

PLANS AND DOCUMENTS
referred to in the PDA
DEVELOPMENT APPROVAL

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Date: 20 August 2019



Celestino Pty Ltd

Riverside Celestino

ROL1 Traffic Impact Assessment

TIA02

Issue 2 | 5 April 2019

This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number 250633

Arup
Arup Pty Ltd ABN 18 000 966 165

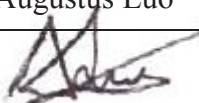
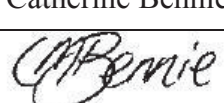
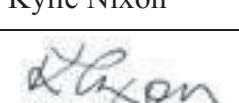
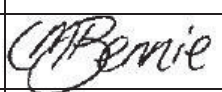
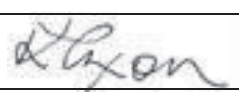


Arup
Level 4, 108 Wickham Street
Fortitude Valley
QLD 4006
GPO Box 685 Brisbane QLD 4001
Australia
www.arup.com

ARUP

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1 Introduction

Arup has been engaged by Celestino to examine the traffic implications for the Reconfiguring a Lot (ROL) development application for Stage 1 (herein as ROL1) of the Riverside Master Planned Community and prepare a Traffic Impact Assessment (TIA). ROL1 comprises Lots 102, 105 and 106 on SP25415 and Lot 800 on SP247625.

1.1 Scope

The purpose of this TIA is to detail the traffic impact of ROL1 of the Riverside Celestino development over the design horizon. This TIA details the tasks and results associated with this development, which involved a review of the internal road network, public and active transport provisions and an assessment of the impact of the development on the surrounding road network. The TIA outlines the results and findings of the assessment, and associated recommendations.

1.2 Background

1.2.1 Riverside Celestino development application

Preliminary approval for the Riverside Celestino Master Plan with a Context Plan was granted by Economic Development Queensland (EDQ) on 21 September 2017. To support the Context Plan, a traffic modelling report (MR01 Modelling Report, dated 12 October 2017) prepared by Arup was submitted to EDQ detailing the road network requirements at an interim (2031) and ultimate (2066) design years with the proposed Riverside Celestino Development.

In response to the October 2017 Modelling Report, EDQ requested updates, dated 16 November 2017, to the modelling be carried out.

Subsequent to this request, to further improve operations at the Teviot Road / Homestead Drive intersection, additional traffic modelling (i.e. beyond responding to EDQ's November request) has been carried out.

This TIA therefore incorporates the results of the more recent traffic modelling that has been carried out and discussed with EDQ, relating to ROL 1.

1.2.2 ROL1 development application

ROL1 is the first stage of the Riverside Celestino master planned development. A TIA (TIA02 ROL1) was submitted to EDQ in support of ROL1 dated 18 July 2019. In response to the TIA, an informal Request for Information (RFI) was issued 14 September 2018 by EDQ. The items raised by the informal RFI, relating to traffic, and how they have been responded in this amended TIA are demonstrated in Table 1.

Table 1 EDQ informal Request for Information (September 2018)

Item	Response
Traffic Impact Assessment	
1. a) TIA is to nominate posted speed limits on each road	Refer Table 5
1. b) TIA is to provide intersection analysis for key intersections based on ultimate scenario. Key intersections may include Harris Road / Road 3 and Harris Road / Road 8. The analysis shall determine appropriate intersection type and geometry, including lengths of auxiliary lanes.	Refer Section 4.1.1
1. d) TIA recommends amended Road 3 from Type 16 Neighbourhood Connector (Minor) to Type 12 Neighbourhood Connector (Major) based on the upcoming model revision. Please submit updated plan for approval the current approved plan "Internal cycleways and road hierarchy plan", drawing number 16-003350, SK09, prepared by Calibre approved on 21-9-2017, to reflect this change.	Refer Appendix A
Harris Road / Road 3 Intersection	
2. a) Intersection layout shown in dwg SK372 rev 2, prepared by Calibre dated 21-6-2018 should be extended to show where it tapers back to the typical mid-block cross-section. Length of turn pockets should be shown.	Refer Figure 15
2. b) All legs do not appear to conform with the approved cross-sections	Refer Figure 15. Lane widths (through and turn) at intersection are 3.5m wide.
2. c) The radius of the left turns across the cycle tracks should be reduced, consistent with sketches provided in TMR's TN128. Small radius will encourage vehicle to reduce speed and also provide drivers a better view of pedestrian and cyclists.	Radius of turns have been designed to cater for the largest design vehicle anticipated through intersection.
2. d) Provide protected intersection for cyclist across the northern leg connecting the share path with the cycle track. This include removal of the slip lane.	Cycle track located on the eastern side of the Centre Connector. Slip lanes not incorporated where cycle track is positioned.
2 e) Regarding the intersection drawing: the design for this one does not comply with TN128. Key components of the intersection are missing or confused: i. Pedestrian crossing storage is conflicting with cycle track. Ped crossing need to be moved back to fit pedestrian ramps and storage areas. ii. Corner islands are to be added iii. Consider providing left turn lane should be added to run the cycle track concurrent with through motor vehicle movement while holding the left turning motor vehicles iv. Install centreline to indicate 2-way cycle track v. Remove green pavement markings as all left and right turns movements across 2 way cycle track are controlled. Green pavement marking is only require for 1 way cycle crossing. (refer to TN128 Fig B4.02). vi. Provide signal phasing plan. Please ensure:	Refer Figure 15 and Section 4.1.1.2.

Item	Response
1. all turn across cycle tracks are to be controlled, filter left or right turns are not allow (See page 50 of TN128) 2. cycle track is given concurrent green time with the parallel through traffic movement. 3. bicycle movement is not set up to use the pedestrian clearance time. 4. a dedicated left turn lane may be require to control left turn.	
Harris Road / Road 8 Intersection	
3. Options to connect the share path with cycle track proposed on the northern side of Harris Rd. a.) Option 1: Consider replacing the priority intersection with roundabout (similar to TN128 Fig B3.03) b.) Option 2: Removing westbound left turn lane and add a refuse island opposite to the eastbound right turn. The removal will simplify the crossing between share path to cycle track.	A mid-block crossing point (un-signalised) has been provided on Harris Road, east of Road 8 opposite lot 577. Refer to Appendix C.
Interim Bus Route	
4. a) Demonstrate the interim bus route and stops can form part of the ultimate bus route and stops locations. This is important as it sets expectations for early PT provision.	Refer Section 3.3
4. b) Temporary bus turn around area show shows the extent of kerb and channel.	Refer Figure 11
4. c) Discussions should occur early with EDQ and TransLink on any potential bus route.	Refer Section 3.3

1.3 Safety in Design

Within the scope of our design activities, we have identified safety in design issues and potential hazards, whenever reasonably practicable within our field of expertise and scope of traffic services. Due to the scale and current status of the project, it is not considered reasonably practicable to identify all potential hazards which may occur throughout the life of a project, including during construction activities.

For any ensuing design stages, it is strongly recommended that subsequent stages further review safety in design and that the findings are reflected in changes or updates to the design associated with the project

1.4 Limits of Report

The above tasks have been carried out based on information supplied by other members of the project team. While Arup has taken care in the preparation of this report, it neither accepts liability nor responsibility whatsoever in respect of:

- Any use of this report by any third party (other than the approving authority)
- Any third party (other than the approving authority) whose interests may be affected by any decision made regarding the contents of this report.

2 Existing conditions

The following sections identify the existing transport networks within the context of the development site and the planned improvement initiatives proposed for this infrastructure.

2.1 Site location

The subject site is located south east of Teviot Road and north of the Logan River as shown in Figure 1. As shown, ROL1 is part of the Riverside Celestino master planned site and will be accessed via the continuation of Teviot Road from the Homestead Drive / Glynton Road intersection.

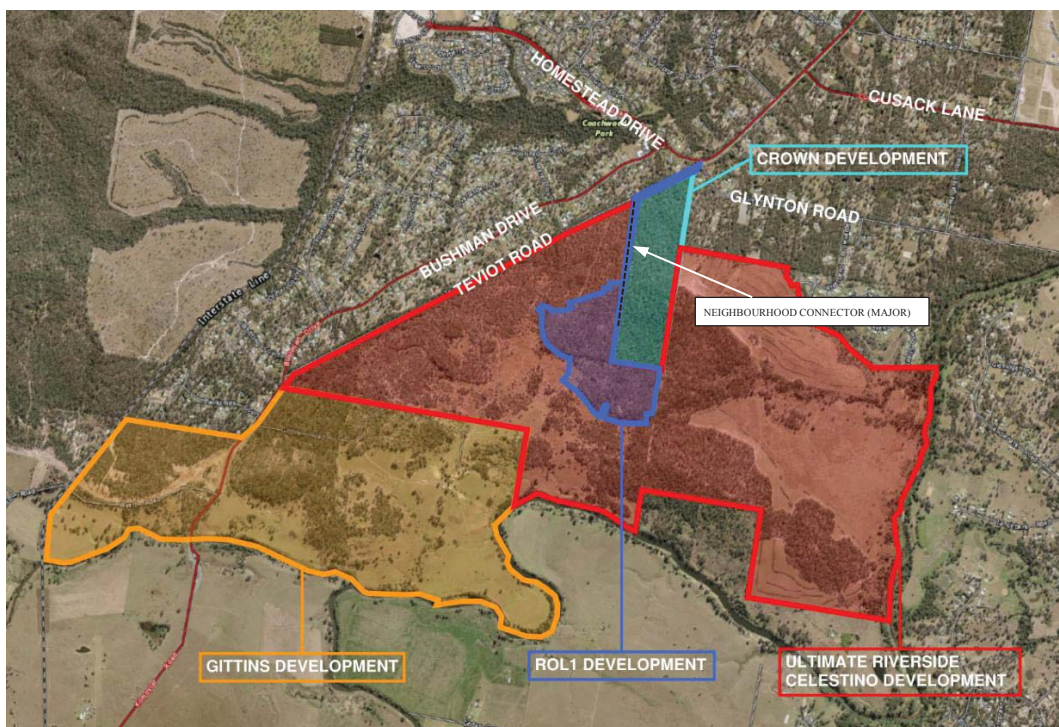


Figure 1: ROL1 location (Source: Qld Globe)

2.2 Existing transport network

2.2.1 Existing road network

Access to ROL1 is provided via a new Neighbourhood Connector (Major) running north-south, connecting to the sub-arterial road that is Teviot Road.

2.2.1.1 Teviot Road

Teviot Road is currently a two-lane, two-way undivided carriageway road with two service lanes (for direct lot access) on either side of the roadway. South of Glynton Road, Teviot Road becomes a gravel road terminating shortly thereafter.

The posted speed limit of Teviot Road, north of Homestead Drive is 70 km/h. The existing layout of the Teviot Road / Homestead Drive / Glynton Road intersection is presented in Figure 2.



Figure 2: Teviot Road / Homestead Drive / Glynton Road intersection (Source: Qld Globe)

The Teviot Road corridor is to be ultimately widened to a four-lane dual carriageway urban arterial type road which is to continue south to Bushman Drive.

Teviot Road will carry the majority of the northbound and southbound traffic in the area and will be a key link to vehicular traffic travelling between the site and Brisbane via the Mount Lindesay Highway.

2.2.1.2 Homestead Drive

Homestead Drive intersects with Teviot Road just north of the development site. It is currently a two-lane, two-way divided roadway with limited pedestrian and cyclist facilities. Homestead Drive, according to the Logan City Council Planning Scheme (2015) is a designated Urban Arterial Dual Carriageway road. The posted speed limit of Homestead Drive is 70km/h.

At the Teviot Road / Homestead Drive / Glynton Road intersection, Teviot Road north to Homestead Drive west is the major priority route. A 45m channelised right turn treatment (CHR) from Homestead Drive to Glynton Road is provided, and a 70m auxiliary left turn treatment (AUL) is provided from Teviot Road north to Glynton Road.

2.2.1.3 Glynton Road

Glynton Road is currently a two-lane, two-way undivided rural roadway with swale drains on either side of the road. According to the Logan City Council

Planning Scheme (2015), Glynton Road is classified as a Rural Arterial Dual Carriageway roadway. However, Glynton Road currently is not divided.

Glynton Road provides the fourth approach at the Teviot Road / Homestead Drive intersection. The posted speed limit of Glynton Road is 70 km/h.

2.2.2 Existing public transport network

At this present time, due to the semi-rural nature of the surrounding land uses, the development density (i.e. population density levels) in the area is not high enough to warrant the establishment of an urban public transport network. There are currently no TransLink urban bus routes within the vicinity of the site due to the low patronage expectations and the extensive distance to existing transport hubs.

The nearest public transport service/s to the site include, TransLink route 540 through Jimboomba, Park Ridge Park 'n' Ride (located approximately 18.5km by car north of the development site at the Crest Road interchange with Mount Lindesay Highway) and Springfield (providing connections to a train station on the Ipswich-Springfield rail line and access to the Centenary Highway).

There are only school routes that currently operate in the surrounding area with stops located on Homestead Drive and Bushman Drive.

2.2.3 Existing active transport network

All higher order roads within the vicinity of the site include no pedestrian / cyclist pathways in the verge and comprise narrow shoulders.

2.3 Crash data review

A review of the latest open source crash data from the Queensland Government was undertaken for the road network surrounding the subject site for a five-year period. The location of crashes occurring between 2012 and 2017 on the surrounding network can be seen in Figure 3. During this period, there was a total of 20 crashes on the road network surrounding the subject site. One of these crashes resulted in a fatality.

As seen in Figure 3, most of these crashes occurred near the intersection of Teviot Road and Cusack Lane, north of the subject site.

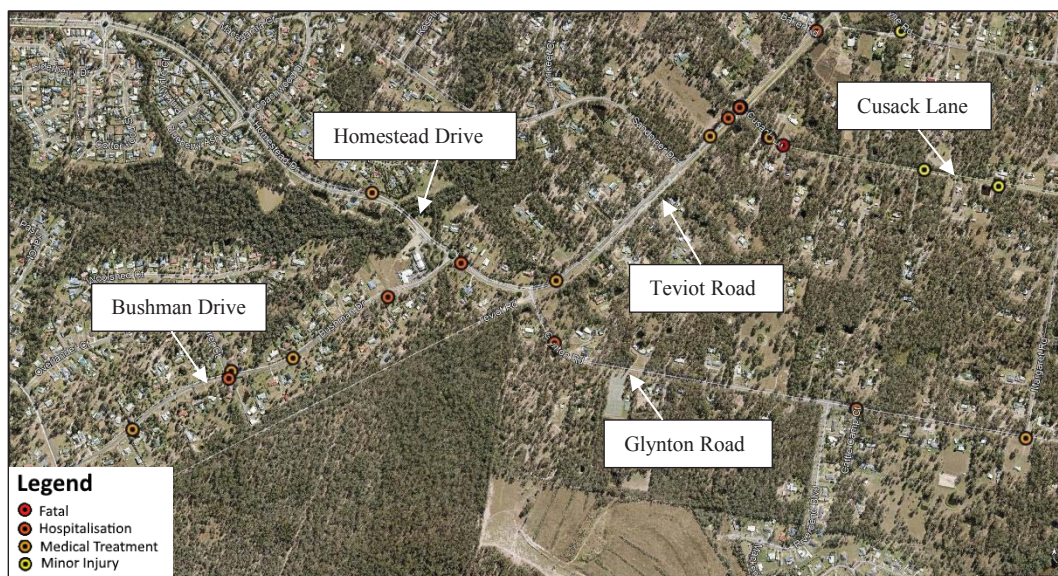


Figure 3: Severity of crashes (2012-2017) within proximity of subject site (Source: Queensland Government)

A summary of the crash type and crash severity surrounding the development is presented in Table 2 and Table 3.

Table 2: Crash type and frequency 2012 – 2017 (Source: Queensland Government)

Crash Type	DCA Code - Description	Frequency
Angle	104 – Vehicle in adjacent approach: Thru-right	3
	202 – Vehicle in opposite approach: Thru-right	2
Head-on	201 – Vehicle in opposite approach: Head on	2
Sideswipe	300 – Vehicle in same direction: other	1
	305 -Vehicle in same direction: land slide swipe	1
Rear-end	303 – Vehicle in same direction: right rear	1
Fall from vehicle	400 – Vehicle manoeuvring: Other	1
Hit Object	502 – Vehicle overtaking: out of control	1
	607 – Vehicle on path: temporary object on carriageway	1
	704 – Off path-straight: Right off carriageway hit object	1
	708 – Off path-straight: mounts traffic island	1
	803 – Off path-curve: off carriageway right bend hit object	4
	804 – Off path-curve: off carriageway left bend hit object	1

Table 3: Crash severity and frequency 2012 – 2017 (Source: Queensland Government)

Crash Severity	Frequency
Fatal	1
Hospitalisation	9
Medical Treatment	7
Minor Injury	3

As seen above, most of the crashes recorded were either angle crashes or collision with an object. As identified previously, these crashes occurred predominately at the Teviot Road / Cusack Lane intersection and the approaches in the vicinity. These crashes are likely to be associated with the rural nature of the road and the high speeds in the area (70-80km/h posted speed limits).

2.4 Traffic volumes

Traffic count surveys were carried out at the Homestead Drive / Teviot Road intersection at 13 June 2017 during the AM and PM peak periods. Traffic volumes for the existing intersection (2017) are detailed in Figure 4.

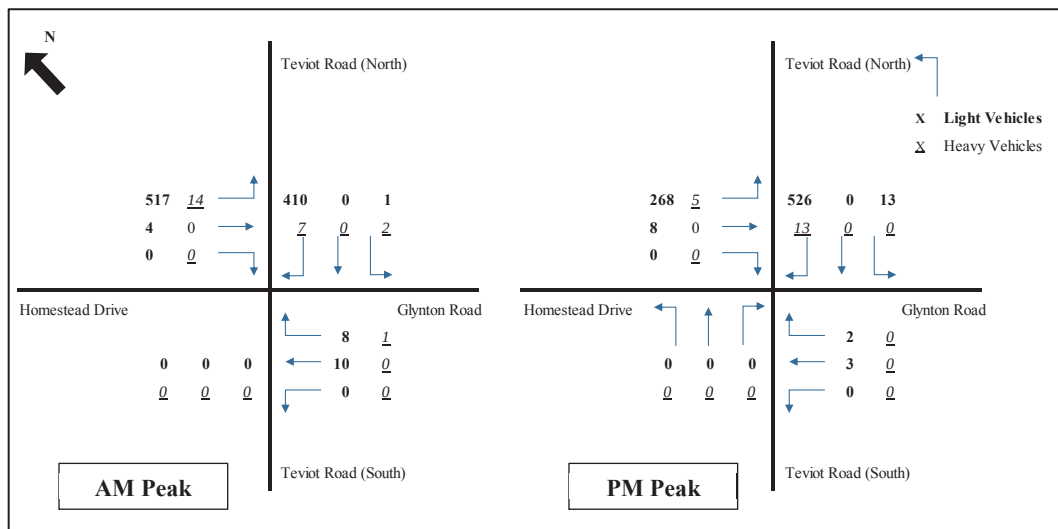


Figure 4 Existing (2017) volumes at the Teviot Road / Homestead Drive intersection

The southern Teviot Road approach has been joined into the subject intersection for display purposes. The primary traffic flows are the Homestead Drive to Teviot Road (North) movements in both directions for the AM and PM peaks.

The performance of the subject intersection under existing (2017) conditions, with the existing geometry and lane configurations, has been undertaken using SIDRA 7. To quantify the intersection performance, the following performance measures of each intersection has been reported as per Austroads: *Guide to Traffic Management Part 12: Traffic Impacts of Development*:

- Degree of saturation (DOS) (%) – the ratio of demand flow to capacity. For priority junctions, the DOS for any movement should not exceed 0.80. For signalised intersection, the DOS for any movement should not exceed 0.90.
- Average delay (sec) – the average delay per vehicle in seconds incurred by vehicles over the modelled time period. Average delay exceeding 42 seconds is considered near / at capacity and other control modes should be considered (Department of Transport and Main Roads (TMR) *Guide to Traffic Impact Assessment GTIA*).
- 95th percentile queue – a queue length measured in metres of which only 5% of queues are equal to or greater than.

The layout of the intersection is illustrated in Figure 5. A summary of the performance of the subject intersection and is given in Table 4.

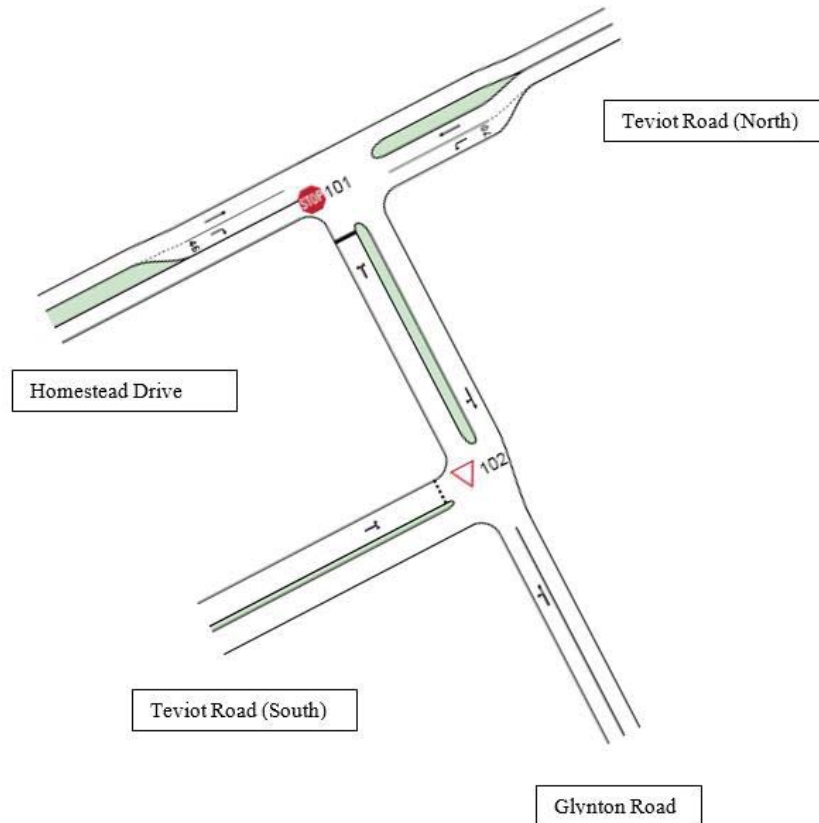


Figure 5: Teviot Road / Homestead Drive / Glynton Road intersection existing (2017) layout

Table 4: Teviot Road / Homestead Drive / Glynton Road existing (2017) performance

Intersection Movement	Peak Period	Maximum DOS (%)	Maximum Average Delay (sec)	Maximum 95%ile Queue (m)
Teviot Road (South)	AM Peak	0%	5.6	0
	PM Peak	0%	5.5	0
Glynton Road	AM Peak	3%	12.4	1
	PM Peak	1%	9.6	0
Teviot Road (North)	AM Peak	23%	6.3	0
	PM Peak	29%	5.5	0
Homestead Drive	AM Peak	29%	7.0	0
	PM Peak	15%	7.8	0

As demonstrated in Table 4, the intersection functions within the acceptable limits of operation in both the AM and PM peak periods under existing conditions.

2.5 Planned transport network improvements

2.5.1 Road network improvements

A review of the PDA, Logan City Council and TMR transport strategies and infrastructure programs has identified future upgrades to Teviot Road and Mount Lindesay Highway. These road network improvements are in various stages of planning and delivery, notably between strategic planning and modelling, and programmed construction, and are detailed below.

2.5.1.1 Mount Lindesay Highway planning

In 2017-2018, according to the Queensland Transport and Roads Investment Program (QTRIP), TMR plan to continue developing planning options to improve the Mount Lindesay Highway between Park Ridge and Jimboomba to determine investment priorities and support ongoing growth.

2.5.1.2 Mount Lindesay Beaudesert strategic transport network investigation

The Mount Lindesay / Beaudesert Strategic Transport Network Investigation explores the transport needs for the Mount Lindesay / Beaudesert region for the next 40 to 50 years. The findings relevant to the subject site include:

- Establishment of a major regional road corridor between Beaudesert and Springfield, likely incorporating Teviot Road
- Investigation of an east-west arterial corridor between Flagstone and the Pacific Motorway.

The plan was developed in 2009 and is in place to guide future investigations, planning and delivery of transport networks and other services to the area.

2.5.1.3 Sub-regional road upgrades

Sub-regional roads that have been identified by the *Greater Flagstone Urban Development Area Development Scheme* to be upgraded to support anticipated transport demands include:

- Teviot Road
- Homestead Drive
- Cusack Lane.

2.5.2 Long term public transport network improvements

2.5.2.1 Salisbury to Beaudesert rail corridor study

Long term regional planning by the Queensland Government has identified a need for additional public transport infrastructure to service Salisbury to Beaudesert.

TMR are working with local councils to ensure growing communities, south-west of Brisbane is connected to services, employment and educational opportunities.

Planning for this project is currently progressing towards the identification and preservation of land required for a future rail corridor. The current alignment near the ROL1 site is west of the Teviot Road corridor with one station being considered north-west of the development at Flagstone Central, and another at the south-west at Gittins Development.

2.5.2.2 Mount Lindesay Beaudesert strategic transport network investigation

The Mount Lindesay / Beaudesert Strategic Transport Network Investigation addressed the potential demand for future public transport use to assist in developing the regional level network for 2056. The study considered potential public transport connections to / from the Flagstone area including east-west connection to Jimboomba / Mount Lindesay Highway (north of Riverside Celestino), southern connection to Bromelton and Beaudesert parallel to the potential rail corridor, and northern connection to Greenbank via Teviot Road.

2.5.3 Active transport network improvements

2.5.3.1 Mount Lindesay Beaudesert strategic transport network investigation

The key design principles developed by the *Mount Lindesay / Beaudesert Strategic Transport Network Investigation* to guide the development of the cycle network for the region include:

- Cycle routes to provide good connections between Flagstone and other local government areas including Jimboomba, Beaudesert and Greenbank
- Good quality cycling routes to be created between key residential areas, enterprise precincts and activity centres and other popular destinations
- Priority to be given to providing safe cycling routes surrounding schools
- High quality recreational routes to be developed within townships and between key recreational destinations
- New developments to be designed in accordance with cycling best practice initiatives
- Cyclists and pedestrians should be separated where possible
- Routes to be designed in accordance with all requirements and guidelines.

2.5.3.2 Queensland cycle strategy 2017-2027

The *Queensland Cycle Strategy* has been developed by TMR to ensure that, as population grows, people are supported to choose cycling as a convenient,

enjoyable and healthy way to travel and socialise. The priorities of the strategy are to:

- Building and connecting infrastructure to grow participation
- Encouraging more people to ride
- Sharing our roads and public spaces
- Powering the economy
- Using research and data in decision making.

The action plan associated with the strategy includes key actions which are to be undertaken to realise the strategy objectives. Actions relevant to the subject site includes the implementation of *TMR Technical Note 128: Selection and Design of Cycle Tracks (TN128)*, in the planning, detailed design and delivery of the Greater Flagstone PDA.

It is noted however, that as part of the action plan, *TN128* is to be reviewed in relation to cycling design guidance including dimensions and warrants, and their inclusion in future updates of *TMR Road Planning and Design Manual*.

2.5.3.3 South East Queensland principal cycle network

In accordance with the *South East Queensland Principal Cycle Network (2016)*, the Cusack Lane to Teviot Road to Homestead Drive route forms part of a Principal Route, as shown in Figure 6.

