Technical Memorandum

Title	**Carseldine Village** **Masterplan Amendment Traffic Assessment**		
Client	Economic Development Queensland	**Project No**	CEB06857
Date	07 April 2022	**Status**	Final
Author	Bradley Fuller	**Discipline**	Traffic and Transport
Reviewer	Andy Johnston (RPEQ: 24764)	**Office**	Brisbane

1 Introduction

Cardno has been commissioned by Economic Development Queensland (EDQ) – Urban Development to provide traffic and transportation advice in relation to the proposed Carseldine Village (CV) development, which falls within Precinct 1 of the Fitzgibbon Priority Development Area (PDA). The intent of Precinct 1 is to demonstrate world-class planning in an urban village context which includes a mixed-use urban village core, employment opportunities, parkland area and sporting facilities.

In 2019, Cardno prepared a traffic impact assessment of the proposed CV masterplan, encompassing Precinct 1 of the PDA. The assessment focused on the traffic and transport impacts of the CV development on the surrounding transport network, inclusive of railway, public transport and active transport considerations.

EDQ have since gained approval for the CV development masterplan (reference DEV2018/932/3). The approved masterplan includes the following uses:

- 606 residential dwellings (inclusive of 150 bed aged care facility)
- 15,050sq.m of commercial use (including existing uses)
- 4,000sq.m for retail
- Childcare for 100 children.

EDQ are now proposing to implement amendments to the CV development masterplan, and are seeking re-approval for the revised development masterplan. The proposed CV development masterplan has been provided at **Appendix A.**

This technical memorandum assesses the proposed amendments to the CV development masterplan, and whether the amendments will have any additional impact in comparison to the approved CV development masterplan.

The proposed masterplan amendments have been compared to the original masterplan conditions utilised for the detailed traffic analysis as part of the traffic impact assessment prepared by Cardno in 2019. This traffic impact assessment has been provided at **Appendix B.**

2 Masterplan Amendments

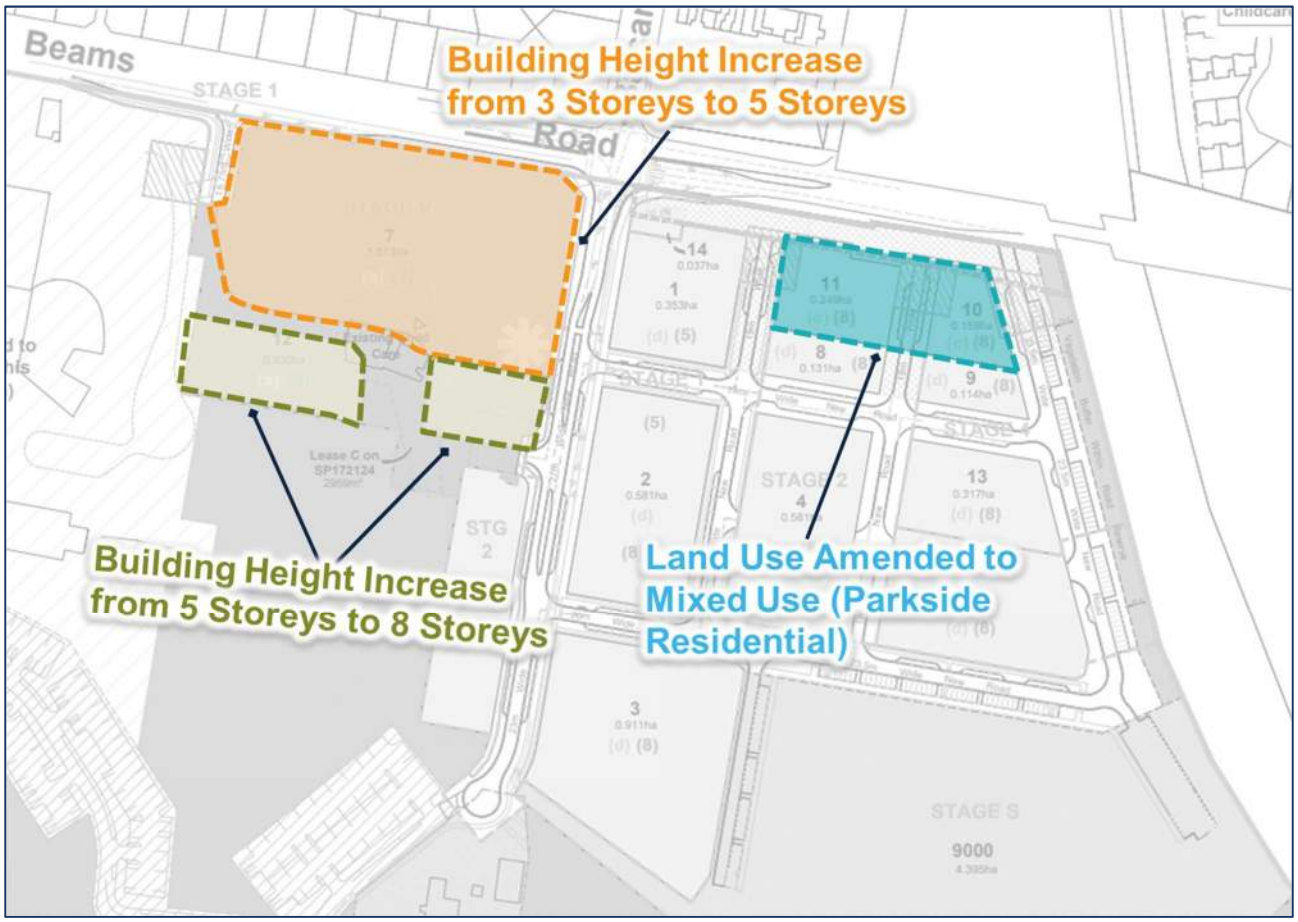
2.1 Overview

The amendments proposed to the approved CV development masterplan are illustrated on Figure 1, and are outlined below:

- Removal of the Mixed Use (High Intensity Employment) land use definition in Zones 10 and 11, and replace with a Mixed Use (Parkside Residential) land use definition for consistency across the residential precinct,
- A building height increase from 5 storeys to 8 storeys (+3 storeys) for the buildings on Zones V002 and V003 within the southern portion of the Mixed-Use Centre (Village Heart),
- A building height increase from 3 storeys to 5 storeys (+2 storeys) for the on Zone V001 within the northern portion of the Mixed-Use Centre (Village Heart).

The proposed CV development masterplan has been provided at **Appendix A.**

Figure 1 CV Masterplan Proposed Amendments



Source: RPS

2.2 Development Yields

As part of the proposed amendments, the development yields across the CV masterplan will not change. While it is acknowledged that the proposed amendments comprise of additional building height storeys, it is acknowledged that the dwelling yields for Stages 1 to 4B of the CV residential precinct are fewer than those within the approved CV masterplan. This is outlined in Table 1.

Table 1 Comparison of Yields – Stages 1 to 4B

	Stages 1 to 4B
Approved Masterplan*	211 dwellings
Revised Development	182 dwellings
Difference	***-29***

**Yields described for Zones 6, 7, 9, 10 and 11 as part of the Traffic Impact Assessment prepared by Cardno in 2019*

Therefore, the revised development yields for Stages 1 to 4B are 29 fewer dwellings than those within the approved CV masterplan. As such, this balance of lots are proposed to be dispersed over the remainder of the CV masterplan, including the building storey increases as part of the proposed amendments.

Therefore, the development yields for the proposed amendments will not vary from those within the approved masterplan, and are outlined below:

- 606 residential dwellings (inclusive of 150 bed aged care facility)
- 15,050sq.m of commercial use (including existing uses)
- 4,000sq.m for retail
- Childcare for 100 children

2.3 Traffic Impact

Provided that the proposed amendments to the CV masterplan will not vary the approved development yields, the findings from the 2019 masterplan traffic impact assessment will stand.

Therefore, the proposed amendments to the CV masterplan will not worsen the traffic impacts determined in the 2019 masterplan traffic impact assessment.

3 Summary

Cardno has been commissioned by Economic Development Queensland (EDQ) – Urban Development to provide traffic and transportation advice in relation to the proposed Carseldine Village (CV) development. EDQ are proposing to implement amendments to the approved CV development masterplan, and are seeking re-approval for the revised development masterplan. The proposed CV development masterplan has been provided at **Appendix A.**

This technical memorandum assesses the proposed amendments to the CV development masterplan, and whether the amendments will have any additional impact in comparison to the approved CV development masterplan. The key outcomes of this assessment are as follows:

- The proposed masterplan amendments include the following:
  - Removal of the Mixed Use (High Intensity Employment) land use definition in Zones 10 and 11, and replace with a Mixed Use (Parkside Residential) land use definition for consistency across the residential precinct,
  - A building height increase from 5 storeys to 8 storeys (+3 storeys) for the apartment buildings on Zones V002 and V003 within the southern portion of the Mixed-Use Centre (Village Heart),
  - A building height increase from 3 storeys to 5 storeys (+2 storeys) for the apartment buildings on Zone V001 within the northern portion of the Mixed-Use Centre (Village Heart).
- The proposed amendments will not result in any net changes to the approved development yields,
- The proposed amendments not worsen the traffic impacts determined in the 2019 masterplan traffic impact assessment.

Therefore, it is considered that the proposed amendments to the CV masterplan will not compromise the safety or efficiency of the existing transport network or the future transport network.

Carseldine Village

APPENDIX A
PROPOSED CV MASTERPLAN

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Development Yield (Maximum Density)	
Residential Dwellings	606 dwellings
Commercial (sq.m)	15,050 sq.m GFA (13,285m² existing DTMR Facility + 1,765m² within Mixed Use Centre - Village Heart)
Retail (sq.m)	4,000 sq.m GFA
Childcare	100 children

Legend

- Site Boundary
- Proposed Stage Boundary
- (a) Mixed Use Centre - Sub-Precinct *Village Heart (a)*
- (d) Mixed Use - Sub-Precinct *Parkside Residential (d)*
- (3) Height Limit (Storeys)
- Indicative Civic Plaza and Pocket Park
- Special Purpose
- Civic and Open Space
- Bushland and Open Space
- Vegetation Within Road Reserve
- Future Busway Corridor
- Existing Driveway and Carpark (Retention)
- Existing Lease Boundary
- Temporary Turnaround Easement
- Investigation Area (Beams Road Railway Overpass)
- Investigation Area (Potential Road Layout Subject to Future Applications)

0 10 20 30 40 50 1 : 1,500 @ A1

CARSELDINE URBAN VILLAGE
OVERALL MASTERPLAN

PLAN REF: 128180 – 37R
DATE: 21 MARCH 2022
CLIENT: EDQ
DRAWN BY: MD
CHECKED BY: MD/DG

Note:
All Lot Numbers, Dimensions and Areas are approximate only, and are subject to survey and Council approval.

Dimensions have been rounded to the nearest 0.1 metres.

Areas have been rounded down to the nearest 5m².

The boundaries shown on this plan should not be used for final detailed engineers design.

Source Information:
Site boundaries: Registered Survey Plans.
Adjoining information: DCDB.
Contours: QUT.

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Carseldine Village

APPENDIX B

TRAFFIC IMPACT ASSESSMENT, PREPARED FOR THE 2019 MASTERPLAN

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Carseldine Urban Village

Traffic Impact Assessment

CEB06857

Prepared for
Economic Development Queensland

October 2019

Cardno
Shaping the Future

Document Information

Prepared for	Economic Development Queensland
Project Name	Traffic Impact Assessment
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Date	October 2019

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Document Control

Version	Date	Description of Revision	Author Initials	Author Signature	Reviewer Initials	Reviewed Signature
01	24 February 2017	Draft for Client Review	BMP	Original signed	ASJ	Original signed
02	31 July 2017	Draft for Client Review	BMP, AXS, SK	Original signed	ASJ	Original signed
03	17 August 2017	Draft for EDQ Review	AXS SK	Original signed	ASJ	Original signed
04	18 August 2017	Revised Draft for EDQ Review	AXS SK	Original signed	ASJ	Original signed
05	22 Sept 2017	Report for DA	AXS SK	Original signed	ASJ	Original signed
06	23 April 2018	Report for DA	AXS SK	Original signed	ASJ	Original signed
07	1 May 2018	Report for DA	AXS SK	Original signed	ASJ	Original signed
08	1 July 2019	For Masterplan Amendment	AXS TA	Original signed	ASJ	Original signed
09	1 August 2019	Draft for DA	AXS TA	Original signed	ASJ	Original signed
10	9 August 2019	Report for DA	AXS TA	Original signed	ASJ	Original signed
11	4 Oct 2019	Report for DA	AXS TA	Digitally signed by Alice Shi Date: 2019.10.04 10:24:24 +10'00'	ASJ	Digitally signed by Andy Johnston Date: 2019.10.04 10:47:22 +10'00'

Version	Reason for Issue / Stage of Deliverable	Approver Initials	Approved Signature	Approved Release Date
01	Client Review	ASJ	Original signed	24/02/17
02	Draft for Pre-Lodgement Discussions	ASJ	Original signed	31/07/2017
03	Draft for EDQ Pre-Application Meeting Discussions	ASJ	Original signed	17 August 2017
04	Revised Draft for EDQ Pre-Application Meeting Actions	ASJ	Original signed	18 August 2017
05	Revised Report for DA Lodgement	ASJ	Original signed	22 Sept 2017
06	Revised Report for DA Lodgement	ASJ	Original signed	23 April 2018
07	Revised Report inc. swept paths for DA Lodgement	ASJ	Original signed	1 May 2018
08	Revised Report for Masterplan Amendment	ASJ	Original signed	1 July 2019
09	Draft Revised Report for Masterplan Amendment	ASJ	Original signed	1 August 2019
10	Revised Report for Masterplan Amendment	ASJ	Original signed	9 August 2019
11	Revised Report for Revised Masterplan Lot Boundaries	ASJ	Digitally signed by Andy Johnston Date: 2019.10.04 10:47:59 +10'00'	4 Oct 2019

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1 Introduction

1.1 Background

Cardno has been engaged by Economic Development Queensland (EDQ) to provide traffic and transport advice in relation to the proposed Carseldine Urban Village (CUV) development, which forms Precinct 1 of the greater Fitzgibbon Priority Development Area (PDA). The intent of Precinct 1 is to demonstrate world-class planning in an urban village context which includes a mixed use urban village core, employment opportunities, parkland area and sporting facilities.

In 2010, Cardno Eppell Olsen prepared a transport assessment of the proposed Carseldine Urban Village, including Precincts 1, 2 and 3 of the Fitzgibbon Urban Development Area (UDA). The assessment focused on assessing the likely development impact of the full UDA development, including the Beams Road level crossing project, and any associated mitigation measures.

This current stage of work focusses on the specific impact of Precinct 1, to provide an update to the transport study to reflect the more recent development plan. In addition to a transport modelling exercise, this study provides a review of the public transport and active transport facilities throughout the development area. Traffic surveys were completed in late 2016 to inform the background traffic volumes.

In 2018, Cardno prepared a traffic impact assessment of the proposed Carseldine Urban Village, encompassing Precinct 1 of the Fitzgibbon Urban Development Area (UDA). The assessment focused on assessing the likely development impact of the full CUV development in two scenarios which were dependant on the Dorville Road connection as follows:

> Pre-Dorville Road connection (accounting for access via Beams Road only for new development and yields which can be accommodated without a second access)
> Post-Dorville Road connection (accounting for access via Beams Road and Dorville Road for the ultimate development yields)

The Dorville Road connection was indicated as an indicative future road which could connect the main boulevard to Dorville Road, enabling development traffic to have three access points. As a result of the removal of development areas towards Dorville Road, further investigation by EDQ has found that this connection is no longer desired for Carseldine Urban Village and thus the development must be reassessed to determine the impact of the ultimate yields should access be restricted Beams Road only.

1.2 Study Intent

The purpose of the report is to document the updated transport study of Precinct 1 to inform the ultimate transport requirements for the PDA. This includes producing an ultimate road network design with conceptual intersection layouts in addition to recommending a feasible public transport network to ensure the traffic impact of the PDA will operate acceptably in the future.

1.3 Report Structure

Given the abovementioned intent, this report has been structured into four main sections, in order to provide a holistic assessment for the PDA. The following broadly outlines the report structure:

> Section 1: Introduction – an introduction to the project
> Section 2: Project Overview – a brief introduction to the context of the study
> Section 3: Traffic Modelling Methodology – overview of the modelling methodology and assumptions adopted, including final results
> Section 4: Intersection Analysis – External Network – discussion of the necessary street cross sections and intersections needed to support the PDA.
> Section 5: Intersection Analysis – Internal Network – discussion of the necessary street cross sections and intersections needed to support the PDA within the site.
> Section 6: Summary

1.4 References

In preparing this report, the following sources were referenced:

> Australian Bureau of Statistics, *Census Data,* published 2012
> Cardno Eppell Olsen, *Carseldine Urban Village,* 2010
> Institute of Transport Engineers, *Traffic Generation Handbook 8th edition*, 2008
> New South Wales Roads and Traffic Authority, *Guide to Traffic Generating Developments*, October 2002
> New South Wales Roads and Maritime Services, *Guide to Traffic Generating Developments – Updated Traffic Surveys*, August 2013
> Queensland Government, *Connecting SEQ 2032: An Integrated Regional Transport Plan for South East Queensland,* 2011
> Queensland Government, Department of Infrastructure, Local Government and Planning, *Shaping SEQ: South East Queensland Regional Plan 2017*, August 2017
> Urban Land Development Authority, *Fitzgibbon Urban Development Area Development Scheme,* 2011

2 Project Overview

2.1 Existing Land Uses

The land parcel that encompasses the proposed Precinct 1 development is currently partly occupied by existing land uses, as indicated in Figure 2-1. The existing uses feature a Queensland Government Precinct, QUT Testing Facility and child care centre, which have existing accesses on Beams Road and Dorville Road.

The subject site also includes several sporting fields, however these facilities are proposed to be relocated and rejuvenated with additional community uses such as a fitness/play area and dual use tennis and netball courts, bar-be-ques and picnic shelters. While anecdotal evidence suggests that the sports fields are currently under-utilised, it is intended that these renovated sports facilities will be a core community facility.

Figure 2-1 Subject Site – Existing Uses

Source: Nearmap.com

2.2 Local Infrastructure

2.2.1 Road Network

The local road network surrounding Precinct 1 has been captured from the Brisbane City Council *Interactive Mapping* and is displayed below in Figure 2-2 with detailed road characteristics identified in Table 2-1.

Figure 2-2 Surrounding Road Network

Source: Nearmap.com

Table 2-1 Local Road Characteristics

Road Name	Road Classification	Form	Posted Speed Limit	Authority
Beams Road	Arterial Road	4 lanes	60km/hour	BCC
		2 lanes at level crossing	60km/hour	BCC
Carselgrove Avenue	Suburban Road	2 lanes	60km/hour	BCC
Dorville Road (South of Beams Road)	District Road	2 lanes	60km/hour	BCC
Dorville Road (North of Beams Road)	Neighbourhood Road	2 lanes	50km/hour	BCC
Balcara Avenue	Neighbourhood Road	2 lanes	50km/hour	BCC
Golden Place	Neighbourhood Road	2 lanes	50km/hour	BCC
Government Precinct Internal Roads	Private Road	2 lanes	N/A	Privately Owned

2.2.2 Active Transport Considerations

Pedestrian/cycle paths are generally located on each side of the roads surrounding the development. All paths provide convenient connections to surrounding retail shops, residential areas, bus stops and the Carseldine train station. A review of the BCC Interactive Mapping service has identified that there are dedicated bikeway paths that connect the subject site to the external network, these have been identified in Figure 2-3.

2.2.3 Public Transport Network

The development site is well serviced by the existing public transport network. The development is located within a 400m radius of 3 bus stops and Carseldine Train Station, as identified in Figure 2-3. These facilities cater a number of commuter transport routes, as identified in Table 2-2. An overview of key destinations and the frequency of services to/from each during peak periods is provided in Table 2-3.

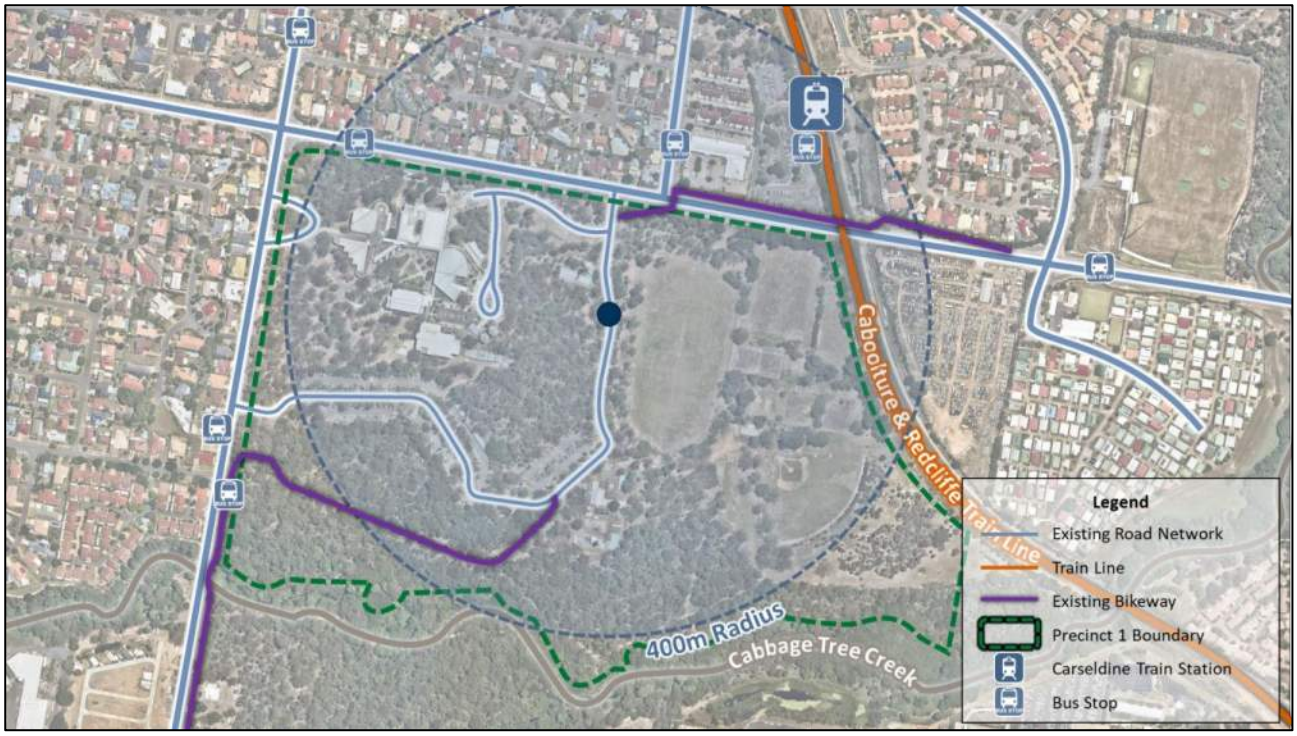
Table 2-2 Public Transport Services – Bus Routes and Train Lines – Within 400m

Bus Routes	Train Lines
329, 335, 340, P341, P344	Kippa-Ring, Springfield Central, Ipswich, Roma Street, Caboolture

Table 2-3 Key Destination Public Transport Frequency – Overview

Key Destination	Approximate Peak Period Frequency
City	10 minutes
Caboolture	15 minutes
Queensland University of Technology (Kelvin Grove)	5 minutes with connections for some services
University of Queensland (St Lucia)	10 minutes with connections for some services
Chermside Westfield	10 minutes with connections for some services

Figure 2-3 Active and Public Transport Overview



Source: Nearmap.com

In summary, the subject site is sufficiently connected to existing public transport networks, with 3 bus stops and a train station within 400m walking distance of the existing Beams Road access to the subject site. It is anticipated that these existing services will accommodate increased user demand associated with the proposed development.

2.3 Development Proposal

The proposed development masterplan for Precinct 1 of the Fitzgibbon PDA is illustrated in Figure 2-4, with a full context plan provided at Appendix A. As indicated in the figure, the subject site is fronted by Beams Road to the north, Dorville Road to the west, and the existing train line to the east. The southern property boundary of CUV is defined by the form of Cabbage Tree Creek.

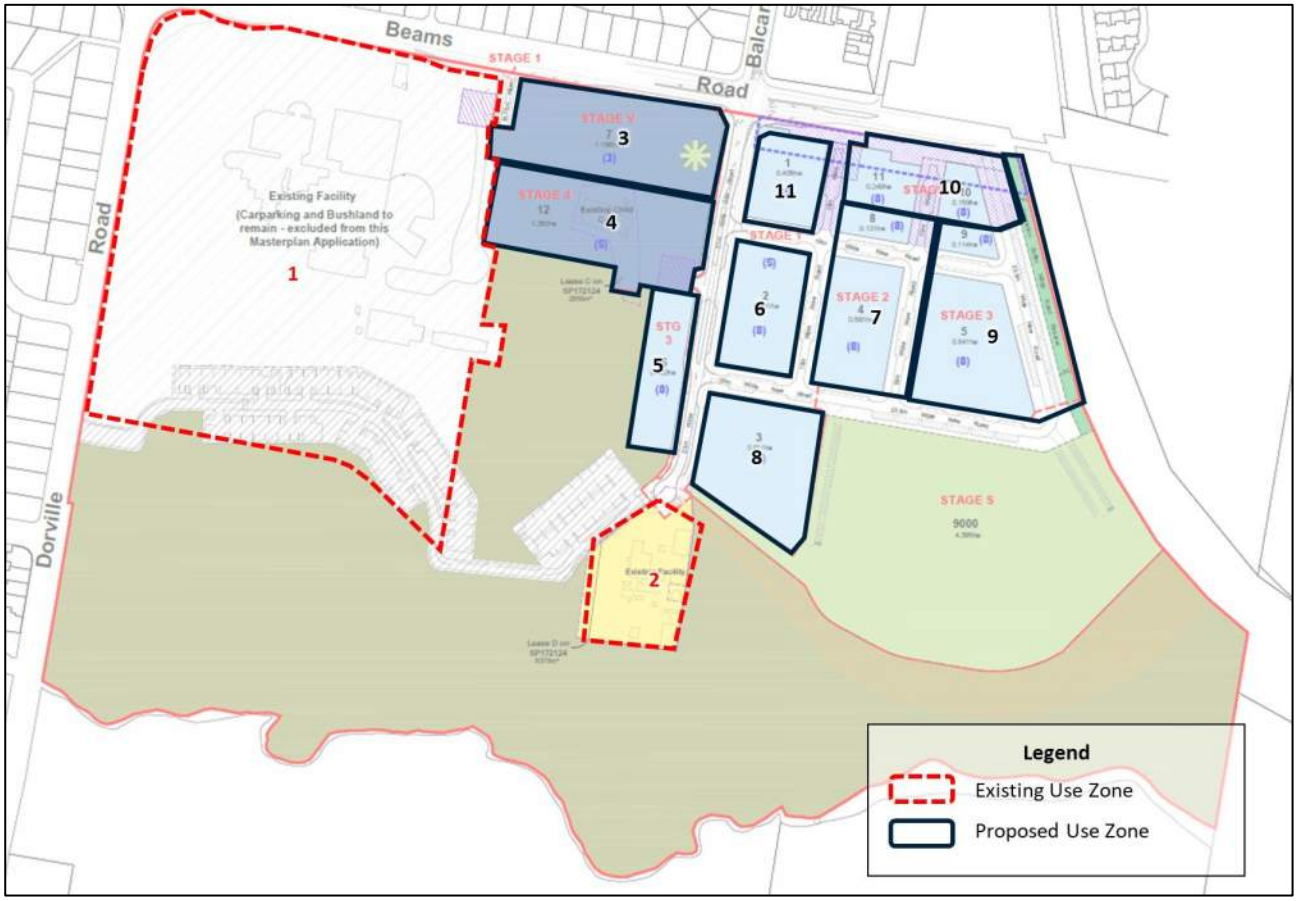
It is noted that the existing facilities on site, including the government office precinct, will be retained in their current capacities. Therefore, should these areas be redeveloped in future, it will be subject to a separate application and hence has not been assessed within this traffic impact assessment.

