) or determined by the VISSIM model.

4.0 Modelling assessment

4.1 2026 VISSIM modelling results

The previous VISSIM model was used as a basis to complete the current modelling for the revised Master Plan. Land use changes as discussed in **Section 2.2** and network changes as discussed in **Section 3.2.2** were in included in updated VISSIM models.

A comparison of the previous SIDRA results from the TMAP against the updated VISSIM results is presented in **Table 7**. A network diagram for the 2026 morning and evening peaks can be found in **Appendix A**.

Table 7 Comparison of previous and updated 2026 Edmondson Park Intersection Performance

Intersection	2026 peak hour	Volumes (veh/hr)	Degree of Saturation[1] (DoS)	Ave Delay (sec)	Overall Level of Service (LoS)	95% Back of Queue (m)
1. Campbelltown Road / Bernera Road	AM previous	3,149	0.874	54.7	D	271
	AM updated	3,179	n/a	52.1	D	122
	PM previous	3,356	0.806	45.6	D	227
	PM updated	3,676	n/a	44.8	D	123
2. Campbelltown Road / Soldiers Parade	AM previous	1,872	0.492	8.3	A	42
	AM updated	2,335	n/a	31.1	C	184
	PM previous	2,505	0.681	10.8	A	88
	PM updated	2,685	n/a	42.3	C	130
3. Campbelltown Road / East Town Centre Street	AM previous	2,514	0.812	50.0	D	262
	AM updated	2,416	n/a	28.8	C	221
	PM previous	2,630	0.612	21.6	B	132
	PM updated	2,685	n/a	38.0	C	185
4. Bernera Road / Primary School South	AM previous	1,429	0.534	11.3	A	85
	AM updated	1,479	n/a	10.4	A	18
	PM previous	1,644	0.586	9.6	A	118
	PM updated	1,773	n/a	14.8	B	25
5. Bernera Road / Soldiers Parade	AM previous	1,558	0.627	10.4	A	68
	AM updated	1,214	n/a	23.4	B	97
	PM previous	1,736	0.820	20.8	B	114
	PM updated	1,315	n/a	13.7	A	106
6. Bernera Road / High School North	AM previous	1,529	0.891	27.1	B	141
	AM updated	1,603	n/a	49.2	D	112
	PM previous	1,157	0.626	10.9	A	89
	PM updated	1,378	n/a	28.4	B	67
7. Bernera Road / Henderson Road	AM previous	1,784	0.704	17.1	B	121
	AM updated	1,375	n/a	30.1	C	16
	PM previous	1,294	0.624	13.5	A	89
	PM updated	1,339	n/a	32.5	C	13

Intersection	2026 peak hour	Volumes (veh/hr)	Degree of Saturation[1] (DoS)	Ave Delay (sec)	Overall Level of Service (LoS)	95% Back of Queue (m)
8. Soldiers Parade / Henderson Road	AM previous	866	0.358	13.8	A	34
	AM updated	686	n/a	44.0	D	77
	PM previous	745	0.446	17.2	B	35
	PM updated	764	n/a	42.2	C	78

[1] Degree of Saturation statistic unavailable in VISSIM

Source: AECOM, 2017

Comparison of intersection performance is limited due to the different software packages used. In particular, the network delays in the EPFTC and surrounding area are captured in the updated VISSIM model, while the previous SIDRA results did not account for this. Consequently, intersection performances in SIDRA may not consider all delays, therefore delays and Level of Service from the updated VISSIM modelling is likely to be higher than the previous traffic modelling.

The comparison table indicates that in 2026, with the revised Master Plan, all intersections are still forecast to perform acceptably at a LoS D or above. In general, volumes and delays have increased, largely attributed to changes in the road network, more traffic movements towards the EPFTC and the additional network delay captured by VISSIM.

The full development in 2026 is not forecast to have major impacts on the key intersections on the surrounding road network. At the intersection of Campbelltown Road / Bernera Road, there is the addition of one through lane on both Campbelltown Road approaches. This mitigates the slight forecast increase in flow, ultimately decreasing delay marginally. Similarly, at the intersection of Campbelltown Road / East Town Centre Street, forecast traffic decreases in the morning peak and results in delay improving from LoS D to LoS C.

Conversely, traffic is forecast to increase at the intersection of Campbelltown Road / Soldiers Parade in both the morning and evening peaks. The permitting of right turns from all approaches and subsequent inclusion of right turn bays to cater for movements into the town centre has resulted in performance decreasing from LoS A to LoS C in the morning and evening peaks.

Within the road network, infrastructure changes have resulted in altered intersection performances. North of Campbelltown Road, the intersection of Bernera Road / Soldiers Parade was reconfigured to a signalised T-intersection, rather than a priority intersection. The right turn movement from Soldiers Parade was also allowed in this configuration. In addition, forecast traffic volumes through this intersection have decreased around 300 vehicles in both peaks. In the morning peak, this has resulted in a forecast decrease in performance from LoS A to LoS B, while the forecast intersection performance improves to LoS A in the evening peak.

Within the EPFTC, forecast delay has increased as a result of the change in land use and the narrowing of Henderson Road to one lane in each direction instead of two. At the intersection of Bernera Road / Henderson Road, forecast performance decreases from LoS A to LoS C in the evening peak. Similarly, at the intersection of Soldiers Parade / Henderson Road, performance in the morning and evening peaks is forecast to decrease to LoS D and LoS C from LoS A and LoS B respectively.

2026 intersection layouts have also been provided in **Appendix B** for key intersections in and around the EPFTC.

4.2 2036 SIDRA modelling results

The performance of the intersections along Campbelltown Road during the 2036 AM peak and PM peak is presented in **Table 8**.

Table 8 2036 Campbelltown Road intersection performance

Intersection	2036 peak hour	Volumes (veh/hr)	Degree of Saturation[1] (DoS)	Ave Delay (sec)	Overall Level of Service (LoS)	95% Back of Queue (m)
1. Campbelltown Road / Bernera Road	AM	3,673	1.317	105.1	F	524
	PM	4,233	1.024	74.5	F	295
	AM upgrade	3,673	0.937	47.9	D	169
	PM upgrade	4,233	0.980	56.0	D	215
2. Campbelltown Road / Soldiers Parade	AM	2,722	0.641	27.4	B	150
	PM	3,131	0.820	40.4	C	199
3. Campbelltown Road / East Town Centre Street	AM	2,834	0.769	29.5	C	205
	PM	3,151	0.752	29.0	C	201