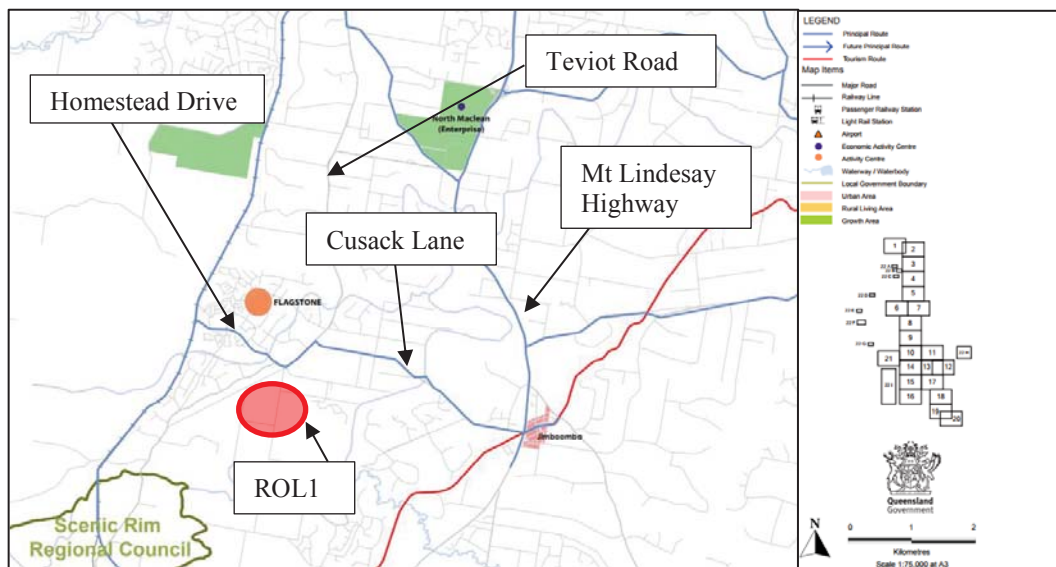


Figure 6: South East Queensland Principal Cycle Network – Map 15 (2016)

The ROL1 development stage includes a total of 582 lots as shown in Figure 7 (and Appendix C) and listed below:

- Residential:
 - Terrace: 129 lots
 - Villa / premium villa: 371 lots
 - Courtyard: 64 lots
 - Traditional: 3 lots
 - Multi-family: 14 lots
- Special use: 1 lot
- Parks:
 - Local parks
 - Linear parks
 - District sports park

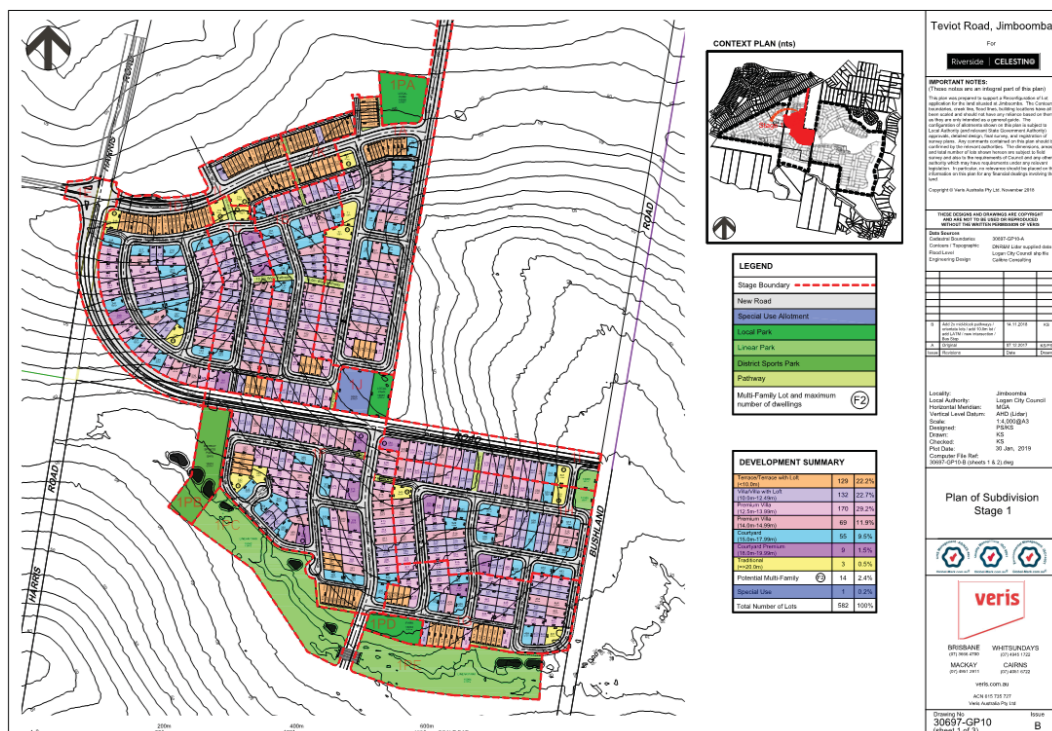


Figure 7: ROL1 Plan of Subdivision (Source: Veris 30/01/19)

As shown, for ROL1, there is one point of access to the external road network via Teviot Road.

3.1 Road network

The internal road hierarchy and cross-sections have been developed collaboratively by Arup and Calibre in consultation with EDQ and are based on the ultimate (2066) design traffic volumes anticipated by the master planned Riverside Celestino site.

The proposed internal hierarchy for ROL1 is shown in Figure 8 and in for the entire master planned Riverside Celestino site in Appendix A.

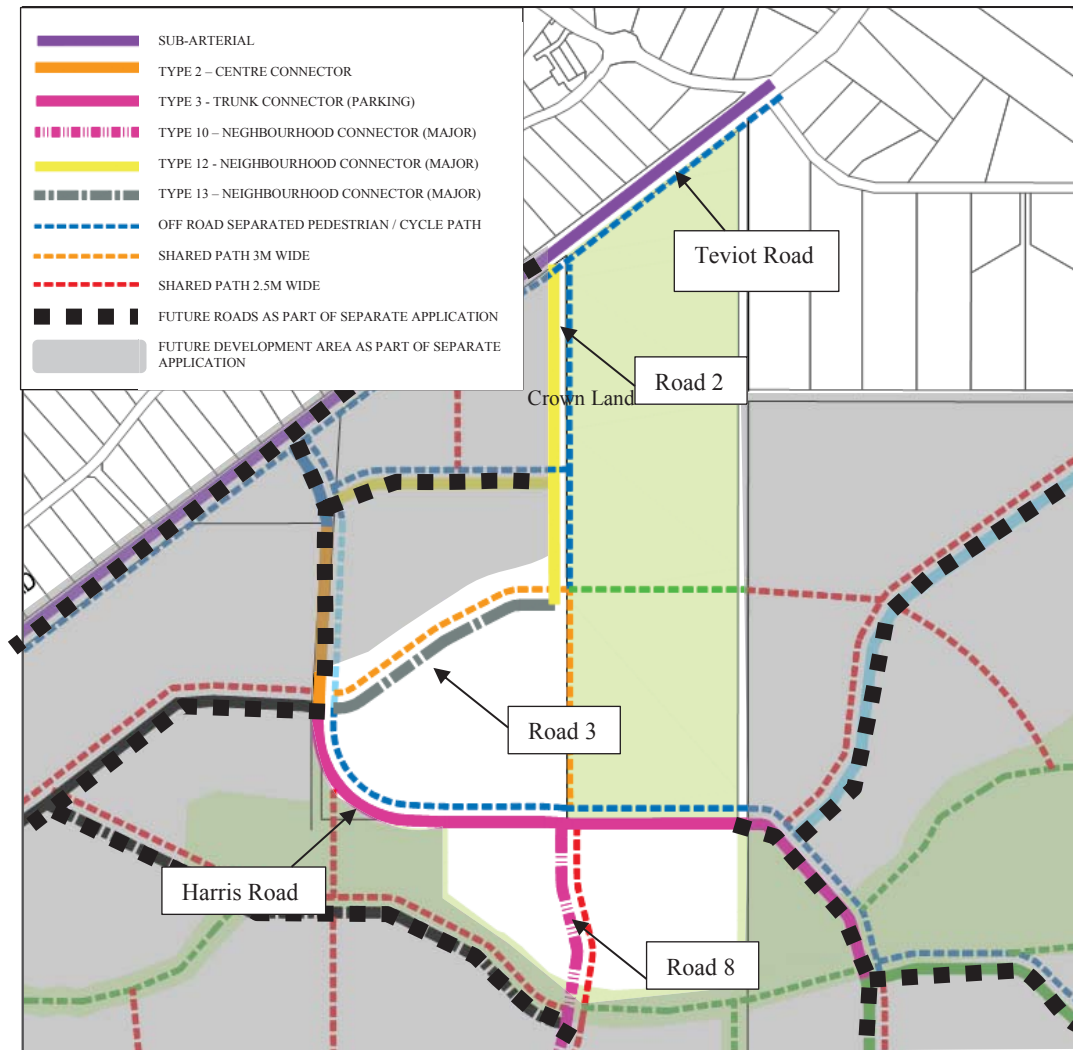


Figure 8: ROL1 Road Hierarchy Layout Plan (Source: Calibre 08/02/19)

The proposed road network differs from the approved context plan road hierarchy, due to the upgrade of Road 3 from a Neighbourhood Connector (Minor) to a Neighbourhood Connector (Major). This is due to updates in the traffic modelling for the ultimate Riverside Celestino site (refer to Chapter 4 of this TIA) which have increased the daily traffic demands along the road way. As such, the proposed road hierarchy is now anticipated to cater for the ultimate demands of both ROL1 and the entirety of the Riverside Celestino development (as discussed with EDQ at the meeting on the 5 June 2018).

3.1.1 Road characteristics

The following table represents the characteristics of the proposed road network for ROL1. The typical cross-sections associated with these are provided in Appendix D.

Table 5 Typical internal road network characteristics

	Teviot Road	Harris Road	Road 2	Road 3	Road 8
Type (as per Appendix D)	Sub-arterial	Type 3	Type 12	Type 13	Type 10
Capacity	11,000 vpd	9,999 vpd	7,499 vpd	7,499 vpd	7,499 vpd
Speed	70km/h	60km/h	50km/h	50km/h	50km/h
No. Lanes	2	2	2	2	2
Lane width	3.5m	3.5m	3.2m	3.2m	3.2m
Parking	-	2.4m x 2 lanes	2.3m x 2 lanes	2.3m x 2 lanes	2.3m x 2 lanes
Shared path	-	-	-	-	2.5m
Separated path	3m cycleway 1.5m ped footpath	3m cycleway 1.5m ped footpath	3m cycleway 1.5m ped footpath	3m cycleway 1.5m ped footpath	-
Additional footpath provision	-	1.5m	1.5m	1.5m	1.5m

3.2 Car parking

The following principles have been adopted for the provision of car parking for each residential lot:

- No direct access to residential lots from Harris Road and Road 3
- Access is located along lot frontage at the farthest point from adjacent intersection or bend in road (i.e. at least 6m separation to adjacent intersection)
- Maximum of one driveway per dwelling unit (excepting multi-family dwellings)
- Minimum distance between adjacent lot driveways is 3m

On-street car parking has been provided to ensure a minimum of 0.75 spaces per dwellings with frontage under 12.5m is achieved.

The access location for the Special Use site is to be confirmed as part of future development applications for the site. Incorporation of a left-in / left-out on Harris Road may be possible, subject to detailed design considerations and would need to be confirmed as part of the future development application process.

Plans detailing the location of each access point for each allotment, on-street parking locations, and the location of parking build-outs, within ROL1 are presented in Appendix C.

3.3 Public transport network

The *Greater Flagstone Urban Development Area (UDA) Development Scheme* stipulates that after the 200th lot in the PDA has been delivered, an interim public transport service (by bus) will be available in the area. During the initial stages of development, the developer is also required to contribute to this interim public transport service for up to five years or until the fare box income exceeds 30% of running costs, whichever is sooner.

Additionally, the *Greater Flagstone UDA Development Scheme* stipulates that public transport is to be readily accessible to the community i.e. 90% of the dwellings should be within 400m of a potential public transport services.

3.3.1 Master plan bus network

The public transport network for the master planned site has been developed to allow for future flexibility to implement bus routes as demand warrants.

As mentioned previously, according to the *Greater Flagstone UDA Development Scheme*, public transport is to be readily accessible to the community i.e. “90% of all dwellings should be within 400m of a potential public transport service. Public transport is to provide effective links to centres, rail stations and external destinations” (Source: Greater Flagstone UDA Development Scheme) i.e. District Centres are to be feeder public transport hubs, and Neighbourhood Centres to provide public transport stops.

Based on these requirements and the given locations of the ‘activity’ centres (i.e. school, district centre, neighbourhood centre), the following major roads are recommended to service public transport at the ultimate and interim (2031) development stages.

As the design process continues it is recommended that engagement with TMR TransLink Division continues to ensure bus network planning, bus stop design and bus services are adequate for the area and meet the emerging community’s needs.

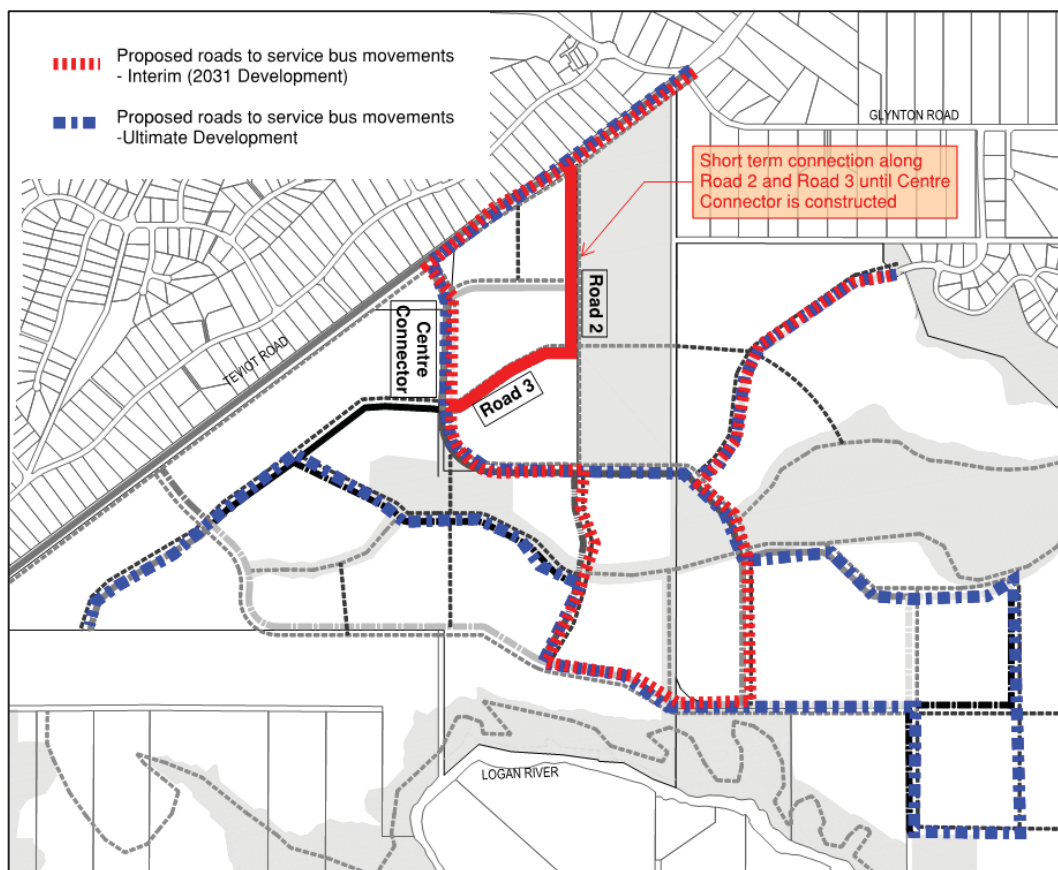


Figure 9: Proposed roads to service bus movements – master planned development

3.3.2 ROL1 bus route

ROL1 proposes to develop 582 residential lots, therefore exceeding the 200th lot trigger. As such, an interim public transport route through ROL1 is proposed as illustrated in Figure 10 which takes into consideration the proposed interim and ultimate bus services for the master planned Riverside Celestino development.

Due to the road network layout of ROL1, buses will be required to follow the same route as they enter and exit the site. A temporary bus turnaround is provided at the ROL1 termination of Harris Road to enable buses to loop within the site. It is envisaged that as development progresses, alternate bus routes will be able to be considered (in consultation with TransLink) which improve the efficiency of the service through the site.

The designated roads on the proposed bus route have appropriate road profiles to accommodate bus manoeuvrability as they have sufficient pavement widths and traffic lanes. Swept path analysis has been carried out by Calibre to ensure that buses are able to manoeuvre through the site along the proposed route. It is noted that as the development stages within ROL1 are constructed, the location of the temporary turnaround will likely reflect the boundary of the catchment at that stage. The resulting ultimate temporary bus turnaround for ROL1 is provided in Figure 11.

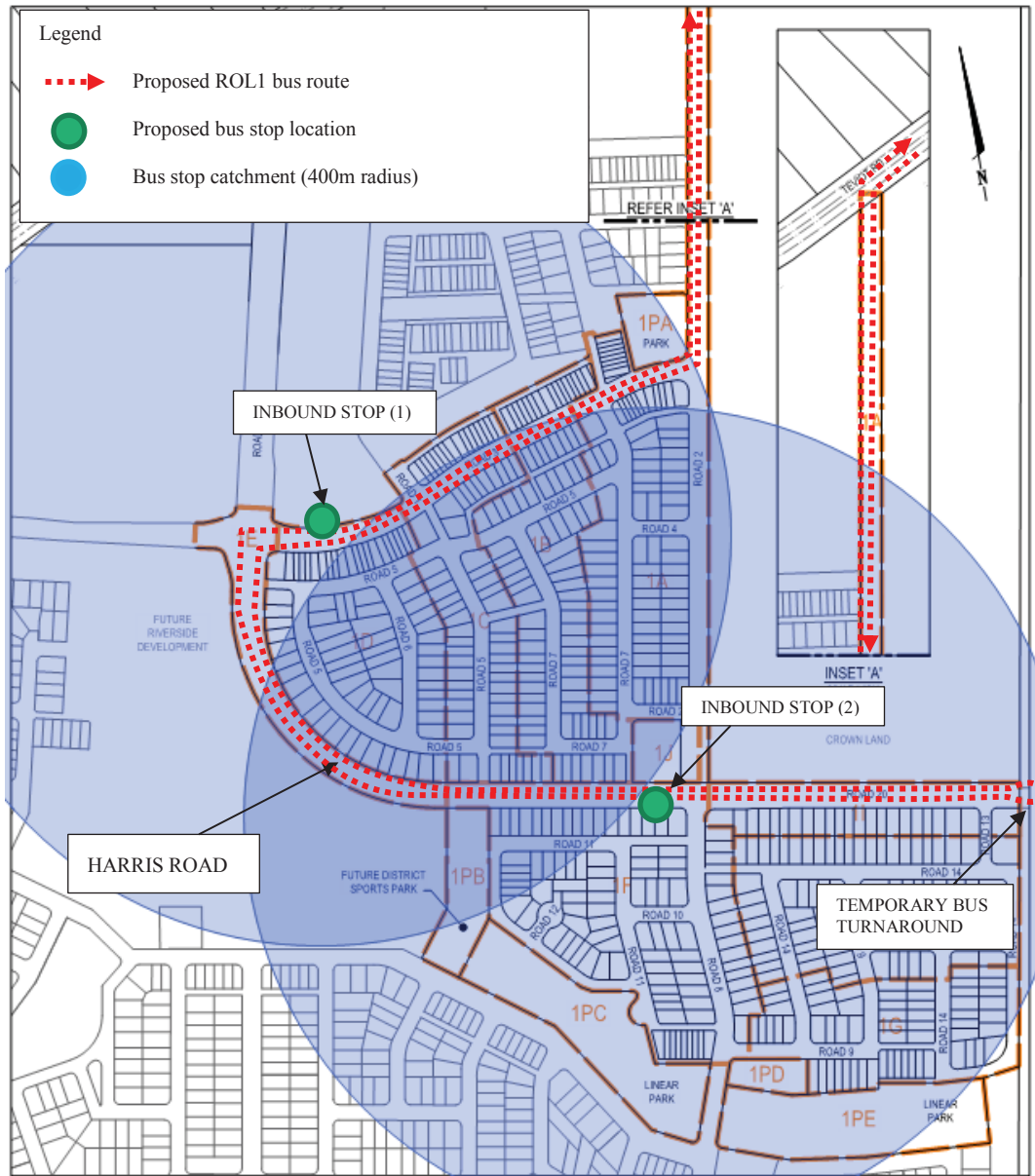


Figure 10: Proposed ROL1 bus route

It is noted that as the master plan progresses (refer Figure 9), the bus route will shift to connect with Teviot Road from the Centre Connector (i.e. northern extension of Harris Road), with the bus stop currently proposed on Road 3 for ROL1 (Inbound Stop (2)) is to be relocated along the Centre Connector as development in the centre progresses.

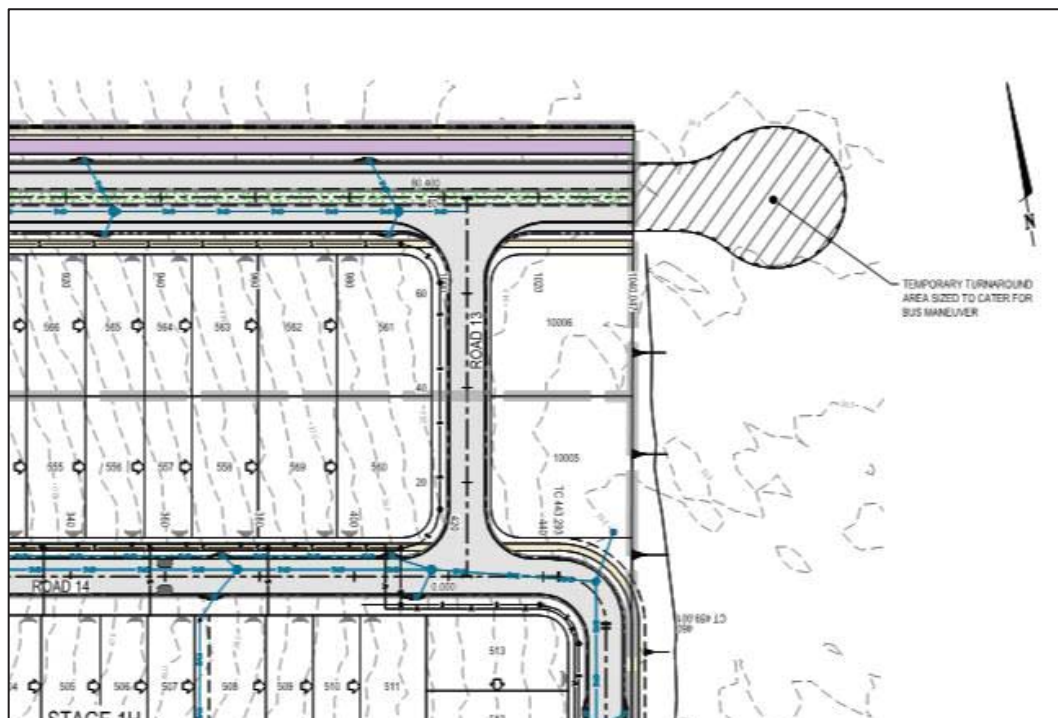


Figure 11: Bus turnaround (Calibre 13/03/19)

3.3.3 Bus stops

As mentioned previously, the *Greater Flagstone UDA Development Scheme* stipulates that 90% of the dwellings should be within 400m of a potential public transport services.

The proposed bus stop/s are to be designed as “Regular Stops” in accordance with *TMR Public Transport Infrastructure Manual (PTIM) 2015*. As such, each stop is to include, at a minimum level, a hardstand, bus stop sign / marker, timetable information, seating and tactile ground surface indicators (to meet the requirements of the disability standards).

In order to provide an accessible public transport service through the site in ROL1, two bus stops are proposed as shown in Figure 10.

- One inbound (to city) bus stop on Harris Road, just west of Road 8 [refer Figure 12]
- One inbound (to city) bus stop on Road 3, just east of Harris Road [refer Figure 13]

It is noted that bus stop pairs have not been considered at this stage due to the circuitous nature of this initial service.

As shown in Figure 10, the proposed bus stop locations achieve a total of 100% of dwellings being located within the 400m catchment. Additionally, the proposed bus stop locations can be accessed via the suggested path network.

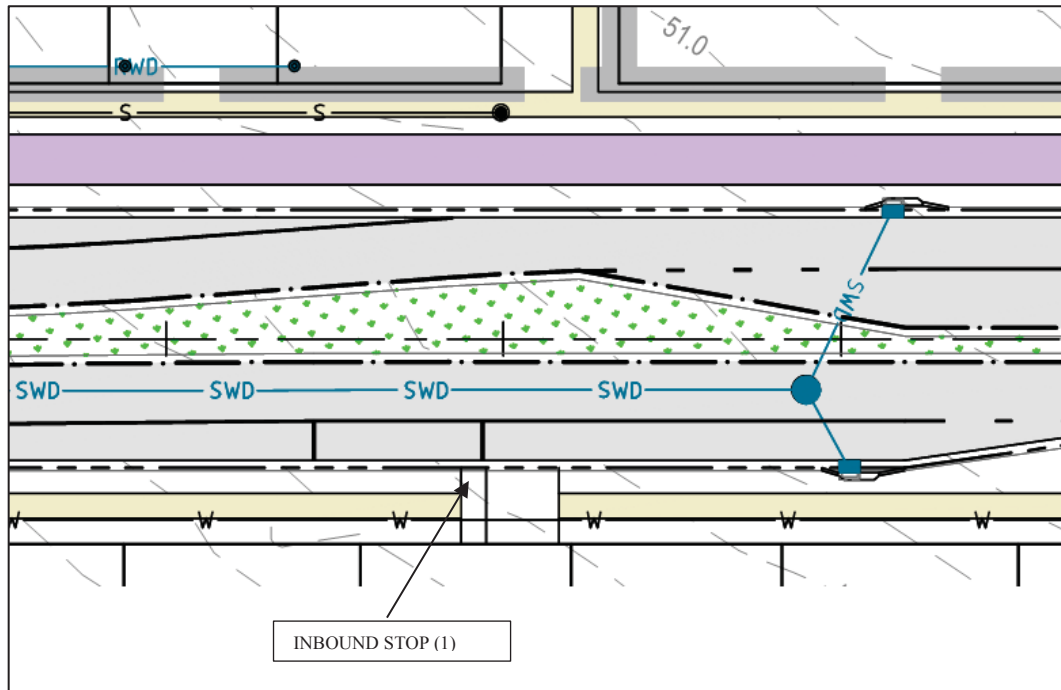


Figure 12: Inbound stop (1) location

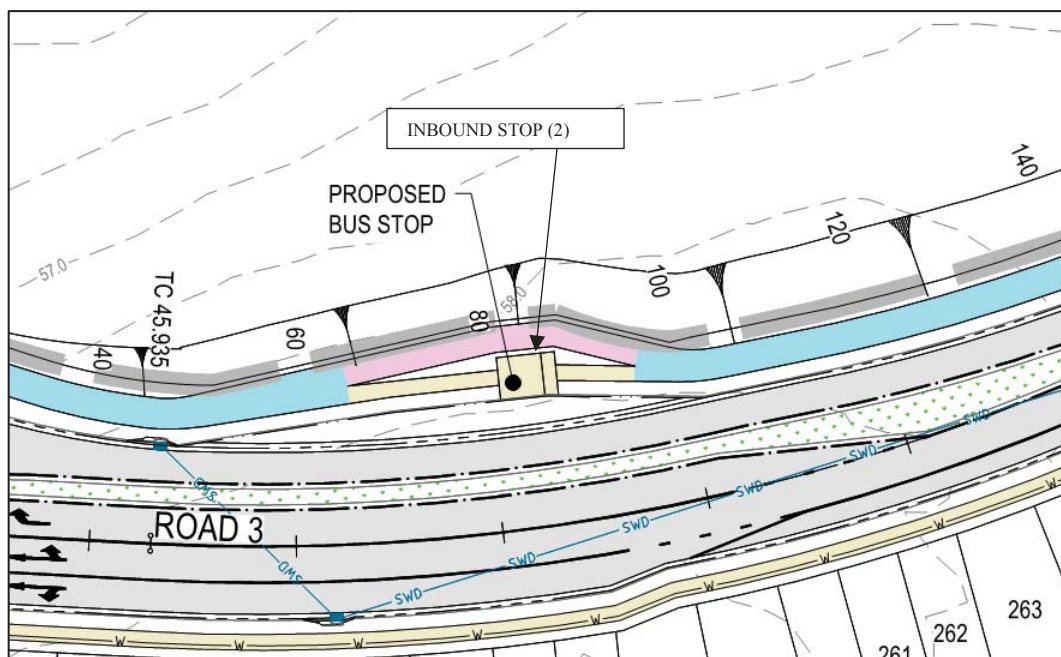


Figure 13: Inbound stop (2) location

3.3.4 External connections

It is envisioned that the bus route will connect to the greater transport network and serve as a feeder to transport customers to PT hubs. Central hubs that are recommended to be connected include; Jimboomba due to its proximity to the site; Park Ridge due to the proximity to Browns Plains (a major regional activity centre), or Springfield (a Principal Regional Activity Centre) which provides connections to a train station (Ipswich-Springfield Line) and also access to the

Centenary Highway. It is proposed that in the ROL1 stage of development, the frequency of the service is hourly, like existing services provided in Jimboomba (TransLink route 540).

In addition to these hubs, connectivity to the Greater Flagstone PDA should also be considered as the PDA matures. As the design process continues it is recommended that TransLink continue to be engaged to ensure network planning and bus services are adequate for the area. Furthermore, discussions with TransLink should be undertaken with respect to the form and location of the bus stops with due consideration to traffic volumes, residential walking catchments and frequency of services and likely timetable/span of hours (as part of delivering accessibility to the community with respect to access to opportunities).

The integration of the subject site as part of the public transport network will develop over the design life of the development and the surrounding Greater Flagstone PDA. It is understood and supported that EDQ and TransLink are working towards the delivery of an early public transport service and associated funding scheme for the entire PDA. Prior to implementation of the early service, access to the public transport network will be reliant upon services at the Park Ridge Park 'n' Ride, requiring residents to drive to this location.

It is expected that future review of the bus service network by EDQ and TransLink will be required with the implementation of the Salisbury to Beaudesert Rail Line and future demand in the Greater Flagstone PDA.