For the purposes of defining land uses, the proposed development layout has been categorised and labelled as identified in Figure 2-5.

Figure 2-4 Development Masterplan

Source: Nearmap.com, Economic Development Queensland

Figure 2-5 Precinct Zone Assignment



Source: Economic Development Queensland

Table 2-4 presents the proposed development yields within Precinct 1 of the Fitzgibbon PDA.

Table 2-4 Development Yields – Development Scheme

Zone Number	Yield				
	Residential	Commercial (sq.m)	Retail (sq.m)	Child Care	Ancillary Commercial / Retail (sq.m)
1		13,285^			
2		1,765^			
3	33 dwellings + 60 units				
4			3,700	100#	
5	100 units				
6	34 dwellings‡				350*
7	43 dwellings‡				
8	200 units†				
9	54 dwellings‡				
10	10 dwellings‡ + 50 units				
11	20 dwellings‡		300		300*
Total	**604 dwellings**	**15,050sq.m**	**4,000sq.m**	**100 enrollments**	**650sq.m**

‡ Terrace dwellings have 2 dwellings per lot, *Work/live dwellings comprising shared home/work living spaces. It is expected that trips will be primarily internal to the site. ^ Existing Government Precinct, # Based on maximum advised enrolments, † Based on maximum feasible dwellings.

The proposed work/live dwellings provide a home / work living arrangement, where commercial/retail space is provided within the same building as the residential dwellings, allowing up to 50sq.m per dwelling. This arrangement is anticipated to reduce residential trips travelling to/from work, as residents can simply access their working quarters within their own home building. Similarly, the trips associated with the commercial uses is anticipated to be reduced.

As a conservative approach, no reduction to the residential trips has been applied and the trips associated with the commercial uses are considered to be accounted for within these residential trips.

In addition, the proposed retail uses located within the residential buildings has been considered ancillary, and the retail trips are considered to be accounted for within the residential trips.

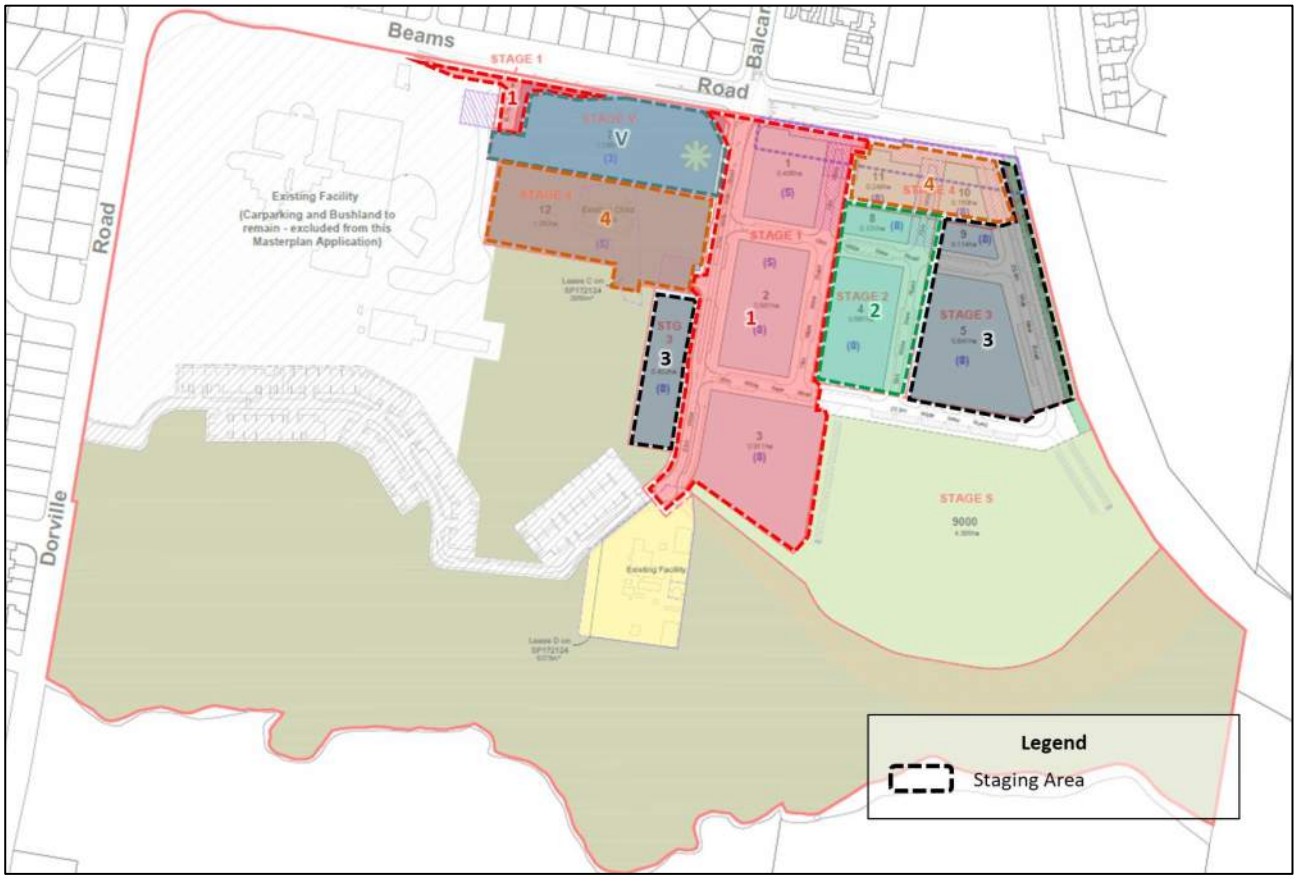
In summary, the PDA envisions the following:

> 604 dwellings comprised of high-density apartments, aged care residential and terrace dwellings.
> 15,050sq.m of commercial space, referring to existing Government precinct
> 4,000sq.m of retail space
> Existing child care centre with a maximum enrolment capacity of 100 children
> Ancillary use comprising 650sq.m GFA of retail / commercial use associated with work/live dwellings.

2.3.2 Development Staging

The proposed development staging is outlined in Figure 2-6 and Table 2-5.

Figure 2-6 Development Staging



Source: Economic Development Queensland

Table 2-5 Development Staging Breakdown

Stage	Yield			
	Residential	Retail (sq.m)	Child Care	Ancillary Commercial / Retail (sq.m)
1	254 dwellings	300		650*
2	43 dwellings			
3	154 dwellings			
4	153 dwelling			
V		3,700	100	
Total	**604 dwellings**	**4,000sq.m**	**100 enrollments**	**650sq.m**

*Work/live dwellings comprising shared home/work living spaces. It is expected that trips will be primarily internal to the site.

2.3.1 Internal Road Hierarchy

While the road network generally conforms to the Fitzgibbon Development Area Development Scheme, there are some deviations however these are considered to be suitable and appropriate for the overall precinct. The road network proposed in the Development Scheme is illustrated in Figure 2-7. The road network proposed as part of this application is illustrated in Figure 2-8.

Figure 2-7 Development Area Road Network – Fitzgibbon Development Scheme

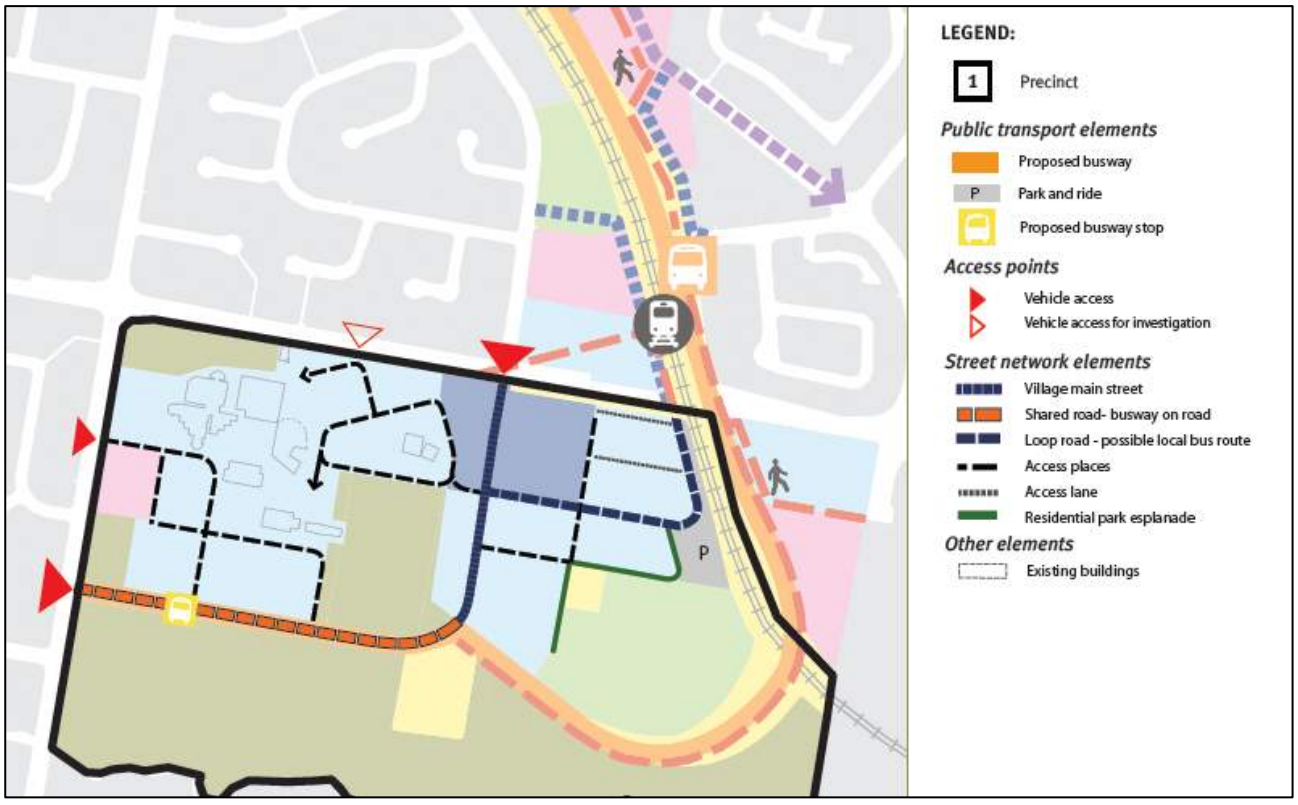


Figure 2-8 Development Area Road Network - Proposed

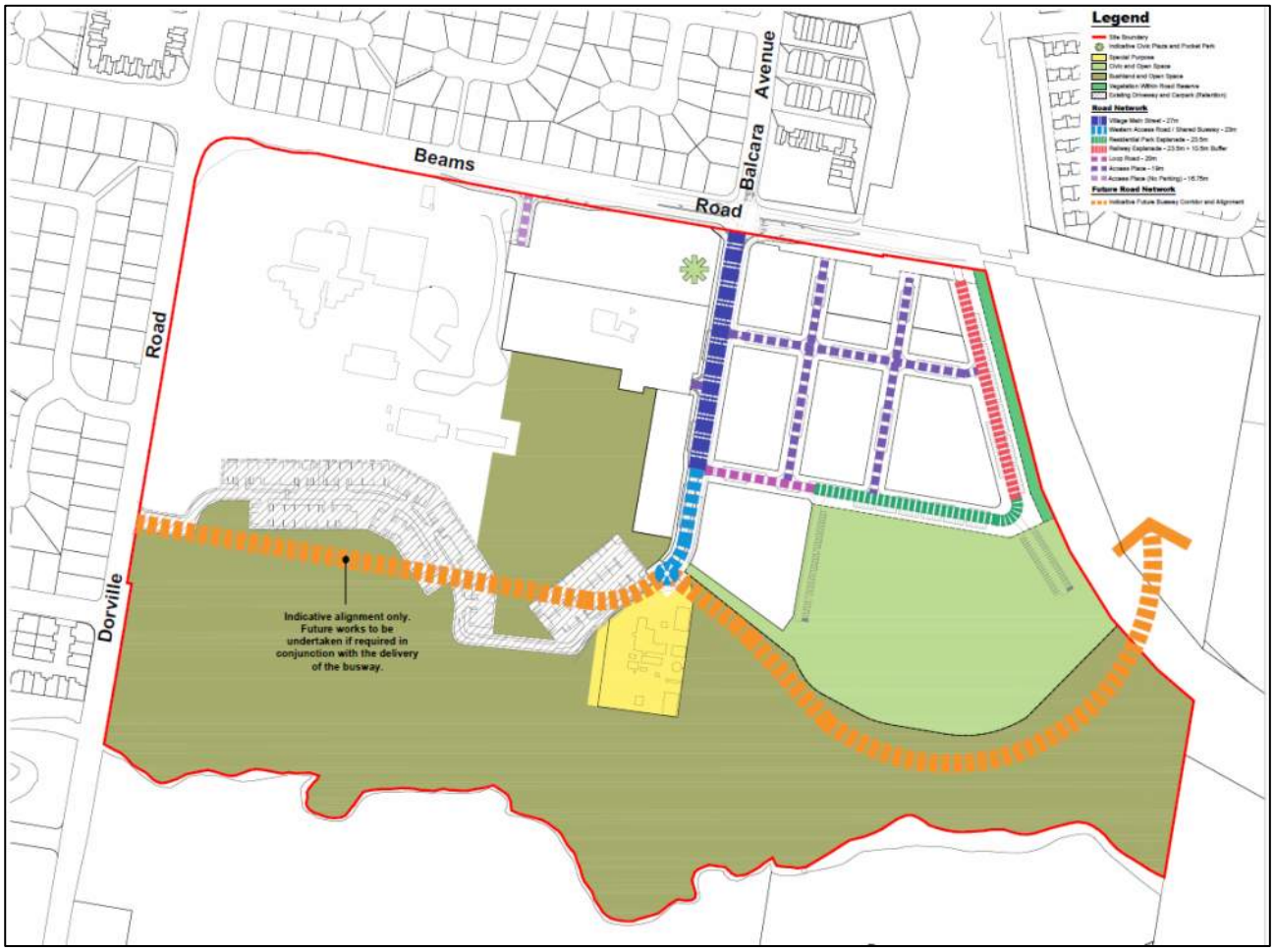


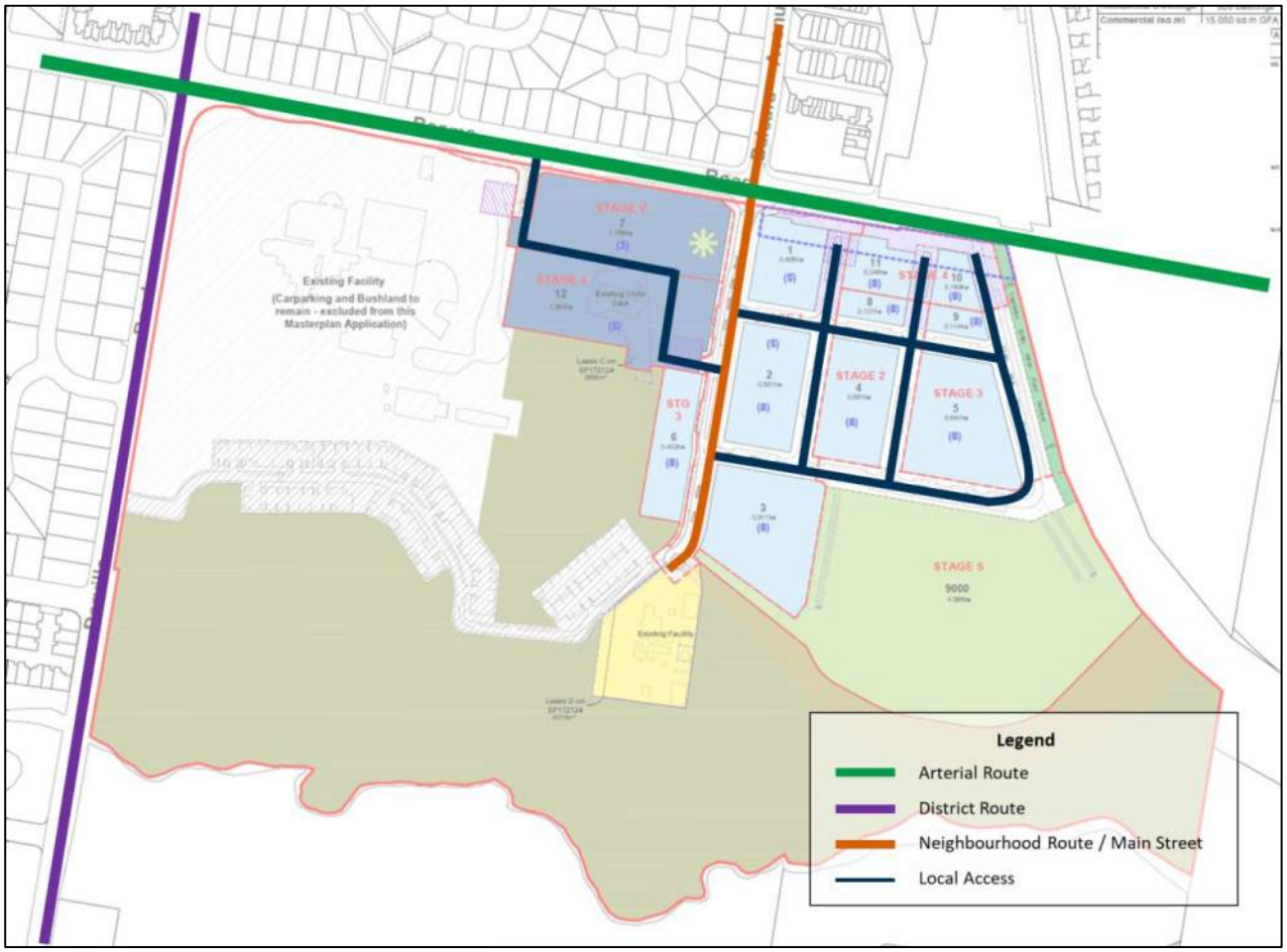
Figure 2-9 also indicates the proposed road classifications. For alignment with BCC's road hierarchy classifications, Cardno has prepared a comparison table summarising the proposed road networks in terms of the BCC road hierarchy classifications.

Table 2-6 Summary of Road Network

Development Scheme Roads	Amended Plan Roads	BCC Road Hierarchy Classifications	Alterations to Cross-Section
Village main street	Village main street	Neighborhood road	✓
Shared road – busway on road	Western access road / shared busway	Neighborhood road	✓
Loop road	Railway esplanade	Local access road	✓
Residential park esplanade	Residential park esplanade	Local access road	
Access places	Access places	Local access road	✓
Access lane	Shared access lane	Local access road	✓

Figure 2-8 illustrates the proposed road network hierarchy as per BCC classifications.

Figure 2-9 Proposed Road Network Hierarchy



2.3.2 Dorville Road Connection

The development masterplan illustrates the development will not utilise the Dorville Road connection. Accordingly, the development has been assessed assuming this connection is not utilised, in which the development will only utilise the road network shown north of the future road alignment. The existing uses currently utilising this road will continue to do so, however this will be a private driveway only.

2.3.3 Road Cross Sections

Similarly to the road network, the road cross sections have also been modified from the Development Scheme. However these changes are considered to be suitable and appropriate for the overall precinct.

A summary of the cross sections proposed in the Priority Development Area and how these compare to the cross sections in the Development Scheme are identified in Appendix B.

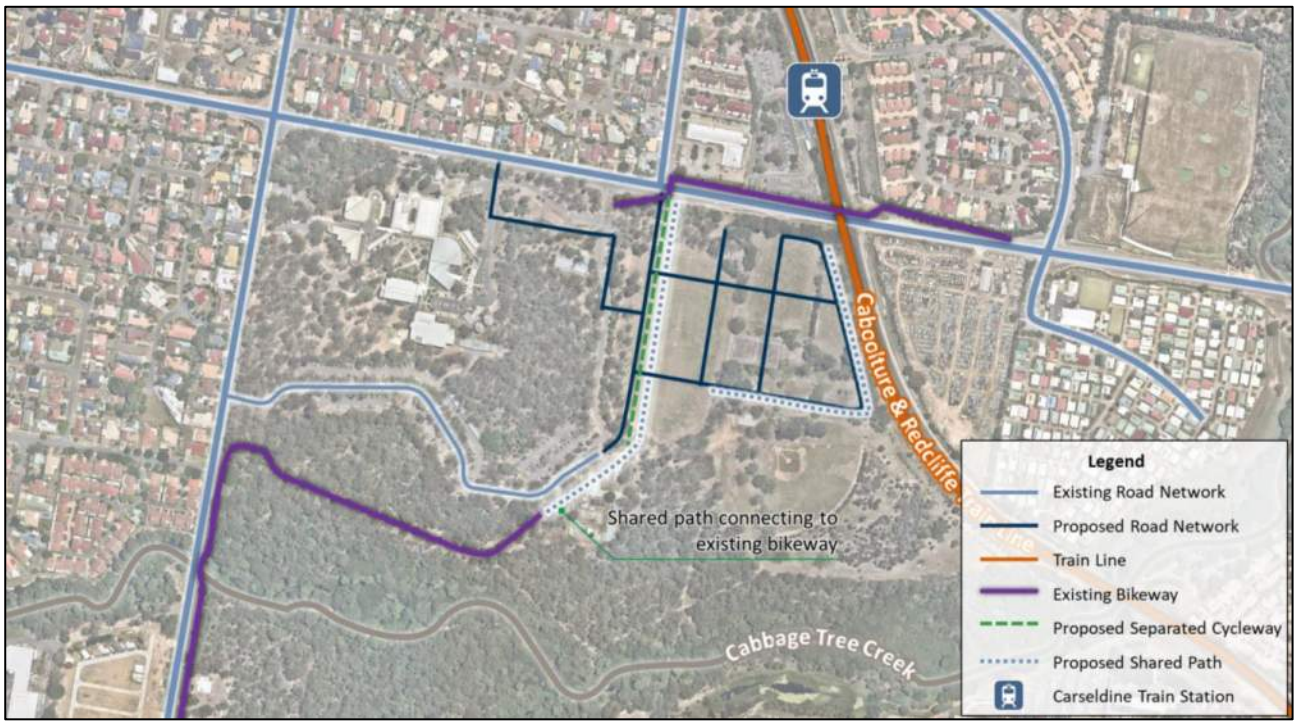
Swept path drawings have been prepared for the access lanes to demonstrate the suitability of a refuse collection vehicle navigating through a typical lane in both clockwise and counter-clockwise directions. These are provided at Appendix C. It is noted that the lane is designated as 7m wide, with a 6m wide pavement.

2.3.4 Active Transport Facilities

As part of the development, a separated cycle way will be along the main boulevard connecting Beams Road to Dorville Road. This will strengthen the active transport connections through the site for users of the site and external users from the wider community. Figure 2-10 illustrates the proposed cycle facilities for the precinct.

It is noted that prior to the upgrade of the existing internal road, the separated cycleway will extend to the existing bikeway rather than to the end of the truncated road. This will limit the instances of cyclists unexpectedly coming to the end of an off-road facility and will allow a continuous connection for cyclists using the site as a through route.

Figure 2-10 Proposed Cycle Facilities

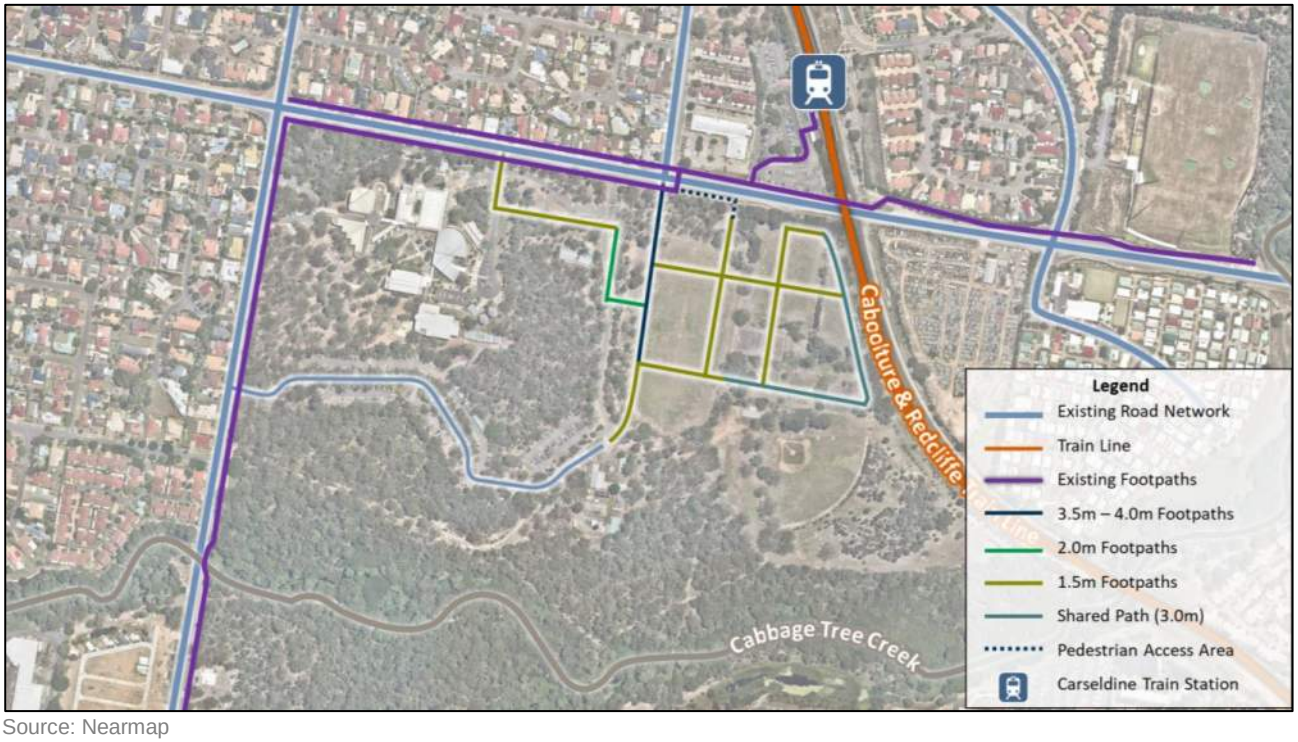


Source: Nearmap

Footpaths will be provided along all new streets with at least 1.5m wide paths on lower order streets and up to 4.0m wide paths on the main boulevard. 3.0m wide shared paths will be provided along the eastern railway corridor, as shown on Figure 2-10.