[1] Degree of Saturation statistic unavailable in VISSIM

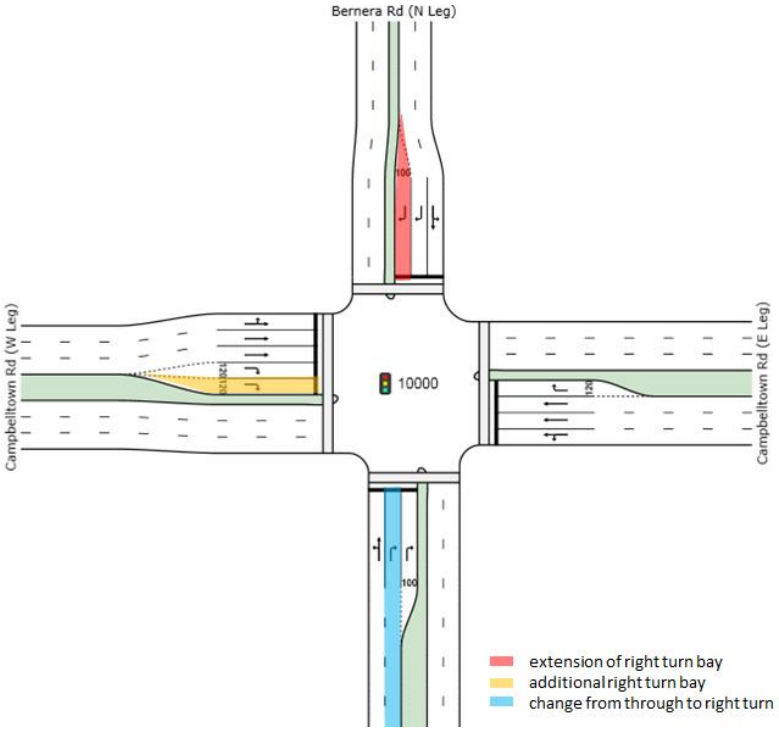
Source: AECOM, 2017

Two of the three intersections are forecast to perform at an acceptable level of service. The intersection of Campbelltown Road / Bernera Road is forecast to operate over capacity requiring the following upgrades / changes:

- Extension of the right turn bay on the northern approach (from 75m to 100m)
- Provision of a right bay on the western approach
- Changing the median through lane to a right turn lane on the southern approach.

Intersection layouts in 2036 have also been provided in **Appendix C** for the Campbelltown Road intersections.

Figure 9 Proposed upgrade at Campbelltown Road / Bernera Road intersection



5.0 Conclusions

AECOM has undertaken additional traffic modelling using previously developed VISSIM models to support the development of the revised Master Plan for the Edmondson Park Frasers Town Centre (EPFTC).

Land use assumptions from the revised Master Plan were used in the trip generation and distribution process to update traffic demands. The trips generated by the development are about 700-800 vehicles higher in each peak and largely result from the increase in residential and retail land use. The overall increase in trips results from a large concentration of increased trips within the EPFTC, offset by decreases in the rest of the precinct. There is a notable decrease in vehicles travelling from the east, which have been redistributed to the north and west.

The revised EPFTC Master Plan introduced several road network changes that were incorporated in the previously developed VISSIM models. These included an altered street network, changes in signal locations, the addition and removal of lanes on some roads, and the modification of permitted movements and lane configuration at intersections. In particular, this included more detail in the EPFTC, such as the introduction of town centre streets and car park accesses.

The VISSIM modelling results indicate that in 2026 the road network proposed in the revised EPFTC Master Plan would support the revised land uses. All intersections are still forecast to perform acceptably at LoS D or above.

The SIDRA modelling indicates that by 2036 the Campbelltown Road intersections are generally forecast to perform at an acceptable level of service, however upgrades are required at the Campbelltown Road | Bernera Road intersection.

Appendix A

2026 Network Diagrams

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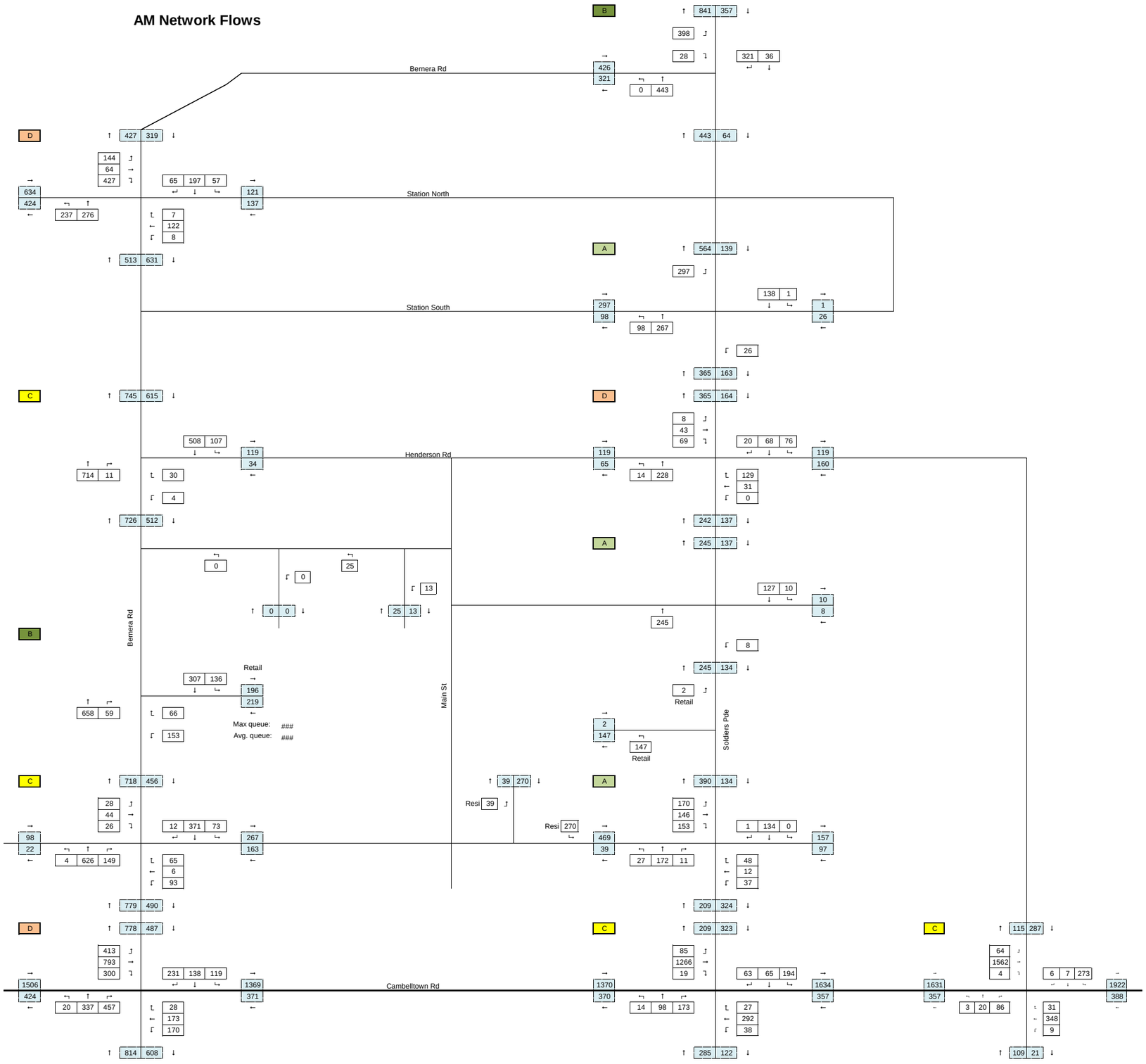
Legend