3.4 Active transport network

ROL1 proposes a connected network of separated and shared pedestrian / cyclist paths and parkland recreational paths. The internal active transport network has been developed in consultation with EDQ and are based mostly on the approved context plan (Approval No. DEV2016/811 dated 21 September 2017) and acknowledges the topographical constraints of the area e.g. Harris Road reaching up to an 8% grade in some locations.

The proposed active transport network for ROL1 is presented in Figure 14.

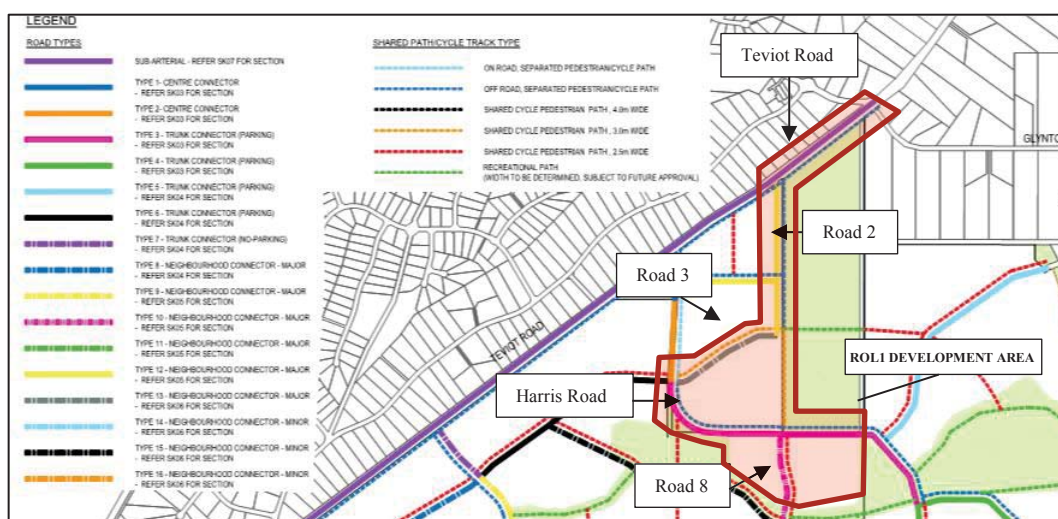


Figure 14: Preliminary Internal Cycleways and Roads Hierarchy Plan

The following cycle path types have been incorporated into the design at ROL1:

- Off-road separated pedestrian and bicycle paths
- Shared pedestrian / bicyclist paths (2.5m wide and 3m wide)
- Local access paths - access links to local land uses or major pedestrian / cyclist routes from residential areas

As part of the active transport strategy for the ROL1 site, no on-street cycle lanes (directly adjacent to traffic lane i.e. no buffer) have been incorporated into the design at ROL1. Off-road facilities are considered as preferred acknowledging the recently released TMR *Queensland Cycle Strategy 2017-2027*, which states 97% of Queenslanders reported feeling safe riding on physically separated cycleways (safe in terms of separation from traffic).

The typical road cross-sections, including the active transport provisions, adopted in ROL1 are provided in Appendix B.

3.4.1 Separated pedestrian and cycle paths

Separated pedestrian and cycle paths as a facility type, address the primary transport routes between key attractors and destinations (i.e. District Centre) in the site. The majority of users are likely to be commuters, therefore these paths typically take the most direct and convenient route.

Separated pedestrian and cycle paths are used in areas that attract high pedestrian and cyclist movements (*Austroads Guide to Road Design Part 6A: Paths for Walking and Cycling*). The separation of users improves safety / conflict issues between pedestrians and / or cyclists (*Austroads Guide to Road Design Part 6A: Paths for Walking and Cycling*).

3.4.1.1 Harris Road cycle track

An off-road separated pedestrian / cycle path is proposed on the eastern and northern sides of Harris Road in ROL1. The path is to comprise a 3m cycle path with an adjacent 1.5m wide pedestrian path separated by a 1m buffer, in compliance with *Austroads Guide to Road Design Part 6A: Paths for Walking and Cycling (2016)*.

On the other side of the roadway to the off-road separated paths, a 1.5m (minimum) pedestrian footpath is provided. This is compliant with the minimum requirements of *Austroads Guide to Road Design Part 6A: Paths for Walking and Cycling (2016)* Table 5.1, being 1.2m.

At the Harris Road / Road 3 signalised intersection, priority treatment to cyclists will be provided along the separated pedestrian / cycle path i.e. eastern approach to the intersection in-line with the requirements for cycle tracks in TMR *TN128*. This treatment is to connect to the proposed cycle track (two-way one side) to be incorporated at verge level on the eastern side of the Centre Connector (i.e. northern extension of Harris Road) as part of future ROL applications.



Figure 15: Harris Road / Road 3 intersection layout (Source: Calibre 13/03/19)

3.4.2 Shared pedestrian / cyclist paths

Shared pedestrian / cyclist paths distribute users to land use precincts / generators in the site. Users of these facilities are most likely both utility and education trips, as such, shared pedestrian / cyclist paths have been used to connect the District Centre to schools and public transport nodes.

3.4.2.1 3m wide shared path

The design of the pedestrian and cyclist infrastructure on Roads 2 and 3, includes a 3m shared path (one side) and 1.5m footpath on other. The width of the shared path is consistent with the minimum requirement of a regional commuter path, and can form part of the principal cycle network as per *Austroads Guide to Road Design Part 6A: Paths for Walking and Cycling (2016)* Table 5.3.

On the other side of the road, a minimum of 1.5m pedestrian footpath is provided. This is compliant with the minimum requirements of *Austroads Guide to Road Design Part 6A: Paths for Walking and Cycling (2016)* Table 5.1, being 1.2m.

3.4.2.2 2.5m wide shared path

Road 8 incorporates a 2.5m shared path on one side and 1.5m footpath on the other side. The width of the shared path is consistent with the desirable minimum requirement of a local access path as per *Austroads Guide to Road Design Part 6A: Paths for Walking and Cycling (2016)* Table 5.3.

On the other side of the road, a minimum of 1.5m pedestrian footpath is provided. This is compliant with the minimum requirements of *Austroads Guide to Road Design Part 6A: Paths for Walking and Cycling (2016)* Table 5.1, being 1.2m.

These facilities are provided throughout the site as “feeders” to / from the major separated cycleways and local residential catchments.

4 Traffic assessment

The purpose of this section of the report is to detail the traffic impact of the proposed ROL1 development.

The internal layout of ROL1, including intersection design, has been determined based on the ultimate (2066) traffic demands within the completed Riverside Celestino master planned site.

The impact of the proposed development on the surrounding road network has been determined by addressing the traffic generation and distribution of ROL1 trips over the immediate design horizon i.e. assumes an opening year of 2021.

4.1 Internal network

The internal layout of ROL1 has been determined based on the ultimate (2066) traffic demands within the completed Riverside Celestino master planned site. Traffic modelling of the ultimate Riverside Celestino development was achieved through a three-tiered modelling approach:

1. **Strategic Modelling** was undertaken externally by Veitch Lister Consulting (VLC) using the Zenith model. This is a regional forecasting model that predicts the overall growth in travel demand across the region.
2. **Local Area Modelling** was undertaken by developing a mesoscopic model using AIMSUN. This model forecasts traffic flows across the local road network. A 2031 and 2066 model was developed by applying traffic growth predictions derived from the Strategic Model. The mesoscopic model establishes the forecast design traffic volumes.
3. **Intersection modelling** of key intersections using SIDRA Intersection was undertaken using traffic volume outputs from the AIMSUN model. SIDRA is a useful tool to determine the intersection capacity, vehicle delays, queues and degree of saturation of the intersections.

The preliminary modelling results for the Riverside Celestino site based on the approved Context Plan were provided to EDQ in a traffic modelling report (*MR01 Transport Modelling Report* dated 12 October 2017) prepared by Arup. The report detailed the road network requirements at the interim (2031) and ultimate (2066) design years with the proposed Riverside Celestino Development. Since submission of the report, EDQ requested updates to the modelling be carried out.

Subsequently, in order to further improve operations at the Teviot Road / Homestead Drive intersection, additional traffic modelling (beyond just responding to EDQ's November 2018 informal RFI) has been carried out. As such, the latest traffic modelling for the Riverside Celestino master planned site addresses two limiting scenarios:

- Option 1: With Glynton Road (including any updates required to address EDQ's comments) – the Teviot Road / Homestead Drive intersection continues to incorporate the Glynton Road approach

- Option 2: Without Glynton Road (including any updates required to address EDQ's comments) – Glynton Road terminates just prior to its intersection with Teviot Road and the Teviot Road / Homestead Drive intersection becomes a signalised 'T' intersection.

As per discussions with EDQ and VLC (5 June 2018), it is assumed that the final solution at the Teviot Road / Homestead Drive / Glynton Road intersection to be adopted would be one that lies between the two extreme scenarios i.e. incorporate some form of access, whether it be left-in only etc. to Glynton Road.

The internal intersection layouts for ROL1 have therefore been designed to accommodate for the worst-case scenario of the two recent modelling options assessed.

4.1.1 Intersection assessment

The indicative layout and anticipated worst-case (2066 Option 1 or Option 2, whichever is worse) performance of each key intersection within ROL1 is detailed in this section of the report. The preliminary results of all key intersections within the master plan of the Riverside Celestino development, for both modelling scenarios (Option 1 and 2) is included in "FN01 With vs Without Glynton Road" attached in Appendix F.

As demonstrated, each intersection is anticipated to operate well within acceptable limits with the full master planned Riverside Celestino development trips at 2066.

The key intersections addressed are (refer Figure 16 for location of each):

- Road 2 / Road 3 priority-controlled 'T' intersection
- Harris Road / Road 3 signalised 'X' intersection
- Harris Road / Road 8 priority-controlled 'T' intersection.

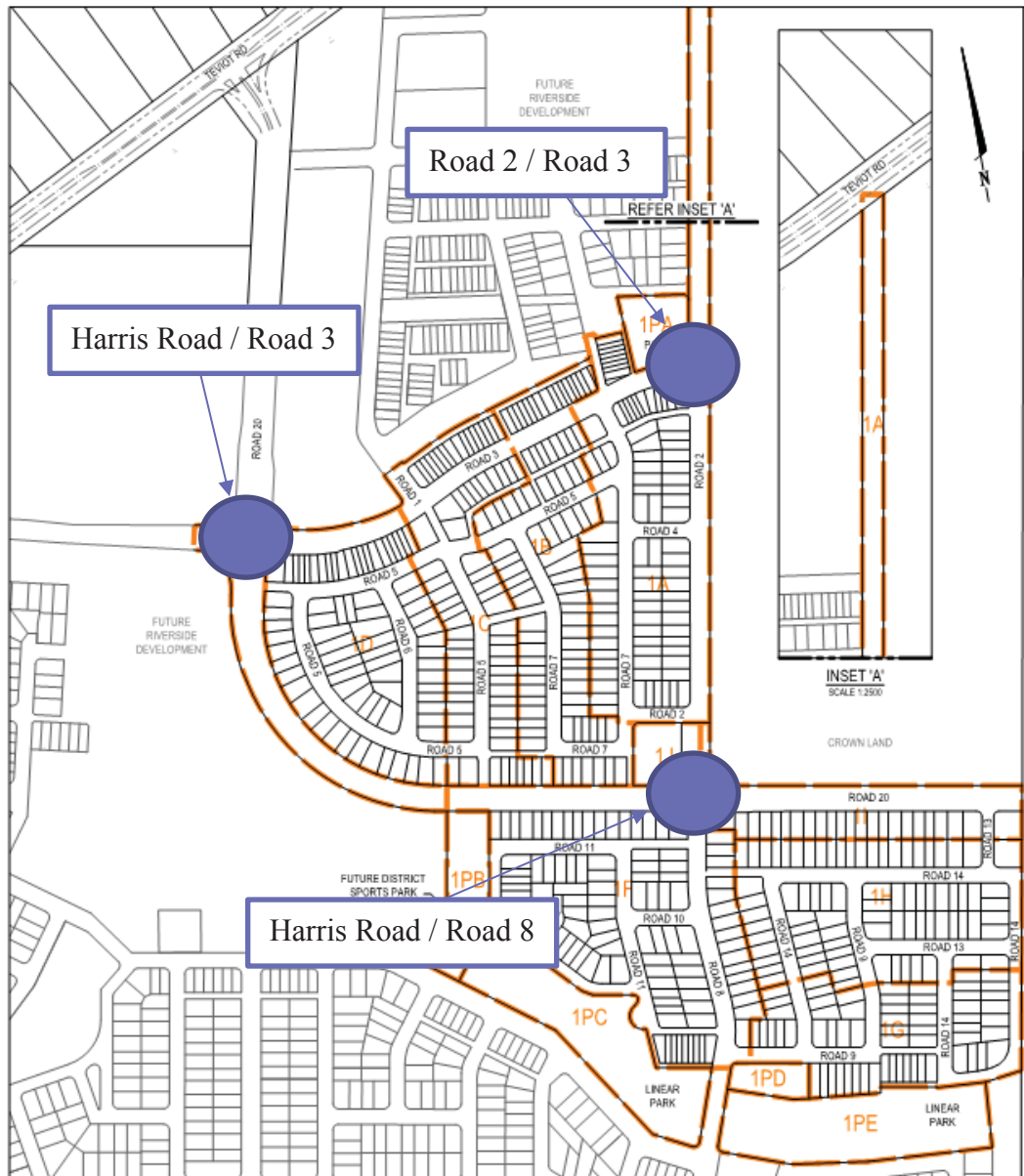


Figure 16: ROL1 key internal intersections

4.1.1.1 Road 2 / Road 3 intersection

The indicative layout to be adopted for the Road 2 / Road 3 intersection is presented in Figure 17. For both Option 1 and Option 2, the intersection layout required at the ultimate design horizon with full Riverside Celestino development trips, is the same. A summary of the worst-case scenario performance (Option 1) of the intersection is presented in Table 6.

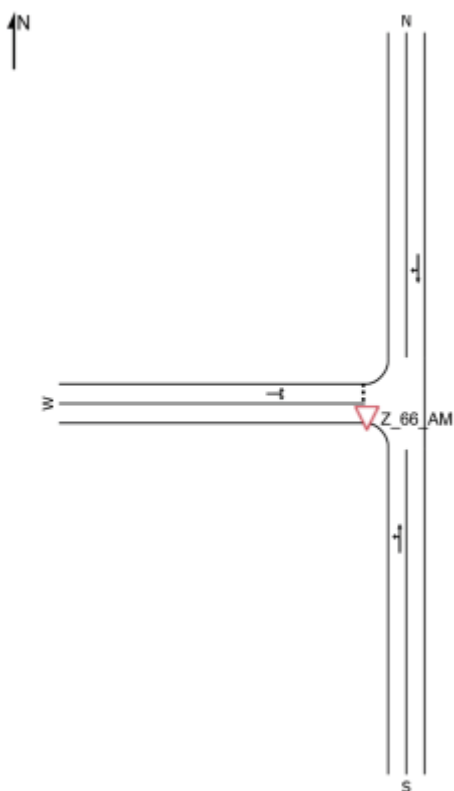


Figure 17: Road 2 / Road 3 ultimate intersection layout (Option 1 and Option 2)

Table 6: Road 2 / Road 3 ultimate (2066) worst-case performance (Option 1)

Peak Period	Maximum DOS (%)	Maximum Average Delay (sec)	Maximum 95%ile Queue (m)
AM Peak	12.7%	5.3	4.6
PM Peak	20.4%	4.8	8.1

As demonstrated in Table 6, the intersection functions within the acceptable limits over the ultimate 2066 design horizon with all trips associated with the fully developed Riverside Celestino site.

4.1.1.2 Harris Road / Road 3

The indicative layout to be adopted for the Harris Road / Road 3 intersection is presented in Figure 18 (and Figure 15). This layout has been updated since the development of FN01 to include an additional left turn lane on the northern approach and a bi-directional cycle path in liaison with EDQ. The performance summary of the Harris Road / Road 3 intersection at 2066 is presented in Table 7.

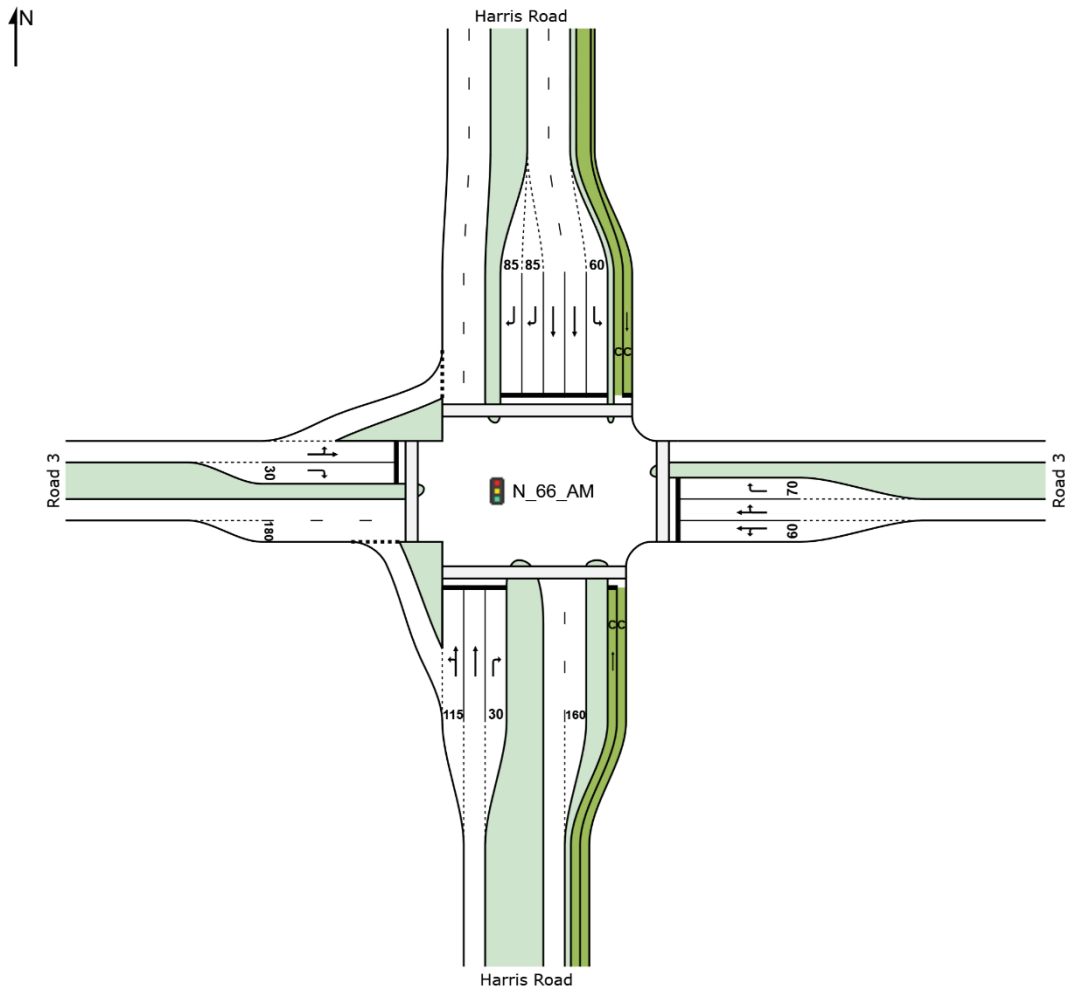


Figure 18: Harris Road / Road 3 ultimate intersection layout

Table 7: Harris Road / Road 3 ultimate (2066) performance summary

Peak Period	Maximum DOS (%)	Maximum Average Delay (sec)	Maximum 95%ile Queue (m)
AM Peak	85.7%	34.3	123.5
PM Peak	78.1%	33.3	84.4

As demonstrated in Table 7, the intersection functions within the acceptable limits over the ultimate 2066 design horizon with all trips associated with the fully developed Riverside Celestino site.

4.1.1.3 Harris Road / Road 8

The indicative layout to be adopted for the Harris Road / Road 8 intersection is presented in Figure 19. For both Option 1 and Option 2, the intersection layout required at the ultimate design horizon with full Riverside Celestino development trips, is the same. A summary of the worst-case scenario performance (Option 2) of the intersection is presented in Table 8.

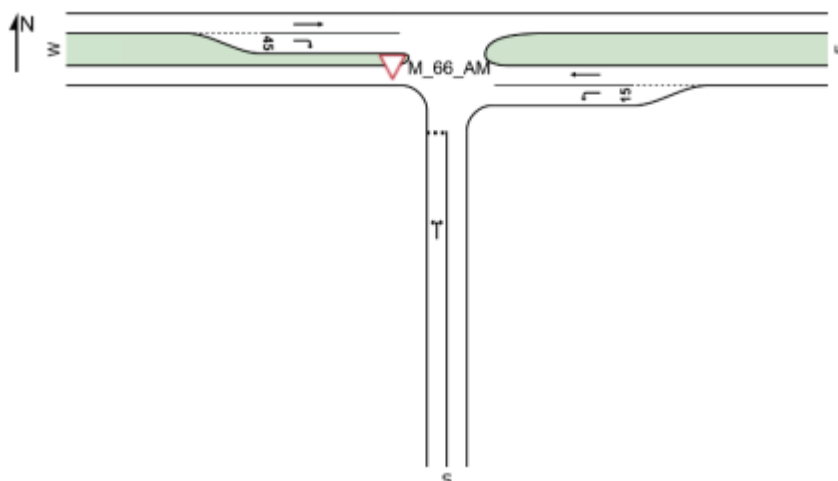


Figure 19: Harris Road / Road 8 ultimate intersection layout (Option 1 and Option 2)

Table 8: Harris Road / Road 8 ultimate (2066) performance summary - Option 2

Peak Period	Maximum DOS (%)	Maximum Average Delay (sec)	Maximum 95%ile Queue (m)
AM Peak	62.5%	5.0	30.9
PM Peak	26.0%	3.1	7.6

As demonstrated in Table 8, the intersection functions within the acceptable limits over the ultimate 2066 design horizon with all trips associated with the fully developed Riverside Celestino site.

4.2 External network

4.2.1 Development traffic

For the proposed development, the traffic generation has been estimated using published trip rates sourced from the *Road Planning and Design Manual, 1st Edition Chapter 3: Road Planning and Design Fundamentals* (TMR, 2005), and the *Guide to Traffic Generation Developments Updated Traffic Surveys* (RTA, 2013).

ROL1 comprises the development of 582 residential lots of which 129 are higher density terrace lots with the remaining 453 lots being detached dwellings. The traffic generation rates for each of proposed uses within the development is summarised in Table 9. As demonstrated below, the total trips generated by the proposed ROL1 development is 462 vehicles per hour (vph).

Table 9: Trip Generation Summary

Land Use	Yield	Trip Rate	Trip Generation
Terrace	129 dwellings	0.6 vph per dwelling	77 vph
Detached dwellings	453 dwellings	0.85 vph per dwelling	385 vph
Total	582 dwellings		462 vph

At this stage of the development, the only access to the site will be via Teviot Road at Road 2. The development is therefore expected to distribute all trips to the surrounding road network via the Teviot Road / Homestead Drive / Glynton Road intersection.

4.2.2 Road link assessment

As mentioned previously, Teviot Road south of Homestead Drive is currently not constructed, and as such will need to be developed as part of ROL1 works (between Homestead Drive and Road 2). The approved interim Teviot Road typical cross section is presented in Figure 20.

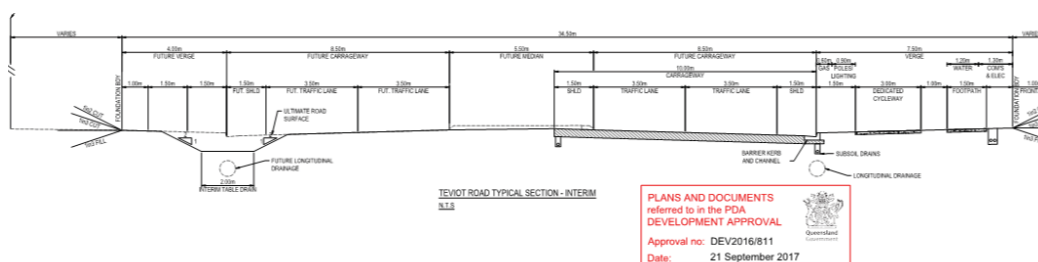


Figure 20: Approved interim Teviot Road typical cross section

The cross-section incorporates two 3.5m wide traffic lanes and a 3m wide cycle track with 1.5m wide footpath on the eastern verge.

According to Austroads *Guide to Traffic Management Part 3: Traffic Studies and Analysis* (2013) Table 5.1, the typical mid-block capacity for urban roads with interrupted flow is 900 vph per lane. Therefore, the approximate capacity of the interim arrangement for Teviot Road is 1,800 vph.

Traffic generation associated with ROL1 is 462 vehicles per hour, and is therefore well within the capacity limits of the interim Teviot Road corridor to be constructed between Homestead Drive and Road 2.

4.2.3 Intersection assessment

The intersection layout to be adopted for the Teviot Road / Homestead Drive / Glynton Road intersection will be dependent on the design year and lot triggers to ensure that sufficient capacity is achieved at the intersection. This is detailed in “TN08 Teviot Road / Homestead Drive / Glynton Road intersection – Triggers for Upgrade” located in Appendix E.

The technical note details the Teviot Road / Homestead Drive / Glynton Road intersection upgrades based on the lot triggers which include:

- Short term layout (2021): 0 - 160 lots
- Short term layout 2 (2021): 160 - 650 lots
- 2031 interim layout: 650 - 3,425 lots

The indicative layouts for the intersection upgrades noted above are illustrated in Figure 21 to Figure 23 with the associated intersection performance results provided in Table 10.