The footpath connections provided to the Carseldine train station are also illustrated on Figure 2-11.

Figure 2-11 Pedestrian Facilities



Source: Nearmap

2.4 Beams Road Open Level Crossing Upgrade

For a significant time the major constraint in the local road network has been the level rail crossing Beams Road, adjacent to the Carseldine Rail Station, as identified in Figure 2-12. In addition to delay associated with this open level crossing caused by halting traffic when trains pass, a bottleneck from four lanes to two (on either side of the crossing) significantly reduces through-traffic capacity in both directions of Beams Road.

Figure 2-12 Beams Road Open Level Rail Crossing

Source: Nearmap.com

The Beams Road Open Level Crossing is a significant project featured in the Brisbane City Council's Priority Infrastructure Plan (PIP) for some time now. The anticipated delivery of this upgrade according to the PIP is between 2022 and 2026, however the Infrastructure Plan featured in the Fitzgibbon Urban Development Area Development Scheme indicates that the development delivered in Precinct 1, 2 and 3 of the PDA will contribute to the cost of the rail crossing upgrade at a rate to be determined through a development agreement and/or special rate or charge.

At the time of writing the Department of Transport and Main Roads (TMR) was investigating options for the open level crossing to mitigate the existing bottleneck issue and improve reliable train times. $6.3 million was committed to the planning and design for the rail level crossing project. EDQ and TMR are currently in discussions to determine the likely form, construction of the rail infrastructure and impacts of the investigated options including on the CUV development, however timelines for the completion of these works are not yet certain.

Given these discussions, the Beams Road Rail Level Crossing project is doubtful to be dictated by the staging of Precincts 1-3 of the Fitzgibbon PDA, and is unlikely to be delivered prior to the construction of Precinct 1. As a subsequent result of this indicative condition, the traffic impact of Precinct 1 should not contribute to a significant worsening of the operation of Beams Road at the opening level train crossing, with no vehicle queueing onto the train line from adjacent intersections.

2.4.1 Observations

Observations made by Cardno report that the road is blocked-off for passing trains for almost 20minutes in total during the AM-peak period (0730 – 0830). It can be assumed that this is consistent throughout the PM-peak period also. It was also observed that currently the Beams Road / Railway intersection does experience some congestion when the road is blocked for a train-passing, but the traffic clears within 3 minutes of the road re-opening. During the peak-period the traffic can queue back to the nearest intersection on the east-side of the crossing. Fortunately, this intersection assists in mitigating the flow.

Further observations made at this intersection note that traffic is kept waiting unnecessarily. The following scenarios indicate instances where waiting time could be saved;

- Where the train is stationary at the station;
- Where passengers are boarding at the station; and

> Where the arrival and/or departure path of the train does not cross the intersection.

With the expected growth in the area along with the traffic generated by the new development, further traffic mitigation methods must be implemented across this intersection.

2.4.2 Signals Upgrade Proposals

Information provided to EDQ during interdepartmental liaison included the possible upgrade of the Beams Road open level rail crossing, resulted in discussion of possible amendments to the signal timing and a restructuring of the road's cross-section as a solution to mitigating the traffic along Beams Road. These improvements to the signalling alone would have significant improvements to the capacity of Beams Road. Given that the signal timing upgrades would be delivered as part of a network wide strategy for the rail system, and benefits both the rail and road networks, it would be funded by TMR and/or Queensland Rail and Council.

Conservatively, it can be assumed that for an Arterial Road, such as Beams Road, a peak hour volume of approximately 1,800 vehicles can be expected. This is in compliance with Brisbane City Council's road classifications. During the current peak hour trend, where only 67% of the hour is being utilised for road traffic to cross due to passing trains, the Beams Road / Railway Crossing intersection is in hindsight only allowing about 1,200 vehicles to pass.

With an upgrade of the signal timings to reflect the scenarios outlined in 2.4.1, it is expected to cut waiting times for traffic - maximising the time traffic has to flow through the intersection. This is expected as improved signalling would mean that the crossing would not need to be closed to traffic for significant time periods, for example the crossing would only close when southbound trains leave the station rather than the whole time it is stationary at the station as is currently the case.

Secondly, a possible upgrade of the crossing from two to four lanes would significantly increase the capacity of the intersection.

3 Traffic Modelling Methodology

3.1 Desktop Modelling

A desktop traffic assessment was prepared for the internal road network and external access intersections. Each parcel was given a zone number, with several land uses split across a number of zones depending on their location within Precinct 1 of the Fitzgibbon PDA. The zones were assigned an access point onto the internal road network and route to the external road network dependent on the trip destination. Figure 3-1 shows the zone and node plan that were used to allocate trips to the road network.

Figure 3-1 Transport Model Network Components

Source: Economic Development Queensland, Note: Indicative only, subject to ongoing review

The trip generation, internal trip ratio, in/out split and distribution for each zone identified herein was used to calculate the resultant trips that were assigned to the road network. The volumes were determined at each intersection and assessed in SIDRA Intersection 8.0 to determine appropriate intersection forms and identify any possible mitigation works required to lessen the impact of the proposed development on the external network.

3.1.2 Intersection Degree of Saturation

The performance of each study intersection has been analysed using SIDRA Intersection 8 (SIDRA). SIDRA is an industry recognised analysis tool that estimates the capacity and performance of intersections based on input parameters, including geometry and traffic volumes, and provides estimates of an intersection's Degree of Saturation (DOS), queues, delays. Simplistically, DOS is a measure of the proportion of traffic entering an intersection relative to the intersection's capacity. Table 3-1 provides the TMR-defined DOS thresholds.

Table 3-1 Adopted Intersection Performance Thresholds – Degree of Situation

Intersection Treatment	DOS Threshold
Signalised intersections	Less than or equal to 0.90
Roundabouts	Less than or equal to 0.85
Priority controlled intersections	Less than or equal to 0.80

Source: DTMR *Guidelines for Assessment of Road Impacts Development*

The guideline notes that a DOS exceeding the values indicated in Table 3-1 indicates that an intersection is nearing its practical capacity and upgrade works may be required. Above these threshold values, users of the intersection are likely to experience rapidly increasing delays and queueing.

3.1.3 Intersection Critical Delay

Importantly it is noted that DOS is not the only performance indicator and that other measures such as critical delay should also be considered when assessing the performance of an intersection. Other authorities such as the NSW Roads and Maritimes Services (RMS) recommend the use of the critical movement delay for assessing the performance of priority-controlled intersections. The RMS *Guide to Traffic Generating Developments* states that the average delay statistics for the critical movement provides a better indication of intersection performance and safety for priority-controlled intersections and roundabouts than DOS. Table 3-2 provides the RMS-defined delay thresholds.

Table 3-2 Adopted Intersection Performance Thresholds – Degree of Situation

LOS	Level of Service Description	Critical Delay
A	Good Operation	Less than 14 sec
B	Acceptable delays and spare capacity	15 to 28 sec
C	Satisfactory, but accident study required	29 to 42 sec
D	Near capacity and accident study required	43 to 56 sec
E	At capacity, requires or control mode	57 to 70 sec

Source: RMS *Guide to Traffic Generating Developments*

3.2 Trip Generation

Proposed weekday generation rates for each of the proposed land uses has been determined from industry guidelines and best practice as well as first principles. A summary of the resultant vehicle trip generation proposed to be assessed is shown in Table 3-3.

Table 3-3 Adopted Trip Generation Rates

Use	Trip Generation Rate Period			Per	Assumption	Source
	AM Peak	PM Peak	Daily			
High Density Apartments	0.23	0.22	2.18	unit	Average of Rockdale, Liberty Grove and Strathfield (areas with similar characteristics)	RMS – High Density Residential
Mixed Use - Retail	2.46	12.3	121	100m^2	AM taken as 20% of PM rate. Weekday AM trading is minimal in assessed peak.	RMS – Shopping Centre
Mixed Use - Retail (Supermarket)	2.46	12.3	121	100m^2	AM taken as 20% of PM rate. Weekday AM trading is minimal in assessed peak.	RMS – Shopping Centre
Terrace Dwelling	0.575	0.575	5.75	unit	Generation bracket ranged from 0.5-0.65, an average was utilised in this assessment.	RTA – Medium Density Residential
Aged Care	0	0.4	2.1	unit		RMS – Housing for Seniors
Child Care	0.8	0.7	2	child		RTA – Child Care Centre (Long-day care)
Government Precinct (Existing)*	2.1	2.3	13.9	100m^2	Total surveyed AM and PM In/Out movements were divided by existing GFA	Austraffic Surveys – November 2016

* Trips associated with existing uses taken as per surveyed volumes

3.2.1 Mode Share

The development is located within 400m of the Carseldine Train Station as well as three bus stops which service routes with peak hour frequency of less than 15 minutes. Given this close proximity to public transport, the travel behaviour of residents and visitors to the site is likely to be more heavily weighted towards public transport than other areas of the region.

For comparison, a study of six areas with mixed use development near South East Queensland (SEQ) train stations was undertaken. The study areas were selected based on the distance from the CBD (within 15km), and the mix of surrounding land uses (retail, commercial and residential). These train stations include the following:

- Wynnum
- Carseldine
- Nudgee - Banyo
- Coorparoo
- Corinda
- Sherwood

Census data (2011) was assessed for each of these areas at the Statistical Area 2 (SA2) level to determine the general trend for mode share.

A comparison with the wider SEQ area, which is considered to generally represent the vehicle trip rates adopted as per Table 3-3, was also undertaken. The Department of Infrastructure, Local Government and Planning document Shaping SEQ: South East Queensland Regional Plan 2017 outlines the baseline (2011) mode share for the SEQ region.

Table 3-4 outlines the mode share values calculated for the six study areas, along with the SEQ baseline mode share.

Table 3-4 Mode Share Comparison

Study Area	Mode Share		
	Vehicle	Public Transport	Active Transport
Wynnum	80%	16%	4%
Carseldine	80%	18%	2%
Nudgee - Banyo	78%	17%	5%
Coorparoo	69%	25%	6%
Corinda	70%	25%	5%
Sherwood	66%	28%	6%
Average	***74%***	***21%***	***5%***
SEQ baseline*	**84.4%**	**8.2%**	**7.3%**
Difference	*-10%*	*13%*	*-2%*

* From Shaping SEQ: South East Queensland Regional Plan 2017

As shown, the mode share comparison indicates that the study areas generally have lower vehicle usage (10% lower), higher public transport usage (13% higher) and lower active transport usage (2% lower) compared to the SEQ baseline data.

It is noted that these mode share values relate to daily travel patterns only and are not directly comparable to the peak hour travel behaviour. However, they may provide some indication of general travel patterns for the development particularly as it reaches ultimate build out.

To provide a conservative assessment, Cardno has adopted the vehicle trip rates as outlined in Table 3-3. However, it is likely that the future development will operate with potentially reduced vehicle trips.

3.3 Internal Trips

The proportion of internal trips associated with each of the site uses is shown in Table 3-5. Each land use has been assigned a conservative reduction in trips based on the other land uses proposed within Precinct 1 of the CUV.

Table 3-5 Internal Trip Proportion

Use	Proportion Internal Trips
High Density Apartments	0%
Mixed Use - Retail	10%
Mixed Use - Retail (Supermarket)	30%
Terrace Dwelling	0%
Aged Care	0%
Child Care	20%
Government Precinct (Existing)	0%

3.4 Total Vehicle Trips by Land Use

By applying the trip generation rates identified in Table 3-3 with the internal trip percentage adopted in Table 3-5, a resultant number of vehicle trips is calculated, shown in Table 3-6. They include a detailed expansion on the yields which were previously mentioned in Section 2.1, which have now been defined by a specific development category.

Table 3-6 Vehicle Trips

Use	Total Yield	Unit of Measure	AM Peak Trips (vph)	PM Peak Trips (vph)	Daily Trips (vpd)
High Density Apartments	210	Units	49	46	459
Mixed Use - Retail	2,760 m^2	GFA	61	306	3,006
Mixed Use - Retail (Supermarket)	1,240 m^2	GFA	21	107	1,050
Terrace Dwelling	194	Units	112	112	1,116
Aged Care	200	Units	0	80	420
Child Care	100	Children	64	56	160
Government Precinct (Existing)	15,050 m^2	GFA	322	339	2,092
TOTAL			**629 vph**	**1,045 vph**	**8,302 vpd**

3.5 Traffic Distribution

In order to determine the likely traffic distribution on the external road network, a Gravity Model was constructed using data from the 2011 Census completed by the Australian Bureau of Statistics (ABS). A gravity model functions by using the population, in this scenario the number of people employed in the area, (ABS SLA2 areas were referred to) and the travel distance to this area from the site to determine how attractive the journey would be to a resident of this area. This allows for a distribution of work trips to be derived.

To complete the assessment, SA2 regions were categorised into one of four directions based on their proximity to the CUV along the existing road network:

- Northwest along Beams Road;
- Northeast along Beams Road;
- Southwest along Dorville Road and Zillmere Road; and
- Southeast along Dorville Road and Zillmere Road.

Table 3-7 Employed Population Proximate to Carseldine Urban Village

Land Use	Catchment Proximity	NE	NW	SE	SW	Total
High Density Apartments	25km	91,728	78,900	11,150	355,262	**537,040**
Mixed Use - Retail	10km	25,815	28,086	6,925	26,292	**87,118**
Mixed Use - Retail (Supermarket)	10km	25,815	28,086	6,925	26,292	**87,118**
Terrace Dwelling	25km	91,728	78,900	11,150	355,262	**537,040**
Aged Care	25km	91,728	78,900	11,150	355,262	**537,040**
Child Care	10km	25,815	28,086	6,925	26,292	**87,118**
Government Precinct	25km	91,728	78,900	11,150	355,262	**537,040**

The origins/destinations to/from the site have been split into four directions as shown in Figure 3-2 while the adopted distribution for each use is shown in Table 3-8. The completed gravity model has been included at Appendix D.

Figure 3-2 Trip Origins/Destinations

Source: Nearmap.com, Economic Development Queensland

Table 3-8 Traffic Distribution

Use	Northeast	Northwest	South East	Southwest	Total
High Density Apartments	20%	20%	4%	56%	**100%**
Mixed Use - Retail	25%	47%	5%	23%	**100%**
Mixed Use - Retail (Supermarket)	25%	47%	5%	23%	**100%**
Terrace Dwelling	20%	20%	4%	56%	**100%**
Aged Care	20%	20%	4%	56%	**100%**
Child Care	25%	47%	5%	23%	**100%**
Government Precinct	20%	20%	4%	56%	**100%**

3.6 Background Traffic

In order to establish the existing traffic volumes surrounding the site, Cardno commissioned traffic surveys to be undertaken on Tuesday 15 November, 2016 for the following key intersections during the 3-hour AM and PM peak periods, which have been identified on Figure 3-3 with the allocated intersection ID:

> **004** – Beams Road / Dorville Road;
> **029** – Beams Road / Carseldine Government Precinct Access;
> **005** – Beams Road / Balcara Avenue;
> **007** – Beams Road / Carseldine Train Station Access;
> **002** – Dorville Road / Carseldine Government Precinct Access;
> **003** – Dorville Road / Carseldine Government Precinct Drop-off Area;
> **001** – Dorville Road / Zillmere Road; and
> **006** – Beams Road / Carselgrove Avenue / Golden Place.

Figure 3-3 Traffic Survey Locations

Source: Nearmap.com

The data collected from this traffic survey has been adopted in calculating the existing and future traffic volumes to be used in this assessment. Whilst each intersection featured a specific peak period where total traffic movements were at a maximum, the average network peak period was adopted for the assessment. The appointed network peak time was:

> AM Peak Period: 7:30am to 8:30am
> PM Peak Period: 4:30pm to 5:30pm

The background traffic surveys indicate a varying heavy vehicle percentage on each approach of the intersections which range from 2% to 5%, however Cardno has conservatively adopted 5% on all approaches for the purposes of the assessment.

3.7 Growth Rate

In order to gauge historical traffic growth and any driver behavioural patterns, Cardno has compared the surveys conducted in 2016 to those which were utilised in the Cardno Eppell Olsen *Carseldine Urban Village* report dated September 2010. The growth on the external network has been illustrated in Figure 3-4.

Figure 3-4 Traffic Growth between 2010 and 2016

Source: Nearmap.com

Between 2010 and 2016, traffic along Beams Road (east of Dorville Road) experiences a substantial decline, whereas traffic on Dorville Road significantly increases. It is understood that this change in traffic patterns is a result of vehicles diverting their trips from Beams Road to Dorville Road to avoid the delay caused by trains crossing at the open level crossing. The adopted traffic growth rate is provided in Table 3-9.

Table 3-9 Adopted Growth Rate

Item	Value
Growth Rate	2% per annum
Growth Type	Linear
Growth from 2016 to 2032	30%

It is noted that the existing government precinct traffic has been captured in background surveys and will be represented in the baseline scenarios. Due to the complexities in backtracking this traffic throughout the existing network, it is not possible to completely remove this traffic from the existing network before adding it via the new access points. As a result, the assessment is likely to over-represent the volume of traffic at external intersections and therefore a conservative analysis will be presented in the findings.

3.8 Intersection Assessment

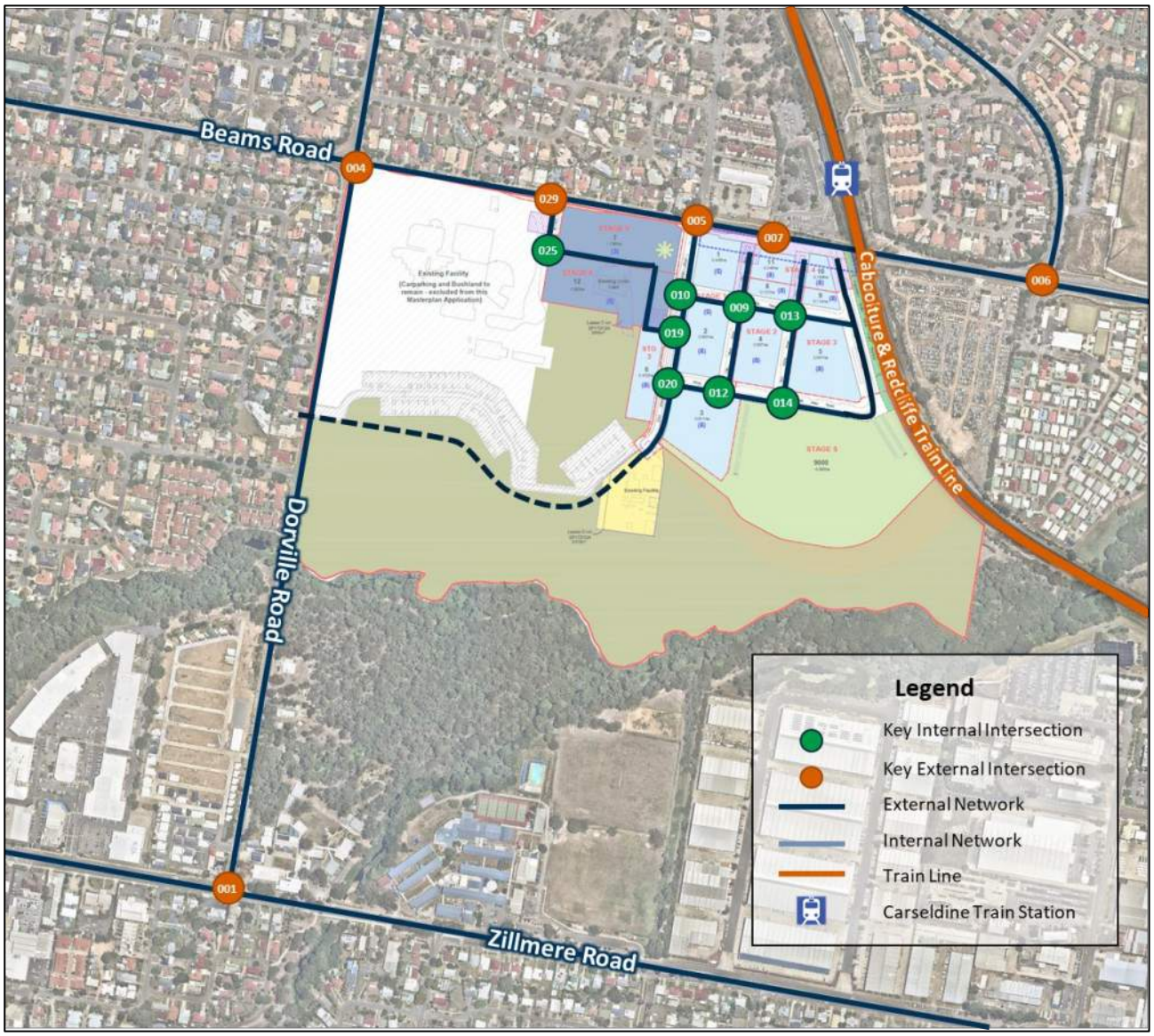
3.8.1 Scenarios

Each intersection has be analysed for the AM and PM peak periods, assessing the proposed Precinct 1 yields and adopting the assumptions detailed herein for the design year 2032.The results for the internal intersections are based upon the sensitivity assessment values, while the external access intersections are based upon the planned values.

3.8.2 Key Intersections

The key internal and external access intersections that require assessment are shown in Figure 3-5. Each intersection has been numbered according to the number it was assigned during the desktop modelling process.

Figure 3-5 Key Intersections



Source: Nearmap.com, Economic Development Queensland

3.8.3 Intersection Forms and Controls

The assessed intersection forms and controls have been adopted from the most up to date planning material available, attached at Appendix A. Consideration has been given to the traffic volumes on each movement and where required the intersections have been updated to reflect the capacity requirements. The adopted intersection controls are shown in Figure 3-6.

Figure 3-6 Intersection Control Types

Source: Nearmap.com, Economic Development Queensland

4 Intersection Analysis – External Network

A detailed assessment has been undertaken by Cardno to gain an understanding of the operation of the external road network in the absence of the proposal and with the yields proposed in Precinct 1 of CUV. Given the location of the development and the turning movements identified in the traffic surveys, detailed intersection analysis has been conducted on the intersections for the with and without development traffic scenarios as identified in Table 4-1.

In order to inform the existing network analysis, the intersection forms have been determined using geometry measured from Nearmap aerial imagery, on site observations, and the most appropriate signal cycle times for the corresponding intersection. The results have been summarised for each intersection to determine if the maximum preferred capacity is reached in the 10-year design horizon without the additional traffic impact imposed by the proposed CUV development.

Each of the assessed intersections have been analysed for the ultimate development yields where there is no future road link that connects to Dorville Road.

Table 4-1 Scenarios Tested

ID	Intersection Location	Without Development	With Development
001	Dorville Road / Zillmere Road Intersection	✓	✓
004	Beams Road / Dorville Road	✓	✓
005	Beams Road / Balcara Avenue / CUV Access	✓	✓
006	Beams Road / Carselgrove Avenue / Golden Place	✓	✓
007	Beams Road / Carseldine Train Station Access	✓	✓
029	Beams Road / CUV Access (Left-in / Left-out)		✓

The intersection analysis software package SIDRA 8.0 has been utilised in performing the assessment, which provides a detailed summary on the intersection capacity and performance. The traffic turning flow diagrams are presented in Appendix E.

4.1 001 – Dorville Road / Zillmere Road Intersection

4.1.1 Existing Form

The existing form of the Dorville Road / Zillmere Road intersection is illustrated on Figure 4-1. Results for the background traffic scenarios are reported in Table 4-2.

Figure 4-2 Dorville Road / Zillmere Road – Existing Intersection Form

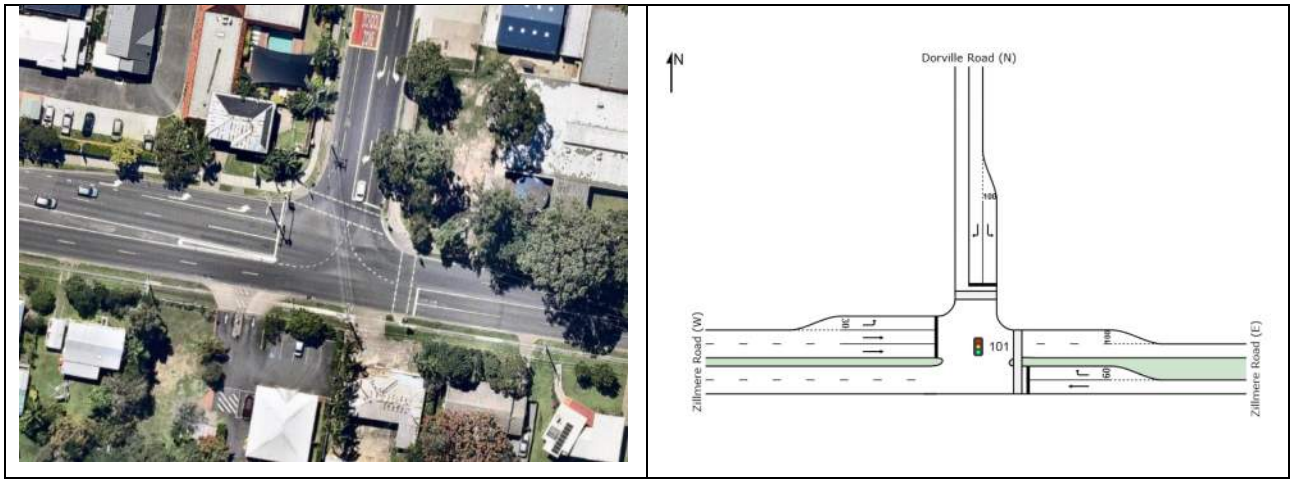


Table 4-2 SIDRA Results – Dorville Road / Zillmere Road Intersection

Scenarios	AM Peak			PM Peak		
	DOS	Delay	95th %ile Queue	DOS	Delay	95th %ile Queue
2016 Background	0.520	31.4 sec	157.4m	0.815	33.3 sec	192.5m
2022 Background	0.592	28.0 sec	159.2m	**0.948**	**50.0 sec**	**352.0m**
2032 Background	0.727	242 sec	167.5m	**1.123**	**114.5 sec**	**892.3m**

Maximum preferred DoS of 0.900 for a signalised intersection

Analysis of the Dorville Road / Zillmere Road signalised intersection indicates that it will reach maximum preferred capacity before 2022, without the additional impact of traffic generated by the proposed development.