- Turning Volume
- Mid-block Volume
- C — Intersection Level of Service

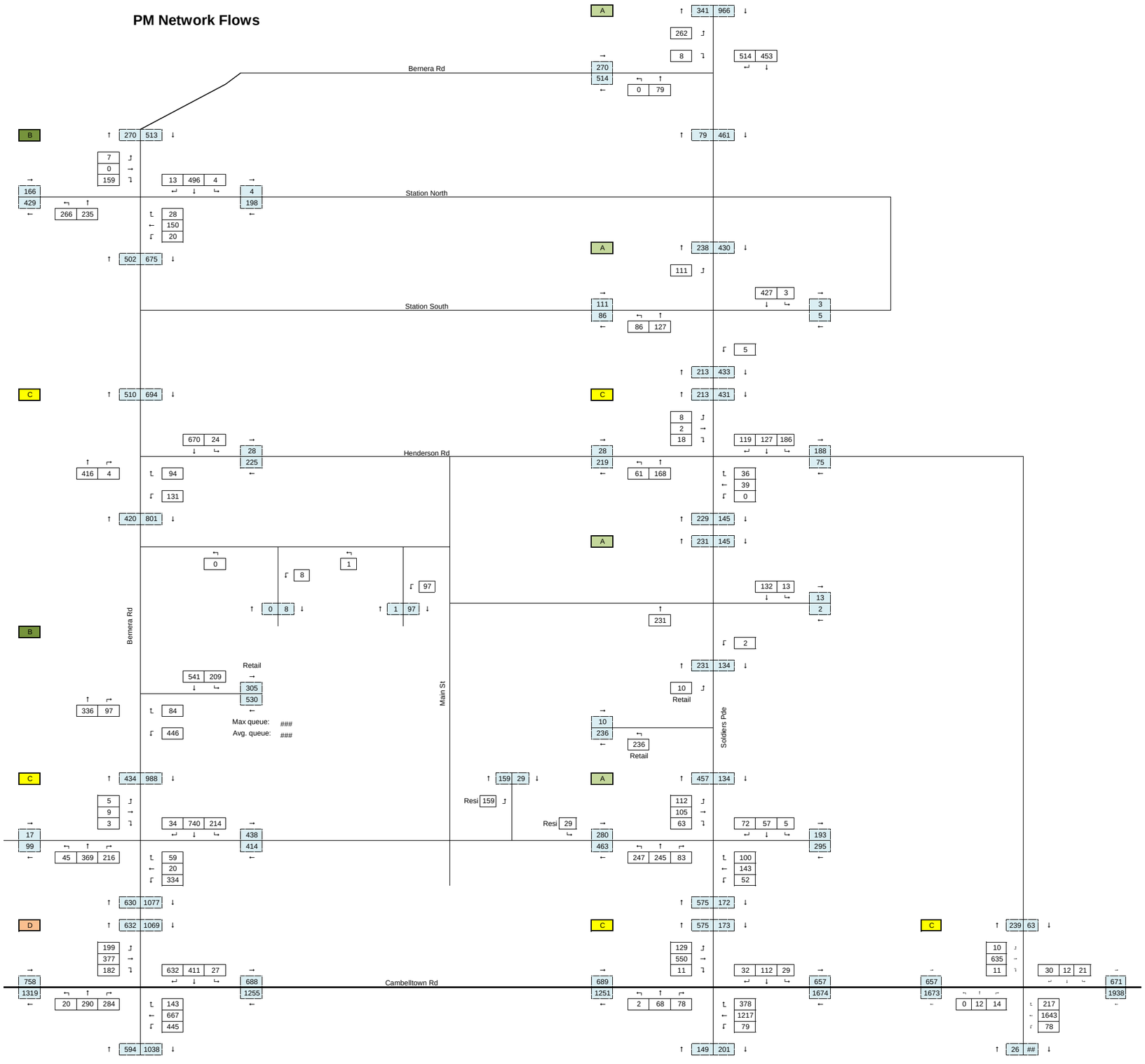
AM Network Flows



Legend

- Turning Volume
- Mid-block Volume
- C — Intersection Level of Service

PM Network Flows



Appendix B

2026 Intersection Layouts

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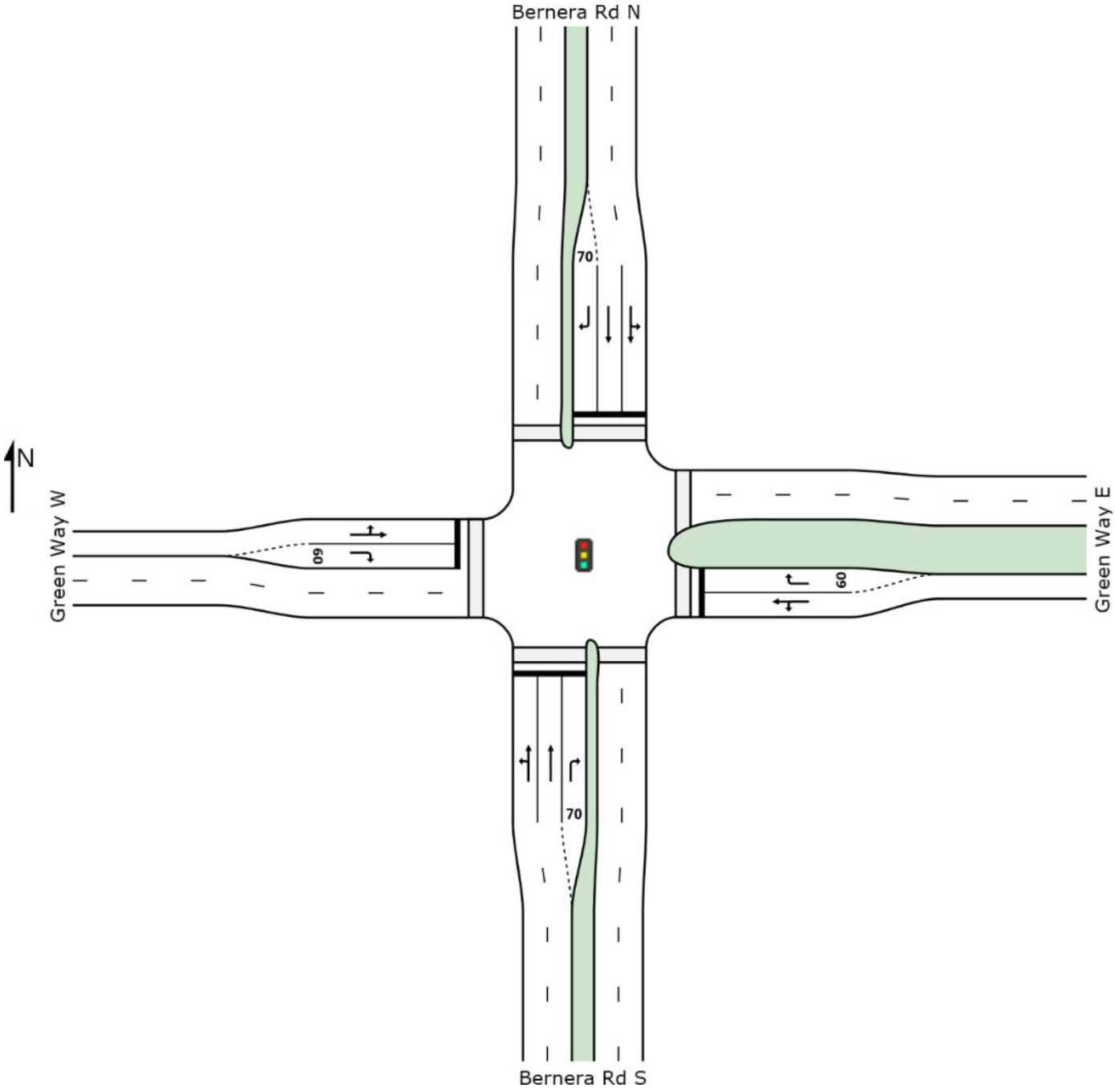
SITE LAYOUT