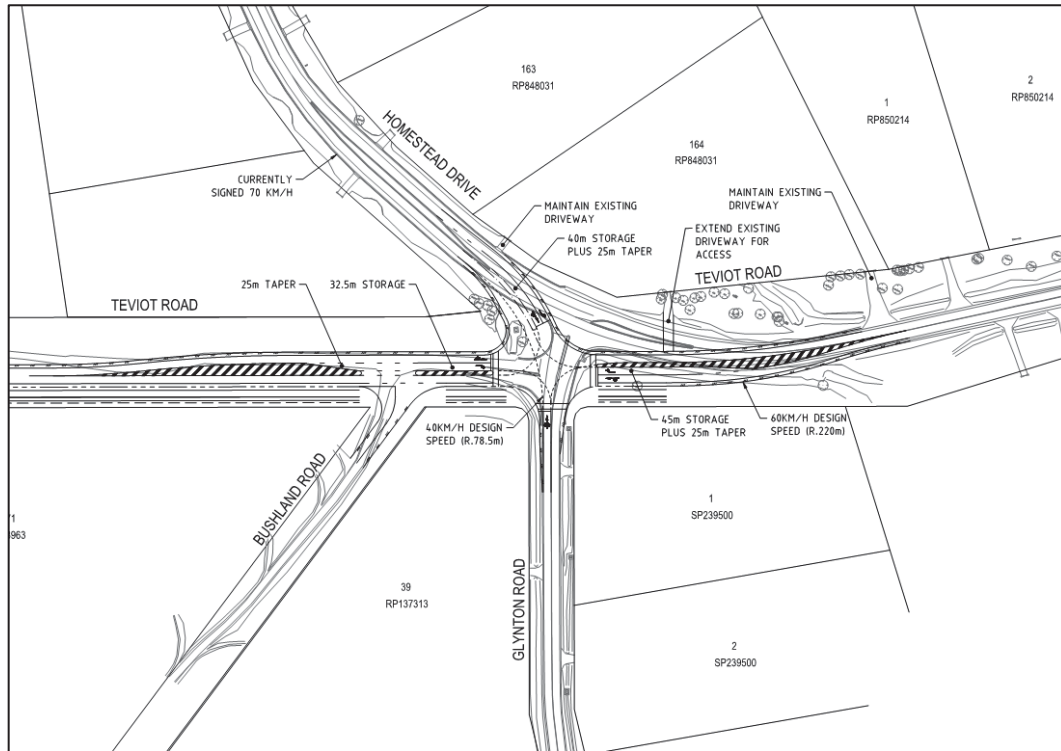


Figure 21: Short term intersection layout– Source: Calibre DWG 17-001548 SK03 rev2

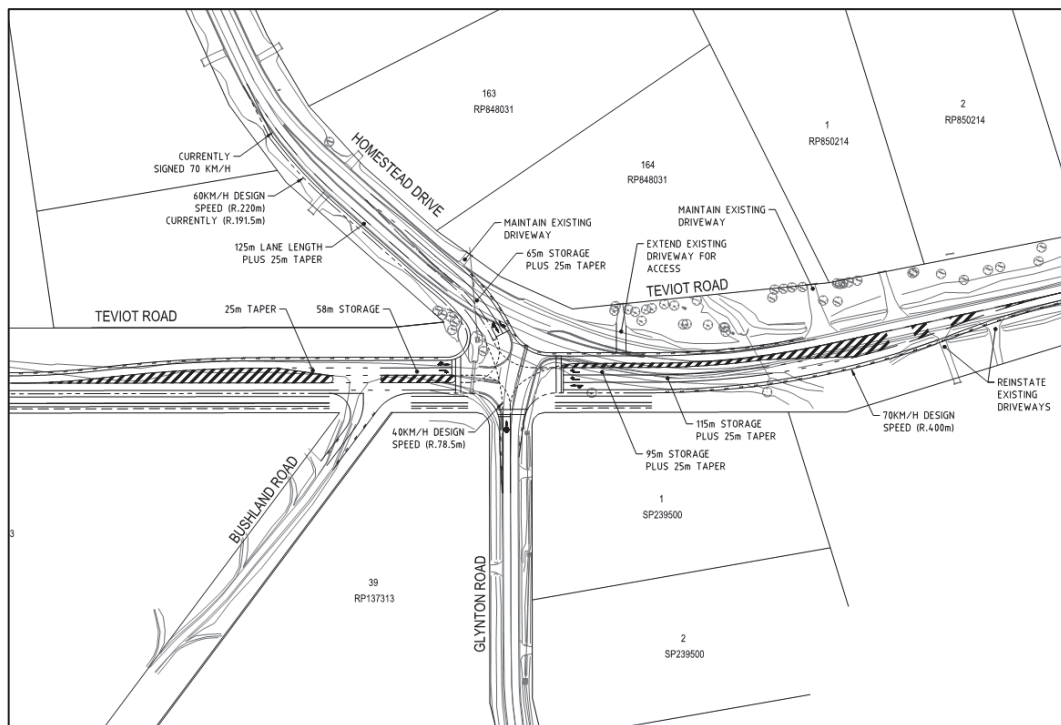


Figure 22: Short term intersection layout 2 – Source: Calibre DWG 17-001548 SK05 rev1

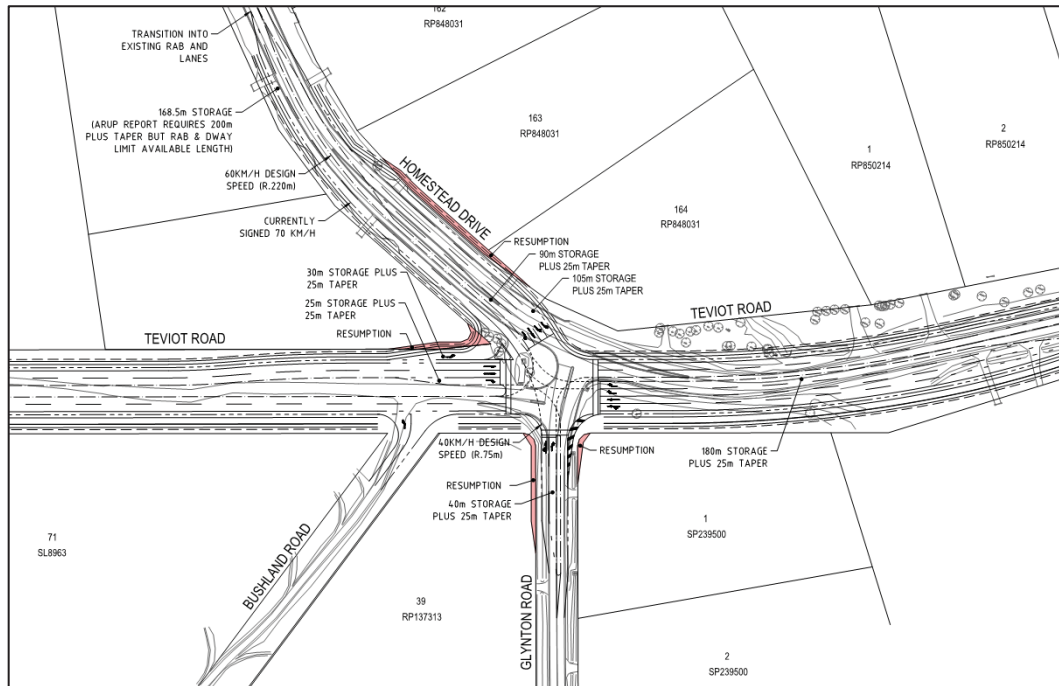


Figure 23: 2031 Intersection layout – Source: Calibre DWG 17-001548 SK01

Table 10: Glynton Road interim layouts - Intersection performance summary

Intersection Movement	Peak Period	Maximum DOS (%)	Maximum Average Delay (sec)	Maximum 95%ile Queue (m)
Short Term Layout (2021) at 160 lots				
Teviot Road (South)	AM Peak	84%	58	38
	PM Peak	53%	87	22
Glynton Road	AM Peak	23%	51	9
	PM Peak	46%	87	19
Teviot Road (North)	AM Peak	90%	50	212
	PM Peak	89%	53	262
Homestead Drive	AM Peak	66%	33	81
	PM Peak	57%	87	92
Short Term Layout 2 (2021) at 650 lots				
Teviot Road (South)	AM Peak	85%	57	189
	PM Peak	86%	62	64
Glynton Road	AM Peak	36%	69	15
	PM Peak	44%	58	18
Teviot Road (North)	AM Peak	66%	45	127
	PM Peak	74%	45	118
Homestead Drive	AM Peak	85%	48	190
	PM Peak	72%	60	113
2031 Interim layout at 3,425 lots				
All	AM Peak	88%	38	183
	PM Peak	80%	33	177

As demonstrated above, the Teviot Road / Homestead Drive / Glynton Road intersection is able to operate well within acceptable limits once upgraded. As shown, the Short Term Intersection Layout 2 is expected to cater for up to 650 lots within the Riverside Celestino development, which is greater than the proposed 582 lots associated with ROL1.

5 Conclusions and Recommendations

This report has assessed the proposed ROL1 Riverside Celestino development for the site at 155-243 Bushland Road, 1394-1432 Teviot Road, and 1294-1352 Teviot Road, Jimboomba.

The development proposes 582 residential lots, of which 129 are higher density terraces. Access to the development is via the extension of Teviot Road from its intersection with Homestead Drive and Glynton Road.

The internal road hierarchy and cross-sections have been developed collaboratively by Calibre and Arup in consultation with EDQ and are based on the ultimate (2066) design traffic volumes anticipated by the master planned Riverside Celestino site.

A public transport network is proposed as part of the ROL1 development which includes a “regular” bus stop located west of Road 8, which is to be serviced by a loop service. It is understood and supported that EDQ and TransLink are working towards the delivery of an early public transport service and associated funding scheme for the entire PDA. Prior to the implementation of such services, access to the public transport will be reliant upon services at the Park Ridge Park ‘n’ Ride. As the design process continues it is recommended that TransLink are further engaged to ensure network planning and bus services are adequate for the area, facilitating community access to opportunities (e.g. jobs, education, services). Furthermore, additional discussions with TransLink should be undertaken with respect to the form and location of the bus stops with due consideration to traffic volumes, residential walking catchments, frequency of services and likely timetable/span of hours.

Active transport provisions within the site is well provided, with both on and off-road separated pedestrian/bicycle paths or shared pedestrian/bicycle paths provided along the primary routes identified within the development - facilitating use of active modes to centres within the site.

Internal intersection layouts have been designed to cater for the ultimate (2066) design traffic volumes anticipated by the fully developed master planned Riverside Celestino site.

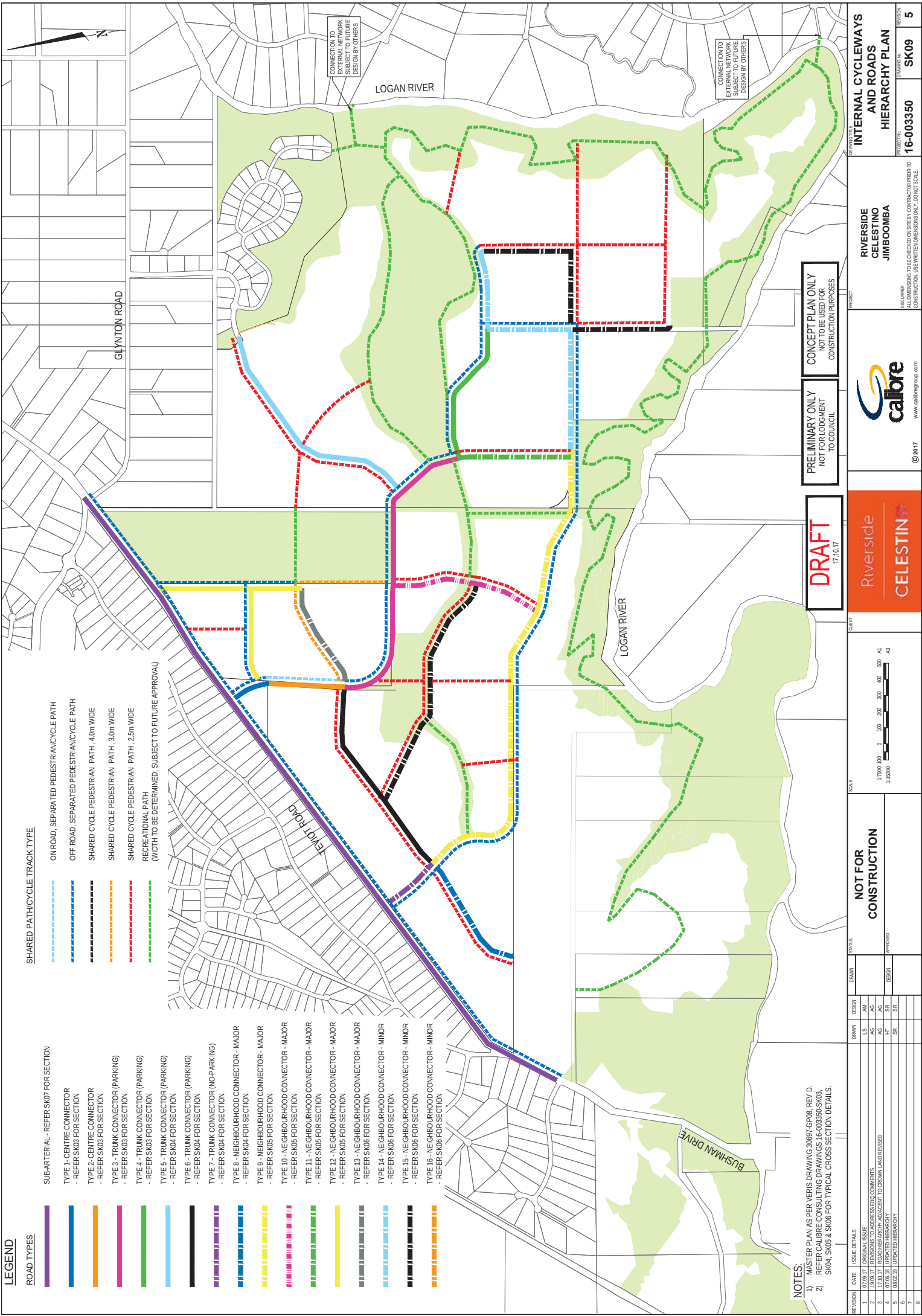
The interim Teviot Road corridor to be provided between Homestead Drive and Road 2 (adjacent to the Crown Land), is anticipated to cater for the traffic demands of ROL1.

A development lot-based trigger analysis has been completed and four incremental intersection layouts has been developed from the existing to the 2031 design year for the Teviot Road / Homestead Drive / Glynton Road intersection.

Based on the traffic assessment outlined in this report, we would recommend that this application be approved from a transport planning viewpoint.

Appendix A

Road Hierarchy Plan



LEGEND

ROAD TYPES

- SUBARTERIAL - REFER SK07 FOR SECTION
- TYPE 1 - CENTRE CONNECTOR - REFER SK03 FOR SECTION
- TYPE 2 - CENTRE CONNECTOR - REFER SK03 FOR SECTION
- TYPE 3 - TRUNK CONNECTOR (PARKING) - REFER SK03 FOR SECTION
- TYPE 4 - TRUNK CONNECTOR (PARKING) - REFER SK03 FOR SECTION
- TYPE 5 - TRUNK CONNECTOR (PARKING) - REFER SK04 FOR SECTION
- TYPE 6 - TRUNK CONNECTOR (PARKING) - REFER SK04 FOR SECTION
- TYPE 7 - TRUNK CONNECTOR (NO-PARKING) - REFER SK04 FOR SECTION
- TYPE 8 - NEIGHBOURHOOD CONNECTOR - MAJOR - REFER SK04 FOR SECTION
- TYPE 9 - NEIGHBOURHOOD CONNECTOR - MAJOR - REFER SK05 FOR SECTION
- TYPE 10 - NEIGHBOURHOOD CONNECTOR - MAJOR - REFER SK05 FOR SECTION
- TYPE 11 - NEIGHBOURHOOD CONNECTOR - MAJOR - REFER SK06 FOR SECTION
- TYPE 12 - NEIGHBOURHOOD CONNECTOR - MAJOR - REFER SK06 FOR SECTION
- TYPE 13 - NEIGHBOURHOOD CONNECTOR - MAJOR - REFER SK06 FOR SECTION
- TYPE 14 - NEIGHBOURHOOD CONNECTOR - MINOR - REFER SK06 FOR SECTION
- TYPE 15 - NEIGHBOURHOOD CONNECTOR - MINOR - REFER SK06 FOR SECTION
- TYPE 16 - NEIGHBOURHOOD CONNECTOR - MINOR - REFER SK06 FOR SECTION

SHARED PATH/CYCLE TRACK TYPE

- ON ROAD, SEPARATED PEDESTRIAN/CYCLE PATH
- OFF ROAD, SEPARATED PEDESTRIAN/CYCLE PATH
- SHARED CYCLE PEDESTRIAN PATH - 4.0m WIDE
- SHARED CYCLE PEDESTRIAN PATH - 3.0m WIDE
- SHARED CYCLE PEDESTRIAN PATH - 2.5m WIDE
- RECREATIONAL PATH (WIDTH TO BE DETERMINED, SUBJECT TO FUTURE APPROVAL)

NOTES:

- MASTER PLAN AS PER VERIS DRAWING 30897-GP08; REV. D. REFER CALIBRE CONSULTING DRAWINGS 16-003350-SK03.
- SK04, SK05 & SK06 FOR TYPICAL CROSS SECTION DETAILS.

DRAFT
17.10.17

PRELIMINARY ONLY
NOT FOR LOGS/MENT
TO COUNCIL

CONCEPT PLAN ONLY
NOT TO BE USED FOR
CONSTRUCTION PURPOSES

REVISION		DATE	ISSUE DETAILS	DESIGN	DRAWN	STATUS	NOT FOR CONSTRUCTION		SCALE	CLIENT		PROJECT		PRODUCT		REVISION	
1	17.03.17	ORIGINAL SCALE	1	AS	AS	DESIGN	NOT FOR CONSTRUCTION		1:2500 100 0 100 200 300 400 500 A1	Riverside Celestino		RIVERSIDE CELESTINO JIMBOOMA		INTERNAL CYCLEWAYS AND ROADS HIERARCHY PLAN		16-003350	
2	17.03.17	REVISIONS TO ADDRESS SEQA COMMENTS	2	AS	AS	DESIGN	NOT FOR CONSTRUCTION		1:1000	calbre		RIVERSIDE CELESTINO JIMBOOMA		INTERNAL CYCLEWAYS AND ROADS HIERARCHY PLAN		16-003350	
3	17.03.17	ROAD HIERARCHY ADJACENT TO CROWN LAND REVISED	3	AS	AS	DESIGN	NOT FOR CONSTRUCTION			calbre		RIVERSIDE CELESTINO JIMBOOMA		INTERNAL CYCLEWAYS AND ROADS HIERARCHY PLAN		16-003350	
4	07.08.18	UPDATED HIERARCHY	4	AS	AS	DESIGN	NOT FOR CONSTRUCTION			calbre		RIVERSIDE CELESTINO JIMBOOMA		INTERNAL CYCLEWAYS AND ROADS HIERARCHY PLAN		16-003350	
5	08.02.19	UPDATED HIERARCHY	5	AS	AS	DESIGN	NOT FOR CONSTRUCTION			calbre		RIVERSIDE CELESTINO JIMBOOMA		INTERNAL CYCLEWAYS AND ROADS HIERARCHY PLAN		16-003350	
6			6				NOT FOR CONSTRUCTION			calbre		RIVERSIDE CELESTINO JIMBOOMA		INTERNAL CYCLEWAYS AND ROADS HIERARCHY PLAN		16-003350	
7			7				NOT FOR CONSTRUCTION			calbre		RIVERSIDE CELESTINO JIMBOOMA		INTERNAL CYCLEWAYS AND ROADS HIERARCHY PLAN		16-003350	
8			8				NOT FOR CONSTRUCTION			calbre		RIVERSIDE CELESTINO JIMBOOMA		INTERNAL CYCLEWAYS AND ROADS HIERARCHY PLAN		16-003350	

Appendix B

Layout Plan

Appendix C

Car Parking Plan

Teviot Road, Jimboomba

For

Riverside | CELESTINO

IMPORTANT NOTES:

(These notes are an integral part of this plan)
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Data Sources: 30697-BLE001-A
Contours / Topographic: DNRAM Ldair supplied data
Road Level: Logan City Council smp file
Engineering Design: Calibre Consulting

Issue	Revisions	Date	Drawn
A	Original	07.12.2017	KSP/PE
B	ADD 2x mid block pathways / overpasses (add 100m lot / bus stop / new intersection)	14.11.2018	KS

Locality: Jimboomba
Local Authority: Logan City Council
Horizontal Meridian: MGA
Horizontal Level Datum: AHD (Ldair)
Scale: 1:1500@A3
Designed: PSKS
Checked: PSKS
Plot Date: 14 Nov. 2018
Computer File Ref: 30697-BLE001-B.dwg

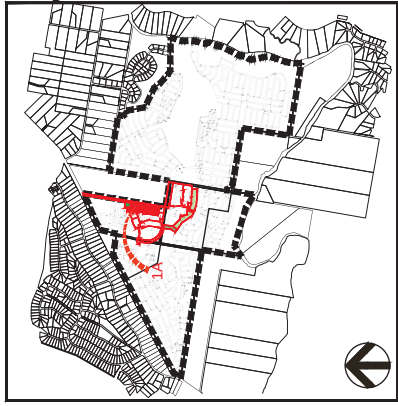
Plan of Development
Stage 1A



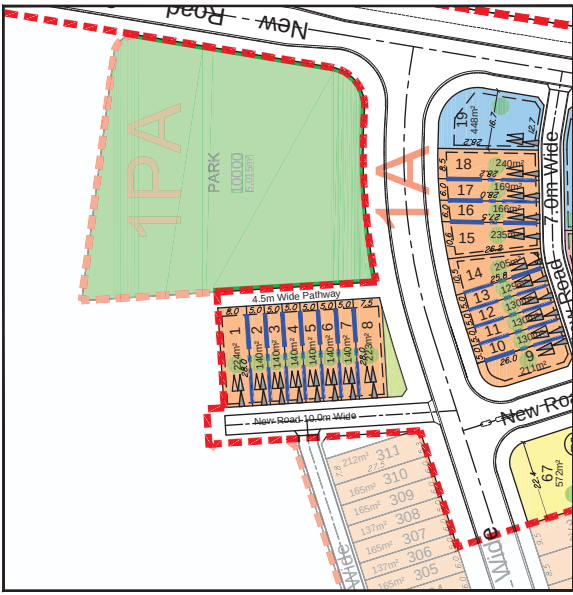
BRISBANE WHITSUNDAYS
(07) 3666 4700
MACKAY CAIRNS
(07) 4951 2911
veris.com.au
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Drawing No 30697-BLE001A
Issue B

CONTEXT PLAN (nts)

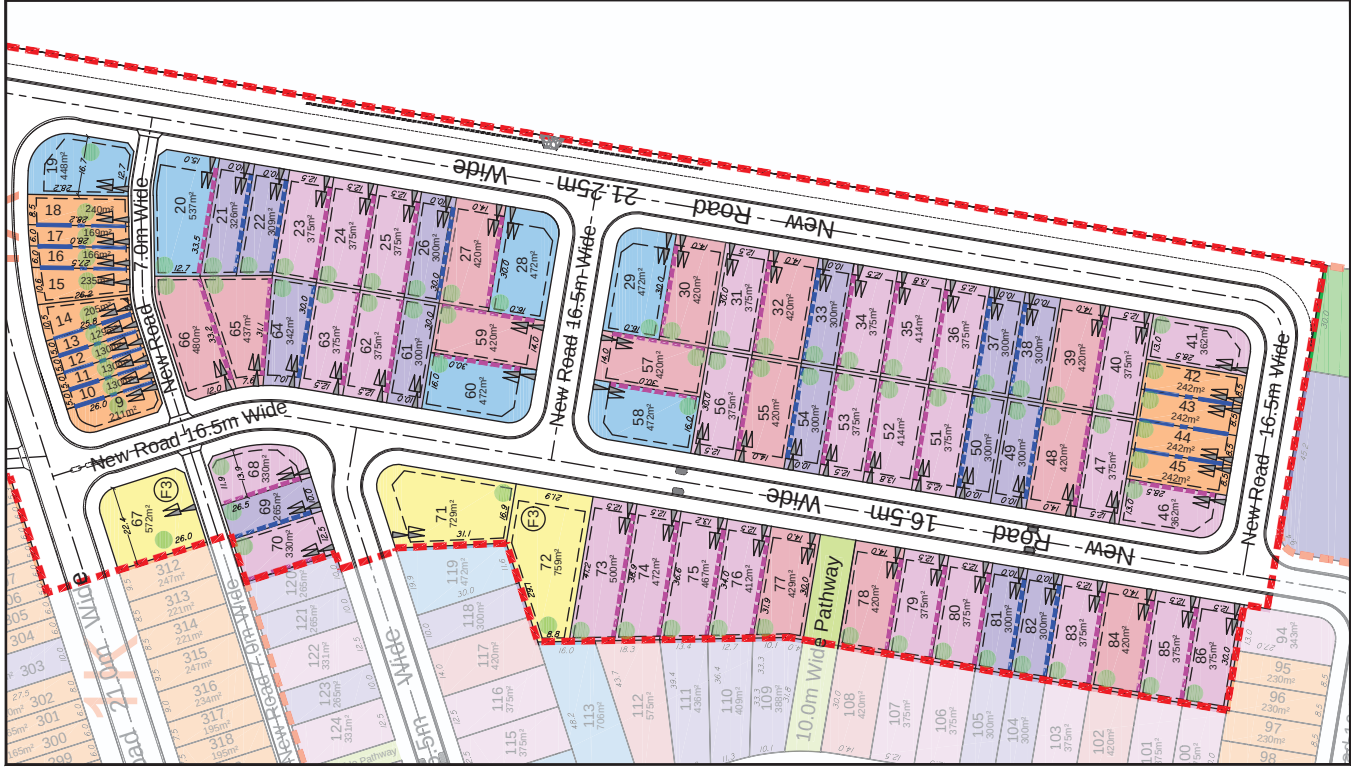
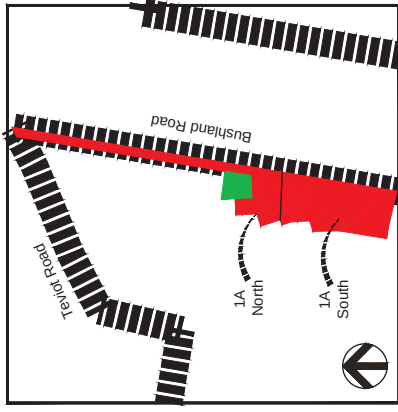


Stage Boundary	Red dashed line
Preferred Garage Location when Built to Boundary Wall is utilised	Green circle
Indicative Private Open Space	Green square
Building Location Envelope (BLE)	Blue dashed line
Mandatory built to boundary wall	Blue solid line
Optional built to boundary wall	Blue dotted line
Shared built to boundary wall	Blue dash-dot line
Mandatory 2 Storey Dwelling	Star symbol
Multi-Family Lot and maximum number of dwellings	F2 symbol
Must address this frontage with the minimum architectural intent associated with a primary frontage (i.e.: front door, pathway, windows, front fencing, letterbox).	Yellow triangle



STAGE 1A - North

CONTEXT PLAN - Stage 1A (nts)



STAGE 1A - South

225m
150mm SCALE BAR

150m
100mm

75m
50mm

0

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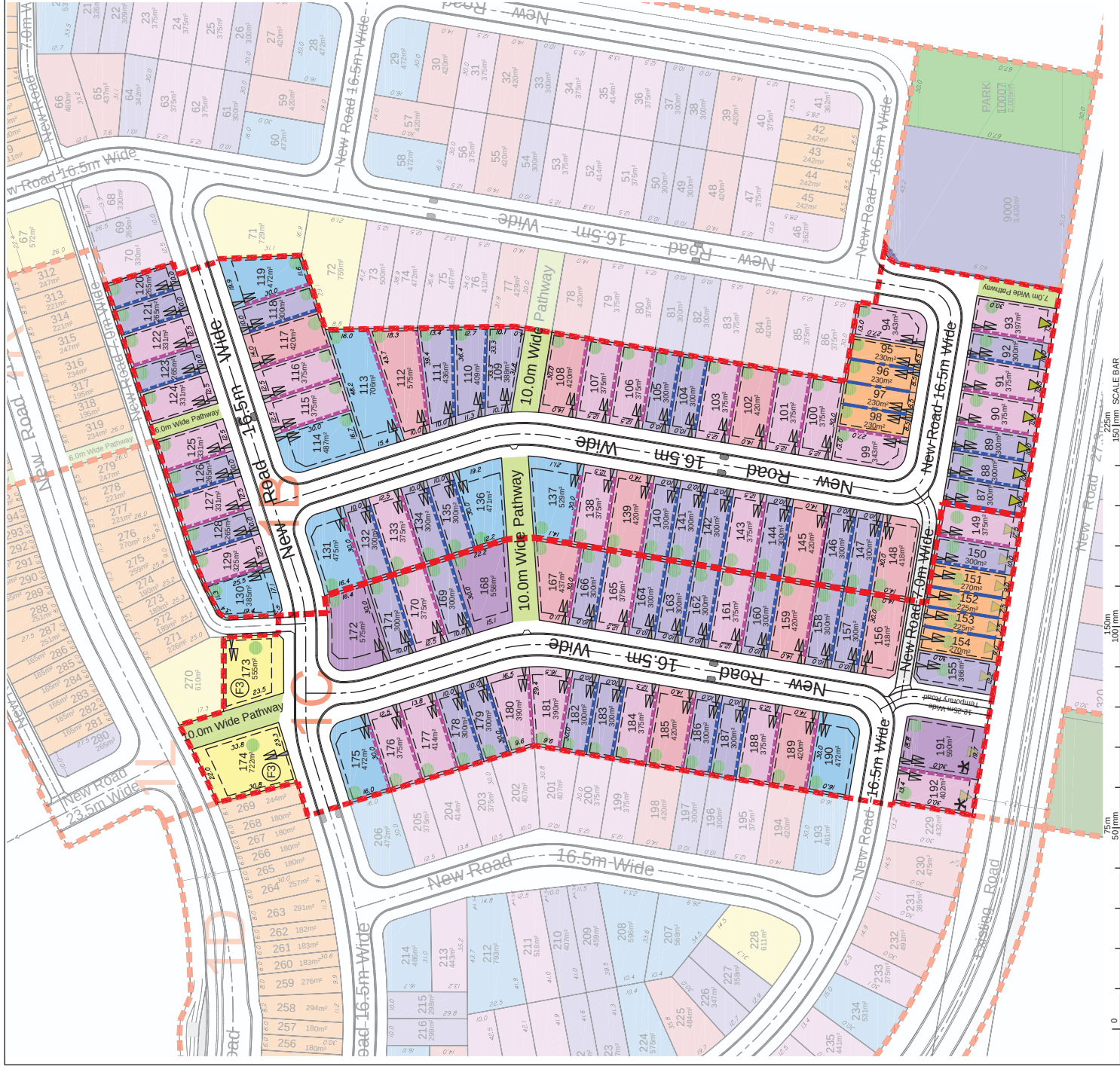
B	Add 2x mid-block pathways / add LATM / new intersection / Bus Stop							14.11.2018		KS
A	Original Revisions							07.12.2017		ksp/S Drawn

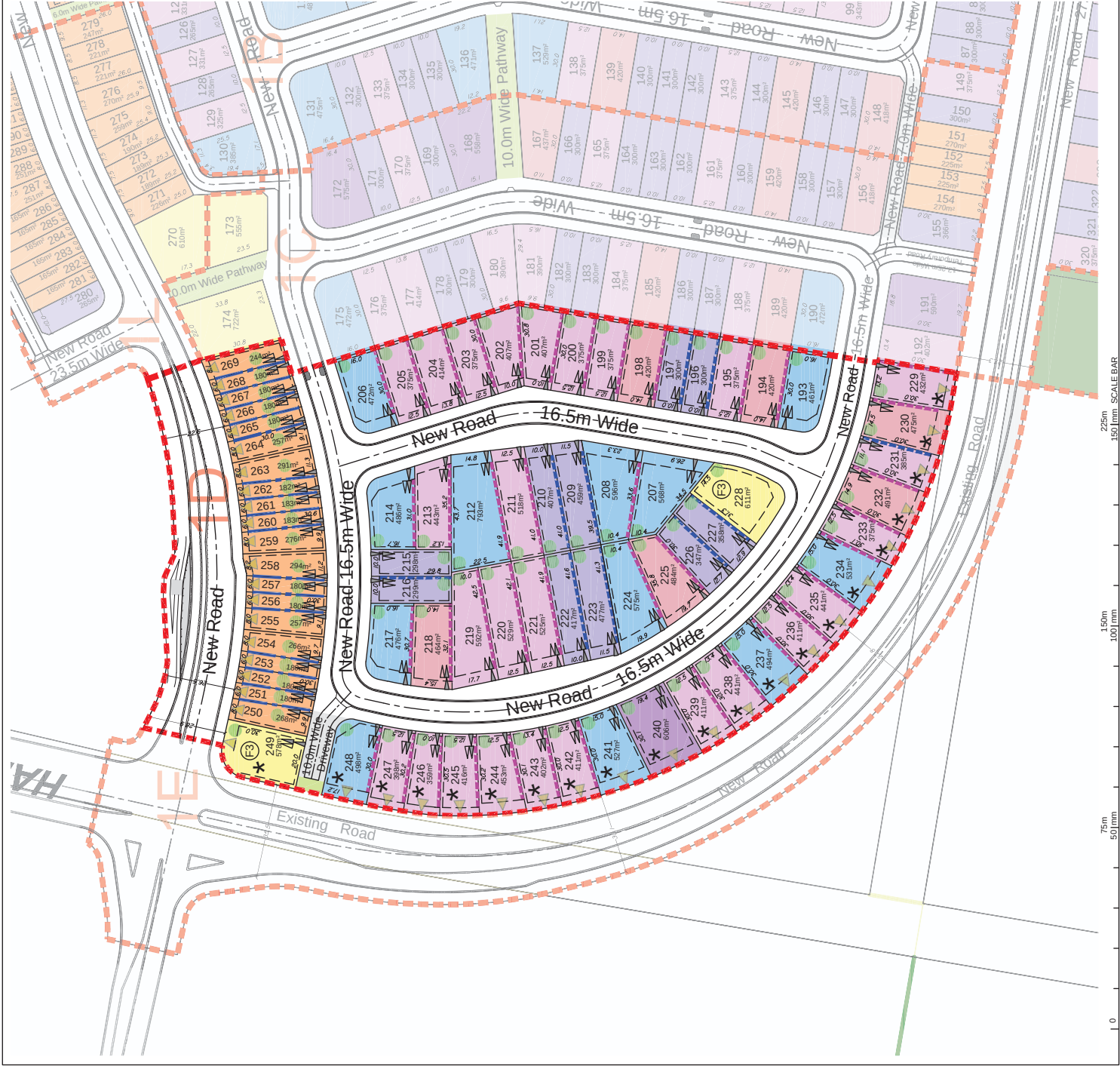
Plan of Development Stage 1B & 1C



Drawing No	Issue
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LEGEND	
Stage Boundary	
Preferred Garage Location when Built to Boundary Wall is utilised	
Indicative Private Open Space	
Building Location Envelope (BLE)	
Mandatory built to boundary wall	
Optional built to boundary wall	
Shared built to boundary wall	
Mandatory 2 Storey Dwelling	
Multi-Family Lot and maximum number of dwellings	
Must address this frontage with the minimum architectural intent associated with a primary frontage (i.e.: front door, pathway, windows, front fencing, letterbox).	