4.1.2 Proposed Form

The existing form of the Dorville Road / Zillmere Road signalised intersection will reach maximum capacity prior to 2032 without the impact of the proposed development and will exceed accepted DOS thresholds prior to 2022. Figure 4-2 identifies necessary upgrade works required to accommodate the future traffic of CUV as well as forecast background traffic. The following changes have been made to the intersection layout:

> Conversion of stand-up left turn on Zillmere Road (W) to a high angle slip lane with 50m storage;
> Addition of signalised pedestrian crossing on the Zillmere Road (W) approach including across the slip lane to be activated by push button calling;
> Extension of existing right-turn pocket on Zillmere Road (E) from 60m to 250m;
> Line-marking change on Dorville Road (N) to allow for dual right turns; and
> Shortening of exit lane along Zillmere Road (E).

Cardno has prepared a concept design sketch for the proposed upgrades, which can be found at Appendix F (dwg no. CEB06857-SK01).

SIDRA analysis results have been provided in Table 4-3. It is noted that the analysis was undertaken with the following inputs:

> Delayed start for left turn vehicles when opposed by pedestrians (6 second delay)
> Left turn slip lane on Zillmere Road (W) to run as give way unless stopped when pedestrians call the signalised crossing

Figure 4-3 Dorville Road / Zillmere Road – Existing and Proposed Form

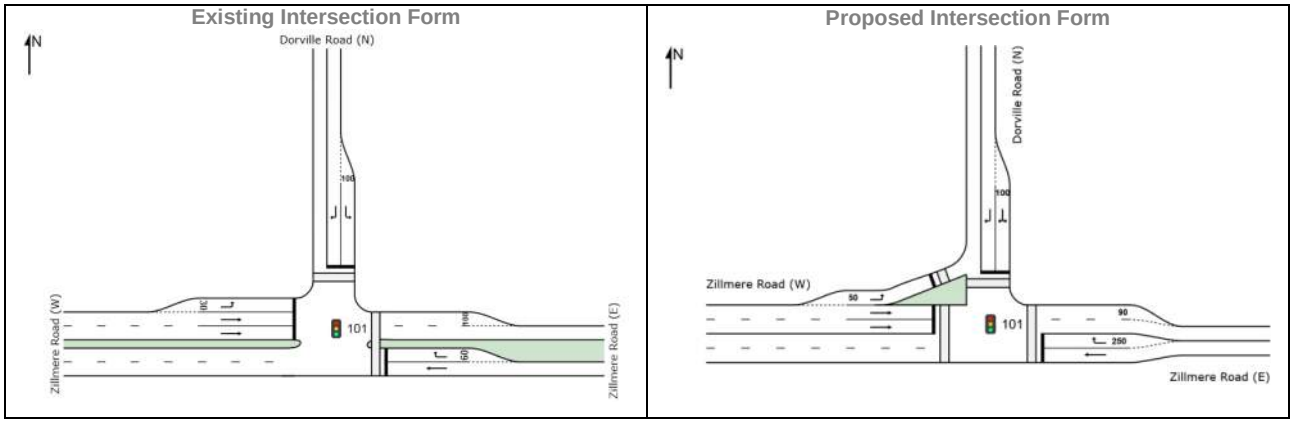


Table 4-3 SIDRA Results – Dorville Road / Zillmere Road Intersection

Scenarios	AM Peak			PM Peak		
	DOS	Delay	95th %ile Queue	DOS	Delay	95th %ile Queue
2022 Background + Development (Ultimate)	0.764	33.2 sec	178.1m	0.756	39.7 sec	302.5m
2032 Background + Development (Ultimate)	0.902	38.5 sec	272.6m	0.877	47.6 sec	423.7m

Maximum preferred DoS of 0.900 for a signalised intersection

The results presented in Table 4-3 indicate that the proposed upgrade for the Dorville Road / Zillmere Road intersection will operate within the thresholds set by DTMR Guidelines for Assessment Road Impacts Development of a maximum DOS of 0.9 for a signalised intersection for all scenarios with the exception of 2032 AM peak with development which is slightly over at DOS of 0.902. This is considered to be negligible for the intersection operations.

4.1.3 Upgrade Timing

The timing of the proposed upgrade form is identified to be necessary at the completion of Stage 1 of the CUV. Based on approximate timing of Stage 1 being completed by 2020, it has been identified that the existing form of the signalised intersection will exceed acceptable capacity thresholds at this time. Table 4-4 outlines the results of the threshold scenario for the existing intersection form.

Table 4-4 SIDRA Results – Dorville Road / Zillmere Road Intersection – Upgrade Timing

Scenarios	AM Peak			PM Peak		
	DOS	Delay	95th %ile Queue	DOS	Delay	95th %ile Queue
2020 Background + Development (Stage 1)	0.567	29.5 sec	161.0m	**0.936**	48.2 sec	311.1m

As the DOS of the intersection at the PM peak scenario is only slightly over the threshold of 0.90 for signalised intersections, it is believed that it will not present a major issue. In congested urban areas, it is considered acceptable to allow for up to DOS of 0.95, therefore the maximum expected operations performance of 0.936 is considered to be suitable before the proposed upgrade is completed.

4.2 004 – Beams Road / Dorville Road

4.2.1 Existing Form

The existing form of the Beams Road / Dorville Road intersection is illustrated on Figure 4-4. Results for the background traffic scenarios are reported in Table 4-5.

Figure 4-4 Beams Road / Dorville Road – Existing Intersection Form

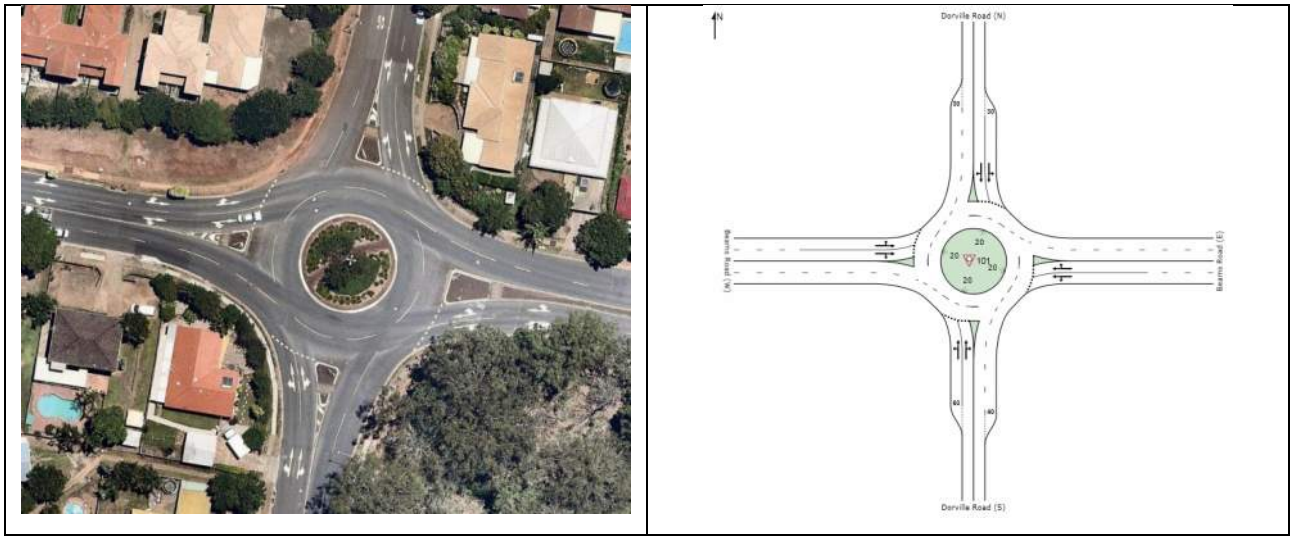


Table 4-5 SIDRA Results – Beams Road / Dorville Road Intersection

Scenarios	AM Peak			PM Peak		
	DOS	Delay	95th %ile Queue	DOS	Delay	95th %ile Queue
2016 Background	0.503	10.3 sec	26.2m	0.616	10.9 sec	32.5m
2022 Background	0.561	13.0 sec	32.1m	0.720	11.8 sec	45.6m
2032 Background	0.702	23.0 sec	59.5m	**0.925**	**20.7 sec**	**109.8m**

Maximum preferred DoS of 0.850 for a roundabout

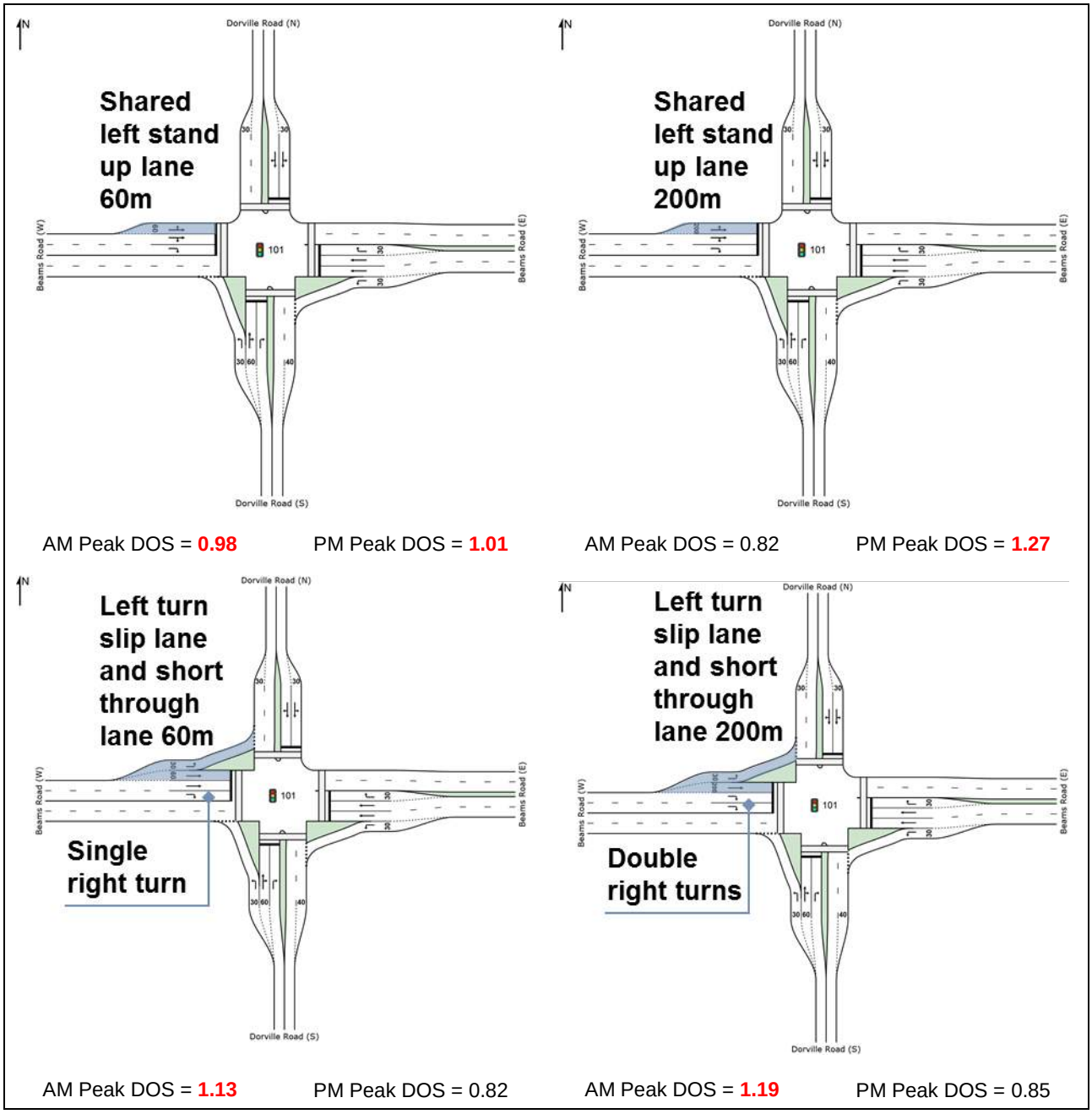
The results of the Beams Road / Dorville Road intersection analysis has identified that the roundabout will reach maximum preferred capacity prior to the 2032 design horizon under existing network conditions.

4.2.2 Proposed Form

The existing form of the Beams Road / Dorville Road roundabout will reach maximum capacity prior to 2032 without the impact of the proposed development.

The constraining point for the roundabout operation is identified by the SIDRA analysis as the left lane on the southern Dorville Road approach. This is driven by the high left turn demand at the southern approach being opposed by the roughly equal through volume arriving from Beam Road east. Therefore, a signalised form was tested to investigate whether the controlled timing would provide better capacity for the southern approach. Figure 4-5 illustrates the different forms tested, with the differences between the forms indicated.

Figure 4-5 Beams Road / Dorville Road – Signalised Forms Investigated



As indicated, all forms exceed the capacity threshold (DOS>0.85) in the AM or PM peak periods. Therefore, in addition to calling for a larger footprint than the existing roundabout form, the operation of all the signalised forms investigated exceed capacity and are found to not be acceptable. Therefore, improvements to the existing roundabout were investigated.

Figure 4-6 identifies necessary upgrade works required to accommodate the future traffic of CUV as well as forecast background traffic. The additional intersection requirements include:

- Provision for a short (60m) left-turn slip lane on Beams Road (E);
- Reallocation of turn movements on Dorville Road (S) approach, allowing for a dedicated left turn lane;
- Lane lengthening of the left lane on Dorville Road (S) approach from a short lane to a full lane, as a result of the lengthened exit lane from intersection 002 Dorville Road / CUV Access (South) / Whitehorse Street Intersection.

Cardno has prepared a concept design sketch for the proposed upgrades, which can be found at Appendix F (dwg no. CEB06857-SK03). While it is acknowledged that the introduction of a slip lane is not the safest

arrangement for cyclists, being an arterial road, the strategic intent of Beams Road is as a through traffic corridor.

SIDRA analysis results have been provided in Table 4-6.

Figure 4-6 Beams Road / Dorville Road – Existing and Proposed Form

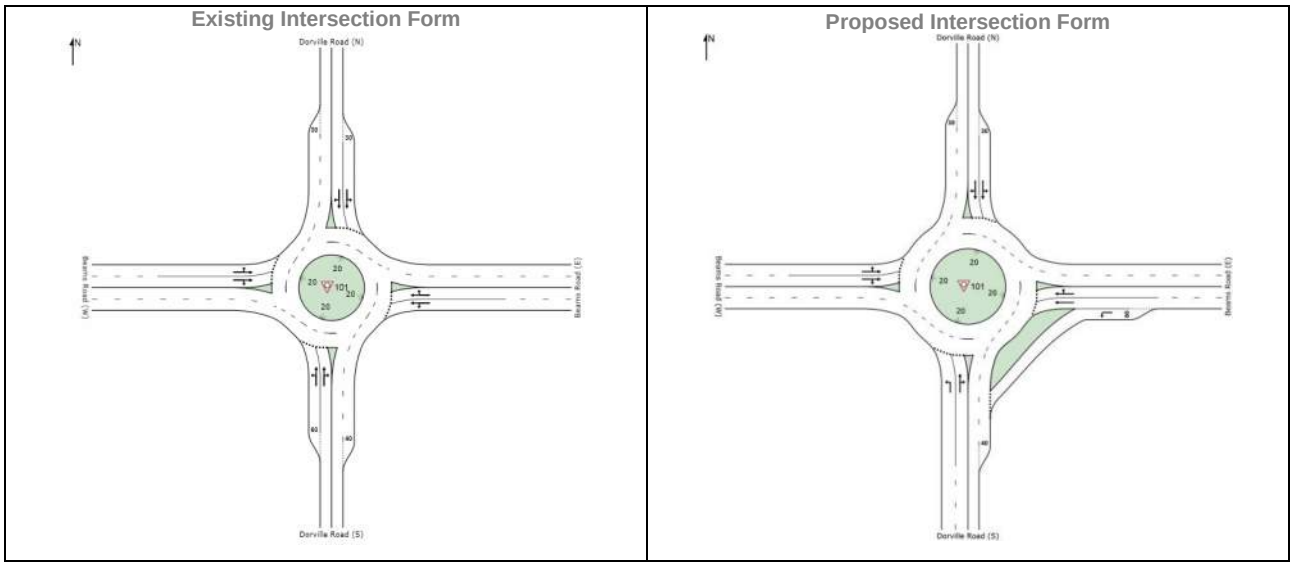


Table 4-6 SIDRA Results – Beams Road / Dorville Road Intersection

Scenarios	AM Peak			PM Peak		
	DOS	Delay	95th %ile Queue	DOS	Delay	95th %ile Queue
2022 Background + Development (Ultimate)	0.589	10.4 sec	34.0m	0.667	12.0 sec	32.4m
2032 Background + Development (Ultimate)	0.707	12.4 sec	51.0m	0.842	15.2 sec	59.1m

Maximum preferred DoS of 0.850 for a roundabout

The results presented in Table 4-6 indicate that the proposed form of the Beams Road / Dorville Road roundabout will operate within maximum preferred parameters for all scenarios. The addition of a dedicated slip lane for left turns on the Beams Road (East) approach significantly mitigates the impact of the proposed development.

4.2.3 Upgrade Timing

Cardno has identified that the existing form of the intersection will not exceed capacity thresholds until the completion of Stage V. This is based on the assumption that Stage V will be completed at 2022. Table 4-7 reports the results for the threshold scenario for the existing roundabout form.

Table 4-7 SIDRA Results – Beams Road / Dorville Road Intersection – Upgrade Timing

Scenarios	AM Peak			PM Peak		
	DOS	Delay	95th %ile Queue	DOS	Delay	95th %ile Queue
2022 Background + Development (Stage V)	0.581	9.3 sec	39.1m	0.890	16.7 sec	137.3m

At this time, the proposed upgrade form will be required.

4.3 005 – Beams Road / Balcara Avenue

4.3.1 Existing Form

The existing form of the Beams Road / Balcara Avenue intersection is illustrated on Figure 4-7. Results for the background traffic scenarios are reported in Table 4-8.

Figure 4-7 Beams Road / Balcara Avenue – Existing Intersection Form

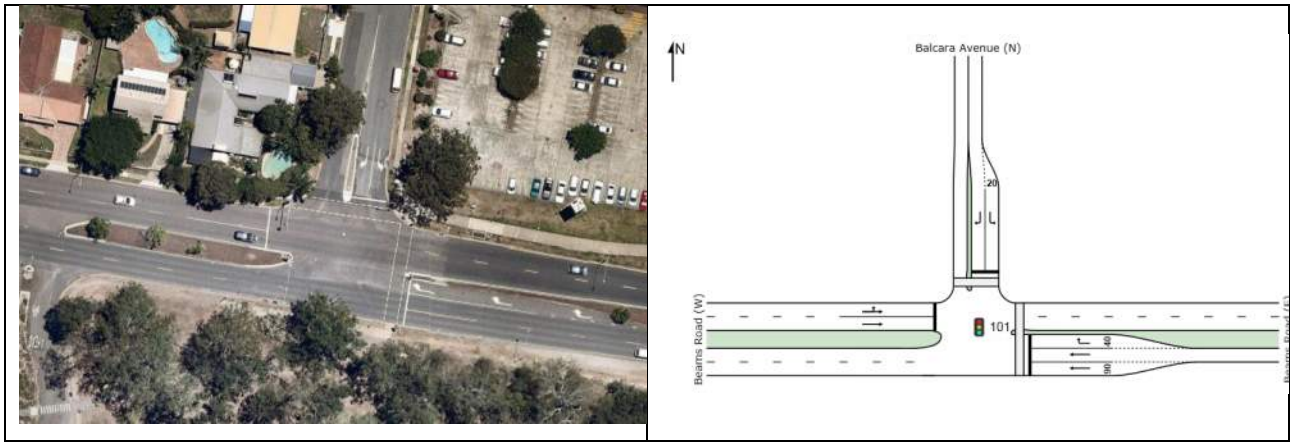


Table 4-8 SIDRA Results – Beams Road / Balcara Avenue Intersection

Scenarios	AM Peak			PM Peak		
	DOS	Delay	95th %ile Queue	DOS	Delay	95th %ile Queue
2016 Background	0.297	12.6 sec	76.3m	0.282	14.6 sec	77.8m
2022 Background	0.330	11.7 sec	85.6m	0.308	14.0 sec	87.0m
2032 Background	0.379	11.1 sec	103.1m	0.352	13.0 sec	100.1m

Maximum preferred DoS of 0.900 for a signalised intersection

The operation of the Beams Road / Balcara Avenue intersection is significantly under maximum preferred parameters, and the ultimate intersection form will be dictated by the additional southern approach for the CUV access.

4.3.2 Proposed Form

As a result of the proposed subject site gaining access off this existing intersection, additional infrastructure is required to accommodate vehicle trips into and out of the site. The existing and proposed form of the Beams Road / Balcara Avenue is illustrated in Figure 4-8, with detailed additions noted below:

- Provision for a short (150m) right-turn lane on the Beams Road (W) approach;
- Provision for a full length left turn lane on the southern approach;
- Provision for a short (60m) through and right-turn lane on the southern approach;
- Extension of existing short through lane on Beams Road (E) to 150m with high-angle left turn;
- Provision for a full length exit lane on the southern leg;
- Line marking change on Balcara Avenue (N) approach right lane to allow for shared right-turn and through movements; and
- Shortening of left exit lane from full length to 60m on the eastern leg.

Cardno has prepared a concept design sketch for the proposed upgrades, which can be found at Appendix F (dwg no. CEB06857-SK04). SIDRA analysis results have been provided in Table 4-9. It is noted that the analysis was undertaken with the following input:

- Delayed start for left turn vehicles when opposed by pedestrians (6 second delay)

Figure 4-8 Dorville Road / Balcara Avenue / CUV Access – Existing and Proposed Form

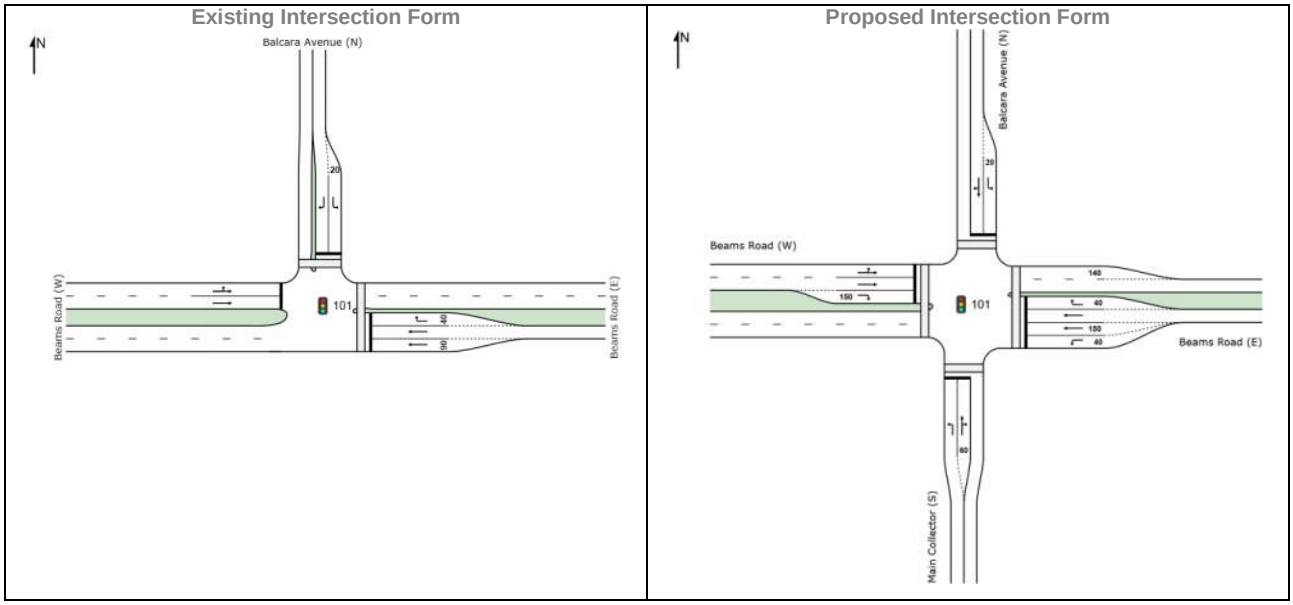


Table 4-9 SIDRA Results – Dorville Road / Balcara Avenue / CUV Access Intersection

Scenarios	AM Peak			PM Peak		
	DOS	Delay	95th %ile Queue	DOS	Delay	95th %ile Queue
2022 Background + Development (Ultimate)	0.587	36.4 sec	197.9m	0.753	51.3 sec	205.3m
2032 Background + Development (Ultimate)	0.675	36.4 sec	243.6m	0.822	53.1 sec	249.5m

Maximum preferred DoS of 0.900 for a signalised intersection

The results presented in Table 4-9 indicate that the proposed form of the Dorville Road / Balcara Avenue / CUV Access intersection will operate at or within maximum preferred parameters under all design scenarios.