Site: Bernera Rd / Green Way

Intersection of Bernera Rd and Green Way
Signals - Fixed Time Isolated



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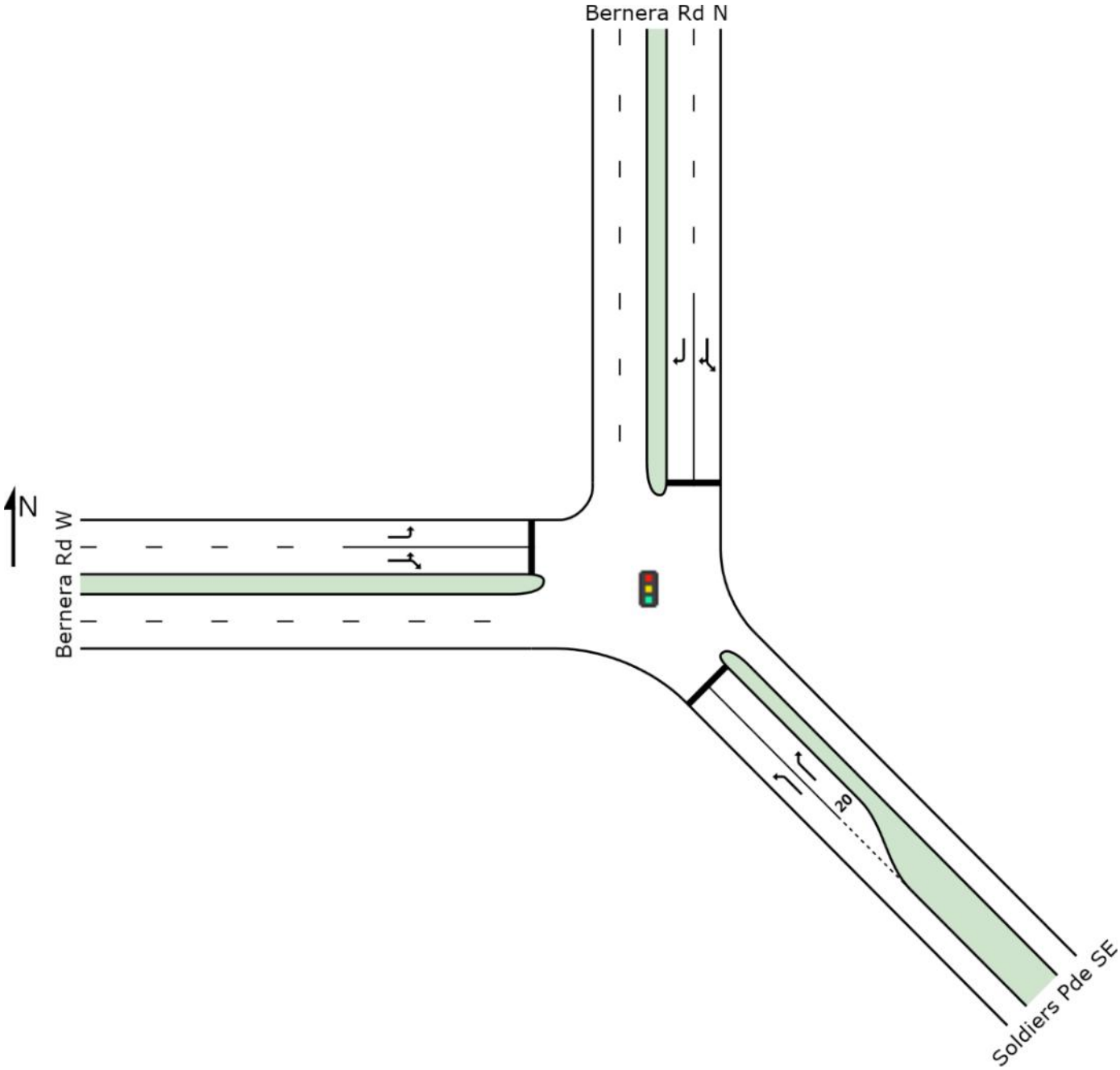
Project:

SITE LAYOUT

Site: Bernera Rd / Soldiers Pde

New Site
Signals - Fixed Time Isolated



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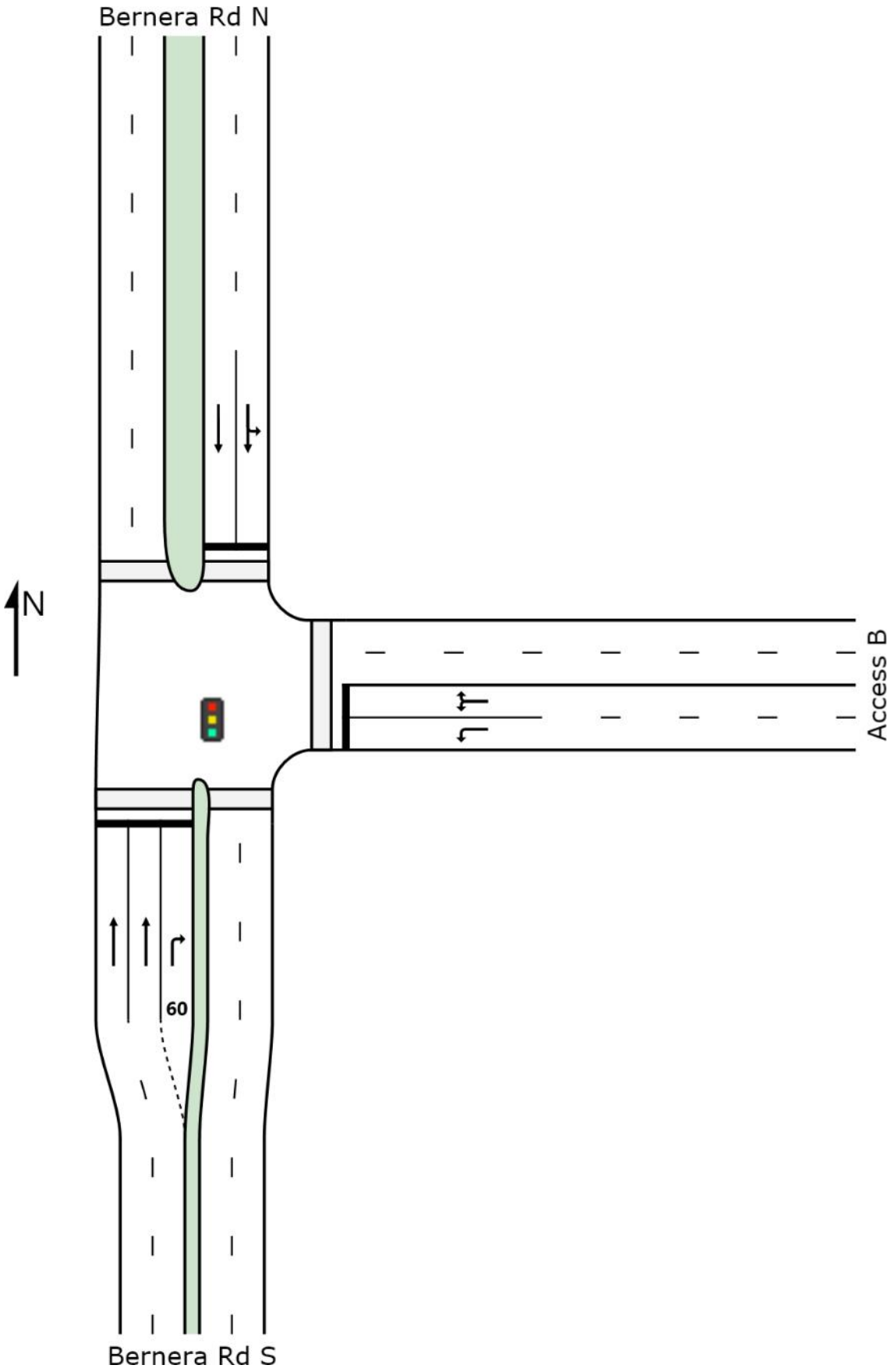
SITE LAYOUT