Teviot Road, Jimboomba

For

Riverside | CELESTINO

IMPORTANT NOTES:

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Data Sources: 30697-BLE001-A
Central Boundaries: DNRAM LdL supplied data
Road Level: Logan City Council and file
Engineering Design: Calibre Consulting

Issue	Revisions	Date	Drawn
B	ADD 2nd mid block pathway / overpasses / add 100m lot / bus stop / new intersection /	14.11.2018	KS
A	Original	07.12.2017	KP/PS

Locality: Jimboomba
Local Authority: Logan City Council
Horizontal Meridian: MGA
Vertical Level Datum: AHD (Lidar)
Scale: 1:1500@A3
Designed: KPS
Checked: PSKS
Plot Date: 14 Nov. 2018
Computer File Ref: 30697-BLE001-B.dwg

Plan of Development
Stage 1D



BRISBANE WHITSUNDAYS
(07) 3666 4700
(07) 4845 1722
MACKAY CAIRNS
(07) 4951 2811
(07) 4951 6722
veris.com.au
ACH 615 735 727
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Drawing No 30697-BLE001D
Issue B

Teviot Road, Jimboomba

For

Riverside | CELESTINO

IMPORTANT NOTES:

(These notes are an integral part of this plan)
This plan was prepared to support a Reconfiguration of Lot application for the land situated at Jimboomba. The Contours shown on this plan are based on a survey conducted on the land and should not be used as a guide as they are only intended as a general guide. The Contours of the land are subject to change and should be confirmed by a surveyor as they are only intended as a general guide. The Contours of the land are subject to change and should be confirmed by a surveyor as they are only intended as a general guide. The Contours of the land are subject to change and should be confirmed by a surveyor as they are only intended as a general guide.

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Data Source: 30697-BLE001-A
Central Boundaries: DNRAM Ldtr supplied data
Contours / Topographic: Logan City Council smp file
Road Level: Calibre Consulting
Engineering Design

Issue	Revisions	Date	Drawn
B	ADD 2nd and 3rd stage pathways / connections (add 100m to / from intersection / Bus Stop)	14.11.2018	KS
A	Original	07.12.2017	KOPS

Locality: Jimboomba
Local Authority: Logan City Council
Horizontal Meridian: MGA
Vertical Level Datum: AHD (Lidar)
Scale: 1:1500@A3
Designed: PS/KS
Checked: PS/KS
Plot Date: 14 Nov. 2018
Computer File Ref: 30697-BLE001-B.dwg

Plan of Development
Stage 1F



BRISBANE WHITSUNDAYS
(07) 3666 4700
MACKAY CAIRNS
(07) 4951 2911

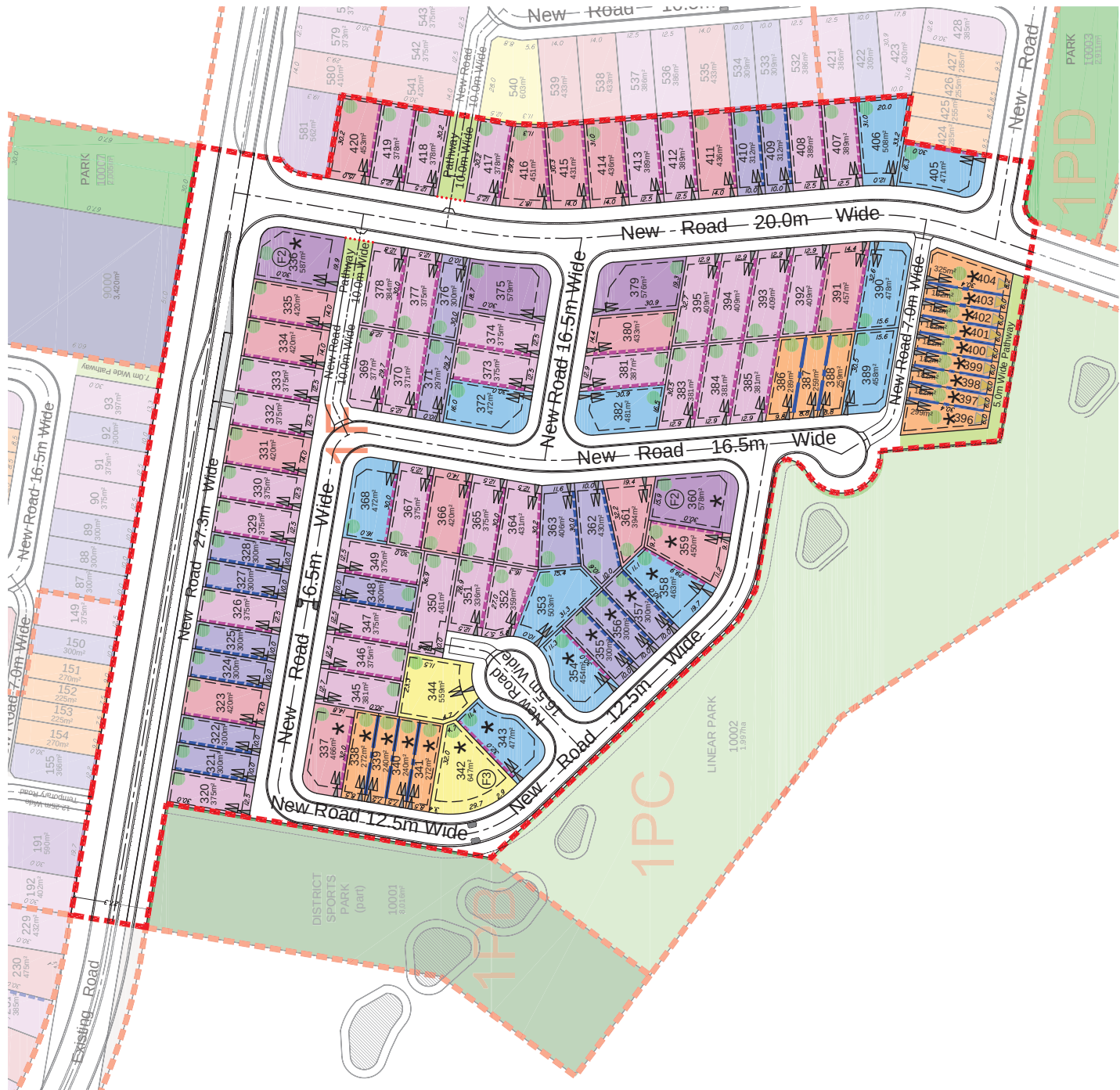
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Drawing No 30697-BLE001F
Issue B

CONTEXT PLAN (nrs)



LEGEND	
Stage Boundary	
Preferred Garage Location when Built to Boundary Wall is utilised	
Indicative Private Open Space	
Building Location Envelope (BLE)	
Mandatory built to boundary wall	
Optional built to boundary wall	
Shared built to boundary wall	
Mandatory 2 Storey Dwelling	
Multi-Family Lot and maximum number of dwellings	
Must address this frontage with the minimum architectural intent associated with a primary frontage (i.e. front door, pathway, windows, front fencing, letterbox).	



Teviot Road, Jimboomba

For

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IMPORTANT NOTES:

IMPORTANT NOTES:
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Data Sources	30697-BLE001-A
Cadastral Boundaries	DNR&M Lidar supplied data
Contours / Topographic	Logan City Council shp file
Flood Level	Calibre Consulting
Engineering Design	

[illegible]

Locality: Jimboomba
 Local Authority: Logan City Council
 Horizontal Meridian: MGA
 Vertical Level Datum: AHD (Lidar)
 Scale: 1:1,500@A3
 Designed: PSKS
 Drawn: PSKS
 Checked: PSKS
 Plot Date: 14 Nov, 2018
 Computer File Ref:

Plan of Development
Stage 1G, 1H & 1I

BRISBANE
(07) 3666 4700

MACKAY
(07) 4951 2911

WHITSUNDAYS
(07) 4945 1722

CAIRNS
(07) 4051 6722

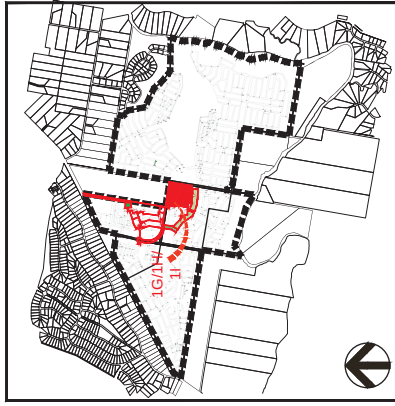
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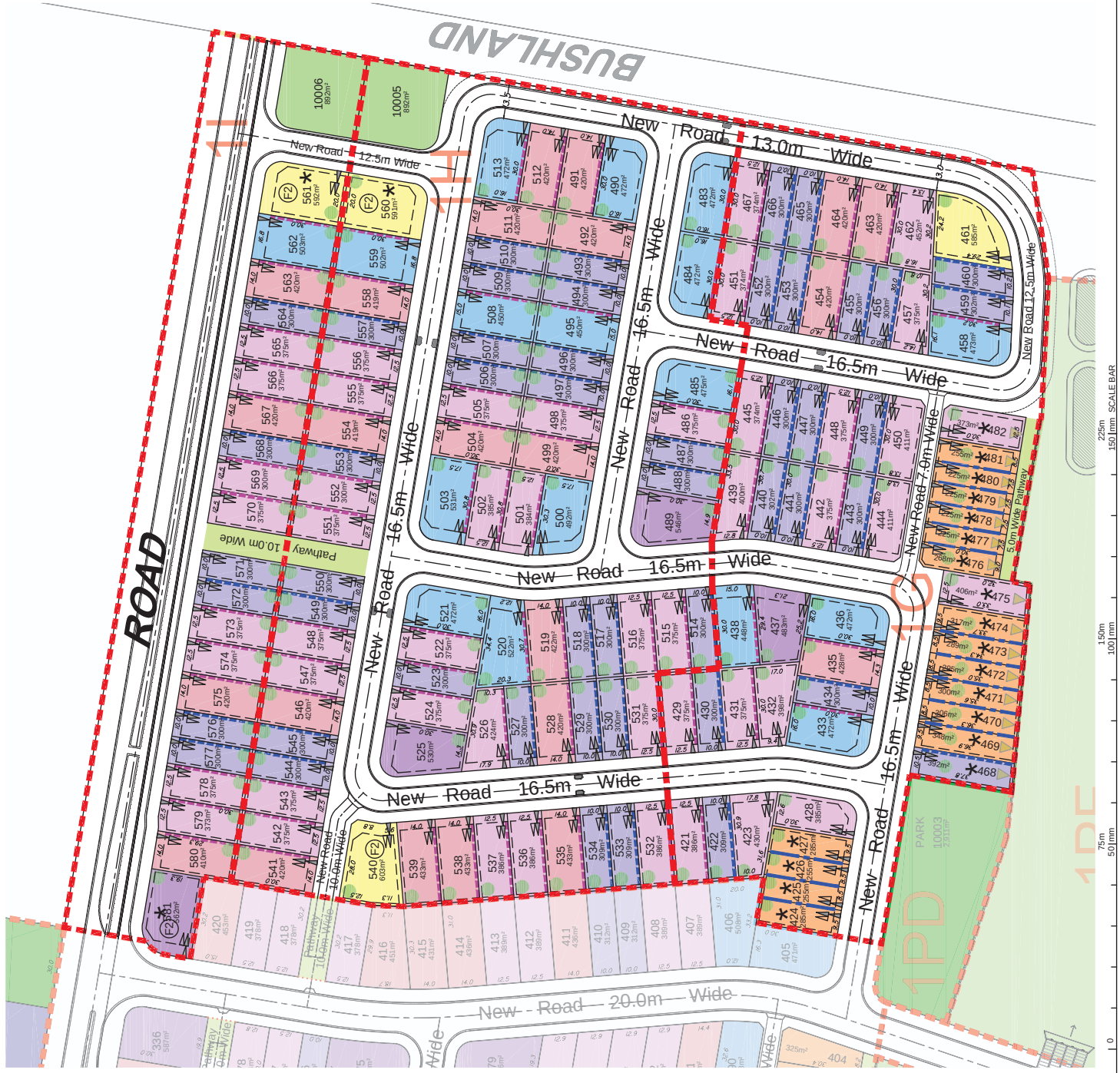
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Drawing No	Issue
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20607-BI E001C-14-11 B



LEGEND	
Stage Boundary	
Preferred Garage Location when Built to Boundary Wall is utilised	
Indicative Private Open Space	
Building Location Envelope (BLE)	
Mandatory built to boundary wall	
Optional built to boundary wall	
Shared built to boundary wall	
Mandatory 2 Storey Dwelling	
Multi-Family Lot and maximum number of dwellings	
Must address this frontage with the minimum architectural intent associated with a primary frontage (i.e. front door, pathway, windows, front fencing, letterbox).	
	



For
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This plan was prepared to support a Reconfiguration of Lot application for the lot situated at Jumbula. The Contour boundaries, creek line, flood line, building locations have all been surveyed and shown on the plan. The notes on them are the way they are intended as a general guide. The configuration of allotments shown on this plan is subject to Local Authority (and relevant State Government) approval, detailed design, final survey, and registration of the plan.

The following information is provided for the Council and is confirmed by the relevant authorities: The dimensions, areas and total number of lots shown herein are subject to field survey and also to the requirements of Council and any other authority which may have requirements under any relevant legislation. In particular, no reliance should be placed on the information in this plan for any financial dealings regarding the lot.

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Data Sources	306597-BLE001-A
Cadastral Boundaries	DNR&M Lidar supplied data
Contours / Topographic	Logan City Council ship file
Flood Level	Calibre Consulting
Engineering Design	

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Locality: Jimboomba
 Local Authority: Logan City Council
 Horizontal Meridian: MGA
 Vertical Level Datum: AHD (Lidar)
 Scale: 1:1,500@A3
 Designed: PS/KS
 Drawn: PS/KS
 Checked: PS/KS
 Plot Date: 14 Nov, 2018
 Computer File Ref: 30697-BLE001-B.dwg

Plan of Development

Stage 1K & 1L



BRISBANE (07) 3666 4700
MACKAY (07) 4951 2911
WHITSUNDAYS (07) 4945 1722
CAIRNS (07) 4051 6722

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Drawing No	Issue
30697-BLE001K-L	B

LEGEND	
Stage Boundary	
Preferred Garage Location when Built to Boundary Wall is utilised	
Indicative Private Open Space	
Building Location Envelope (BLE)	
Mandatory built to boundary wall	
Optional built to boundary wall	
Shared built to boundary wall	
Mandatory 2 Storey Dwelling	
Multi-Family Lot and maximum number of dwellings	
Must address this frontage with the minimum architectural intent associated with a primary frontage (i.e. front door, pathway, windows, front fencing, letterbox).	



0 75m 150m 225m
0 50mm 100mm 150mm SCALE BAR

Teviot Road, Jimboomba

For

Riverside | CELESTINO

IMPORTANT NOTES:

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Data Sources: 30697-BLE001-A
Contours / Topographic: DNRAM Lidar supplied data
Road Level: Logan City Council smp file
Engineering Design: Calibre Consulting

Issue	Revisions	Date	Drawn
B	ADD 25m wide road to the north of the site and 100m wide road to the south of the site.	14.11.2018	KJS
A	Original	07.12.2017	KJP/RS

Locality: Jimboomba
Local Authority: Logan City Council
Horizontal Meridian: MGA
Horizontal Level Datum: 12.500@A3
Scale: 1:2500
Designed: PSKS
Checked: PSKS
Plot Date: 14 Nov. 2018
Computer File Ref: 30697-GP01-B.dwg

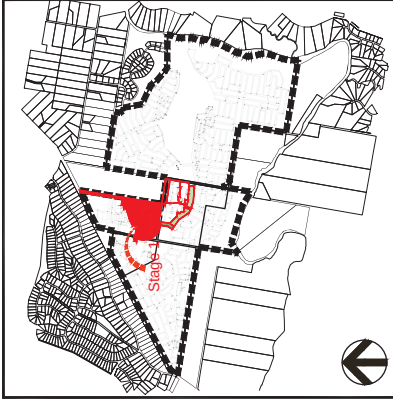
Car Parking Plan
Stage 1



BRISBANE WHITSUNDAYS
(07) 3868 4700
MACKAY CAIRNS
(07) 4951 2911
VERIS.COM.AU
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Drawing No
30697-GP01
(Sheet 1 of 2)
Issue
B

CONTEXT PLAN (nrs)



LEGEND
Stage Boundary
Preferred Garage Location
On-street Car Park

DEVELOPMENT SUMMARY	
Total Number Lots Under 12.5m	264
On street Car Parking Provision	0.75
Total Number of On Street Car Parks required	198
Shown - On street Car Parking	201



0 125m 50mm 250m 100mm 375m 150mm SCALE BAR

For
Riverside | CELESTINO

This plan was prepared to support a Reconfiguration of Lot boundaries for the land situated at Jiminiboo. The Omurru, applications, creek line, flood lines, building locations have all been sealed and should not have any relevance based on them as they are only intended as a general guide. The plan is subject to the Local Authority (and relevant State Government Authority) approvals, detailed design, final survey, and registration of the plan. Any comments contained on this plan should be made in the context of the above stated matters. The areas of the plan that have been sealed are subject to the local authority and also to the requirements of Council and any other authority which may have requirements under any relevant legislation. In particular, no relevance should be placed on the registration information for any financial dealings involving the property.

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Data Sources	
Cadastral Boundaries	30697-GP10-A
Contours / Topographic	DNR&M Lidar supplied data
Flood Level	Logan City Council shp file
Engineering Design	Calibre Consulting

[illegible]

Locality: Jimboomba
 Local Authority: Logan City Council
 Horizontal Meridian: MGA
 Vertical Level Datum: AHD (Lidar)
 Scale: 1:12,500@A3
 Designed: PS/KS
 Drawn: KS
 Checked: KS
 Plot Date: 14 Nov, 2018
 Computer File Ref:
 30697-GP10-B (sheet 3 of 3).dwg

Plan Showing Stage 1 Layout and Balance Lots



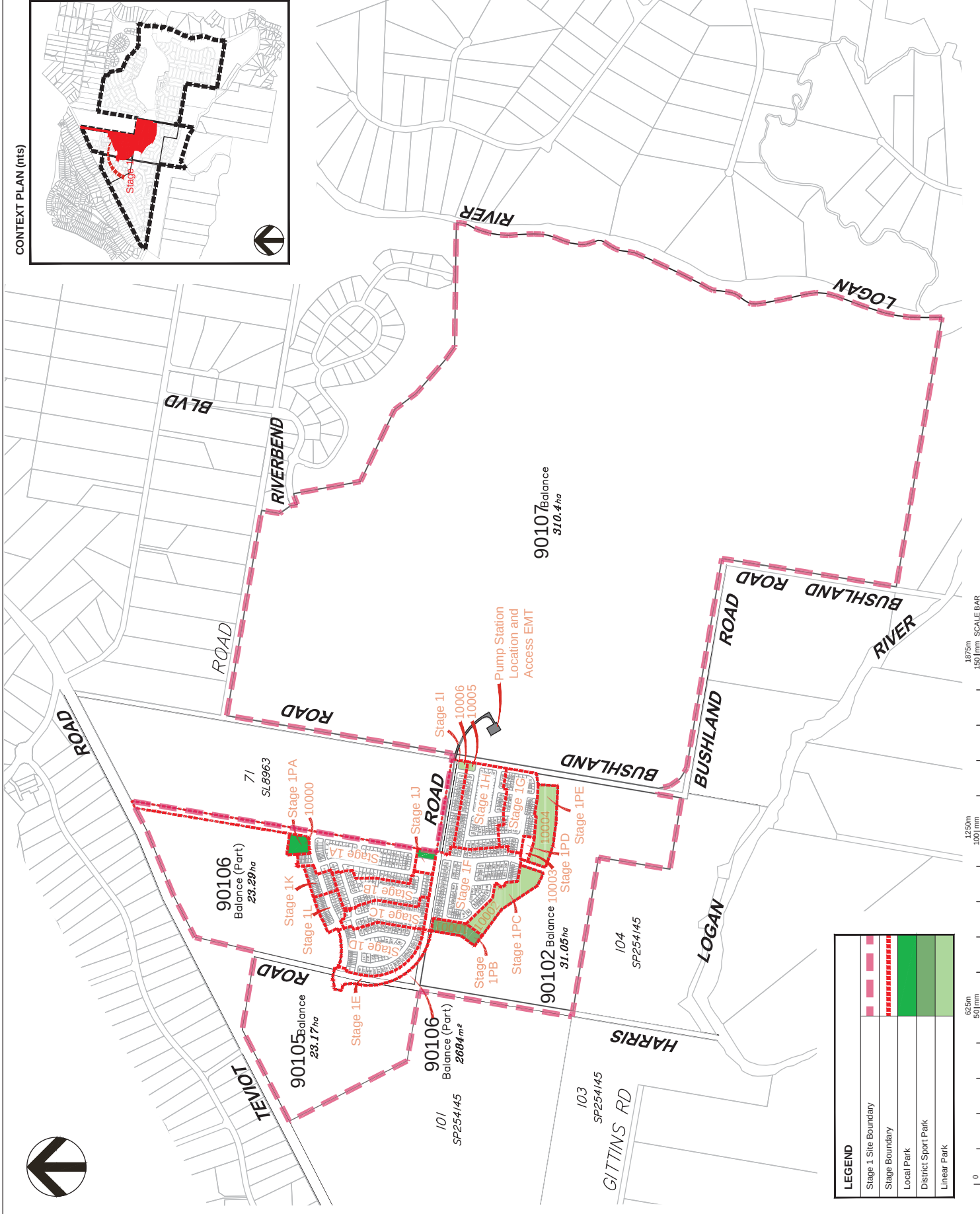
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Drawing No **30697-GP10**
(sheet 3 of 3)

Issue **B**



Teviot Road, Jimboomba

For

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Data Sources: 30697-LP001-A
Cadastral Boundaries: DHRAM Ldair supplied data
Contours / Topographic: Logan City Council smp file
Road Level: Calibre Consulting
Engineering Design

Issue	Revisions	Date	Drawn
A	Original	07.12.2017	KOPS
B	ADD 2m mid-block pathways / overpasses / add 100m lot / bus stop / new intersection /	14.11.2018	KS

Locality: Jimboomba
Local Authority: Logan City Council
Horizontal Meridian: MGA
Horizontal Level Datum: AHD (Lidar)
Scale: 1:1,500@A3
Designed: PSKS
Checked: PSKS
Plot Date: 30 Jan, 2019
Computer File Ref: 30697-LP001-B.dwg

Plan of Subdivision
Stage 1A & 1PA



BRISBANE WHITSUNDAYS
(07) 3666 4700
MACKAY CAIRNS
(07) 4651 2811
veris.com.au
ACN 615 735 727
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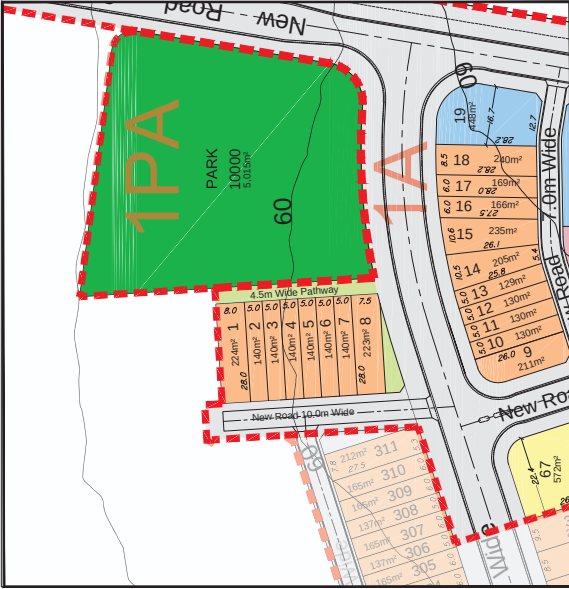
Drawing No 30697-LP001A-1PA B
Issue

CONTEXT PLAN (nts)

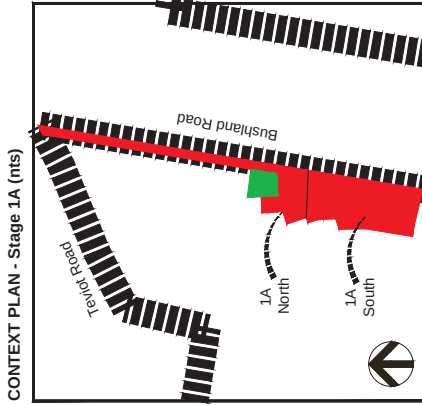


DEVELOPMENT SUMMARY Stage 1A	
Total Stage Area	6.486ha
Area of Lots	2.9543ha
Total Number of Allotments	86
Average Lot Area	343m ²
Length of New Road (incl. Laneway)	1,786m
Length of Laneway	97m
Total Area of Pathways	503m ²
Total Area of New Road	3,4741ha
Local Park	0m ²
District Sports Park	0m ²
Linear Park	0m ²
Terraced Terrace with Loft	22 25.0%
Villa Villa with Loft	14 16.3%
Premium Villa	28 32.0%
Premium Villa	13 15.1%
Courtyard	6 7.0%
Condominium	0 0%
Traditional	1 1.1%
Potential Multi-Family	2 2.3%
Special Use	0 0%
Total Number of Lots	86 100%