4.3.3 Upgrade Timing

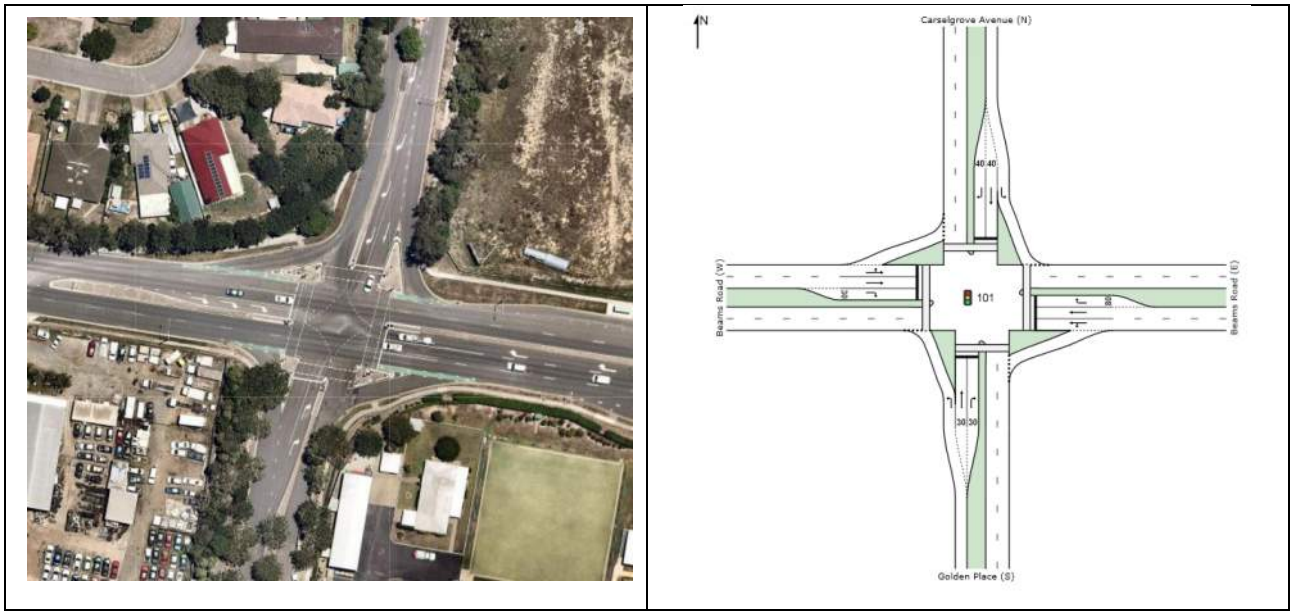
As the introduction of the fourth approach to this intersection will form part of Stage 1, providing access to this stage and the ultimate development, this upgrade will be required as a matter of functionality for the network. Therefore, the upgrade will be required prior to the completion of Stage 1.

4.4 006 – Beams Road / Carselgrove Avenue / Golden Place

4.4.1 Existing Form

The existing form of the Beams Road / Carselgrove Avenue / Golden Place intersection is illustrated on Figure 4-9. Results for the background traffic scenarios are reported in Table 4-10.

Figure 4-9 Beams Road / Carselgrove Avenue / Golden Place – Existing Intersection Form



Maximum preferred DoS of 0.900 for a signalised intersection

Table 4-10 SIDRA Results – Beams Road / Carselgrove Avenue / Golden Place Intersection

Scenarios	AM Peak			PM Peak		
	DOS	Delay	95th %ile Queue	DOS	Delay	95th %ile Queue
2016 Background	0.479	36.0 sec	139.3m	0.470	37.6 sec	129.4m
2022 Background	0.536	36.9 sec	160.9m	0.525	38.7 sec	148.4m
2032 Background	0.633	38.7 sec	199.4m	0.619	40.5sec	183.3m

The Beams Road / Carselgrove Avenue / Golden Place intersection does not surpass the maximum preferred degree of saturation for a signalised intersection in the 2032 design year for either peak periods. It is worth noting however that the 95th percentile queue of 179.5m in the AM peak occurs on the western approach, and due to the proximity of the Beams Road open level crossing, this will need to be monitored in the 'with development' scenario.

4.4.2 Proposed Form

The form of the Beams Road / Carselgrove Avenue / Golden Place intersection does not require any upgrade works to mitigate the impact of the proposed Carseldine Urban Village. Results of the intersection assessment for the 'with development' scenarios has been provided in Table 4-11.

Table 4-11 SIDRA Results – Beams Road / Carselgrove Avenue / Golden Place Intersection

Scenarios	AM Peak			PM Peak		
	DOS	Delay	95th %ile Queue	DOS	Delay	95th %ile Queue
2022 Background + Development (Ultimate)	0.550	36.7 sec	168.9m	0.552	39.0 sec	164.3m
2032 Background + Development (Ultimate)	0.647	39.0 sec	210.5m	0.643	40.8 sec	200.6m

Maximum preferred DoS of 0.900 for a signalised intersection

The intersection operates within maximum preferred thresholds for all design scenarios and does not generate significant delays for motorists. The 95th percentile queue experienced on the western leg is approximately 211m, which does not extend past the open level crossing, as identified in Figure 4-10.

Figure 4-10 Intersection Separation to Train Crossing

Source: Nearmap.com, Economic Development Queensland

4.5 007 – Beams Road / Carseldine Train Station Access

This intersection is located wholly within the PDA site and as such, is under the jurisdiction of EDQ. Assessment of this intersection has been included for information purposes.

4.5.1 Existing Form

The existing form of the Beams Road / Carseldine Train Station Access intersection is illustrated on Figure 4-11. Results for the background traffic scenarios are reported in Table 4-12.

Figure 4-11 Beams Road / Carseldine Train Station Access – Existing Intersection Form

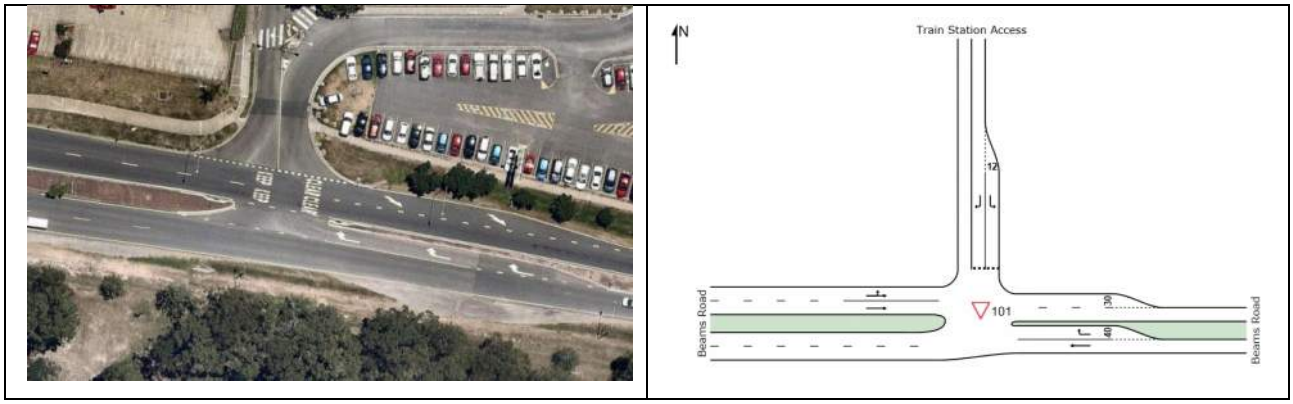


Table 4-12 SIDRA Results – Beams Road / Carseldine Train Station Access Intersection

Scenarios	AM Peak			PM Peak		
	DOS	Delay	95th %ile Queue	DOS	Delay	95th %ile Queue
2016 Background	0.351	36.6 sec	8.6m	0.376	32.7 sec	11.2m
2022 Background	0.393	51.6 sec	11.5m	0.499	46.9 sec	14.9m
2032 Background	0.663	112.0 sec	20.1m	0.830	121.6 sec	29.5m

Maximum preferred DoS of 0.800 for an unsignalised intersection

The Beams Road intersection with the Carseldine Train Station Access reaches maximum preferred operating parameters for the 2032 design year without the additional traffic generated by the proposed CUV. The future form and operation of this intersection will be considered when assessing the 'with development' scenario.

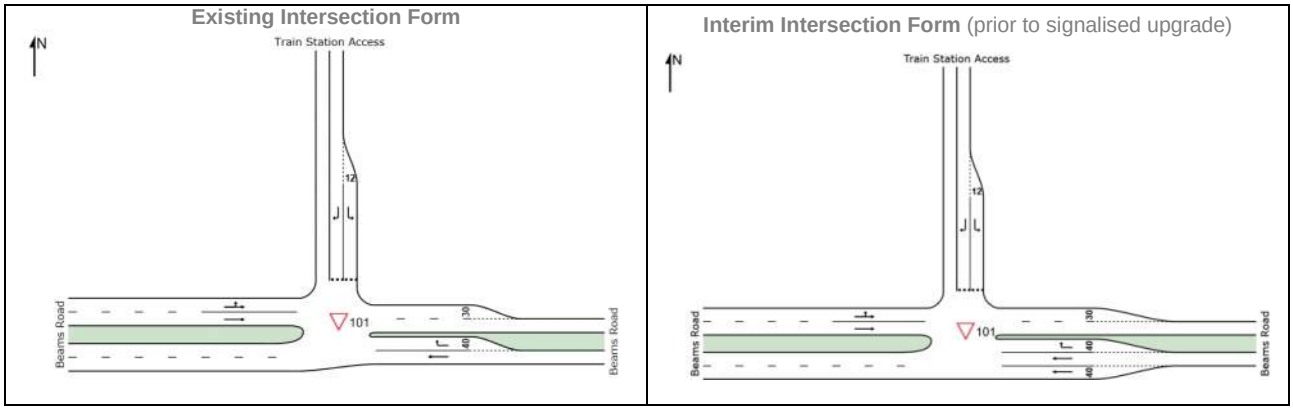
This intersection provides access to the Carseldine Train Station which is subject to the investigation of the Carseldine Rail Station Park and Ride Project. The project is assessing the existing layout of the Carseldine Train Station and may upgrade the facility. In which case any upgrade would directly traffic impact the demands of the existing Beams Road / Carseldine Train Station Access intersection.

Furthermore, as part of the Beams Road Open Level Crossing Upgrade, an option that is currently under investigation is providing an overpass at the location. Consequently, preliminary findings from the study indicate that the intersection may be removed altogether in order to build an overpass. Given the two projects at this location, it is imperative to understand the outcomes to further analyse the intersection. Nonetheless, Cardno has proposed intersection form which has been analysed below.

4.5.2 Interim Intersection Form

The existing unsignalised form of the Beams Road / Carseldine Train Station Access intersection exceeds performance thresholds for the 2032 design year. However, it is noted that the upgrade proposed for the upstream Beams Road / Balcara Avenue / CUV Access intersection immediately west of the intersection will impact on the form on the Carseldine Train Station Access intersection. This relates to the lengthened through lane extending across this intersection. The form of this is shown on Figure 4-11.

Figure 4-12 Beams Road / Carseldine Train Station Access – Existing and Interim Intersection Form



Results for this form are reporting in Table 4-13.

Table 4-13 SIDRA Results – Beams Road / Carseldine Train Station Access – Interim Form

Scenarios	AM Peak			PM Peak		
	DOS	Delay	95th %ile Queue	DOS	Delay	95th %ile Queue
2022 BG + Dev	0.457	60.2 sec	11.5m	0.738	86.9 sec	22.0m
2032 BG + Dev	0.779	148.4 sec	21.5m	**1.235**	**365.9 sec**	**91.9m**

The results of the intersection analysis indicate that the interim intersection form will exceed capacity thresholds at the 2032 with development traffic design horizon. This is due to the larger critical gap required for vehicles exiting the train station. Although the intersection exceeds capacity thresholds, it is expected that either it will be for a short period or the intersection alignment will no longer be the same in the 2032 design horizon. With the investigation of the Carseldine Rail Station Park and Ride Project and Beams Road level crossing project, Cardno believes this intersection should be reassessed in the future pending the outcome of these key projects.

4.6 029 - Beams Road / CUV Access (Left-in / Left-out)

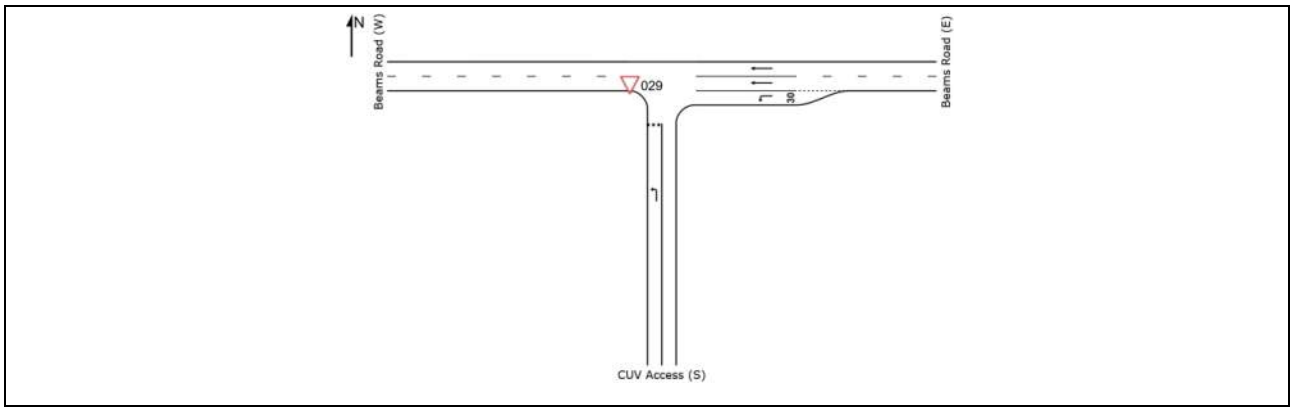
4.6.1 Existing Form

As this is a new intersection introduced as part of the CUV development, there is not existing form to assess.

4.6.2 Proposed Form

The proposed form of the left in left out access from Beams Road is illustrated on Figure 4-13. Cardno has prepared a concept design sketch for the proposed upgrades, which can be found at Appendix F (dwg no. CEB06857-SK10).

Figure 4-13 Beams Road / CUV Access (Left-in / Left-out) – Proposed Intersection Form



SIDRA analysis results have been provided in Table 4-14.

Table 4-14 SIDRA Results – Beams Road / CUV Access (Left-in / Left-out)

Scenarios	AM Peak			PM Peak		
	DOS	Delay	95th %ile Queue	DOS	Delay	95th %ile Queue
2022 Background + Development (Ultimate)	0.229	5.5 sec	1.8m	0.227	5.5 sec	7.1m
2032 Background + Development (Ultimate)	0.263	5.5 sec	1.9m	0.262	5.5 sec	7.6m

Maximum preferred DoS of 0.800 for a priority controlled intersection

As indicated from the results, the operation of the proposed left in left out access is expected to remain within maximum preferred parameters under all design scenarios. The maximum queueing internal to the site is expected to be 7.6m which will not block the adjacent internal intersection which is located approximately 35m upstream.

4.6.3 Upgrade Timing

As the introduction of this intersection will form part of Stage 1, providing access to the existing government precinct and the ultimate development, this upgrade will be required as a matter of functionality for the network. Therefore, the upgrade will be required prior to the completion of Stage 1.

4.7 Upgrade Timing Summary

The estimated timing for the proposed upgrades will be dependent upon the staging of the development and impacts on the road network. For the purposes of this assessment, it has been assumed that Stage 1 will be completed at 2019 and Stage 4 will be completed at 2022. Table 4-15 summarises the proposed upgrade timing.

Table 4-15 Proposed Upgrade Timing

Intersection		Proposed Upgrade Timing
001	Dorville Road / Zillmere Road	Before Stage 1 completion^
004	Dorville Road / Beams Road	Before Stage V completion*
005	Beams Road / Balcara Avenue / CUV Access	Before Stage 1 completion
007	Beams Road / Carseldine Train Station Access	Before Stage 1 completion (interim form)
029	Beams Road / CUV Access (Left-in / Left-out)	Before Stage 1 completion

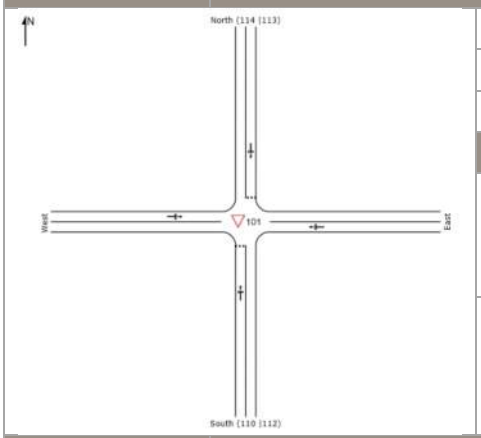
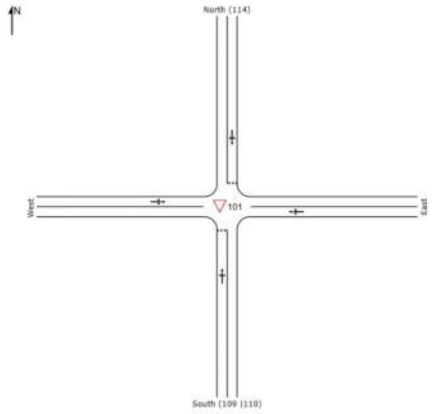
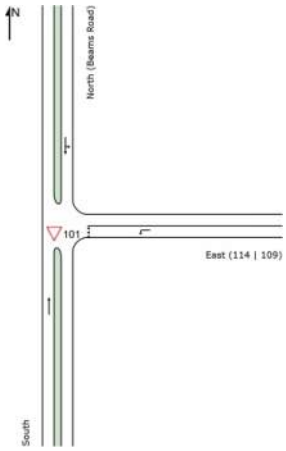
^ Assuming Stage 1 is completed at 2020, * Assuming Stage V is completed at 2022

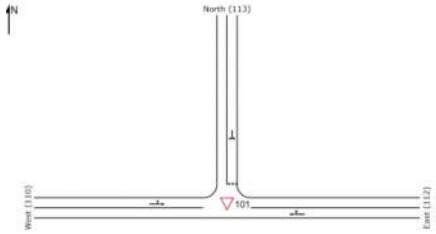
5 Intersection Analysis – Internal Network

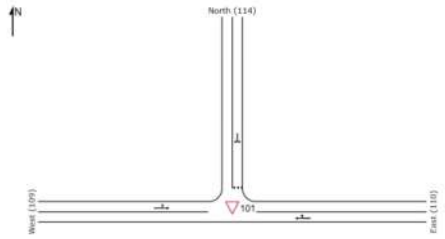
5.1 Operational Performance

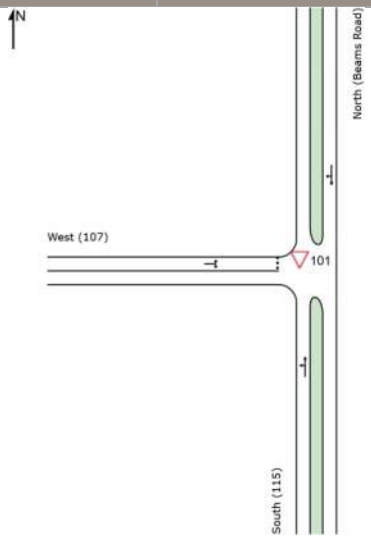
All internal intersections were assessed assuming ultimate development yield in 2032. A summary of the assessment results are shown in Table 5-1.

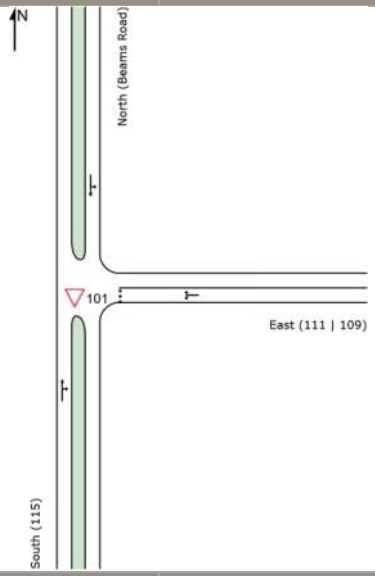
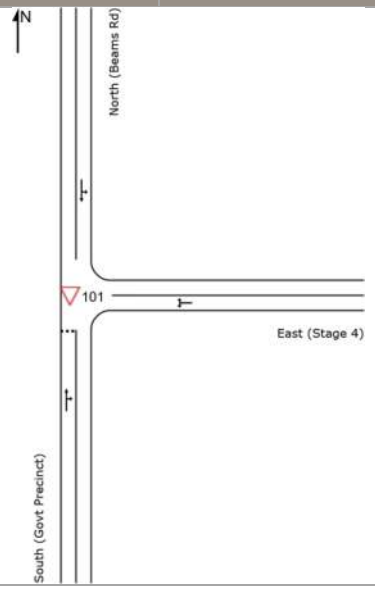
Table 5-1 SIDRA Intersection Analysis Results Summary – Internal Intersections

013				
	**Configuration:**	Four-way		
	Control Type:	Priority		
	Scenario	Development Traffic Only		
	SIDRA Results	**DoS**	**Delay**	**95th %ile queue**
	AM Peak	0.015	5.6 sec	0.4m
	PM Peak	0.018	5.6 sec	0.5m
009				
	**Configuration:**	Four-way		
	Control Type:	Priority		
	Scenario	Development Traffic Only		
	SIDRA Results	**DoS**	**Delay**	**95th %ile queue**
	AM Peak	0.020	5.8 sec	0.5m
	PM Peak	0.044	5.9 sec	1.1m
010				
	**Configuration:**	T-intersection		
	Control Type:	Priority		
	Scenario	Development Traffic Only		
	SIDRA Results	**DoS**	**Delay**	**95th %ile queue**
	AM Peak	0.036	5.7 sec	0.0m
	PM Peak	0.178	6.3 sec	0.0m

014				
	**Configuration:**	T-intersection		
	Control Type:	Priority		
	Scenario	Development Traffic Only		
	SIDRA Results	**DoS**	**Delay**	**95th %ile queue**
	AM Peak	0.005	5.5 sec	0.1m
	PM Peak	0.003	5.5 sec	0.1m

012				
	**Configuration:**	T-intersection		
	Control Type:	Priority		
	Scenario	Development Traffic Only		
	SIDRA Results	**DoS**	**Delay**	**95th %ile queue**
	AM Peak	0.009	5.5 sec	0.2m
	PM Peak	0.038	5.7 sec	0.1m

019				
	**Configuration:**	T-intersection		
	Control Type:	Priority		
	Scenario	Development Traffic Only		
	SIDRA Results	**DoS**	**SIDRA Results**	**95th %ile queue**
	AM Peak	0.009	**AM Peak**	0.2m
	PM Peak	0.038	**PM Peak**	0.1m

020				
	**Configuration:**	T-intersection		
	Control Type:	Priority		
	Scenario	Development Traffic Only		
	SIDRA Results	**DoS**	**Delay**	**95th %ile queue**
	AM Peak	0.013	5.5 sec	0.3m
	PM Peak	0.048	5.6 sec	0.6m
025				
	**Configuration:**	T-intersection		
	Control Type:	Priority		
	Scenario	Development Traffic Only		
	SIDRA Results	**DoS**	**Delay**	**95th %ile queue**
	AM Peak	0.040	5.5 sec	1.0m
	PM Peak	0.120	5.6 sec	3.3m

The analysis results indicate that the internal intersections will operate within the acceptable DOS thresholds during both peak periods in the year 2032.

6 Transport Network Safety

6.1 Pedestrian Safety

Pedestrian safety is upheld with a continuous network of footpaths along all internal roads. Crossing locations are provided at key intersections, with pedestrian refuges provided near the village heart where the majority of pedestrian traffic will occur.

A shared path is proposed along the road fronting the sports precinct and extending along the road parallel to the railway line. This will allow pedestrians to move within a corridor separate from vehicles, while mixing with cyclists. Being designed at 3.0m width, this facility is in excess of the 2.5m desired minimum width for local access shared paths as outlined in Austroads Guide to Road Design Part 6A: Paths for Walking and Cycling.

6.2 Cyclist Safety

In line with current best practice, the development proposes to provide a separated cycleway along the length of the main boulevard connecting Beams Road to Dorville Road. This level of facility is endorsed by the Department of Transport and Main Roads (TMR) through the published Technical Note TN128 Selection and Design of Cycle Tracks (May 2015).

Physically separating cyclists from both vehicles and pedestrians, this limits the risk of conflicts along the route. It is noted that intersection treatments will need to be designed in accordance with TN128 to ensure conflicting movements are managed in the safest manner. With this in mind, the number of crossings along this cycleway has been reduced to two intersections, with limited access for the laneways proposed in Stage 1, which will truncate before connecting to the cycleway. Similarly, the treatment at the Beams Road/CUV Access/Balcara Street intersection will need to be designed in accordance with TN128 to ensure the safety of all road users will be upheld.

It is noted that prior to connection of the main boulevard through to Dorville Road, the separated cycleway will connect to the existing bikeway path to provide a continuous connection for cyclists passing through the site.

As mentioned above, a shared path is proposed near the sports precinct. This will allow pedestrians and cyclists to move within a shared leisure space.

6.3 Driver Safety

The safety of drivers is largely enforced via a slow speed environment throughout the precinct. The highest order of road, the main boulevard section between Beams Road and the retirement village, is classed as a Neighbourhood road which specifies design speed of up to 50km/h. All other roads will be local streets with unposted speed limits, therefore a limit of 50km/h will apply.

Major intersection forms have been designed to be limited to three way junctions, rather than four way intersections, to minimise conflict points. Minor intersections with local traffic function have been designed as four way intersections, however these are noted to have limited traffic and therefore reduced risk of conflict.

Horizontal alignment for the roads has been designed with straight alignment where possible. Where curves have been designed, intersections have been avoided to ensure potential conflicts are minimised.

7 Summary

Cardno has been commissioned by Economic Development Queensland (EDQ) to provide traffic and transport advice in relation to the proposed Carseldine Urban Village (CUV) development, which forms Precinct 1 of the greater Fitzgibbon Priority Development Area (PDA). The proposed development is comprised of a mixed use urban village core providing the community with employment opportunities and recreational land like sporting facilities and parklands.

Cardno has prepared a Traffic Impact Assessment (TIA) for EDQ. The report identifies potential impacts of the development on the surrounding transport network, inclusive of railway, public transport and active transport considerations.

The following intersections, external to the development, have been assessed within this report;

- Dorville Road / Zillmere Road Intersection
- Beams Road / Dorville Road
- Beams Road / Balcara Avenue
- Beams Road / Carselgrove Avenue / Golden Place
- Beams Road / CUV Access (Left-in / Left-out)
- Beams Road / Carseldine Train Station Access

It was found that a few of the intersections above will need to be upgraded to accommodate for traffic growth and development traffic generation. Cardno has provided proposed intersection upgrade layouts to ensure the functionality of the above intersections.

Cardno believes that the findings outlined within this TIA are in compliance with standard traffic engineering practices and accurately depict the impacts on the surrounding and internal road networks of the developments.

Traffic Impact Assessment

APPENDIX A
DEVELOPMENT MASTERPLAN

Cardno
Shaping the Future

Development Yield (Maximum Density)	
Residential Dwellings	606 dwellings
Commercial (sq.m)	15,050 sq.m GFA ^
Retail (sq.m)	4,000 sq.m GFA
Childcare	100 children

^ Includes existing commercial and community uses.