Site: Bernera Rd / Access B

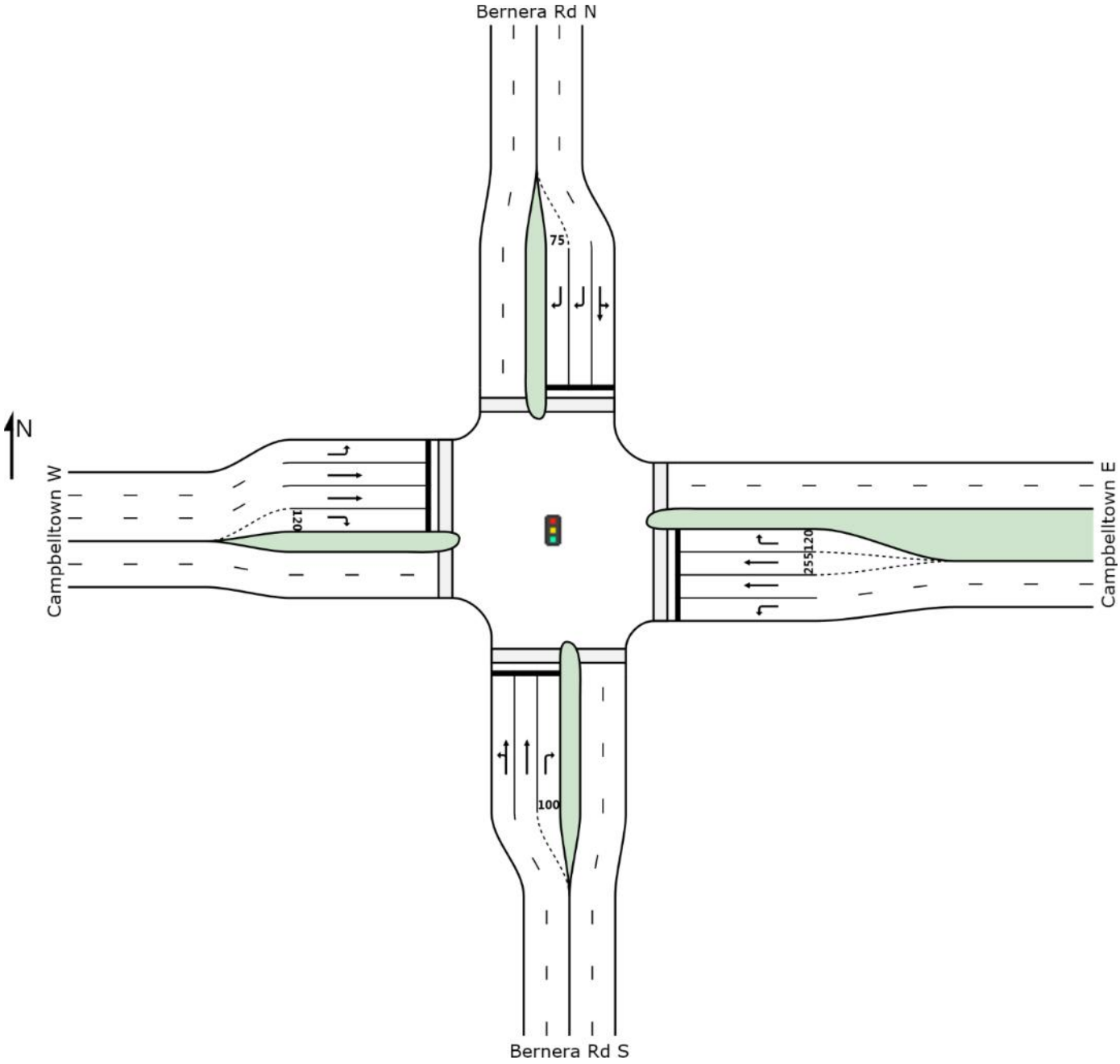
Intersection of Bernera Rd and Town Centre Core Access B
Signals - Fixed Time Isolated



SITE LAYOUT

Site: Campbelltown Rd / Bernera Rd

Intersection of Campbelltown Rd and Bernera Rd
Signals - Fixed Time Isolated



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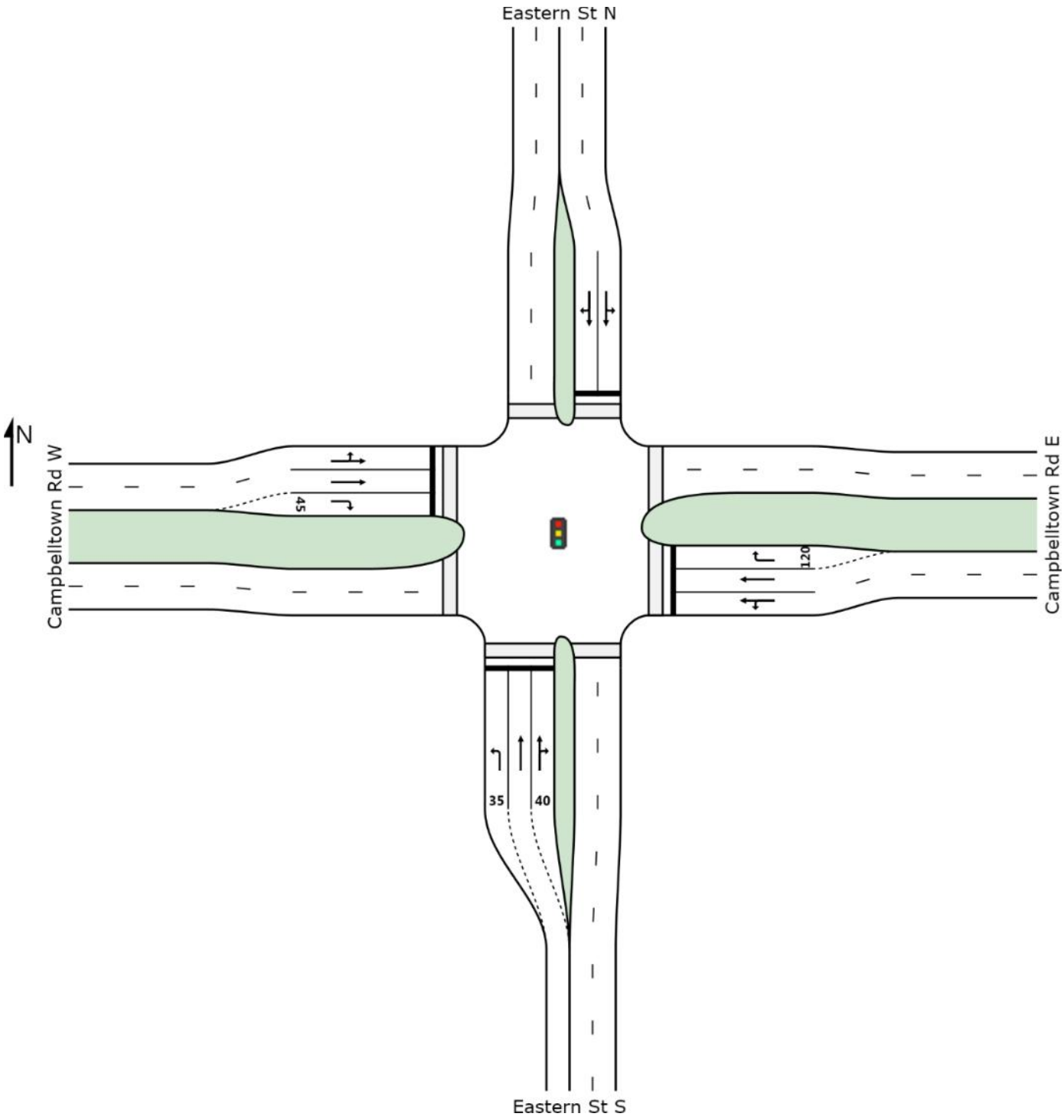
SITE LAYOUT