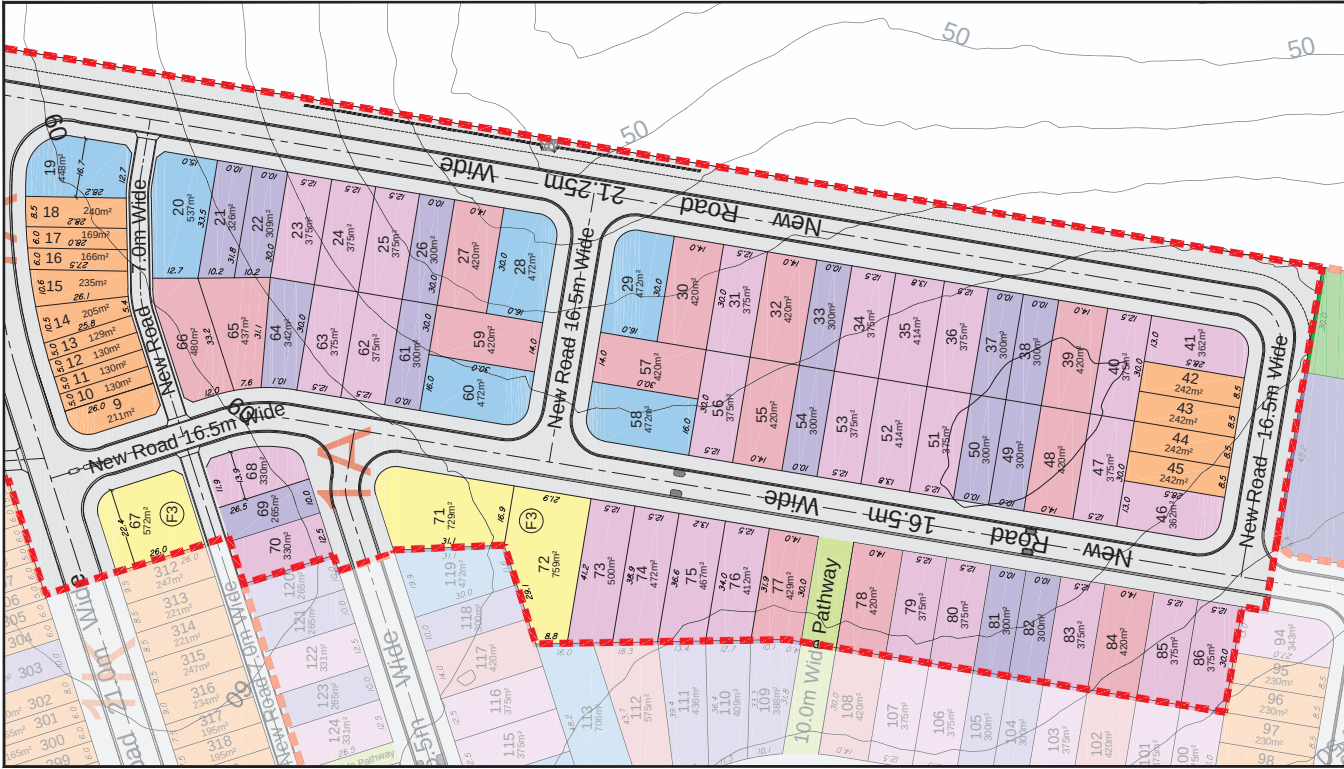
DEVELOPMENT SUMMARY Stage 1PA	
Total Stage Area Stage 1A	0.5015ha
Local Park	0.5015ha
District Sports Park	0ha
Linear Park	0ha



STAGE 1A - North



CONTEXT PLAN - Stage 1A (nts)



STAGE 1A - South

0 75m 150m 225m SCALE BAR
150mm 100mm 50mm

Teviot Road, Jimboomba

For



IMPORTANT NOTES:

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Data Source: 30697-LP001-A
Central Boundaries: DNRGM Lidar supplied data
Road Level: Logan City Council smp file
Engineering Design: Calibre Consulting

Issue	Revisions	Date	Drawn
A	Original	07.12.2017	KOPS
B	As per 2d and 3d road pathway / easements (add 100m lot / easement / new intersection / bus stop)	14.11.2018	KS

Locality: Jimboomba
Local Authority: Logan City Council
Horizontal Meridian: MGA
Vertical Level Datum: AHD (Lidar)
Scale: 1:1500 (GAS)
Designed: PS/KS
Checked: PS/KS
Plot Date: 30 Jan, 2019
Computer File Ref: 30697-LP001-B.dwg

Plan of Subdivision
Stage 1B & 1C & 1J



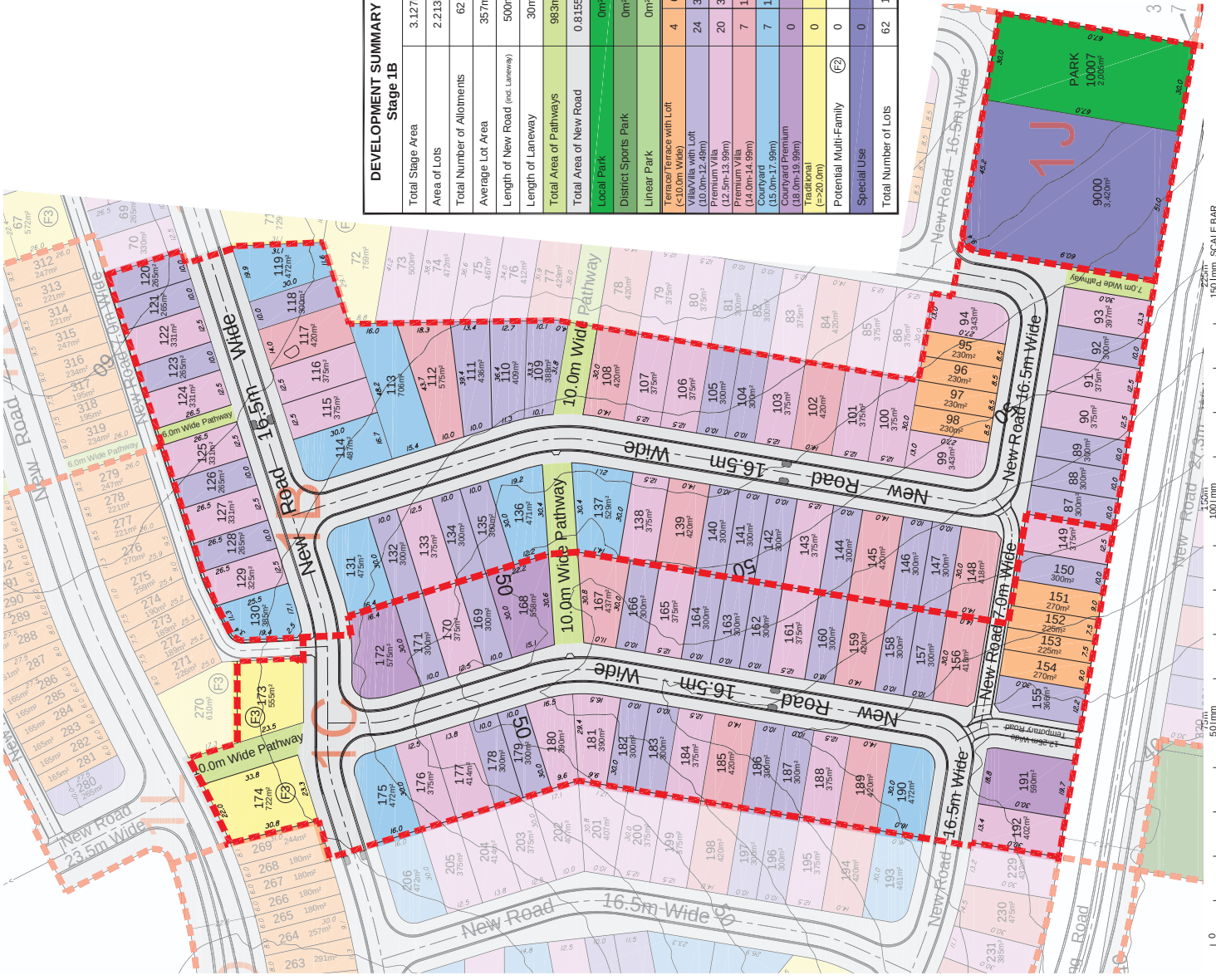
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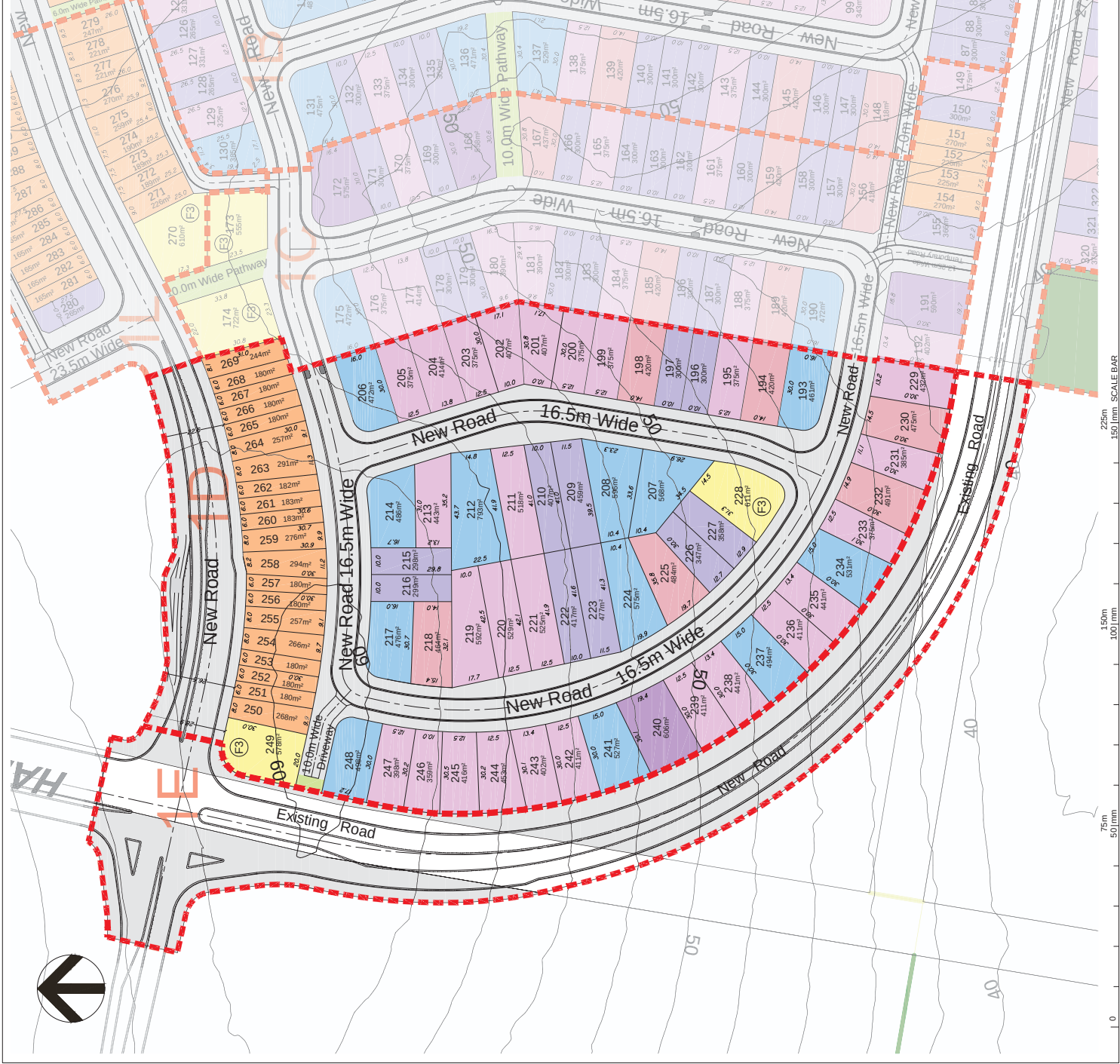
Drawing No
30697-LP001B-1C-1J
Issue
B

CONTEXT PLAN (nrs)



DEVELOPMENT SUMMARY		Stage 1B		Stage 1C		Stage 1J	
Total Stage Area	3.127ha	Total Stage Area	2.316ha	Total Stage Area	2.316ha	Total Stage Area	0.5435ha
Area of Lots	2.213ha	Area of Lots	1.6436ha	Area of Lots	1.6436ha	Area of Lots	0.3420ha
Total Number of Allotments	62	Total Number of Allotments	44	Total Number of Allotments	44	Total Number of Allotments	1
Average Lot Area	357m ²	Average Lot Area	373m ²	Average Lot Area	373m ²	Average Lot Area	0m ²
Length of New Road (incl. LaneWAY)	500m	Length of New Road (incl. LaneWAY)	380m	Length of New Road (incl. LaneWAY)	380m	Length of New Road	0m
Length of LaneWAY	30m	Length of LaneWAY	30m	Length of LaneWAY	30m	Length of LaneWAY	0m
Total Area of Pathways	983m ²	Total Area of Pathways	384m ²	Total Area of Pathways	384m ²	Total Area of Pathways	0m ²
Total Area of New Road	0.8155ha	Total Area of New Road	0.6021ha	Total Area of New Road	0.6021ha	Total Area of New Road	0ha
Local Park	0m ²	Local Park	0m ²	Local Park	0m ²	Local Park	2.005m ²
District Sports Park	0m ²	District Sports Park	0m ²	District Sports Park	0m ²	District Sports Park	0m ²
Linear Park	0m ²	Linear Park	0m ²	Linear Park	0m ²	Linear Park	0m ²
Terrace/Terrace with Loft (<10.0m Wide)	4	Terrace/Terrace with Loft (<10.0m Wide)	4	Terrace/Terrace with Loft (<10.0m Wide)	4	Terrace/Terrace with Loft (<10.0m Wide)	0
Villa/Villa with Loft (10.0m-12.49m)	24	Villa/Villa with Loft (10.0m-12.49m)	17	Villa/Villa with Loft (10.0m-12.49m)	17	Villa/Villa with Loft (10.0m-12.49m)	0
Premium Villa (12.5m-13.99m)	20	Premium Villa (12.5m-13.99m)	11	Premium Villa (12.5m-13.99m)	11	Premium Villa (12.5m-13.99m)	0
Premium Villa (14.0m-14.99m)	7	Premium Villa (14.0m-14.99m)	5	Premium Villa (14.0m-14.99m)	5	Premium Villa (14.0m-14.99m)	0
Courtyard Premium (15.0m-17.99m)	7	Courtyard Premium (15.0m-17.99m)	2	Courtyard Premium (15.0m-17.99m)	2	Courtyard Premium (15.0m-17.99m)	0
Courtyard Premium (18.0m-19.99m)	0	Courtyard Premium (18.0m-19.99m)	3	Courtyard Premium (18.0m-19.99m)	3	Courtyard Premium (18.0m-19.99m)	0
Traditional (≥20.0m)	0	Traditional (≥20.0m)	0	Traditional (≥20.0m)	0	Traditional (≥20.0m)	0
Potential Multi-Family (F2)	0	Potential Multi-Family (F2)	2	Potential Multi-Family (F2)	2	Potential Multi-Family (F2)	0
Special Use	0	Special Use	0	Special Use	0	Special Use	1
Total Number of Lots	62	Total Number of Lots	44	Total Number of Lots	44	Total Number of Lots	1





Teviot Road, Jimboomba

For

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IMPORTANT NOTES:

(These notes are an integral part of this plan)
This plan was prepared to support a Reconfiguration of Lot application for the land situated at Jimboomba. The Contours, boundaries, dimensions and areas shown on this plan are based on the information provided by the applicant and are not to be used as a basis for any other purpose. The applicant is responsible for ensuring that the information provided is accurate and complete. The applicant is also responsible for ensuring that the information provided is up-to-date and reflects the current state of the land. The applicant is also responsible for ensuring that the information provided is consistent with the relevant legislation and regulations. The applicant is also responsible for ensuring that the information provided is consistent with the relevant planning and zoning requirements. The applicant is also responsible for ensuring that the information provided is consistent with the relevant environmental requirements. The applicant is also responsible for ensuring that the information provided is consistent with the relevant heritage requirements. The applicant is also responsible for ensuring that the information provided is consistent with the relevant cultural requirements. The applicant is also responsible for ensuring that the information provided is consistent with the relevant social requirements. The applicant is also responsible for ensuring that the information provided is consistent with the relevant economic requirements. The applicant is also responsible for ensuring that the information provided is consistent with the relevant environmental requirements. The applicant is also responsible for ensuring that the information provided is consistent with the relevant heritage requirements. The applicant is also responsible for ensuring that the information provided is consistent with the relevant cultural requirements. The applicant is also responsible for ensuring that the information provided is consistent with the relevant social requirements. The applicant is also responsible for ensuring that the information provided is consistent with the relevant economic requirements.

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Data Sources: 30697-LP001-A
Contours / Topographic: DNRAM LdL supplied data
Road Level: Logan City Council smp file
Engineering Design: Calibre Consulting

Issue	Revisions	Date	Drawn
A	Original	07.12.2017	KGP/S
B	Add 2x mid-block pathway / overcrossings (add 100m lot / bus stop / new intersection /	14.11.2018	K/S

Locality: Jimboomba
Local Authority: Logan City Council
Horizontal Meridian: MGA
Vertical Level Datum: AHD (Lidar)
Scale: 1:1500@A3
Designed: K/S
Checked: PS/KS
Plot Date: 30 Jan, 2019
Computer File Ref: 30697-LP001-B.dwg

**Plan of Subdivision
Stage 1D & 1E**



BRISBANE WHITSUNDAYS
(07) 3668 4700
MACKAY CAIRNS
(07) 4651 2811
Veris.com.au
ACN 615 735 727
Veris Australia Pty Ltd

Drawing No
30697-LP001D-1E
Issue
B

DEVELOPMENT SUMMARY	
Stage 1D	
Total Stage Area	4.335ha
Area of Lots	3.0054ha
Total Number of Allotments	77
Average Lot Area	390m ²
Length of New Road	720m
Length of LaneWAY	0m
Total Area of Pathways	50m ²
Total Area of New Road	1.3449ha
Local Park	0m ²
District Sports Park	0m ²
Linear Park	0m ²
Terrace/ Terrace with Loft	20 25.9%
Villa/Mia with Loft	10 12.9%
Premium Villa	26 33.7%
Premium Villa	6 7.8%
Courtyard	12 15.8%
Courtyard Premium	1 1.3%
Traditional	0 0%
Potential Multi-Family	2 2.6%
Special Use	0 0%
Total Number of Lots	77 100%

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This plan was prepared to support a Reconfiguration of Lots for the land situated at Jimboomba. The Contour boundaries, creek line, flood lines, building locations have been scaled and should not have any reliance based on them as they are only intended as a general guide. The configuration of allotments shown on this plan is subject to the Local Authority (and relevant State Government Authority) approvals, detailed design, final survey, and registration of survey points. Any comments concerning this plan should be directed to the relevant authority. All lots shown are subject to field survey and also to the requirements of Council and any other legislation. In particular, no reliance should be placed on information on this plan for any financial dealings involving land.

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Data Sources	
Cadastral Boundaries	30697-LP001-A
Contours / Topographic	DNR&M Lidar supplied data
Flood Level	Logan City Council ship file
Engineering Design	Calibre Consulting

					KSP's Drawn
A	Original Revisions	Date	07.12.2017		KSP's Drawn
B	Add 2x mid-block pathways / orientate lots / add 10.0m lot / add LATM / new intersection / Bus Stop	14.11.2018			KS

Locality: Jimboomba
Local Authority: Logan City Council
Horizontal Meridian: MGA
Vertical Level Datum: AHD (Lidar)
Scale: 1:1,500@A3
Designed: PS/KS
Drawn: PS/KS
Checked: PS/KS
Plot Date:
Computer File Ref: 30697-LP001-B.dwg

Plan of Subdivision Stage 1F, 1PB & 1PC



BRISBANE (07) 3666 4700
MACKAY (07) 4951 2911
WHITSUNDAYS (07) 4945 1722
CAIRNS (07) 4051 6722
veris.com.au
ACN 615 735 727
Veris Australia Pty Ltd

Drawing No	Issue
30697-LP001F-1PB-1PC	B

DEVELOPMENT SUMMARY Stage 1F		
Total Stage Area		6.467ha
Area of Lots		3.8262ha
Total Number of Allotments		101
Average Lot Area		378m ²
Length of New Road (incl. Laneway)		1.392m
Length of Laneway		60m
Total Area of Pathways		900m ²
Total Area of New Road		2.5512ha
Local Park		0m ²
District Sports Park		0m ²
Linear Park		0m ²
Terrace/Terrace with Loft		16
Loft		15.8%
Villa/Villa with Loft		16
(10.0m-12.49m)		15.8%
Premium Villa		37
(12.5m-13.99m)		36.6%
Premium Villa		15
(14.0m-14.99m)		14.9%
(15.0m-17.99m)		11
Courtyard Premium		2
(18.0m-19.99m)		2.0%
Traditional		1
(>= 20.0m)		1.0%
Potential Multi-Family		3
Special Use		0
Total Number of Lots		101

DEVELOPMENT SUMMARY	
Stage 1PB	
Total Stage Area Stage 1PB	0.8016ha
Local Park	0ha
District Sports Park	0.8016ha
Linear Park	0ha

DEVELOPMENT SUMMARY		
Stage 1PC		
Total Stage Area	Stage 1PC	1.997ha
Local Park		0ha
District Sports Park		0ha
Linear Park		1.997ha



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This plan was prepared to support a Reconfiguration of Lot 1, which is shown on the attached map. The boundaries of the subject lot are shown by a dashed line. The boundaries, creek line, flood line, building footprints have all been sealed and should not have any reliance based on them as they are only intended as a general guide. The configuration of all mentions shown in this plan is subject to Local Authority (and relevant State Government Authority) survey plans. Any comments contained on the plan should be confirmed by the relevant authorities. The dimensions, areas and total number of lots shown herein are subject to field survey and also to the requirements of Council and any other authority which may have requirements under any relevant legislation. The information on this plan for any financial dealings involving the land.

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Data Sources	306597-LP001-A
Cadastral Boundaries	DNR&M Lidar supplied data
Contours / Topographic	Logan City Council shp file
Flood Level	Calibre Consulting
Engineering Design	

[illegible]

Locality: Jimboomba
 Local Authority: Logan City Council
 Horizontal Meridian: MGA
 Vertical Level Datum: AHD (Lidar)
 Scale: 1:1500@A3
 Designed: PS/KS
 Drawn: PS/KS
 Checked: PS/KS
 Plot Date: 30 Jan, 2019

Plan of Subdivision Stage 1G, 1H & 1I



BRISBANE
(07) 3666 4700

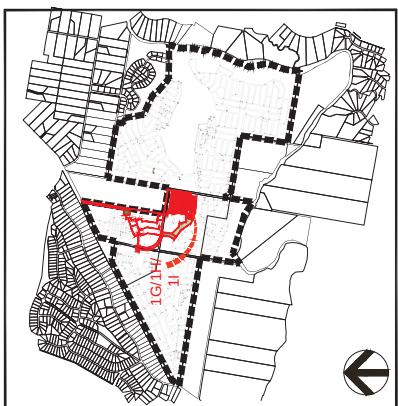
MACKAY
(07) 4951 2911

WHITSUNDAYS
(07) 4945 1722

CAIRNS
(07) 4051 6722

ACN 615 735 727
veils.com.au

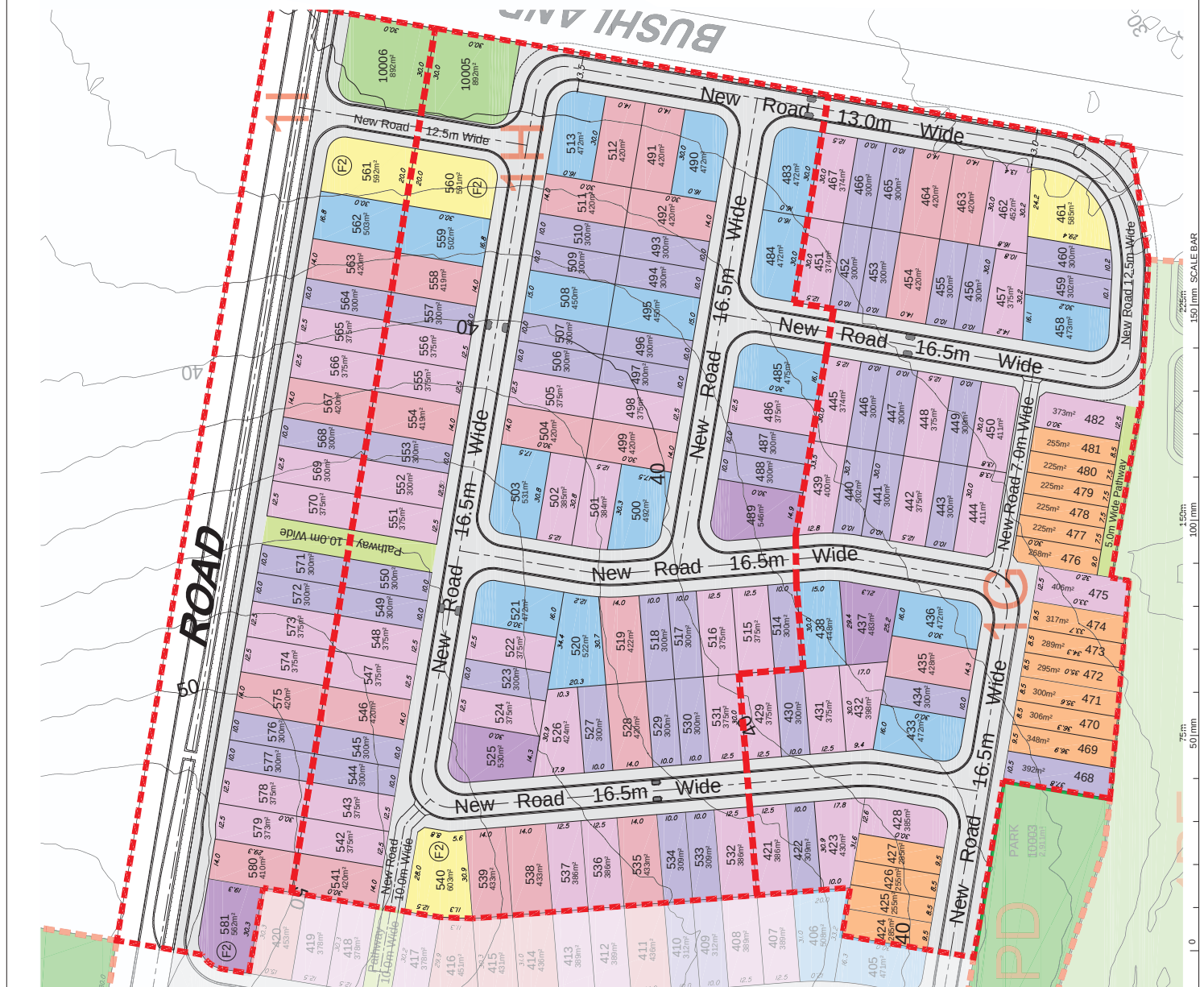
Drawing No	Issue
30697-1 P001G-1H-1I B	



Stage 1G			16	25.8%
Total Stage Area	3.081ha	Terrace Terrace with Loft	16	25.8%
Area of Lots	2.1532ha	VillaVila with Loft (10.0m-12.48m)	18	29.0%
Total Number of Allotments		Premium Villa (12.2m-13.95m)	18	29.0%
Average Lot Area	347m ²	Courtyard (14.0m-14.95m)	4	6.5%
Length of New Road (incl. Laneway)	606m	Courtyard (15.0m-17.95m)	4	6.5%
Length of Laneway	60m	Courtyard Premium (18.0m-19.95m)	1	1.6%
Total Area of Pathways	300m ²	Traditional (2-4.0.0m)	1	1.6%
Total Area of New Road	0.9141ha	Multi-Family	0	0%
Local Park	0m ²	Special Use	0	0%
District Sports Park	0m ²	Total Number of Lots	62	100%
Linear Park	0m ²			

stage 1H	
Total Stage Area	4.455ha
Area of Lots	3.0264ha
Total Number of Allotments	78
Average Lot Area	388m ²
Length of New Road	814m
Length of Laneway	0m
Total Area of Pathways	300m ²
Total Area of New Road	1.3112ha
Local Park	0m ²
District Sports Park	0m ²
Linear Park	892m ²
Time/surface with Loft (<10.0m)	0
Villa/Villa with Loft (10.0m-12.48m)	25
Premium Villa (12.5m-13.95m)	22
Premium Villa (14.0m-15.95m)	15
Courtyard (16.0m-17.95m)	12
Courtyard Premium (18.0m-19.95m)	2
Traditional (>20.0m)	0
Potential Multi-Family	2
Special Use	0
Total Number of Lots	78

Stage 11		
Total Stage Area	1.881ha	
Area of Lots	0.8124ha	
Total Number of Allotments	21	
Average Lot Area	386m ²	
Length of New Road	362m	
Length of Laneway	0m	
Total Area of Pathways	300m ²	
Total Area of New Road	0.9471ha	
Local Park	0m ²	
District Sports Park	0m ²	
Linear Park	892m ²	
Terrestrial Terrace with Loft (c.10.0m Wide)	0	0%
VilaNova with Loft (10.0m-12.48m)	6	28.6%
Premium Villa (12.5m-13.99m)	8	38.1%
Premium Villa (14.0m-15.99m)	4	19.0%
Courtyard (15.0m-17.99m)	1	4.8%
Courtyard Premium (18.0m-19.99m)	0	0%
Traditional (≥20.0m)	0	0%
Potential Multi-Family	2	9.5%
Special Use	0	0%
Total Number of Lots	21	100%



For

IMPORTANT NOTES:
(These notes are an integral part of this plan)

This plan was prepared as support for a Reconfiguration of Local Government Areas (LGA) for the State of Jambosha. The Contour boundaries, creek lines, flood lines, building footprints have been taken from the existing maps and are not to be used for any other purpose than the way they are intended as a general guide. The configuration of all elements shown on this plan is subject to approval (and relevant State Government Authority) of local, regional, state, federal, and registration of all assets, detailed design, final survey, and registration of the plan.