Legend

- Site Boundary
- Proposed Stage Boundary
- Mixed Use - Village Heart
- Mixed Use
- (3) Height Limit (Storeys)
- Indicative Civic Plaza and Pocket Park
- Special Purpose
- Civic and Open Space
- Bushland and Open Space
- Vegetation Within Road Reserve
- Future Busway Corridor
- Existing Driveway and Carpark (Retention)
- Existing Lease Boundary
- Temporary Turnaround Easement
- Investigation Area (Beams Road Railway Overpass)
- Investigation Area (Potential Road Layout Subject to Future Applications)

Beams Road

Balcara Avenue

Dorville Road

STAGE 1

STAGE V
7
1.156ha
(3)

STAGE 4
12
1.250ha
(5)

Existing Child Care

Existing Facility
(Carparking and Bushland to remain - excluded from this Masterplan Application)

Lease C on SP172124
2959m²

STG 3
6
0.432ha
(8)

1
0.405ha
(5)

11
0.249ha
(8)

8
0.131ha
(8)

10
0.159ha
(8)

9
0.114ha
(8)

STAGE 4

STAGE 1

2
0.581ha
(8)

STAGE 2
4
0.581ha
(8)

STAGE 3
5
0.841ha
(8)

3
0.911ha
(8)

STAGE S
9000
4.395ha

Existing Facility

Lease D on SP172124
8378m²

16.75m Wide

20m Wide New Road

19m Wide New Road

23m Wide New Road

23.5m Wide New Road

Vegetation Buffer Within Road Reserve

0 10 20 30 40 50 1 : 1,500 @ A1

CARSELDINE URBAN VILLAGE
OVERALL MASTERPLAN

PLAN REF: 128180 – 37O
DATE: 03 October 2019
CLIENT: EDQ
DRAWN BY: MD
CHECKED BY: MD/DG

Note:
All Lot Numbers, Dimensions and Areas are approximate only, and are subject to survey and Council approval.

Dimensions have been rounded to the nearest 0.1 metres.

Areas have been rounded down to the nearest 5m².

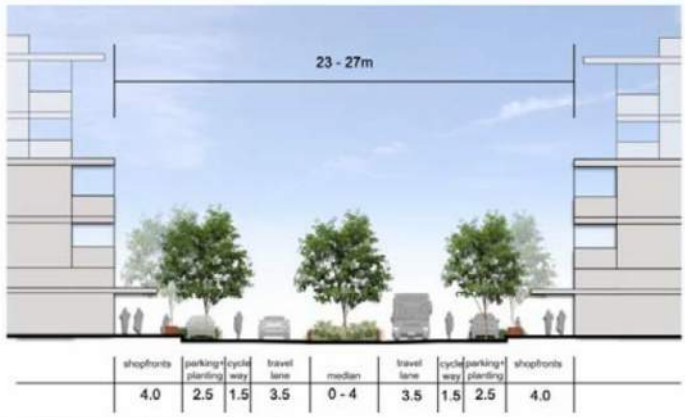
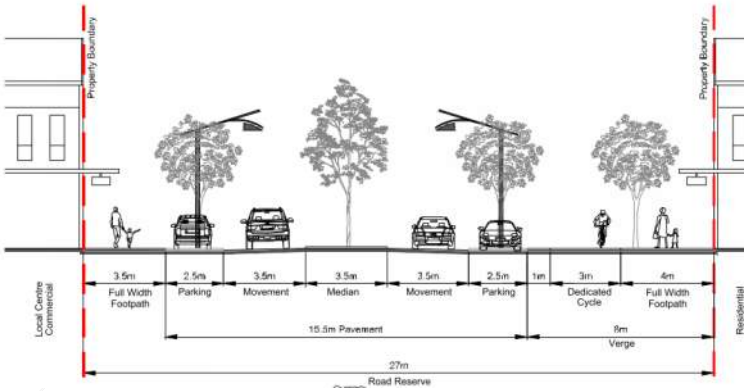
The boundaries shown on this plan should not be used for final detailed engineers design.

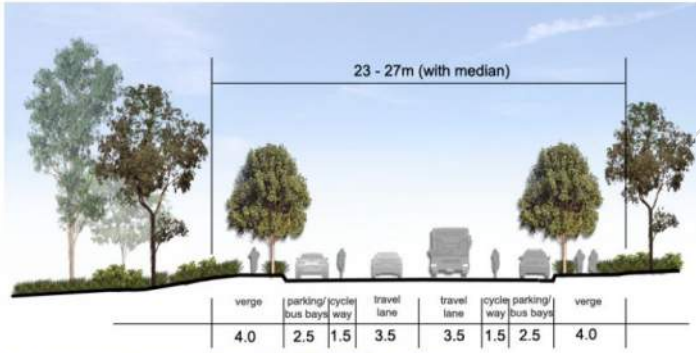
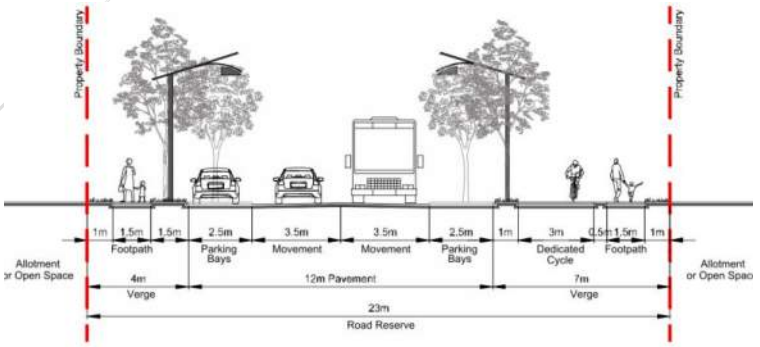
Source Information:
Site boundaries: Registered Survey Plans.
Adjoining information: DCDB.
Contours: QUT.

URBAN DESIGN
Level 4 HQ South
520 Wickham Street
PO Box 1559
Fortitude Valley QLD 4006
T +61 7 3539 9500
W rpsgroup.com

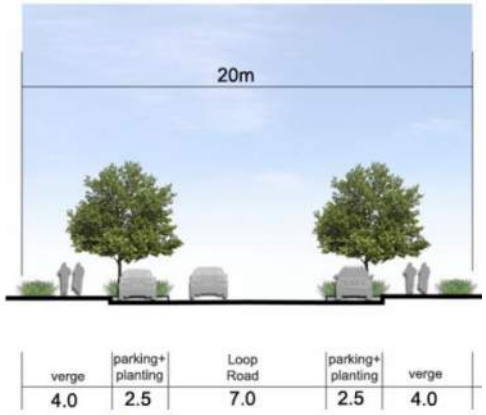
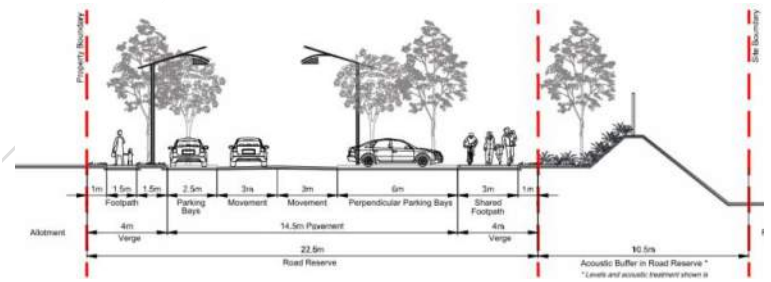
APPENDIX B
CROSS SECTION COMPARISON

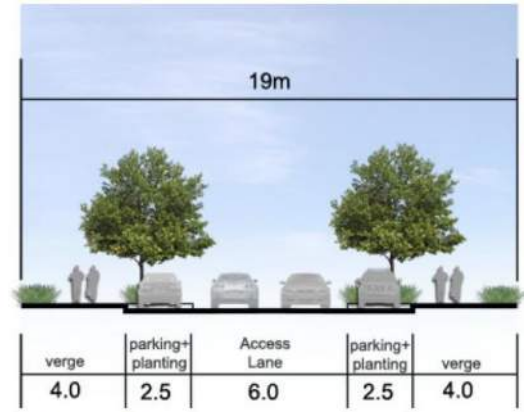
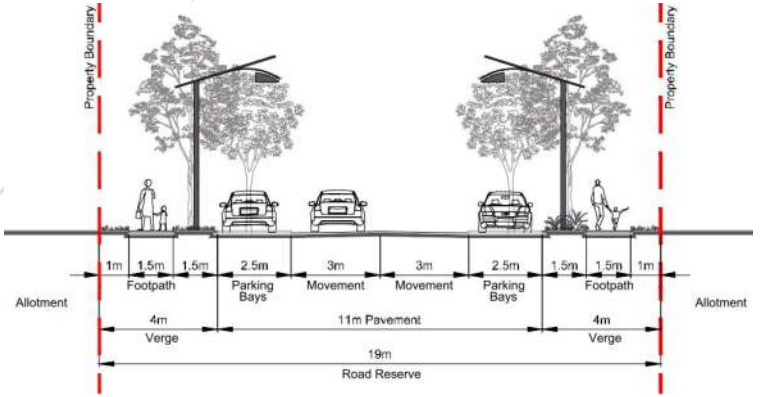
Cardno
Shaping the Future

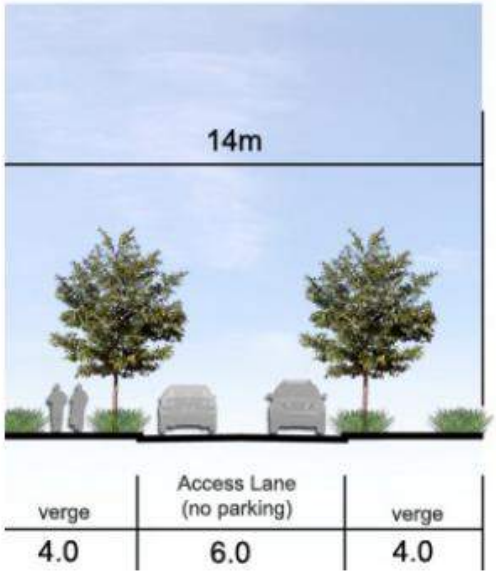
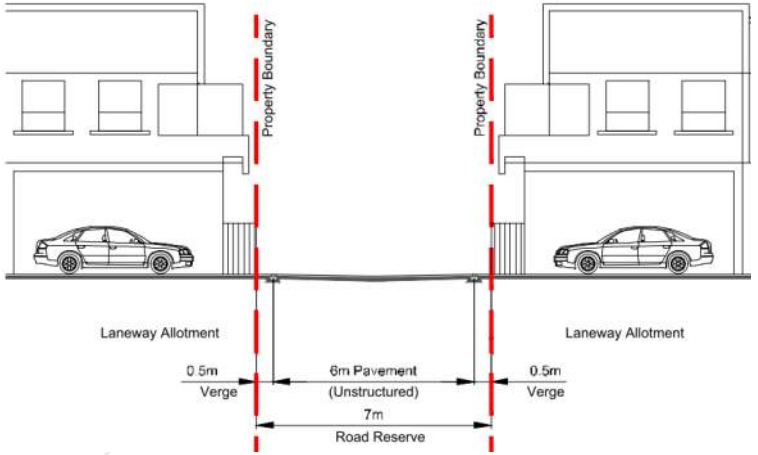
Development Scheme	Proposal	Summary of Differences	Comments
 1. Village Main Street		▪ Reduction of left-side verge from 4m to 3.5m ▪ Reconfiguration of on road cycle lanes to dedicated 2-way 3m separated cycle path on the right-side. ▪ Median resized to 3.5m	▪ The new configuration of the road cross-section has retained many of its key components and original width of a maximum of 27m. ▪ The proposed cross-section provides a two-way separated cycle way facility. Additionally, the cycle way is provided within the verge, separated from the parking lane. This provides increased cyclist safety as parking vehicles will no longer be crossing the cycle lane to access the parking space and the risk of dooring will be eliminated.

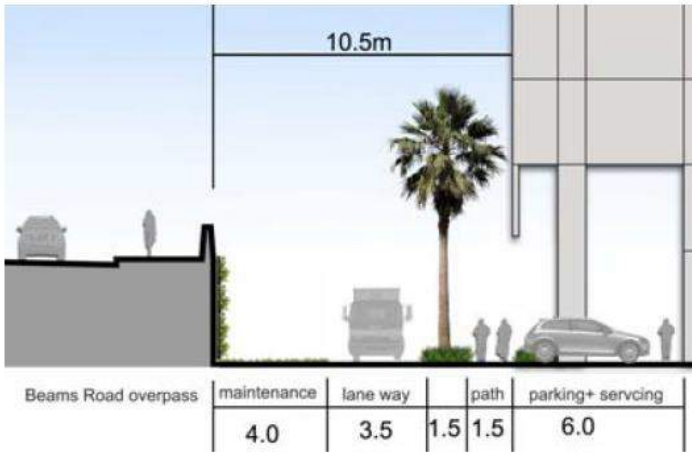
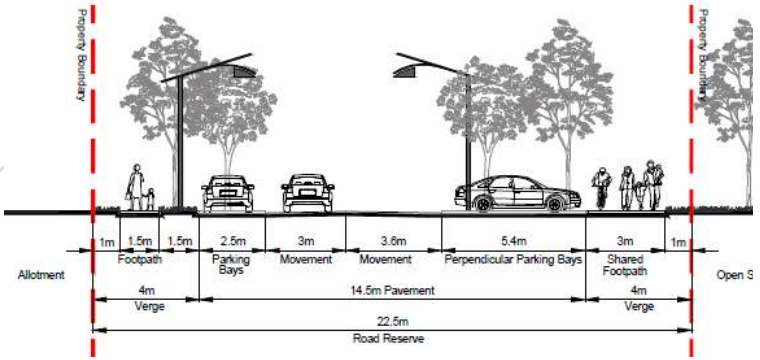
Development Scheme	Proposal	Summary of Differences	Comments
			▪ Further, as most connections filter onto the Village Main Street, it is fitting for it to have a full 3.5m and 4m wide footpath on either side of the road reserve. ▪ Lastly, a 3.5m carriageway in either direction will accommodate for larger vehicles and buses.
 2. Western Access Road / Shared Busway		▪ Reconfiguration of on road cycle lanes to dedicated 2-way 3m separated cycle way alongside a dedicated 1.5m footpath	▪ The removal of the on road cycle lanes to a 2-way separated path on one-side improves cyclist safety. ▪ Additionally, the cycle way is provided within the verge, separated from the parking lane. This provides increased cyclist safety as parking

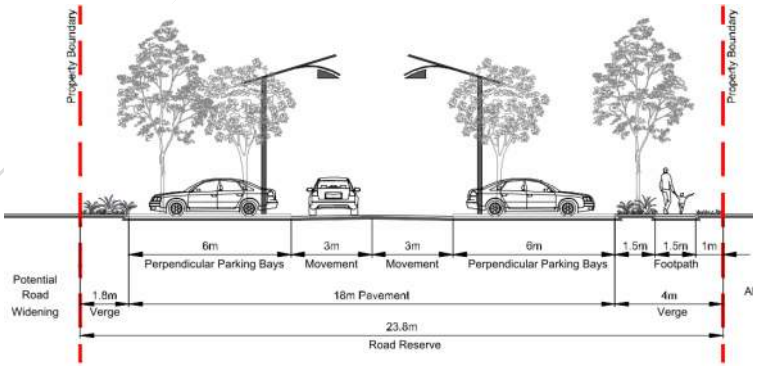
Development Scheme	Proposal	Summary of Differences	Comments
			vehicles will no longer be crossing the cycle lane to access the parking space and the risk of dooring will be eliminated. ▪ Furthermore, as the corridor is intended to be a shared busway, the 3.5m lane widths will be sufficient in accommodating for heavy vehicles. ▪ Lastly, the open space outside the verges have been indicated as possible allotment areas. This space could also be utilised for road widening in future.

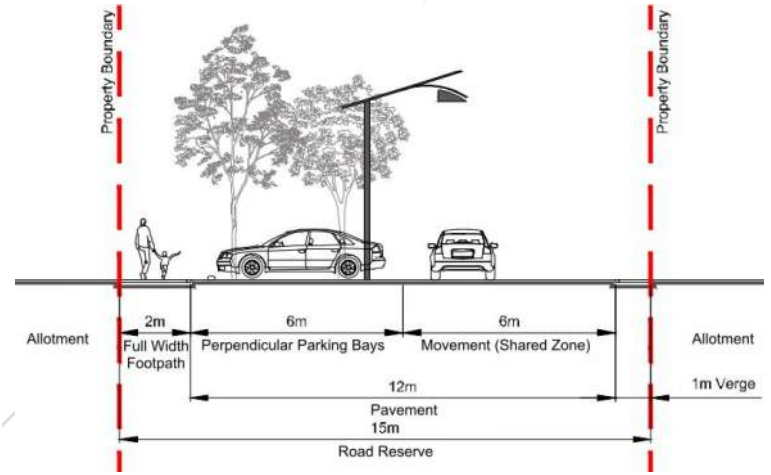
Development Scheme	Proposal	Summary of Differences	Comments
 3a. Loop Road	Not proposed to be used	▪ N/A	▪ N/A
 3b.Loop Road / Railway Esplanade		▪ Adoption of 3m shared footpath on the right-side ▪ Reduction of width of carriageway from 7m to 6m ▪ Removal of 1.5m buffer between travel lanes and parking bays ▪ Overall reduction in road reserve width from 25m to 22.5m	▪ The Railway Esplanade has been configured to encourage active transport use along the corridor. ▪ The provision of a 3m shared footpath along the rail corridor is sufficient width for mixed-active transport use. ▪ The provision of perpendicular parking bays will service the adjacent properties

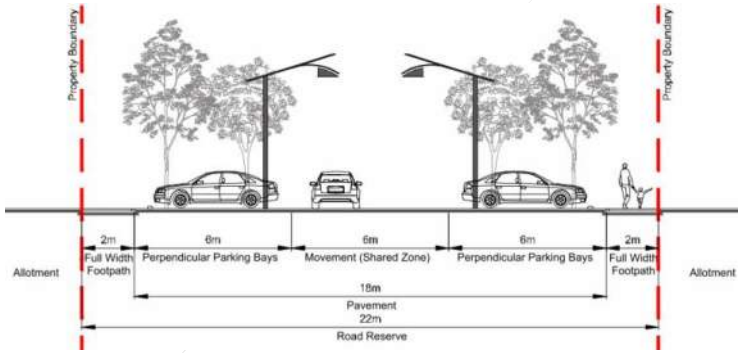
Development Scheme	Proposal	Summary of Differences	Comments
			and/or visitor to the civic and open space. ▪ Given the slow speed environment and narrowed travel lanes, risk of conflict between through vehicles and parking vehicles (entering or reversing) will be minimised.
 4. Access Place		▪ N/A	▪ No significant changes have been made to the configuration of this corridor. The access place road reserves are primarily designed for residential use. The provision of parking bays and footpaths are intended to be used by adjacent properties. Likewise, the 3m wide lanes are sufficient for

Development Scheme	Proposal	Summary of Differences	Comments
			local traffic utilisation.
 5. Access Lanes		▪ Reconfiguration of 4m lane verge to 0.5m	▪ The lane is intended to service residential dwellings, similar to the operation of a shared driveway. ▪ The configuration of the lane encourages safe and efficient vehicle movements in/out of the block, without obstruction from active travellers or parked cars.

Development Scheme	Proposal	Summary of Differences	Comments
	Not proposed to be used	▪ N/A	▪ N/A
 6. Residential Park Esplanade		▪ Removal of 10m buffer to the right-side ▪ Specifications of footpaths sizing within verge: 1.5m pedestrian path to the left and 3m shared path to the right ▪ Movement lanes increased to 6.6m from 6.0m, to accommodate manoeuvring for the 90 degree parking spaces, as per AS2890.5.	▪ The Residential Park Esplanade will primarily service the adjacent civic and open space. The parking within the road reserve will be utilised by park visitors. ▪ Coinciding with this, the shared footpath between the carriageway and parkland provides good amenity to the surrounding uses.

Development Scheme	Proposal	Summary of Differences	Comments
		Additional 0.6m width will be treated as manoeuvring space at the rear of the parking bays. ▪ 90 degree parking space length reduced to 5.4m from 6.0m (shift in length designated as manoeuvring space).	
N/A		▪ N/A	▪ The given corridor is planned to be located north of the Railway Esplanade, where further parking will be provided to service the area. ▪ The configuration of the proposed road reserve is safe for all road users and the plan has potential for road

Development Scheme	Proposal	Summary of Differences	Comments
			widening in future. ▪ Additionally, the corridor runs parallel to Beams Road- this could allow for future road widening.
N/A		▪ N/A	▪ The configuration of the proposed road reserve is safe for all road users. ▪ The road being an access lane, also provides perpendicular parking on one side of the road reserve, these spaces will service the surrounding land uses, as will this particular corridor.

Development Scheme	Proposal	Summary of Differences	Comments
N/A		▪ N/A	▪ The given corridor is intended to provide connection between the above access lane and the Village Main Street. ▪ Parking spaces will be provided along the lane and will service both nearby residents and other land use establishments along Village Main Street. ▪ Pedestrian foot paths have been provided on either side and will provide access onto Village Main Street.

APPENDIX C
ACCESS LANE SWEPT PATH

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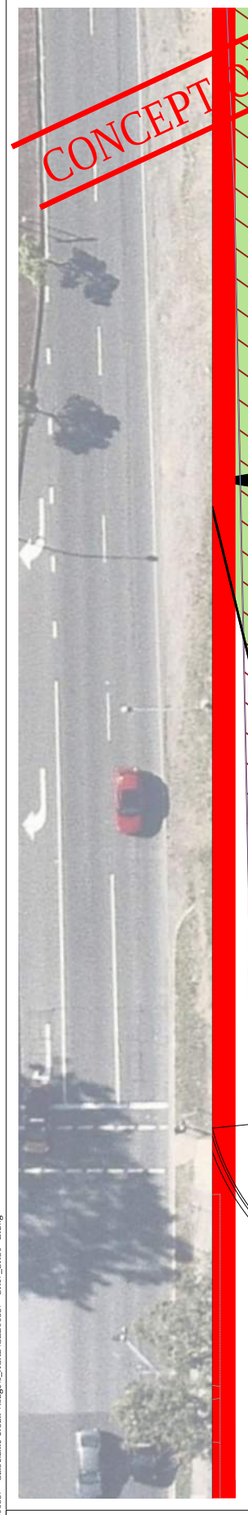
Shaping the Future

CONCEPT ONLY



MAINTENANCE ACCESS

OVERPASS

POTENTIAL 4m WIDE

11.7

11.65

9

6.5

19m Wide Street

6.5m Wide Lane

6.5m Wide Lane

19m Wide Street

6.5m Wide Lane

Lane

1001 1000 1002 1003 1004 1005 1006

1007 1008 1009 1010 1011 1012 1013 1014 1015

1016 1017 1018 1019 1020

1021 1022 1023 1024 1025 1026 1027 1028 1029

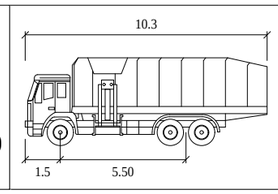
1030 1031 1032 1052 1053 1054

20.6 180m²

23.5m - 25m Wide New Road (3/4 Construction - Ultimate Width 27m)

SWEPT PATH LEGEND

- VEHICLE BODY
- FRONT TIRES
- VEHICLE PATH
- VEHICLE CLEARANCE (500mm)
- VEHICLE



TAPS Code Side Loader

	Meters
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 39.9
Travel Height	: 4.0
Operating Height	: 4.50

NORTH

0 2 4 6 8 10 12 14 16 18 20m

4 3 2 1

SCALE 1:400 @ A3

Cardno (Qld) Pty Ltd | ABN 57 051 074 992
Level 11, 515 St Paul's Terrace
Fortitude Valley, QLD 4006
Tel: 07 3369 9822 Fax: 07 3369 9722
Web: www.cardno.com.au

Carseldine Urban Village
Stage 1 Access Review
Swept Path Assessment - 10.3m Side Load RCV

Drawn	Date	Scale	Size
T.Anang	10/09/2019	1:400	A3

Drawing Number: CEB06857 - SK17
Revision: F

CAD File: \\aubnect\05\mS\Current Job\sCEB06857 - Carseldine Urban Village\6_ACAD\CEB06857 - SK17_SK30 - E.dwg

Imagery supplied by nearmap, August 2019

CONCEPT ONLY

19m Wide Street

19m Wide Street

20m Wide Street

6.5m Wide Lane

6.5m Wide Lane

6.5m Wide Lane

23.5m - 25m Wide New Road (3/4 Construction

1054 1053 1052 1051 1050 1049 1048 1047

1030 1031 1032 1033 1034 1035 1036 1037

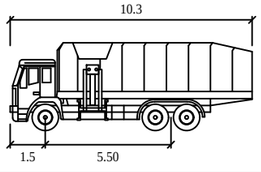
1015 1014 1013 1012 1011 1010 1009 1008 1007

1021 1022 1023 1024 1025 1026 1027 1028 1029

1046 1045 1044 1043 1042 1041 1040 1039 1038

SWEPT PATH LEGEND

- VEHICLE BODY
- FRONT TIRES
- VEHICLE PATH
- VEHICLE CLEARANCE (500mm)
- VEHICLE



TAPS Code Side Loader

	Meters
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 39.9
Travel Height	: 4.0
Operating Height	: 4.50

0 2 4 6 8 10 12 14 16 18 20m

4 3 2 1

SCALE 1:400 @ A3

Cardno (Qld) Pty Ltd | ABN 57 051 074 992
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Web: www.cardno.com.au

Carseldine Urban Village

Stage 1 Review

Swept Path Review - 10.3m Side Load RCV

Drawn	Date	Scale	Size
T.Anang	10/09/2019	1:400	A3

Drawing Number: CEB06857 - SK18

Revision: F

CAD File: \\aubnect\05\mtS\Current Jobs\CEB06857 - Carseldine Urban Village\6_ACAD\CEB06857 - SK17_SK30 - E.dwg