Site: Campbelltown Rd / East TC St

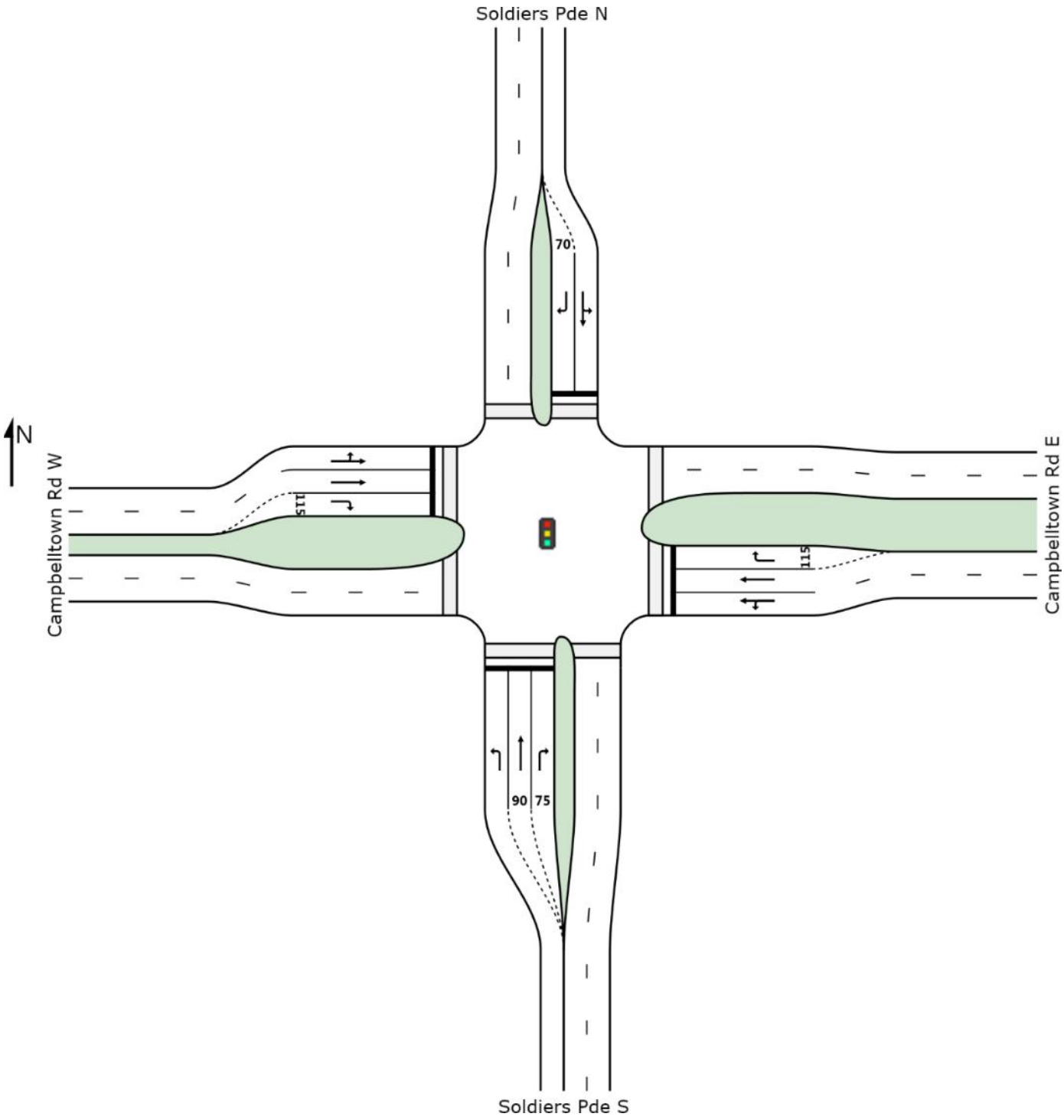
Intersection of Campbelltown Rd and Eastern St
Signals - Fixed Time Isolated