The dimensions of the lots shown on this plan are confirmed by the relevant authorities. The dimensions, area, and total number of lots shown herein are subject to field survey and also to the requirements of Council and any relevant authority which may have requirements under any relevant legislation. In particular, no reliance should be placed on information on this plan for any financial or involving legal purposes.

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Data Sources	30697-LP001-A	DNR&M Lidar supplied data
Cadastral Boundaries		Logan City Council ship files
Contours / Topographic		Callibre Consulting
Flood Level		
Engineering Design		

B	Add 2x mid-block pathways / orientate lots / add 10 dm lot / add LATM / new intersection / Bus Stop	14.11.2018			KS
A	Original		07.12.2017	Date	KSPS Drawn
	Revisions				

Locality: Jimboomba
 Local Authority: Logan City Council
 Horizontal Meridian: MGA
 Vertical Level Datum: AHD (Lidar)
 Scale: 1:1,500@A3
 Designed: PS/KS
 Drawn: PS/KS
 Checked: PS/KS
 Plot Date: 30 Jan, 2019
 Computer File Ref:

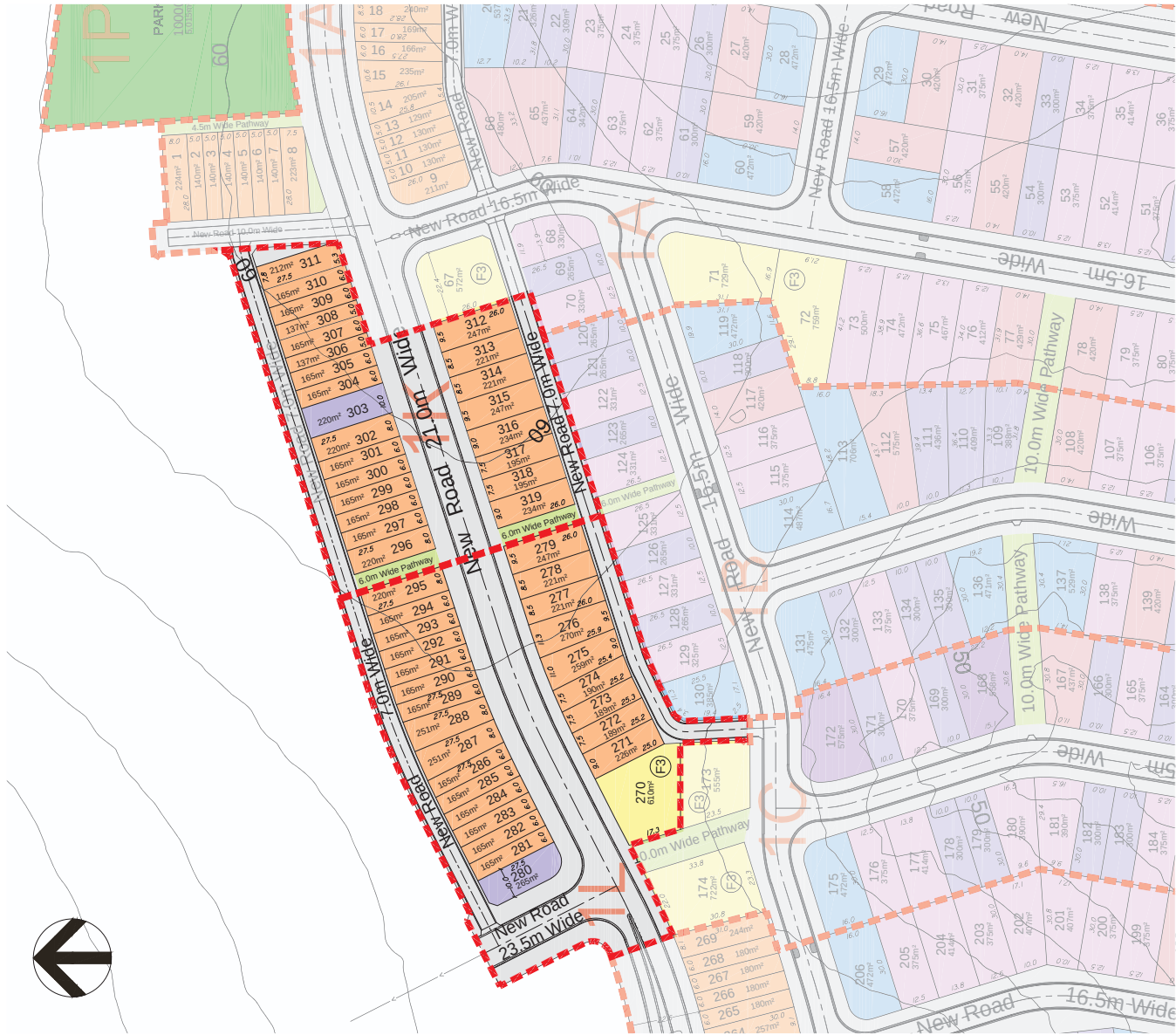
Plan of Subdivision
Stage 1K & 1L

BRISBANE (07) 3666 4700
MACKAY (07) 4951 2911
WHITSUNDAYS (07) 4945 1722
CAIRNS (07) 4051 6722
veris.com.au
ACN 615 735 727
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Drawing No	Issue
30697-LP001K-1L	B

DEVELOPMENT SUMMARY Stage 1K		
Total Stage Area	0.797ha	
Area of Lots	0.466ha	
Total Number of Allotments	24	
Average Lot Area	194m ²	
Length of New Road (incl. Laneway)	267m	
Length of Laneway	192m	
Total Area of Pathways	321m ²	
Total Area of New Road	0.3004ha	
Local Park	0m ²	
District Sports Park	0m ²	
Linear Park	0m ²	
Terrace/Tenace with Loft (<10.0m)	23	95.8%
Villa/Villa with Loft (10.0m-12.49m)	1	4.2%
Premium Villa (12.5m-13.99m)	0	0%
Premium Villa (14.0m-14.99m)	0	0%
Courtyard Premium (15.0m-17.99m)	0	0%
Courtyard Premium (18.0m-19.99m)	0	0%
Traditional (≥20.0m)	0	0%
Potential Multi-Family	0	0%
Special Use	0	0%
Total Number of Lots	24	100%

DEVELOPMENT SUMMARY Stage 1L			
Total Stage Area	1.08ha		
Area of Lots	0.5589ha		
Total Number of Allotments	26		
Average Lot Area	215m ²		
Length of New Road (incl. Laneway)	384m		
Length of Laneway	210m		
Total Area of Pathways	0m ²		
Total Area of New Road	0.5231ha		
Local Park	0m ²		
District Sports Park	0m ²		
Linear Park	0m ²		
Turnover/acre with Lot (<10.0m)	24	92.4%	
Villa/Villa with Lot (10.0m-12.4m)	1	3.8%	
Premium Villa (12.5m-13.9m)	0	0%	
Premium Villa (14.0m-14.9m)	0	0%	
Premium Villa (15.0m-17.9m)	0	0%	
Courtyard Premium (18.0m-19.9m)	0	0%	
Traditional (≥20.0m)	0	0%	
Potential Multi-Family (≥2)	1	3.8%	
Special Use	0	0%	
Total Number of Lots	26	100%	



	0	75m	150m	225m
150mm SCALE BAR				

Teviot Road, Jimboomba

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IMPORTANT NOTES:

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Data Sources
Cadastral Boundaries
Contours / Topographic
Flood Level
Engineering Design

[illegible]

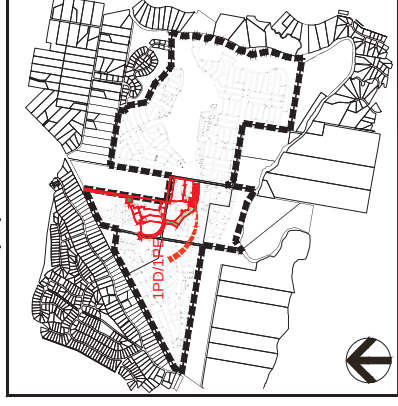
Locality: Jimboomba
Local Authority: Logan City Council
Horizontal Meridian: MGA
Vertical Level Datum: AHD (Ldarp)
Scale: 1:1.500@A3
Designed: PS/KS
Drawn: PS/KS
Checked: PS/KS
Plot Date: 30 Jan, 2019
Computer File Ref: 30897-LP001-B.dwg

Plan of Subdivision
Stage 1PD & 1PE

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Drawing No	Issue
------------	-------



DEVELOPMENT SUMMARY	
Stage 1PD	
Total Stage Area Stage 1PD	0.2911ha
Local Park	0.2911ha
District Sports Park	0ha
Linear Park	0ha

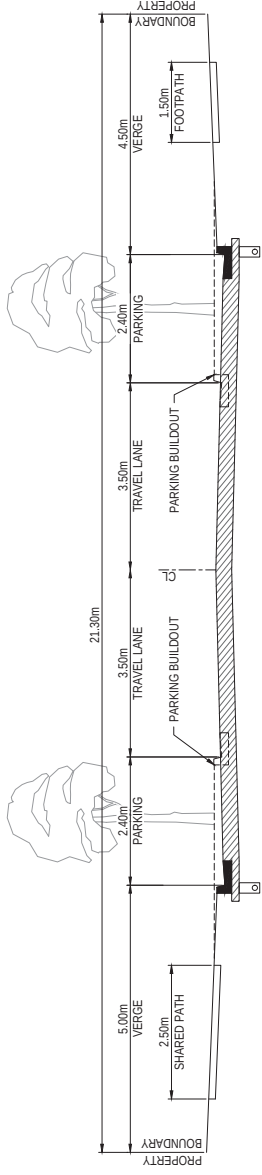
DEVELOPMENT SUMMARY	
Stage 1PE	
Total Stage Area Stage 1PE	2.008ha
Local Park	0ha
District Sports Park	0ha
Linear Park	2.008ha



0 75m 150m 225m
0 50mm 100mm 150mm SCALE BAR

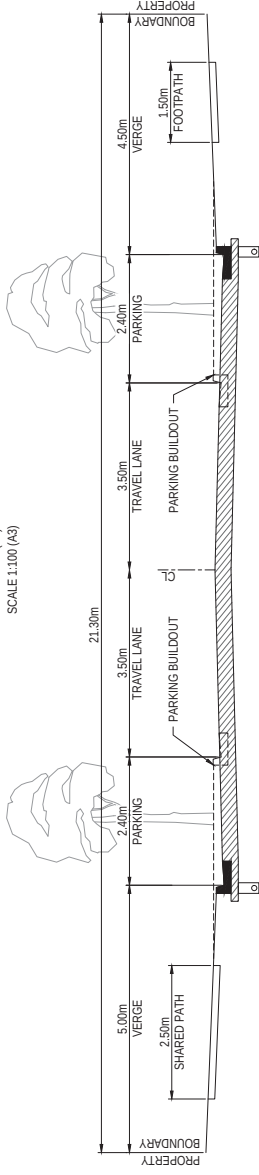
Appendix D

Typical Road Cross-Sections



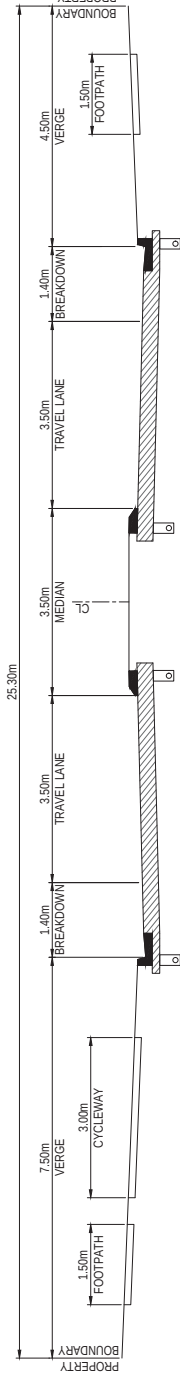
TYPE 5, TRUNK CONNECTOR (PARKING) (7,500 - 9,999vpd)

SCALE 1:50 (A1)
SCALE 1:100 (A3)



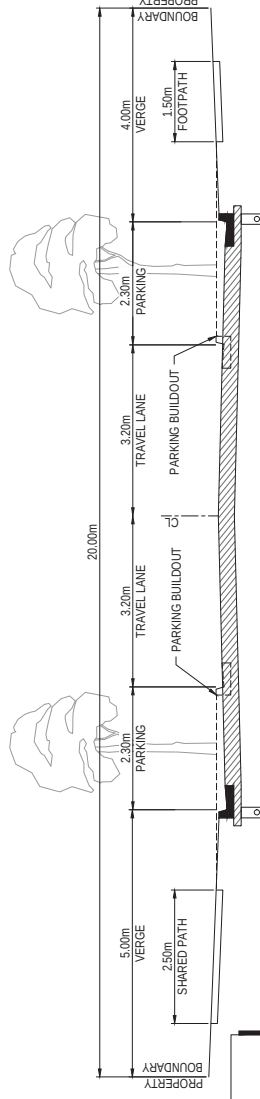
TYPE 6, TRUNK CONNECTOR (PARKING) (7,500 - 9,999vpd)

SCALE 1:50 (A1)
SCALE 1:100 (A3)



TYPE 7, TRUNK CONNECTOR (NO PARKING) (7,500 - 14,999vpd)

SCALE 1:50 (A1)
SCALE 1:100 (A3)



TYPE 8, NEIGHBOURHOOD CONNECTOR - MAJOR (3,000 - 7,499vpd)

SCALE 1:50 (A1)
SCALE 1:100 (A3)

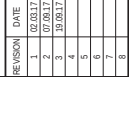
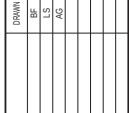
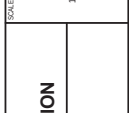
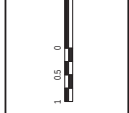
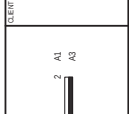
- NOTES:**
1. TYPICAL CROSS SECTIONS PRESENT THE MINIMUM WIDTHS IDENTIFIED.
 2. WITHIN THE OVERALL ROAD RESERVE, VERGES MAY VARY.
 3. SUBJECT TO URBAN DESIGN, ROADS MAY HAVE WIDER VERGES OR PARKING LANES ADDED.
 4. WIDTH OF MEDIAN TO INCREASE FROM 3.5m TO 5.5m AT SIGNALISED INTERSECTIONS TO ACCOMMODATE TURNING LANE AND SHELTER SIGNAL PEDESTALS OR LIGHTING POLE.

DRAFT
19.09.17

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NOT FOR LODGMENT
TO COUNCIL

CONCEPT PLAN ONLY
NOT TO BE USED FOR
CONSTRUCTION PURPOSES

REVISION		DATE	ISSUE DETAILS	DRAWN	DESIGN	STATUS	NOT FOR CONSTRUCTION		SCALE	CLIENT		PROJECT		DRAWING TITLE		PROJECT		REVISION	
1		07/03/17	ORIGINAL ISSUE FOR NEW PROJECT NUMBER	AM	AM				1:50										
2		07/03/17	TYPICAL SECTIONS AMENDED AS PER EDO DISCUSSION	AM	AM				1:100										
3		19/09/17	TYPICAL SHARED PATH AMENDED	AG	AG														
4						DESIGN													
5																			
6																			
7																			
8																			

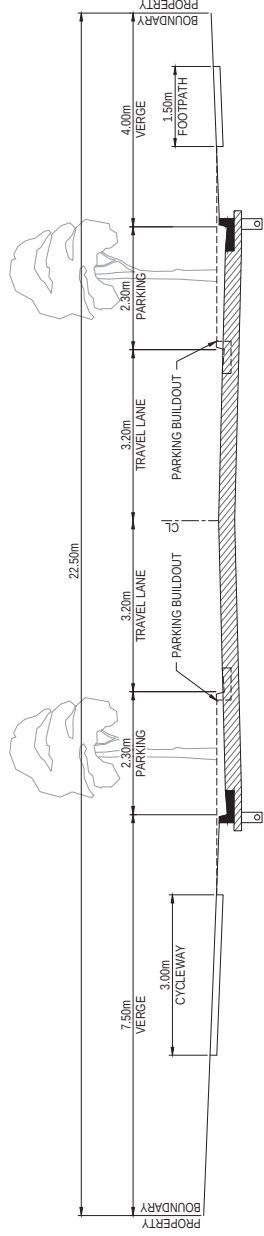


1. TYPICAL CROSS SECTIONS PRESENT THE MINIMUM WIDTHS IDENTIFIED.
2. WITHIN THE OVERALL ROAD RESERVE, VERGES MAY VARY.
3. SUBJECT TO URBAN DESIGN, ROADS MAY HAVE WIDER VERGES OR PARKING LANES ADDED
4. WIDTH OF MEDIAN TO INCREASE FROM 3.5m TO 5.5m AT SIGNALISED INTERSECTIONS TO ACCOMMODATE TURNING LANE AND SHELTER. SIGNAL PEDESTALS OR LIGHTING POLE.



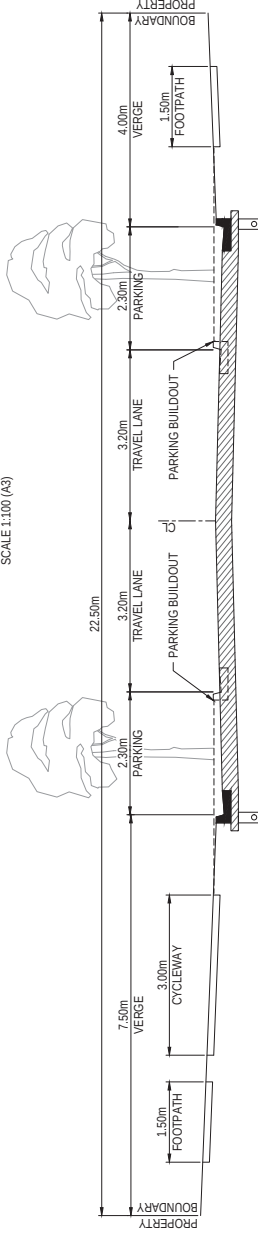
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TO COUNCIL**

CONCEPT PLAN ONLY
NOT TO BE USED FOR
CONSTRUCTION PURPOSES



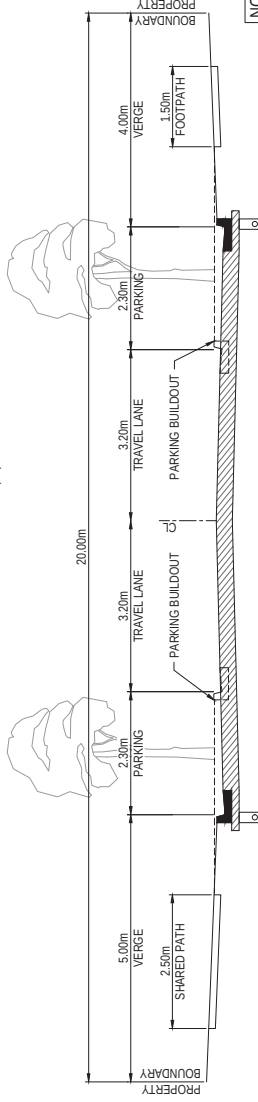
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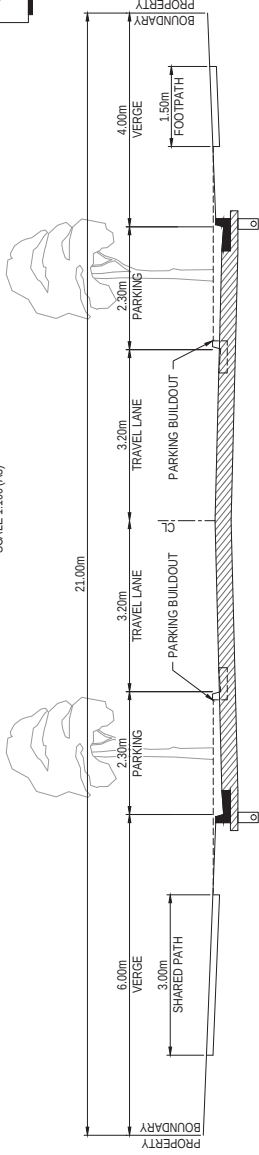
TYPE 14. NEIGHBOURHOOD CONNECTOR - MINOR (1,000 - 2,999vpd)

SCALE 1:50 (A1)
SCALE 1:100 (A3)



TYPE 15. NEIGHBOURHOOD CONNECTOR - MINOR (1,000 - 2,999vpd)

SCALE 1:50 (A1)
SCALE 1:100 (A3)



TYPE 16. NEIGHBOURHOOD CONNECTOR - MINOR (1,000 - 2,999vpd)

SCALE 1:50 (A1)
SCALE 1:100 (A3)

NOTES:

1. TYPICAL CROSS SECTIONS PRESENT THE MINIMUM WIDTHS IDENTIFIED.
2. WITHIN THE OVERALL ROAD RESERVE, VERGES MAY VARY.
3. SUBJECT TO URBAN DESIGN, ROADS MAY HAVE WIDER VERGES OR PARKING LANES ADDED.
4. WIDTH OF MEDIAN TO INCREASE FROM 3.5m TO 5.5m AT SIGNALISED INTERSECTIONS TO ACCOMMODATE TURNING LANE AND SHELTER, SIGNAL PEDESTALS OR LIGHTING POLE.

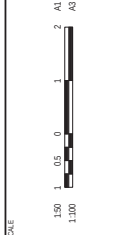
DRAFT
19.08.17

PRELIMINARY ONLY
NOT FOR LODGMENT
TO COUNCIL

CONCEPT PLAN ONLY
NOT TO BE USED FOR
CONSTRUCTION PURPOSES

REVISION	DATE	ISSUE DETAILS
1	07.03.17	ORIGINAL ISSUE
2	10.03.17	TYPE 11 ADDED
3	08.02.19	TYPE 13 ADDED
4		
5		
6		
7		
8		

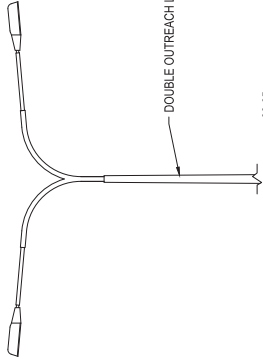
NOT FOR
CONSTRUCTION



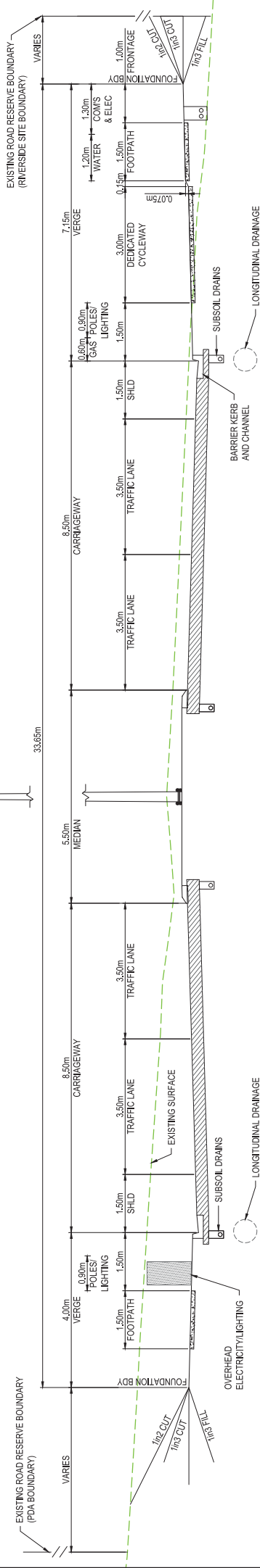
RIVERSIDE
CELESTINO
JIMBOOMBA

INTERNAL ROADS
TYPICAL CROSS SECTIONS
SHEET 4 OF 4

PROJECT
16-003350
SK06
3

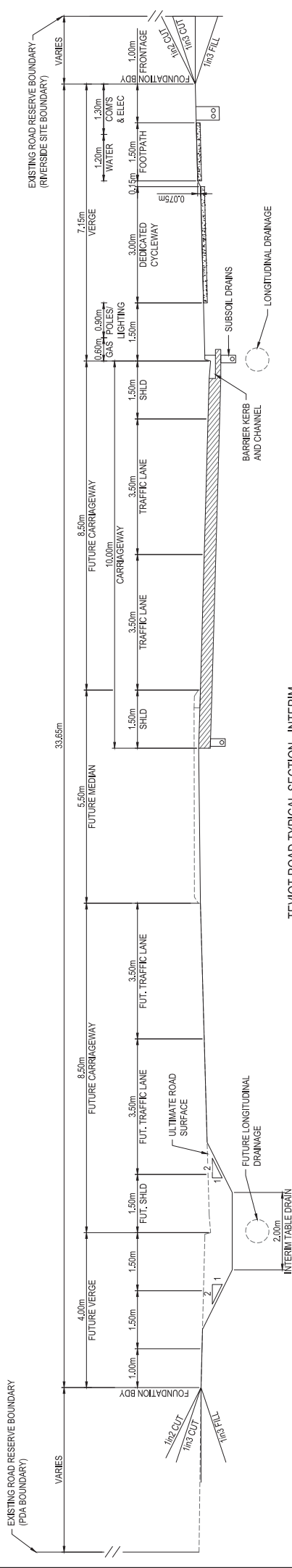


DOUBLE OUTREACH LUMINAIRE



TEVIOT ROAD TYPICAL SECTION - ULTIMATE

N.T.S



TEVIOT ROAD TYPICAL SECTION - INTERIM

N.T.S

REVISION	DATE	ISSUE DETAILS	DRAWN	DESIGN	STATUS	NOT FOR CONSTRUCTION		SCALE	CLIENT	PROJECT	DRAWING TITLE	TEVIOT ROAD TYPICAL CROSS SECTIONS		REVISION
1	05.03.17	ORIGINAL ISSUE ON NEW PROJECT NUMBER	CH	CH										1
2	05.03.18	CYCLEWAY/FOOTPATH GAP REISED	CH	CH										2
3														
4														
5														
6														
7														
8														

Riverside

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RIVERSIDE

CELESTINO

JIMBOOMBA

PROJECT

16-003350

DRAWING NO.

SK07

DRAWING TITLE

TEVIOT ROAD TYPICAL CROSS SECTIONS

REVISION

2

ALL DIMENSIONS TO BE CHECKED ON SITE BY CONTRACTOR PRIOR TO CONSTRUCTION. USE WRITTEN DIMENSIONS ONLY. DO NOT SCALE.

Appendix E

TN08 Teviot Road / Homestead
Drive / Glynton Road Lot
Trigger Analysis

Level 4, 108 Wickham Street
Fortitude Valley
QLD 4006
GPO Box 685 Brisbane QLD 4001
Australia
www.arup.com

t +61 7 3023 6000
f +61 7 3023 6023

Project title Riverside Celestino

Job number

250633-00

cc

File reference

TN08/2018

Prepared by Vincent Chan

Date

7 December 2018

Subject Teviot Road / Homestead Drive / Glynton Road intersection – Triggers for Upgrade

1 Introduction

Arup has been engaged by Celestino to provide traffic engineering services with respect to the traffic impact of proposed Riverside Celestino sub-division development and the traffic capacity of the surrounding road network.

The purpose of this technical note (TN08) is to document a high-level analysis conducted of the triggers for upgrading the Teviot Road / Homestead Drive / Glynton Road intersection (referred to as “the intersection” in this technical note).

This technical note builds upon analysis documented in the following:

- MR01: *Transport Modelling Report*, dated 12 October 2017;
- TN04: *2021 Teviot Road / Glynton Road / Homestead Drive Intersection Layout* technical note, dated 11 December 2017; and
- FN01: *With vs Without Glynton Road Intersection Layouts* file note, dated 10 May 2018.

This technical note (TN08) should be read in conjunction with MR01, TN04 and FN01.

The upgrade triggers have been assessed with respect to the number of lots in the Riverside development, and have been determined for:

- The existing intersection layout;
- The short-term intersection upgrade layout (as per Calibre drawing SK03, dated 22 November 2018); and
- The 2031 intersection upgrade layout (as per the layout presented in FN01).

It should be noted that this analysis has been conducted assuming that the Glynton Road approach to the intersection remains connected to Teviot Road in the future.

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2 Methodology

2.1 Modelling package

The lot trigger analysis was completed through intersection modelling of the intersection, using the SIDRA Intersection software package. SIDRA is a useful tool to determine the intersection capacity, vehicle delays, queues and degree of saturation of the intersections.