Imagery supplied by nearmap, August 2019

Traffic Impact Assessment

APPENDIX D
GRAVITY MODEL

Cardno
Shaping the Future

	Lattitude	Longitude
Development	-27.3504	153.023

10km Radius

SA2 Maincode	SA2 5 Digit Code	SA2 Name	Lattitude	Longitude	Direction	Full Population (N)	Employed Population (N)	Distance (T)	N/T	Proportion of Sum
314011382	31382	Albany Creek	-27.3535	152.967	NW	15862	2910	6.9	2298.841	5%
302021027	31027	Aspley	-27.3658	153.019	SW	12448	3710	3	4149.333	9%
302011022	31022	Bald Hills	-27.3084	153.022	NW	6947	1215	6.5	1068.769	2%
302031035	31035	Boondall	-27.3481	153.072	NE	8748	1475	4.6	1901.739	4%
302041041	31041	Bracken Ridge	-27.3173	153.033	NW	16799	2103	5.9	2847.288	6%
302011023	31023	Bridgeman Downs	-27.352	152.994	NW	7637	632	4	1909.25	4%
302041042	31042	Brighton (Qld)	-27.2963	153.054	NE	9011	1288	9.4	958.617	2%
302011024	31024	Carseldine	-27.348	153.018	NW	7767	1335	1.2	6472.5	14%
302021028	31028	Chermside	-27.3839	153.033	SW	8171	12298	6.2	1317.903	3%
302021029	31029	Chermside West	-27.3836	153.012	SW	6122	634	5.4	1133.704	3%
302041043	31043	Deagon	-27.3279	153.059	NE	3460	982	6	576.6667	1%
314011385	31385	Eatons Hill	-27.3409	152.936	NW	7991	857	9.2	868.587	2%
302011025	31025	Everton Park	-27.3995	152.987	NW	8325	1377	8.9	935.3933	2%
302021030	31030	Geebung	-27.3721	153.045	SE	4299	5805	5.1	842.9412	2%
305031123	31123	Grange	-27.4213	153.016	SW	4162	708	9.7	429.0722	1%
314011386	31386	Hills District	-27.3781	152.942	NW	22634	3361	9.2	2460.217	6%
302021031	31031	Kedron - Gordon Park	-27.4074	153.033	SW	12608	4488	7.9	1595.949	4%
302011026	31026	McDowall	-27.3832	152.992	NW	7087	1385	8	885.875	2%
302031038	31038	Northgate - Virginia	-27.381	153.071	NE	6364	10667	8.3	766.747	2%
302031039	31039	Nudgee - Banyo	-27.3639	153.088	NE	8723	5715	5.4	1615.37	4%
302041044	31044	Sandgate - Shorncliffe	-27.3211	153.067	NE	6538	2391	7.8	838.2051	2%
302021032	31032	Stafford	-27.4102	153.01	SW	6041	3770	8.5	710.7059	2%
302021033	31033	Stafford Heights	-27.397	153.01	SW	6779	684	6.4	1059.219	2%
314031394	31394	Strathpine - Brendale	-27.3134	152.987	NW	11126	12911	7.6	1463.947	3%
302041045	31045	Taigum - Fitzgibbon	-27.3413	153.036	NE	8908	1275	3.7	2407.568	5%
302021034	31034	Wavell Heights	-27.3917	153.047	SE	9436	1120	8	1179.5	3%
302041046	31046	Zillmere	-27.3587	153.04	NE	8105	2022	4	2026.25	5%
									44720.16	100%

Direction	Proportion
NE	25%
NW	47%
SE	5%
SW	23%
Total	100%

Direction	Proportion
NE	25815
NW	28086
SE	6925
SW	26292
Total	87118

	Lattitude	Longitude
Development	-27.3504	153.023

25km Radius

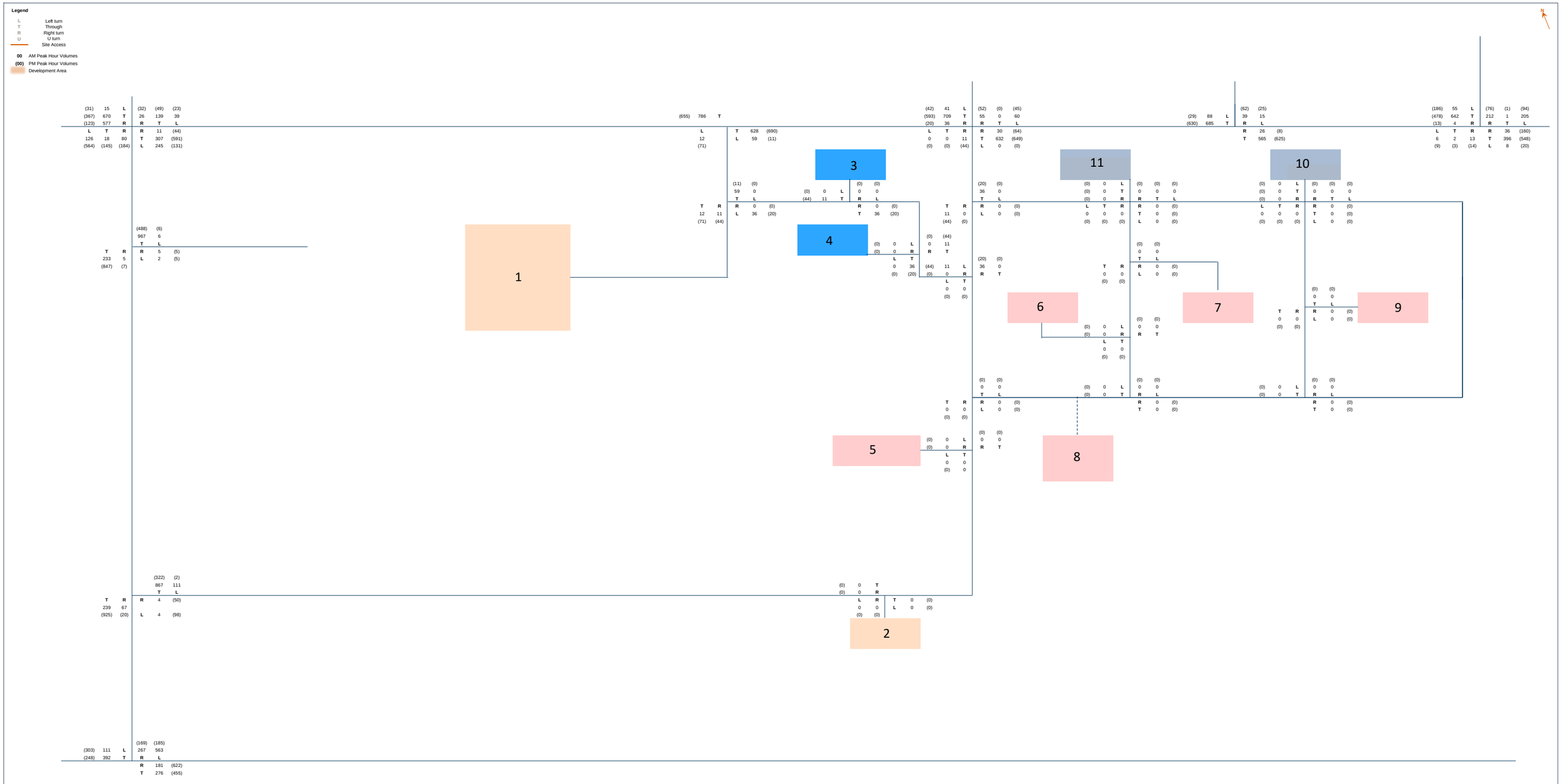
SA2 Maincode	SA2 5 Digit Code	SA2 Name	Lattitude	Longitude	Direction	Full Population (N)	Employed Population (N)	Distance (T)	N/T	Proportion of Sum
314011382	31382	Albany Creek	-27.3535	152.967	NW	15862	2910	6.9	421.7391	1%
305031119	31119	Albion	-27.4335	153.044	SE	2551	4225	11.9	355.042	1%
305031120	31120	Alderley	-27.4251	153	SW	5680	866	10.8	80.18519	0%
303021052	31052	Annerley	-27.5126	153.033	SW	10665	2355	20.7	113.7681	0%
305031121	31121	Ascot	-27.4299	153.065	NE	5166	1352	13.9	97.26619	0%
305041132	31132	Ashgrove	-27.445	152.982	NW	12915	3010	14.6	206.1644	1%
302021027	31027	Aspley	-27.3658	153.019	SW	12448	3710	3	1236.667	3%
305041133	31133	Auchenflower	-27.4744	152.996	SW	5352	3361	18.7	179.7326	0%
302011022	31022	Bald Hills	-27.3084	153.022	NW	6947	1215	6.5	186.9231	0%
305021113	31113	Balmoral	-27.4565	153.069	SW	3828	599	21.4	27.99065	0%
305041134	31134	Bardon	-27.4597	152.978	NW	9255	1301	18.1	71.87845	0%
302031035	31035	Boondall	-27.3481	153.072	NE	8748	1475	4.6	320.6522	1%
302041041	31041	Bracken Ridge	-27.3173	153.033	NW	16799	2103	5.9	356.4407	1%
314031391	31391	Bray Park	-27.2938	152.968	NW	10003	1172	10.9	107.5229	0%
302011023	31023	Bridgeman Downs	-27.352	152.994	NW	7637	632	4	158	0%
302041042	31042	Brighton (Qld)	-27.2963	153.054	NE	9011	1288	9.4	137.0213	0%
302031036	31036	Brisbane Airport	-27.3896	153.118	NE	91	16729	16.8	995.7738	2%
305011105	31105	Brisbane City	-27.4691	153.023	SW	8706	116132	18.5	6277.405	15%
305021114	31114	Bulimba	-27.4495	153.06	SW	5942	2127	21.7	98.01843	0%
313041372	31372	Burpengary	-27.1547	152.951	NW	12963	2870	24.4	117.623	0%
303011047	31047	Camp Hill	-27.4975	153.076	SW	10533	1508	23.7	63.62869	0%
303011048	31048	Cannon Hill	-27.4724	153.096	NE	4509	4540	23.9	189.9582	0%
302011024	31024	Carseldine	-27.348	153.018	NW	7767	1335	1.2	1112.5	3%
302021028	31028	Chermside	-27.3839	153.033	SW	8171	12298	6.2	1983.548	5%
302021029	31029	Chermside West	-27.3836	153.012	SW	6122	634	5.4	117.4074	0%
305031122	31122	Clayfield	-27.418	153.055	NE	10005	2425	11.4	212.7193	1%
313051377	31377	Clontarf	-27.2481	153.082	NE	7911	3108	15.5	200.5161	0%
303021053	31053	Coorparoo	-27.4979	153.061	SW	14946	5347	22	243.0455	1%
314021388	31388	Dakabin - Kallangur	-27.2413	152.992	NW	20427	2667	19.2	138.9063	0%
302041043	31043	Deagon	-27.3279	153.059	NE	3460	982	6	163.6667	0%
313041373	31373	Deception Bay	-27.1798	153.011	NW	21763	4064	20.6	197.2816	0%
302031037	31037	Eagle Farm - Pinkenba	-27.4314	153.097	NE	260	10905	13	838.8462	2%
305021115	31115	East Brisbane	-27.4842	153.048	SW	5598	2539	18	141.0556	0%
314011385	31385	Eatons Hill	-27.3409	152.936	NW	7991	857	9.2	93.15217	0%
304041098	31098	Enoggera	-27.4258	152.975	NW	7684	7096	13.5	525.6296	1%
302011025	31025	Everton Park	-27.3995	152.987	NW	8325	1377	8.9	154.7191	0%
303021054	31054	Fairfield - Dutton Park	-27.5007	153.025	SW	4026	2261	22.9	98.73362	0%
305011106	31106	Fortitude Valley	-27.4561	153.035	SW	5216	20109	20	1005.45	2%
302021030	31030	Geebung	-27.3721	153.045	SE	4299	5805	5.1	1138.235	3%
305031123	31123	Grange	-27.4213	153.016	SW	4162	708	9.7	72.98969	0%
303021055	31055	Greenslopes	-27.5057	153.049	SW	8566	5663	21.7	260.9677	1%
305031124	31124	Hamilton (Qld)	-27.4363	153.063	NE	4719	1863	13.8	135	0%
305021116	31116	Hawthorne	-27.4648	153.059	SW	4778	675	19.8	34.09091	0%
305031125	31125	Hendra	-27.4167	153.07	NE	4419	2621	12.4	211.371	1%
305011107	31107	Highgate Hill	-27.4875	153.017	NW	5823	524	18.1	28.95028	0%
314011386	31386	Hills District	-27.3781	152.942	NW	22634	3361	9.2	365.3261	1%
303021056	31056	Holland Park	-27.5192	153.069	SW	7846	1502	24.2	62.06612	0%
303021057	31057	Holland Park West	-27.5266	153.059	SW	5967	545	25	21.8	0%
304031094	31094	Indooroopilly	-27.5062	152.982	SW	11670	6944	23.8	291.7647	1%
305011108	31108	Kangaroo Point	-27.475	153.036	SW	6999	2106	18.6	113.2258	0%
302021031	31031	Kedron - Gordon Park	-27.4074	153.033	SW	12608	4488	7.9	568.1013	1%
305031126	31126	Kelvin Grove - Herston	-27.4501	153.017	SW	7846	16609	13.9	1194.892	3%
304041100	31100	Keperra	-27.4142	152.953	NW	7010	1453	12.4	117.1774	0%
314031392	31392	Lawnton	-27.2817	152.982	NW	5727	2508	10.4	241.1538	1%
313051378	31378	Margate - Woody Point	-27.2494	153.103	NE	11094	1556	17.3	89.9422	0%
302011026	31026	McDowall	-27.3832	152.992	NW	7087	1385	8	173.125	0%
304041101	31101	Mitchelton	-27.4104	152.97	NW	7658	2729	11.7	233.2479	1%
303041068	31068	Moorooka	-27.5348	153.026	SW	9984	2836	23.3	121.7167	0%
305021117	31117	Morningside - Seven Hills	-27.4662	153.077	SW	11433	5235	21.2	246.934	1%
301031017	31017	Murarrie	-27.4499	153.109	NE	3959	10580	21.4	494.3925	1%
314021389	31389	Murrumba Downs - Griffin	-27.2727	153.038	NW	11753	1215	11.3	107.5221	0%
313041375	31375	Narangba	-27.1869	152.918	NW	16222	3068	21.2	144.717	0%
305011109	31109	New Farm	-27.4657	153.046	SW	11728	3375	16.6	203.3133	0%
305031127	31127	Newmarket	-27.435	153.007	SW	4442	1355	11.6	116.8103	0%
305031128	31128	Newstead - Bowen Hills	-27.4483	153.04	SW	7282	15371	14.4	1067.431	3%
305021118	31118	Norman Park	-27.4789	153.064	SW	6001	615	19.6	31.37755	0%
314021390	31390	North Lakes - Mango Hill	-27.234	153.035	NW	19380	5119	14.3	357.972	1%
302031038	31038	Northgate - Virginia	-27.381	153.071	NE	6364	10667	8.3	1285.181	3%
302031039	31039	Nudgee - Banyo	-27.3639	153.088	NE	8723	5715	5.4	1058.333	3%
302031040	31040	Nundah	-27.4	153.063	NE	10387	4066	10	406.6	1%
305041135	31135	Paddington - Milton	-27.4645	152.999	SW	9977	16759	16.8	997.5595	2%
314031393	31393	Petrie	-27.2629	152.975	NW	8501	1904	14.9	127.7852	0%
305041136	31136	Red Hill (Qld)	-27.4524	153.003	SW	5546	1600	13.9	115.1079	0%
313051379	31379	Redcliffe	-27.2264	153.107	NE	9200	4681	19.2	243.8021	1%
313051380	31380	Rothwell - Kippa-Ring	-27.215	153.066	NW	16614	4746	18.4	257.9348	1%
314011387	31387	Samford Valley	-27.358	152.838	NW	10929	1968	21.7	90.69124	0%
302041044	31044	Sandgate - Shorncliffe	-27.3211	153.067	NE	6538	2391	7.8	306.5385	1%
313051381	31381	Scarborough - Newport	-27.2049	153.095	NE	11168	1487	21.8	68.21101	0%
305011110	31110	South Brisbane	-27.4797	153.02	SW	5417	22759	16.7	1362.814	3%
305011111	31111	Spring Hill	-27.4584	153.023	SW	5626	14550	15.2	957.2368	2%
304031096	31096	St Lucia	-27.498	153.005	SW	11194	8606	21.4	402.1495	1%
302021032	31032	Stafford	-27.4102	153.01	SW	6041	3770	8.5	443.5294	1%
302021033	31033	Stafford Heights	-27.397	153.01	SW	6779	684	6.4	106.875	0%
314031394	31394	Strathpine - Brendale	-27.3134	152.987	NW	11126	12911	7.6	1698.816	4%
302041045	31045	Taigum - Fitzgibbon	-27.3413	153.036	NE	8908	1275	3.7	344.5946	1%
304031097	31097	Taringa	-27.4952	152.98	SW	7933	2227	21.1	105.545	0%
303041071	31071	Tarragindi	-27.5262	153.045	SW	9965	901	23.6	38.17797	0%
304041103	31103	The Gap	-27.4451	152.943	NW	15951	2276	16.1	141.3665	0%
301031018	31018	Tingalpa	-27.474	153.129	SW	8540	3232	24.5	131.9184	0%
305041137	31137	Toowong	-27.4808	152.984	SW	10501	8206	19.9	412.3618	1%
304041104	31104	Upper Kedron - Ferny Grove	-27.4139	152.92	NW	9042	1124	18.1	62.09945	0%
302021034	31034	Wavell Heights	-27.3917	153.047	SE	9436	1120	8	140	0%
305011112	31112	West End	-27.4821	153.006	SW	8062	6821	17.1	398.8889	1%
305031129	31129	Wilston	-27.4345	153.018	SW	3870	896	11.2	80	0%
305031130	31130	Windsor	-27.4346	153.031	SW	6388	3001	11.1	270.3604	1%
303021058	31058	Woolloongabba	-27.4929	153.037	SW	4787	12972	20	648.6	2%
305031131	31131	Wooloowin - Lutwyche	-27.4151	153.038	SW	8738	3081	10.4	296.25	1%
303021059	31059	Yeronga	-27.5232	153.009	SW	8385	3324	22.3	149.0583	0%
302041046	31046	Zillmere	-27.3587	153.04	NE	8105	2022	4	505.5	1%
									40926.08	100%