SITE LAYOUT

Site: Campbelltown Rd / Soldiers Pde

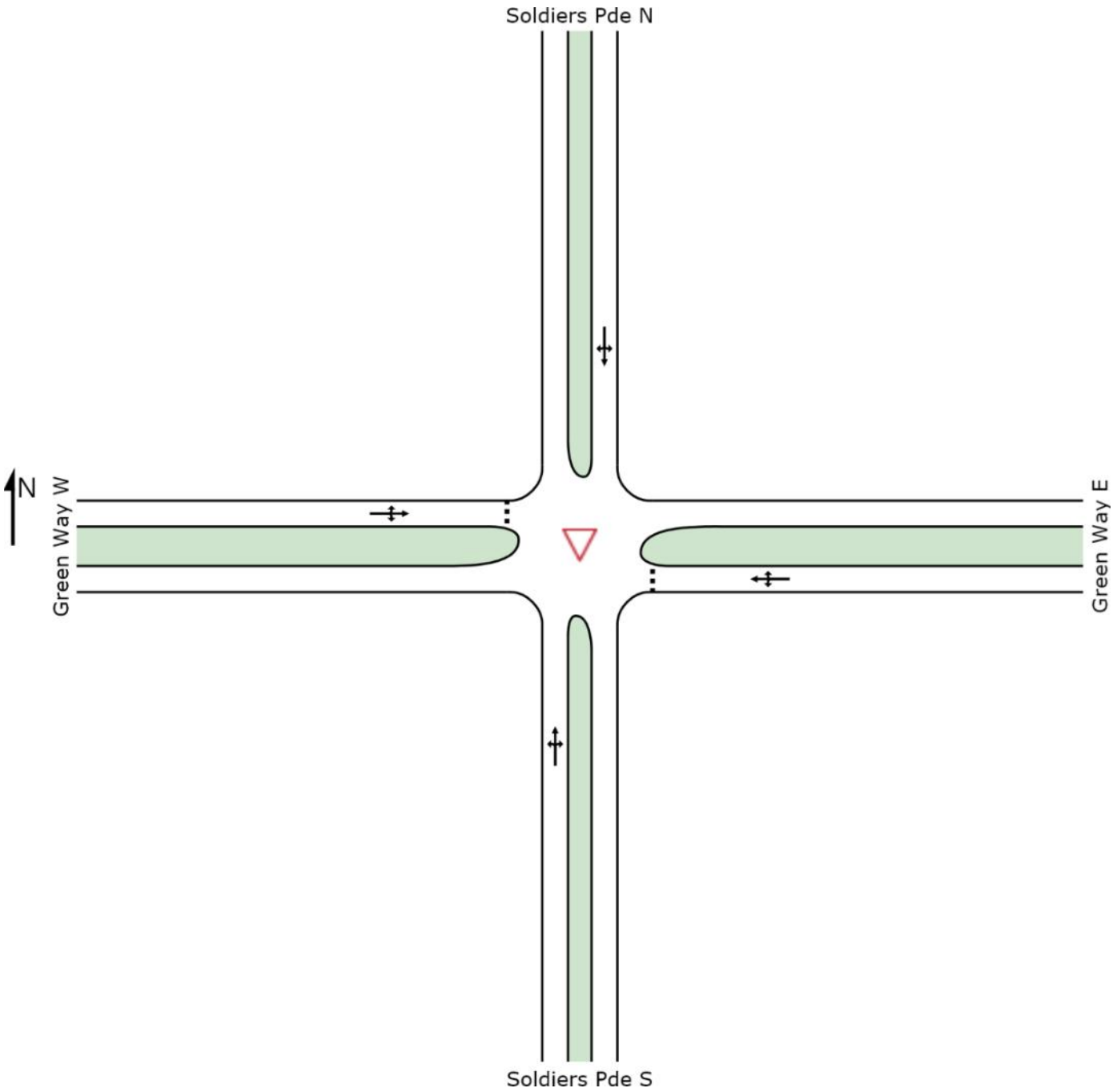
Intersection of Campbelltown Rd / Soldiers Pde
Signals - Fixed Time Isolated



SITE LAYOUT

Site: Soldiers Pde / Green Way

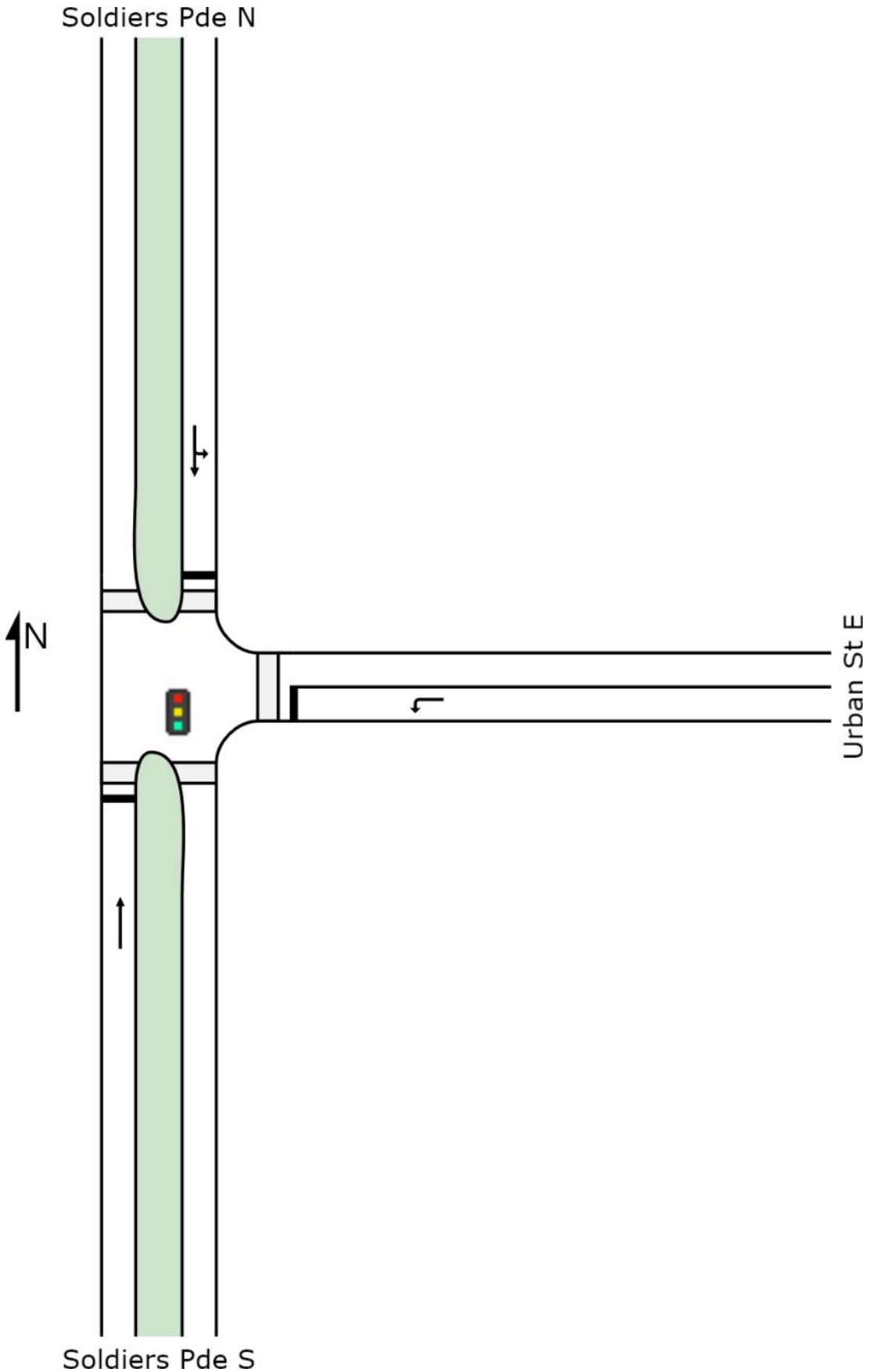
Intersection of Soldiers Pde and Green Way
Test: Signalised
Giveway / Yield (Two-Way)



SITE LAYOUT

Site: Soldiers Pde / Urban St

Intersection of Soldiers Pde and Urban St
Signals - Fixed Time Isolated



Appendix C

2036 Intersection Layouts

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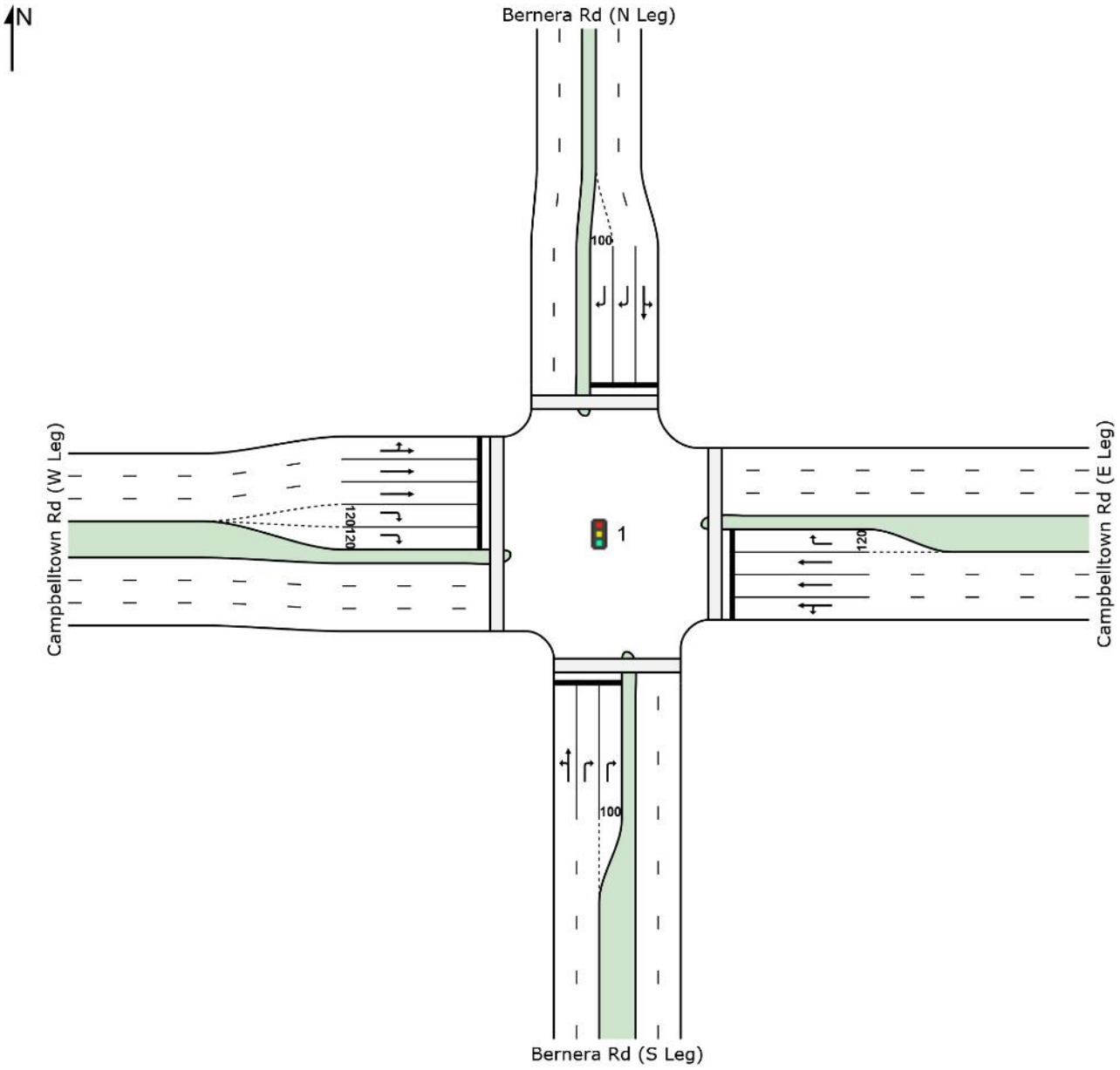
SITE LAYOUT

Site: 1 [2036 Campbelltown Rd / Bernera Rd]

Intersection of Campbelltown and Bernera Roads

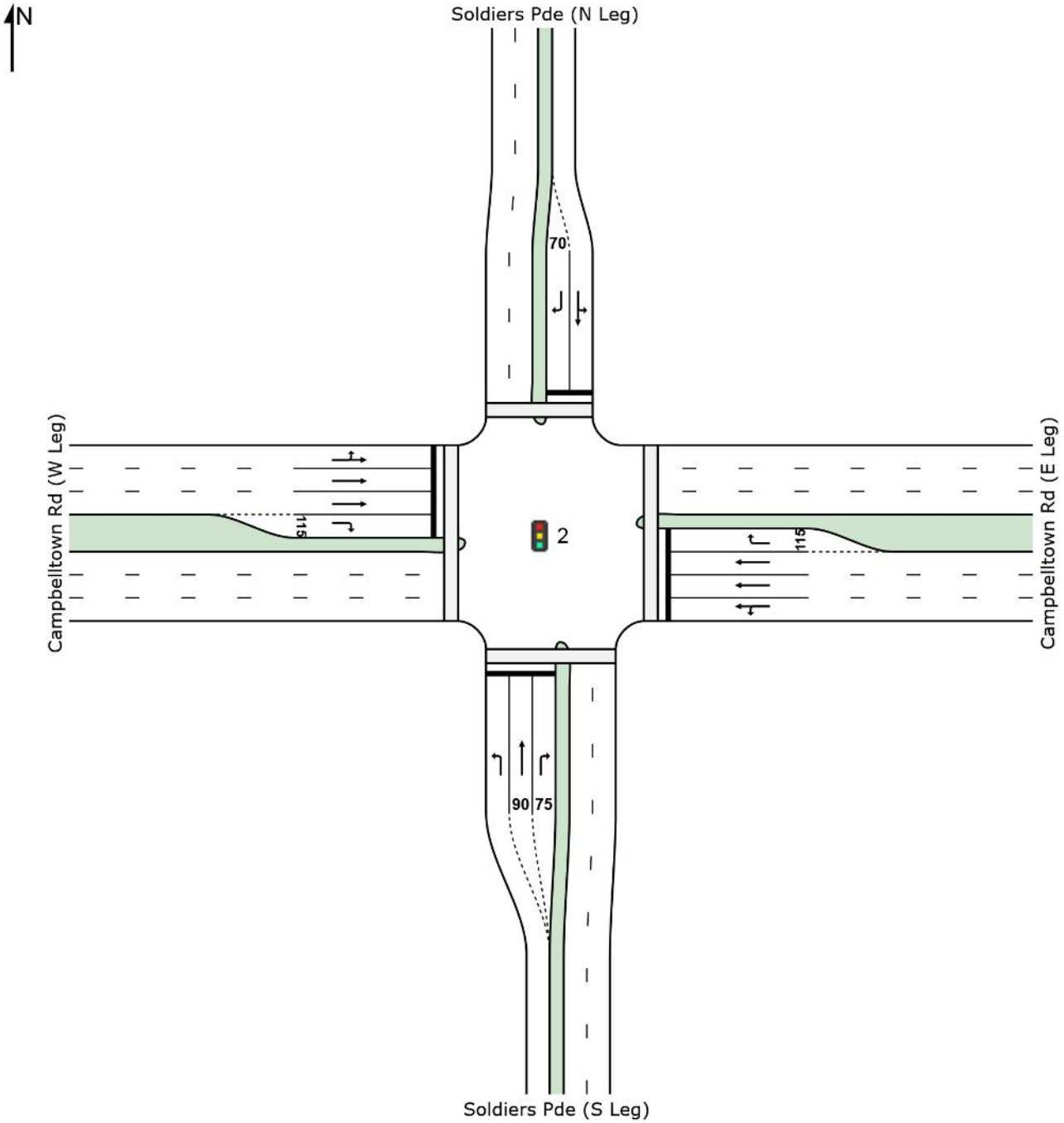
Signals - Fixed Time Coordinated



SITE LAYOUT

Site: 2 [2036 Campbelltown Rd / Soldiers Pde]

Intersection of Campbelltown Road and Soldiers Parade
Signals - Fixed Time Coordinated



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SITE LAYOUT

Site: 3 [2036 Campbelltown Rd / East TC St]

Intersection of Campbelltown and East Town Centre Roads

Signals - Fixed Time Coordinated