Direction	Proportion
NE	20%
NW	20%
SE	4%
SW	56%
Total	100%

Direction	Proportion
NE	91728
NW	78900
SE	11150
SW	355262
Total	537040

APPENDIX E
TRAFFIC FLOW DIAGRAMS

Cardno
Shaping the Future



Carseldine Urban Village

Project Number: **CEB06857**

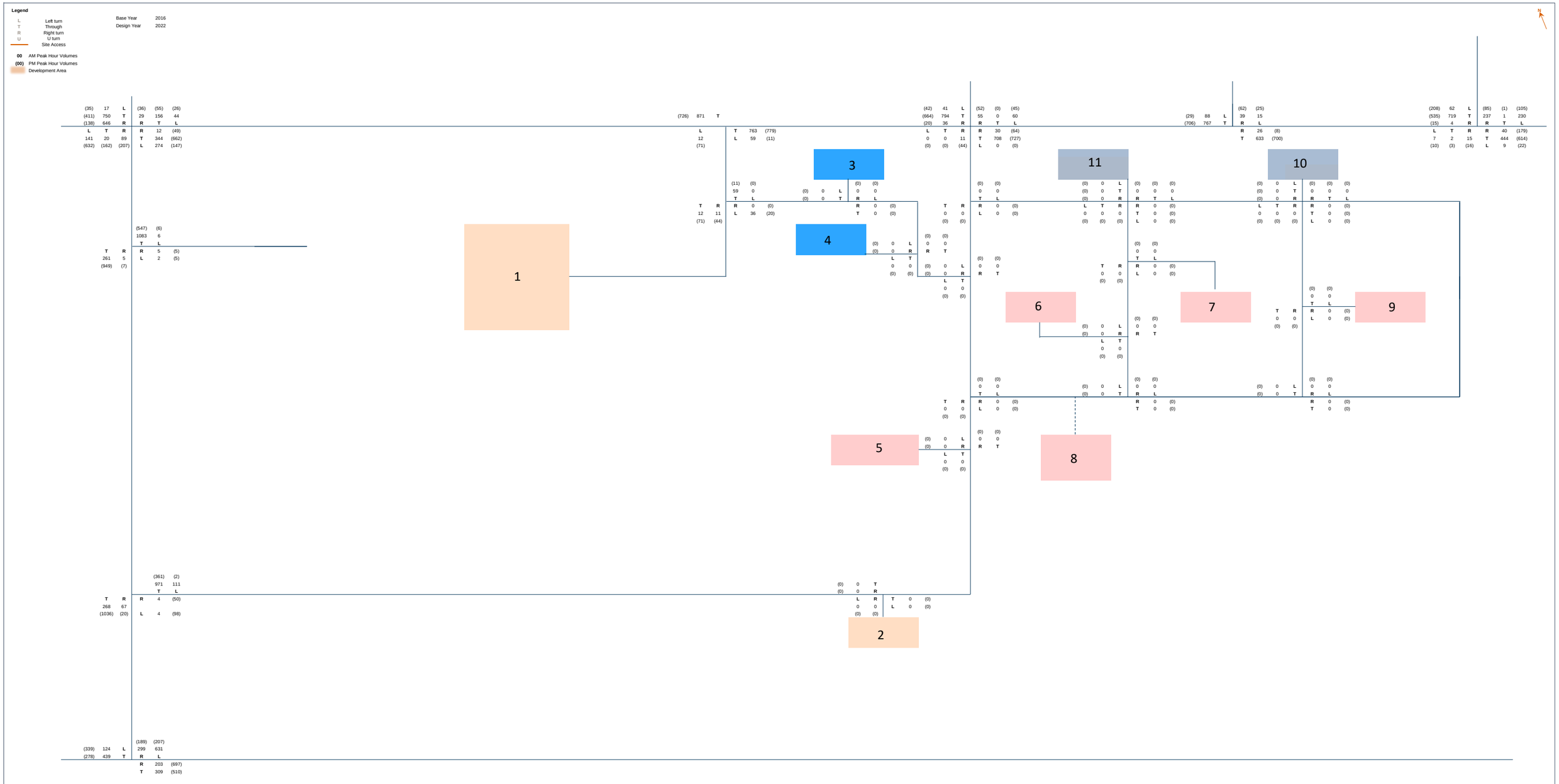
Prepared: **19/04/2018**

Prepared by: **Benjamin Park | Christina Johansson | Tetteh Anang**

Reviewed by: **Alice Shi**

Figure 1

2016 Background Traffic



Carseldine Urban Village

Project Number: **CEB06857**

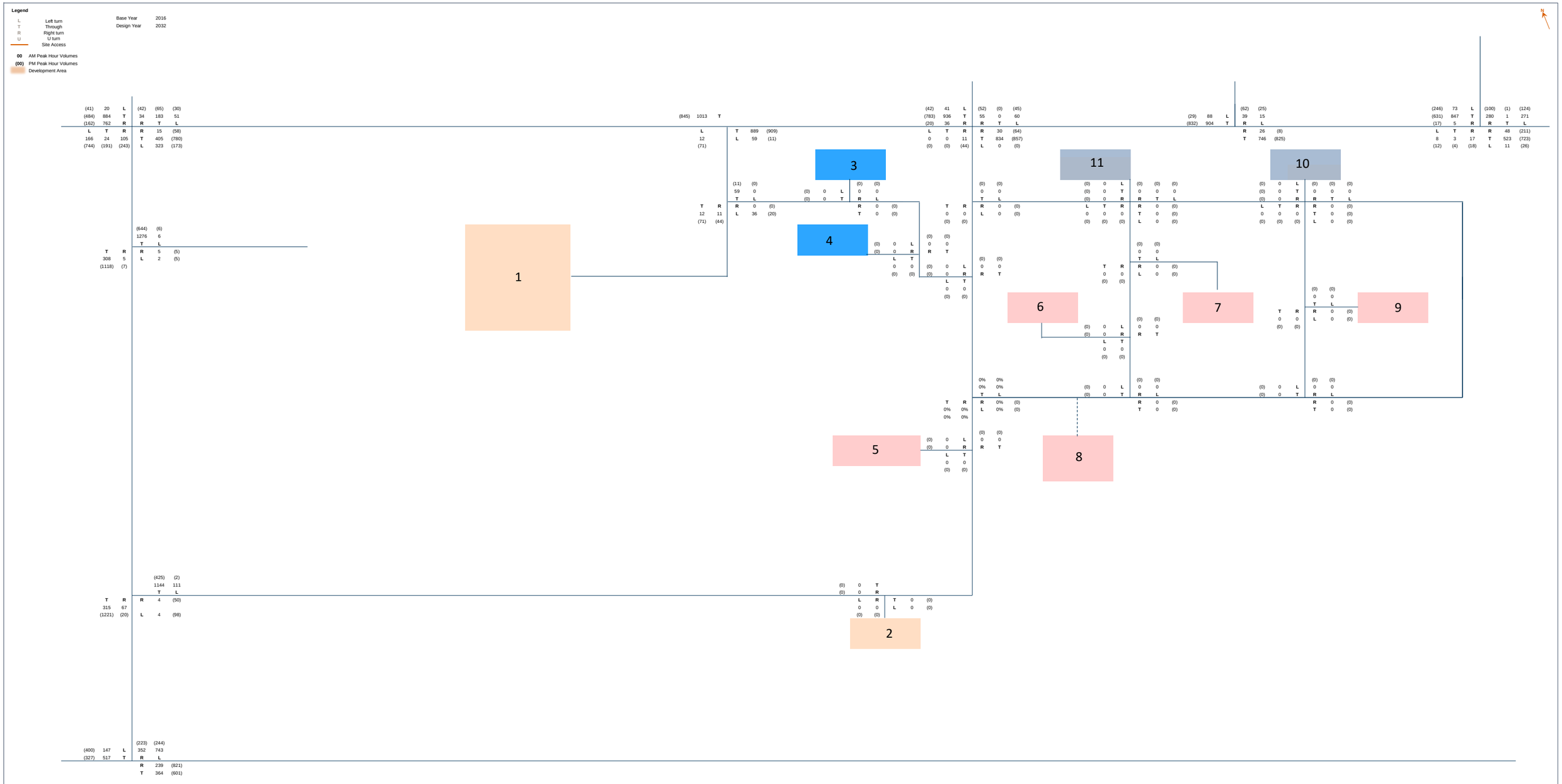
Prepared: **19/04/2018**

Prepared by: **Benjamin Park | Christina Johansson | Tetteh Anang**

Reviewed by: **Alice Shi**

Figure 2

2022 Background Traffic



Carseldine Urban Village

Project Number: **CEB06857**

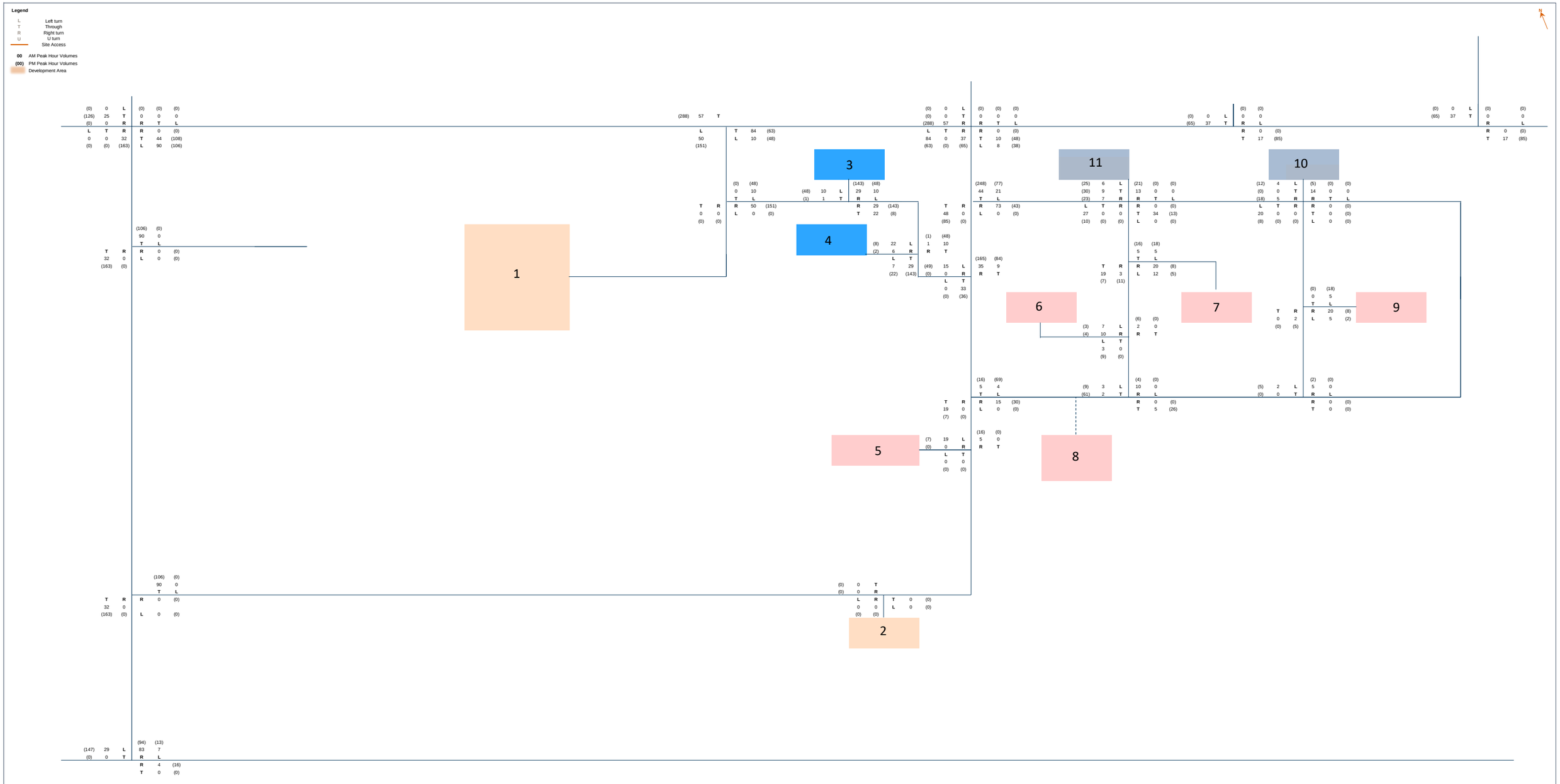
Prepared: **19/04/2018**

Prepared by: **Benjamin Park | Christina Johansson | Tetteh Anang**

Reviewed by: **Alice Shi**

Figure 3

2032 Background Traffic



Carseldine Urban Village

Project Number: **CEB06857**

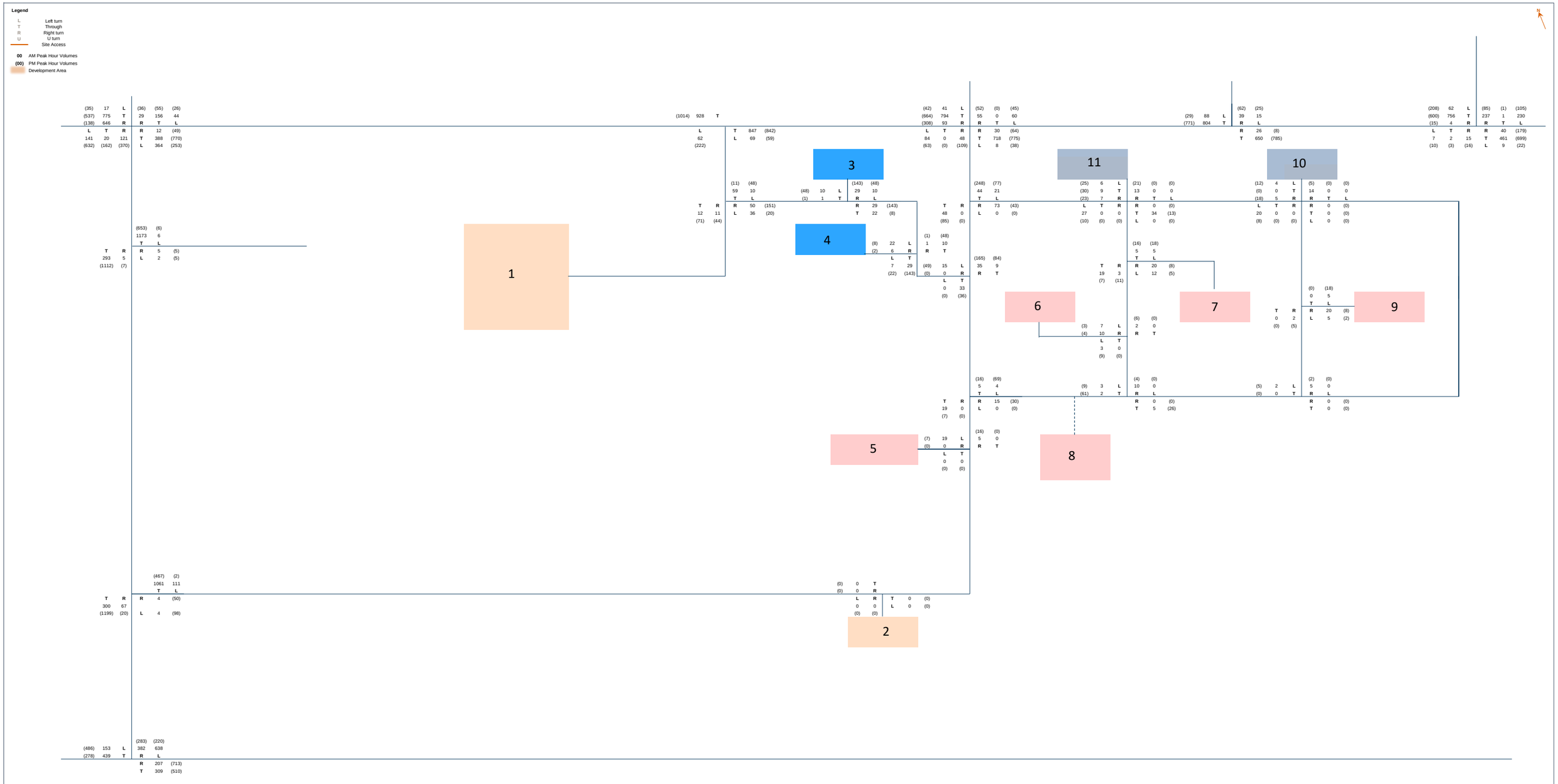
Prepared: **19/04/2018**

Prepared by: **Benjamin Park | Christina Johansson | Tetteh Anang**

Reviewed by: **Alice Shi**

Figure 4

Development Generated Trips



Carseldine Urban Village

Project Number: **CEB06857**

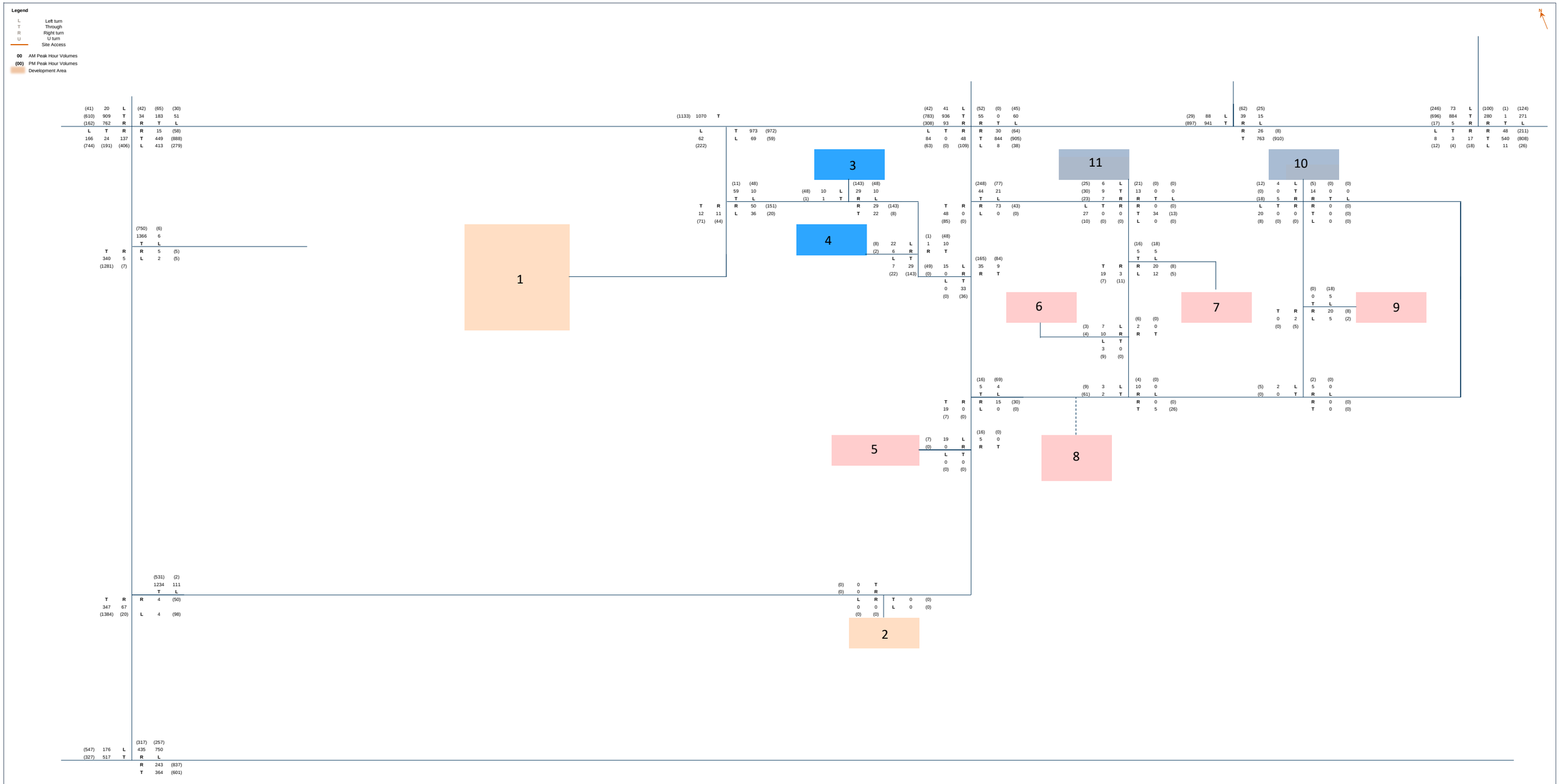
Prepared: **19/04/2018**

Prepared by: **Benjamin Park | Christina Johansson | Tetteh Anang**

Reviewed by: **Alice Shi**

Figure 5

2022 Background Traffic + Development



Carseldine Urban Village

Project Number: **CEB06857**

Prepared: **19/04/2018**

Prepared by: **Benjamin Park | Christina Johansson | Tetteh Anang**

Reviewed by: **Alice Shi**

Figure 6

2032 Background Traffic + Development

APPENDIX F
CONCEPT DESIGN SKETCHES

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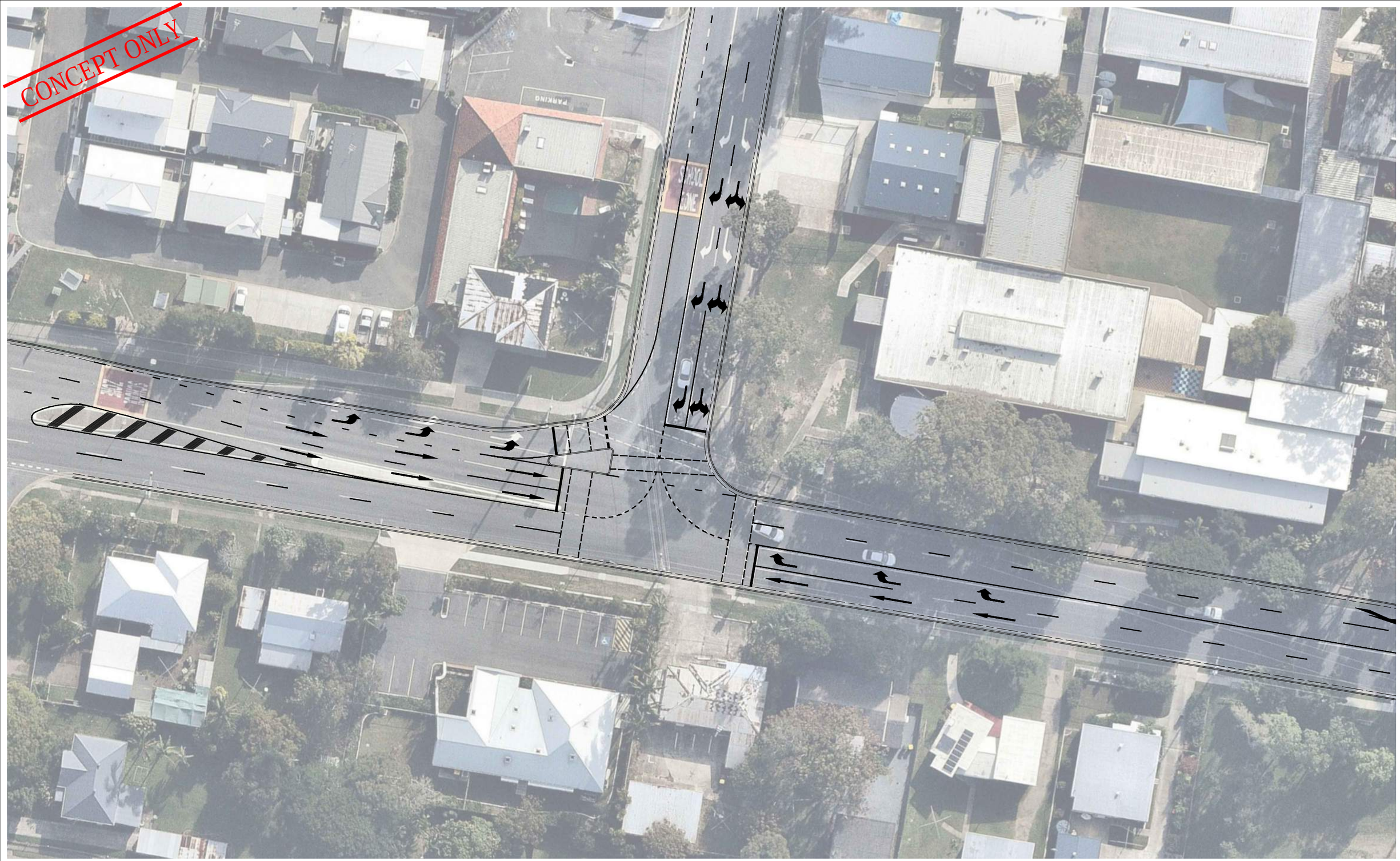
DATE PLOTTED: 6 August 2019 3:54 PM BY : RYAN WOODS

CONCEPT ONLY



Imagery supplied by nearmap, July 2015

NORTH

0 5 10 15 20 25m

5 4 3 2 1

SCALE 1:500 @ A3

Cardno
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Cardno (Qld) Pty Ltd | ABN 57 051 074 992
Level 11, 515 St Paul's Terrace
Fortitude Valley, QLD 4006
Tel: 07 3369 9822 Fax: 07 3369 9722
Web: www.cardno.com.au

Carseldine Urban Village

Intersection Concept Design
Intersection 001
Dorville Road / Zillmere Road

Drawn	Date	Scale	Size
T.Anang	06/08/2019	1:500	A3

Drawing Number	Revision
CEB06857 - SK01	E

CAD File: G:\CEB06857 - Carseldine Urban Village\6_ACAD\CEB06857 - SK01_SK04 - E.dwg

DATE PLOTTED: 6 August 2019 11:34 AM BY: RYAN WOODS

CONCEPT ONLY

Tie Into Existing Kerb

Existing Bus Zone

Approx 428m^2

New Kerb

NORTH

0 5 10 15 20 25m

5 4 3 2 1

SCALE 1:500 @ A3

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Level 11, 515 St Paul's Terrace
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Web: www.cardno.com.au

Carseldine Urban Village
Intersection Concept Design
Intersection 004
Beams Road / Dorville Road

Drawn	Date	Scale	Size
R.Woods	06/08/2019	1:500	A3

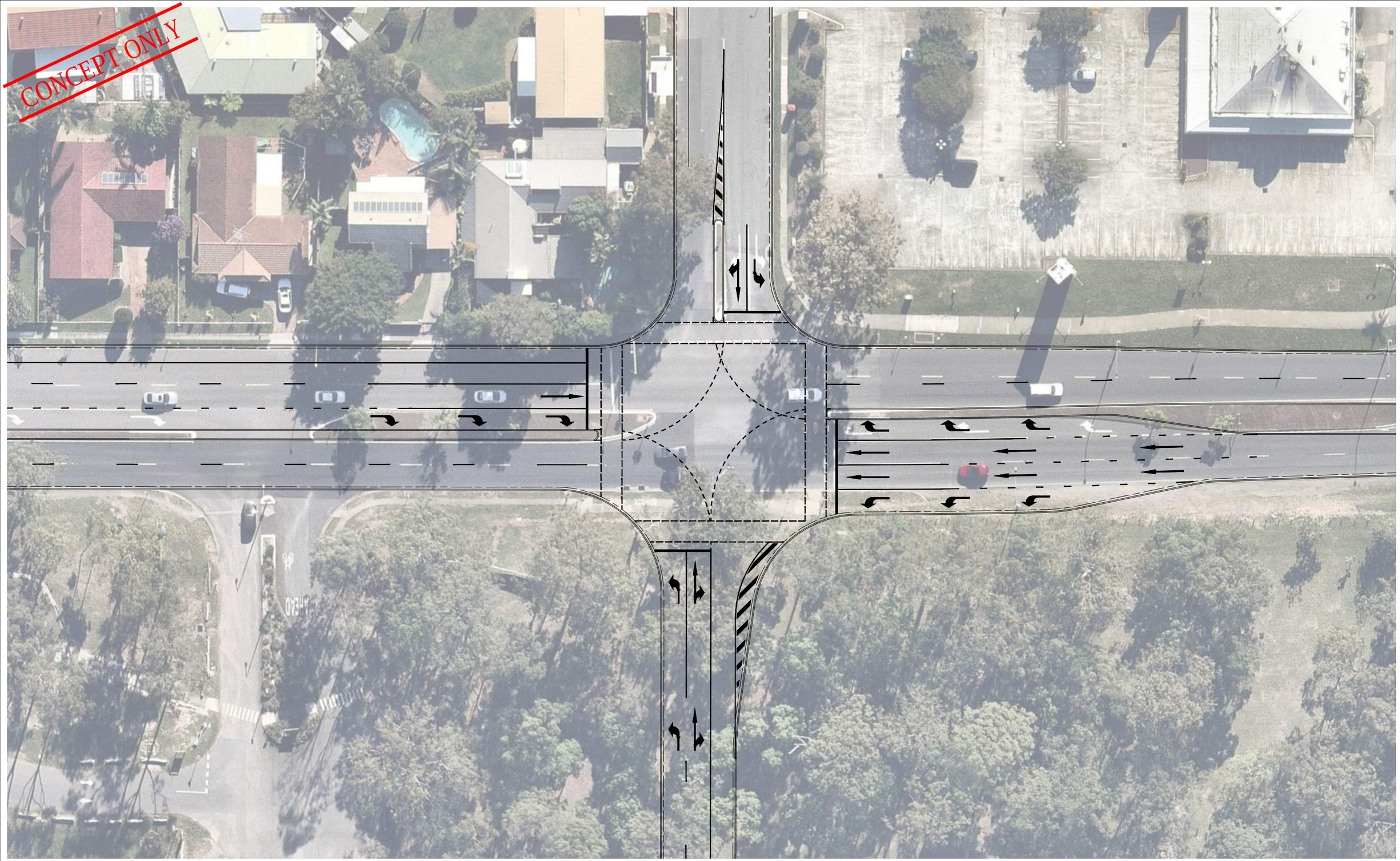
Drawing Number: CEB06857 - SK03
Revision: E

CAD File: G:\CEB06857 - Carseldine Urban Village\6_ACAD\CEB06857 - SK01_SK04 - E.dwg

Imagery supplied by nearmap, July 2015

DATE PLOTTED: 7 August 2019 5:24 PM BY : RYAN WOODS

CONCEPT ONLY



NORTH

0 5 10 15 20 25m

5 4 3 2 1

SCALE 1:500 @ A3

Cardno
Shaping the Future
Cardno (Qld) Pty Ltd | ABN 57 051 074 992
Level 11, 515 St Paul's Terrace
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Web: www.cardno.com.au

Carseldine Urban Village

Intersection Concept Design
Intersection 005
Beams Road / Balcara Avenue

Drawn	Date	Scale	Size
T.Anang	06/08/2019	1:500	A3

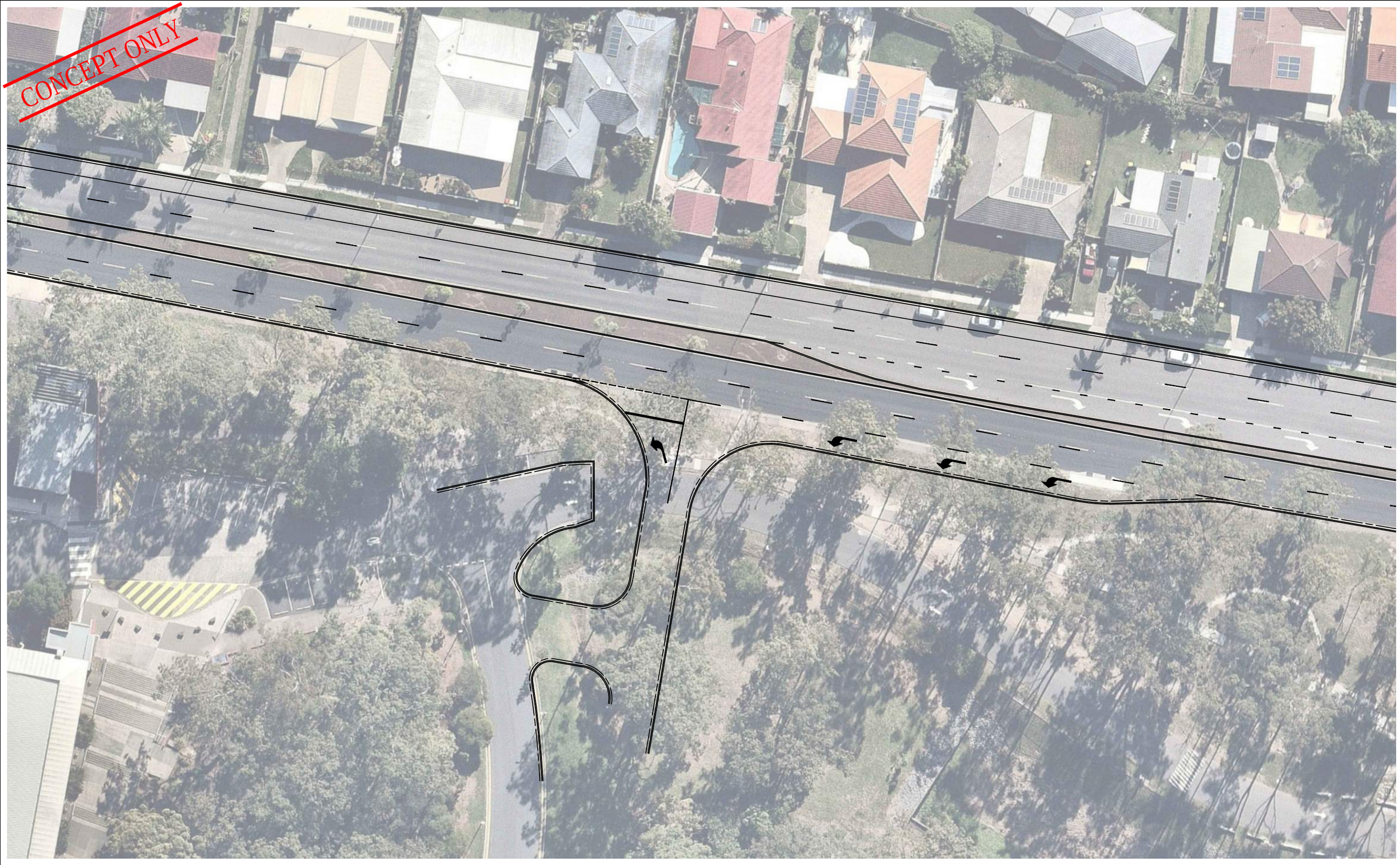
Drawing Number	Revision
CEB06857 - SK04	E

CAD File: G:\CEB06857 - Carseldine Urban Village\6_ACAD\CEB06857 - SK01_SK04 - E.dwg

Imagery supplied by nearmap, July 2015

DATE PLOTTED: 25 January 2018 3:09 PM BY : TETTEH ANANG

CONCEPT ONLY



CAD File: G:\CEB06857 - Carseldine Urban Village\6_ACAD\CEB06857 - SK01_SK04 - A.dwg

Imagery supplied by nearmap, July 2015

NORTH

0 5 10 15 20 25m

5 4 3 2 1

SCALE 1:500 @ A3

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Shaping the Future
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Fortitude Valley, QLD 4006
Tel: 07 3369 9822 Fax: 07 3369 9722
Web: www.cardno.com.au

Carseldine Urban Village

Intersection Concept Design
Intersection 029
Beams Road / CUV Access

Drawn	Date	Scale	Size
T.Anang	25/01/2017	1:500	A3

Drawing Number	Revision
CEB06857 - SK10	A