2.2 Assessment criteria

2.2.1 Existing and short term intersection layouts

The intent of the trigger analysis is to understand:

- The number of lots that the existing Teviot Road / Homestead Drive / Glynton Road intersection layout can accommodate before needing to be upgraded to the short-term layout; and
- The number of lots that the short-term Teviot Road / Homestead Drive / Glynton Road intersection layout can accommodate before needing to be upgraded to the 2031 intersection layout (as defined in File Note FN01).

As the short-term intersection layout would need to be upgraded by 2031, it was considered appropriate to use an interim assessment year for the lot trigger analysis. For the purposes of this analysis, an interim assessment year of 2021 consistent with the analysis completed in TN04 has been adopted.

2.2.2 2031 intersection layout

The lot trigger analysis of 2031 intersection layout was conducted for the 2031 design year, as per the data presented in MR01.

2.2.3 Intersection operation parameters

In order to quantify the intersection performance, the following performance measures of each intersection has been reported as per Austroads: Guide to Traffic Management Part 12:

- Degree of saturation (DOS) (%) – the ratio of demand flow to capacity. For priority junctions, the DOS for any movement should not exceed 80%. For signals, the DOS should not exceed 90%;
- Average delay (sec) – the average delay per vehicle in seconds incurred by vehicles over the modelled time period. For priority controlled intersections and roundabouts, average delay exceeding 42 seconds is considered near / at capacity and other control modes should be considered (TMR Guide to Traffic Impact Assessment GTIA); and
- 95th percentile queue – a queue length measured in metres of which only 5% of queues are equal to or greater than.

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2.3 Assessment scenarios

This technical note considered the following layouts for the intersection:

- Existing layout;
- Short term layout; and
- 2031 layout.

The scope of assessment was to identify upgrade triggers for each layout (i.e. how many lots can the existing layout accommodate before needing to be upgraded to the short term layout; how many lots can the short term layout accommodate before needing to be upgraded to the 2031 layout etc.).

2.4 Traffic volumes

The traffic volumes used in the assessment of the existing and short term layouts are based on those presented in TN04:

- 2017 base traffic volumes based on survey data obtained on 13 June 2017;
- Background traffic volume growth between 2017 and 2021 based on 800 lots of development¹ in Flagstone located to the west (as per Section 3 of TN04); and
- Additional traffic volumes to/from Riverside to travel on Teviot Road (S). The number of lots that this corresponds to was calculated based on trip generation rates presented in the Road Planning and Design Manual (RPDM) Appendix 3A: Trip Generation Rates (0.85 trips per dwelling per hour).

The traffic volumes used in the assessment of the 2031 layout are based on those presented in MR01, which reflect the volumes used in the 2031 AIMSUN modelling.

¹ Note as per previous discussions with EDQ / VLC, a growth rate was not adopted to determine background traffic volumes at the intersection. This is due to the substantial and incremental background growth patterns expected west of the site, which cannot be accurately reflected through use of a nominal growth rate.

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3 Lot trigger assessment

3.1 Existing layout

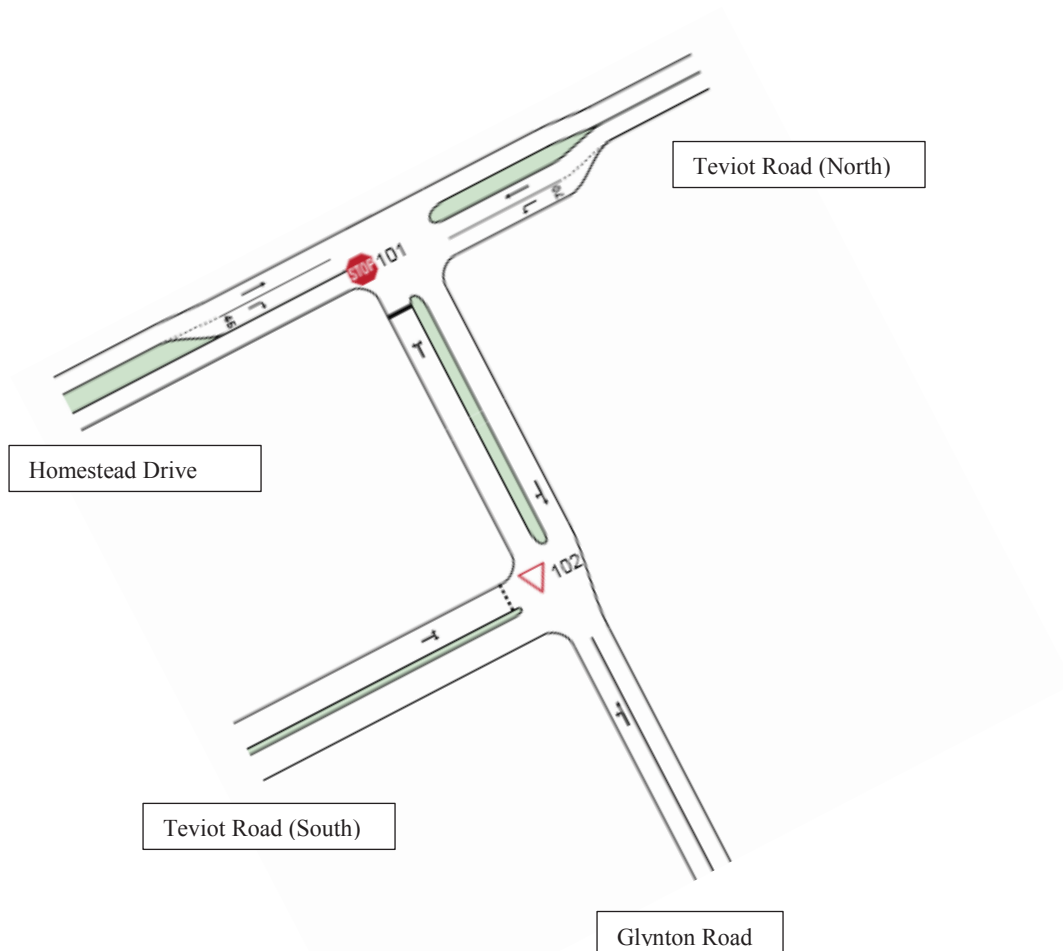


Figure 1: Subject intersection existing (2017) layout

A review of the analysis documented in TN04 indicated that the existing layout can only accommodate 800 lots being built in the Flagstone area (excluding Riverside) between 2017 and 2021. In order to accommodate the background growth in the Flagstone area of 800 lots by 2021 and additional traffic from Riverside, the intersection would need to be upgraded. As such, the lot trigger for the existing layout is **0 lots**.

3.2 Short term layout

The first short term layout tested was based on the layout developed by Calibre Consulting and presented in sketch SK03 (dated 22 November 2018). This layout is presented in the following figure.

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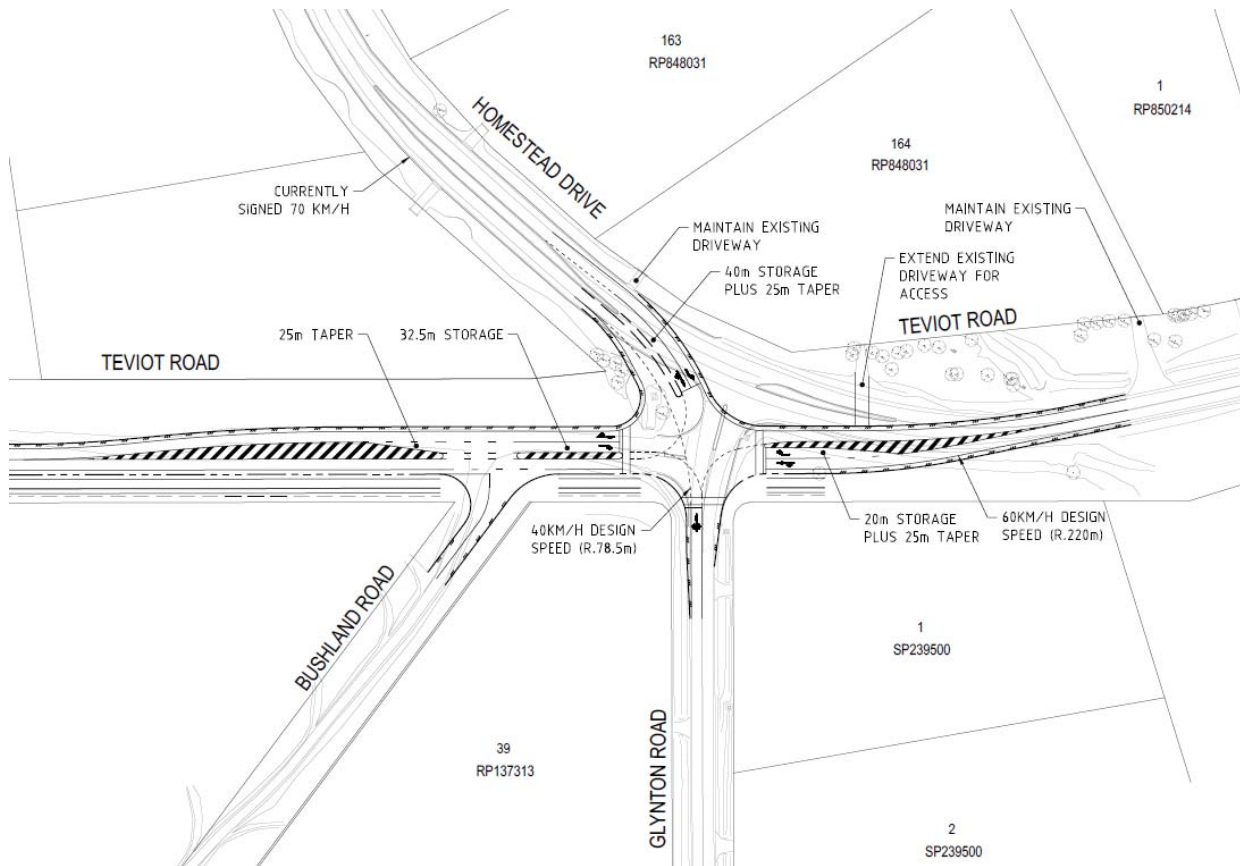


Figure 2 Short term intersection layout

The SIDRA model of this intersection is presented below.

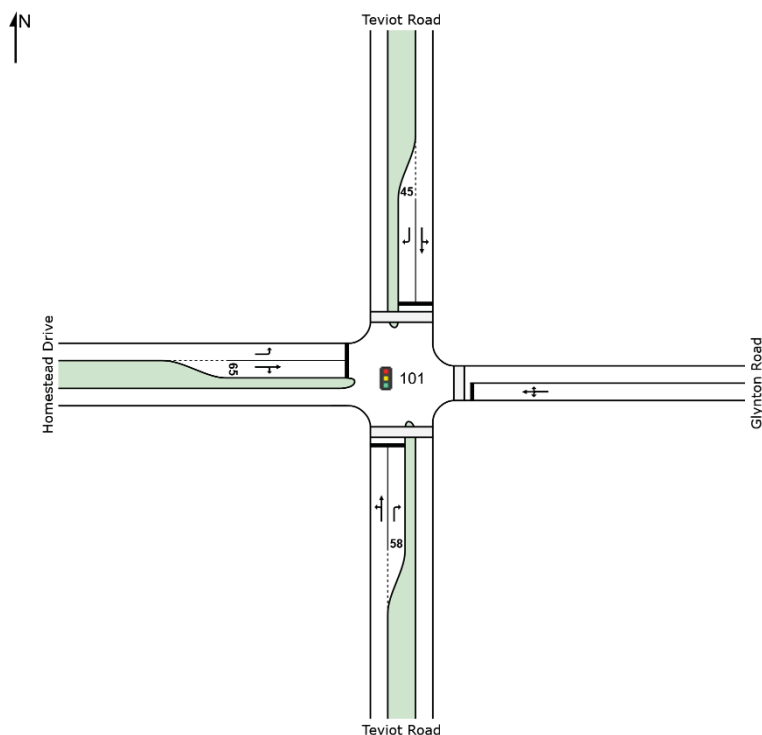


Figure 3 SIDRA layout of intersection

\\GLOBAL.ARUP.COM\AUSTRALASIA\BNE\PROJECTS\250633-00 RIVERBEND TEVIOT BROOK\WORK\INTERNAL\TECHNICAL\REPORT\TIA\TIA02V2 ROL1 2019 REPORT_APPENDIXE\T08_TEVOT HOMESTEAD GLYNTON LOT TRIGGER ANALYSIS.DOCX

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The SIDRA assessment of this layout found that it had minimal ability to accommodate the future traffic volumes. This was due to the following factors:

- In the initial stages of the Riverside development, the main traffic movement is between Teviot Road (N) and Homestead Drive (W). The short term intersection layout provides a single short right turn lane from the north to the west, which constrains the capacity of traffic returning to the Flagstone development in the PM peak;
- There is limited ability to optimise phasing to allow this intersection layout to operate with an appropriate level of service. The “critical path” for phasing at this intersection is:
 - Phase A: All movements from the north. This has been maximised to provide the greatest level of capacity for the N->W right turn;
 - Phase B: All movements from the south. In this analysis, this is already minimised to the shortest green time possible;
 - Phase C: All movements from the west. In this analysis, this is already minimised to the shortest green time possible (the pedestrian crossing was assumed to be called 20% of the time, however it is not noted that reducing this figure does not change the results);
 - Phase D: Right turn from north and left turn from west. This has maximised to provide the greatest level of capacity for the N->W right turn; and
 - Phase E: All movements from the east. In this analysis, this is already minimised to the shortest green time possible.

The analysis found that this intersection layout could accommodate up to a maximum of 160 lots in the Riverside development. It should be noted that at this level of development, this intersection would need to operate with an extended 150 second cycle time during the evening peak hour, and the queue on the northern approach is estimated to exceed 250m.

A summary of the performance of the intersection at the 2021 design year with 160 lots at Riverside is presented below.

Table 1 Subject intersection short term layout design (2021) performance - 160 lots

Intersection Movement	Peak Period	Maximum DOS (%)	Maximum Average Delay (sec)	Maximum 95%ile Queue (m)
Teviot Road (South)	AM Peak	84%	58	38
	PM Peak	53%	87	22
Glynton Road	AM Peak	23%	51	9
	PM Peak	46%	87	19
Teviot Road (North)	AM Peak	90%	50	212
	PM Peak	89%	53	262
Homestead Drive	AM Peak	66%	33	81
	PM Peak	57%	87	92

3.3 Short term layout 2

Noting the constrained intersection operation in the initial short term layout, a slightly modified layout that takes into account the peak movement in the critical evening peak hour (the right turn from the north) was developed. This is shown below.

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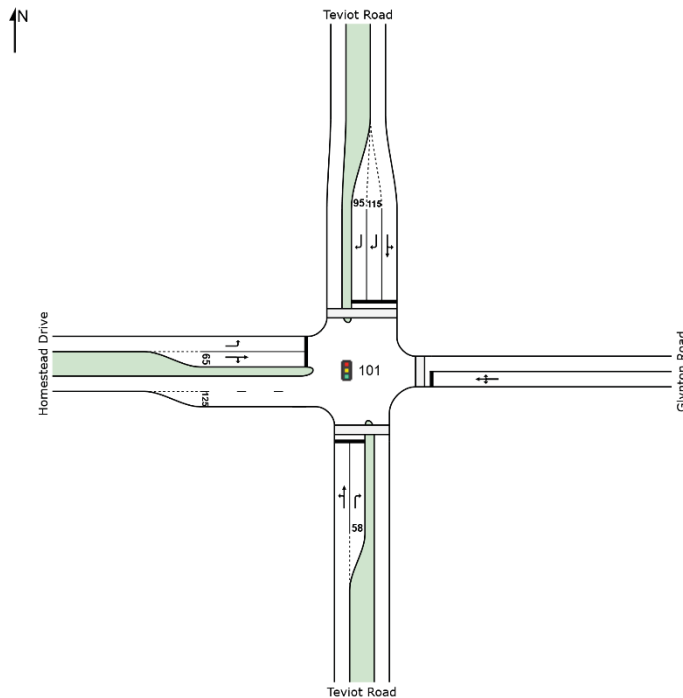


Figure 4 Amended short term intersection layout

This layout increases the capacity of the right turn from the north, while retaining the other features of the intersection.

This intersection was found to be able to accommodate the traffic generated by approximately 650 lots within Riverside with 800 additional lots developed in Flagstone to the west of the site.

Table 2 Subject intersection upgraded short term layout design (2021) performance - 650 lots

Intersection Movement	Peak Period	Maximum DOS (%)	Maximum Average Delay (sec)	Maximum 95%ile Queue (m)
Teviot Road (South)	AM Peak	85%	57	189
	PM Peak	86%	62	64
Glynton Road	AM Peak	36%	69	15
	PM Peak	44%	58	18
Teviot Road (North)	AM Peak	66%	45	127
	PM Peak	74%	45	118
Homestead Drive	AM Peak	85%	48	190
	PM Peak	72%	60	113

3.4 2031 layout

Based on the *Transport Modelling Report* (MR01) dated 12 October 2017, the 2031 layout was developed based on assumed demographics which included 3,425 residential dwellings within Riverside. The layout of the intersection was modified in FN01 (compared to the original layout presented in MR01) to increase capacity slightly.

The intersection modelling results presented in FN01 showed that this intersection operates close to capacity (88% DOS) in 2031, which means that the trigger for upgrading is at 3,425 lots.

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4 Summary

The lot triggers analysis documented in this technical note indicated the following lot triggers for upgrades of the Teviot Road / Homestead Drive / Glynton Road intersection:

- Existing layout: 0 lots;
- Short term layout (as per Calibre Sketch SK03): 160 lots;
- Short term layout (with double right turn from Teviot Road N to Homestead Drive W): 650 lots; and
- 2031 layout: 3,425 lots.

DOCUMENT CHECKING (not mandatory for File Note)

	Prepared by	Checked by	Approved by
Name	Vincent Chan	Catherine Bennie	Roland Cathcart
Signature			

Appendix F

FN01 With vs Without Glynton
Road

File Note

ARUP

Level 4, 108 Wickham Street
Fortitude Valley
QLD 4006
GPO Box 685 Brisbane QLD 4001
Australia
www.arup.com

t +61 7 3023 6000
f +61 7 3023 6023

Project title Riverside Celestino

Job number

250633

cc Lloyd Gomez

File reference

FN01

Prepared by Catherine Bennie

Date

10 May 2018

Subject With vs Without Glynton Road Intersection Layouts

This file note has been prepared in order to detail the intersection layout differences for the 2031 and 2066 design years, for the With Glynton Road and Without Glynton Road scenarios.

For analysis took into account any changes arising from the EDQ RFI for the Traffic Modelling Report using AIMSUN v8.1.2 and SIDRA v7. The following performance criteria was compared at each design year (2031 and 2066), the geometric layouts, degree of saturation, average delay (seconds) and 95th percentile back of queue (m).

A summary of the performance between the two scenarios is provided in Table 1. A map detailing the locations of the internal intersections is presented in Figure 1 and Figure 2 for 2031 and 2066 respectively.

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10 May 2018

Table 1 Peak performance summary of key intersections

Intersection	With Glynton Road			Without Glynton Road		
	DOS (%)	Delay (s)	95%ile Queue (m)	DOS (%)	Delay (s)	95%ile Queue (m)
2031 Design Year						
Teviot Rd / Cusack Ln [A]	0.836	26.4	242.8	0.907	36.6	337.3
Teviot Rd / Homestead Dr [B]	0.884	38.4	182.7	0.879	32.3	236.5
Teviot Rd / Centre Collector [C]	0.670	18.1	58.7	0.711	18.3	72.4
Bushman Dr / Gittins Rd [G]	0.337	0.5	1.3	0.336	0.7	1.5
Bushman Dr / Kilmoylar Rd [H]	0.571	5.6	25.3	0.572	5.6	25.3
M	0.343	4.8	13.0	0.395	4.5	16.6
Centre Cr / Trunk Cr [N]	0.720	23.2	59.2	0.829	24.0	82.7
Homestead Dr / Bushman Dr [AB]	0.811	5.7	109.1	0.781	5.5	93.7
Teviot Rd / Sandpiper Dr [AC]	0.730	9.2	209.5	0.743	9.3	217.2
Teviot Rd / Nbrhd Connector [AD]	0.220	1.8	2.4	0.256	1.7	3.1
Teviot Rd / Bushman Dr [AE]	0.320	1.9	7.3	0.355	2.5	10.3
Cusack Ln / Margaret Rd [AG]	0.754	15.4	220.7	0.741	15.3	213.2
Left-in / Left-out / Right-in [AH]	0.259	2.1	7.3	0.308	2.0	9.2
AI	0.298	0.2	0.3	0.386	0.1	0.4
Teviot Rd / Payne Rd [1]	0.809	8.4	190.2	0.868	10.4	309.7
Cusack Ln / Duncan Rd [2]	0.672	8.2	176.7	0.822	17.0	217.5
Glynton Rd / Riverbend Bvd [3]	0.173	5.7	5.5	0.147	5.7	4.7
Bushman Dr / Drover Cr [4]	0.051	3.8	1.3	0.064	3.5	1.6
2066 Design Year						
Teviot Rd / Cusack Ln [A]	0.954	35.6	546.4	0.993	46.5	688.3
Teviot Rd / Homestead Dr [B]	1.110	86.7	758.9	0.922	36.0	329.4
Teviot Rd / Centre Collector [C]	0.823	26.2	190.5	0.838	27.3	200.2
Teviot Rd / Trunk Connector [D]	0.885	24.2	187.6	0.891	26.1	214.2
Teviot Rd / Drover Cr [E]	0.883	24.7	135.6	0.890	23.4	162.9
Bushman Dr / Gittins Rd [G]	0.888	36.3	152.5	0.875	36.5	171.5
Bushman Dr / Kilmoylar Rd [H]	0.564	5.8	36.9	0.624	6.1	45.2
M	0.591	5.1	29.3	0.625	5.0	30.9
Centre Cr / Trunk Cr [N]	0.761	34.6	92.4	0.827	36.3	112.3
Homestead Dr / Bushman Dr [AB]	0.708	6.4	80.3	0.703	5.9	78.1
Teviot Rd / Sandpiper Dr [AC]	0.849	7.2	290.9	0.888	9.0	375.1
Teviot Rd / Nbrhd Connector [AD]	0.559	1.0	2.9	0.604	1.3	9.3
Teviot Rd / Bushman Dr [AE]	0.893	17.3	267.1	0.819	11.7	212.2
Wyatt Rd / New Rd [AF]	0.833	13.4	330.2	0.842	13.6	340.0
Cusack Ln / Margaret Rd [AG]	0.738	18.7	232.6	0.783	17.8	265.2
Left-in / Left-out / Right-in [AH]	0.413	2.2	12.9	0.507	2.4	16.2
AI	0.397	0.2	0.5	0.440	0.2	0.4
Teviot Rd / Payne Rd [1]	0.354	7.4	66.2	0.456	10.2	74.7
Cusack Ln / Duncan Rd [2]	0.886	11.1	297.2	0.717	8.6	290.5
Glynton Rd / Riverbend Bvd [3]	0.693	8.9	69.7	0.617	6.9	42.4
Bushman Dr / Drover Cr [4]	0.548	5.2	36.5	0.540	5.5	32.3

As demonstrated above, with the modelled intersection layouts, the Without Glynton scenario allows for improvements mostly at Teviot Road / Homestead Drive. The remaining intersections (excepting Teviot Road / Cusack Lane) are anticipated to operate within acceptable limits in both scenarios.

File Note

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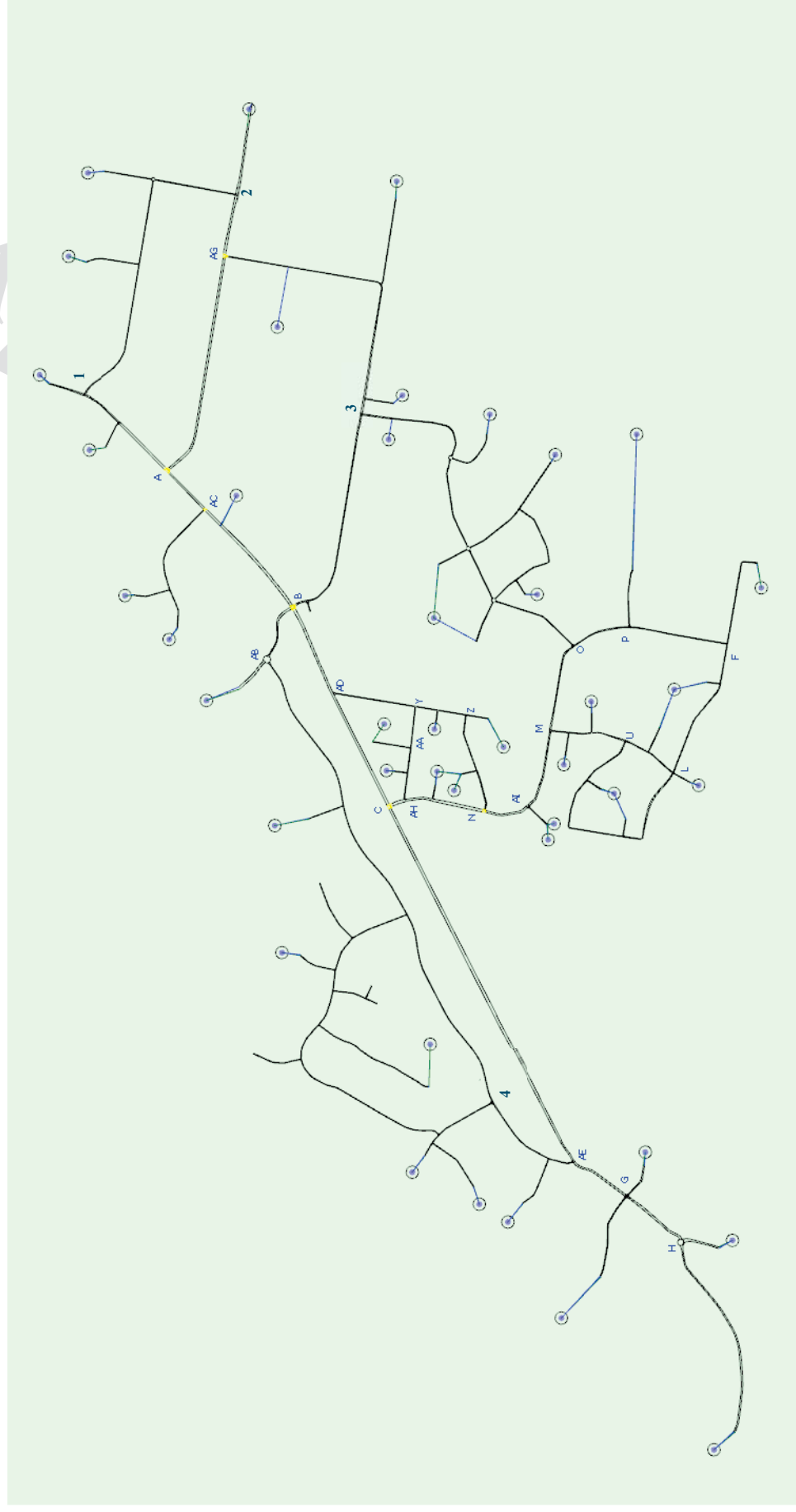


Figure 1 AIMSUN Model Area – 2031 Design Year

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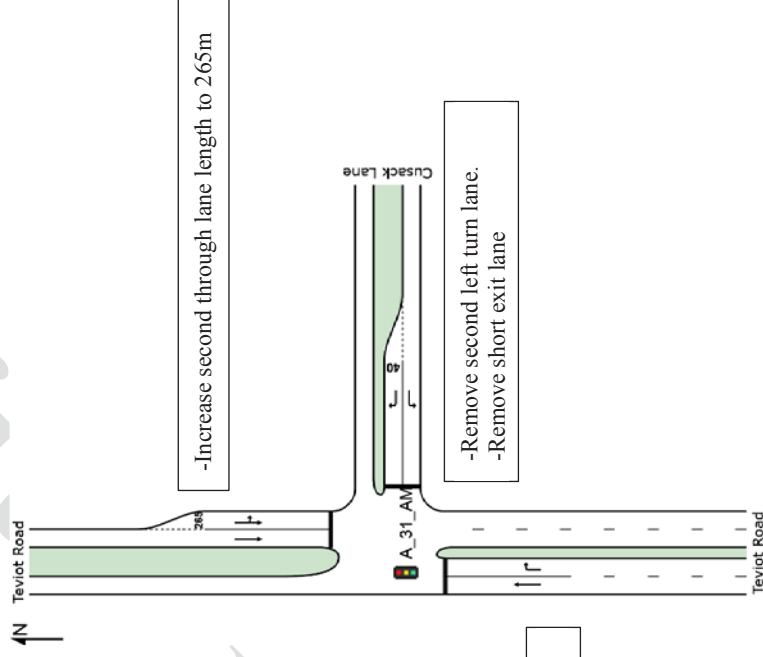
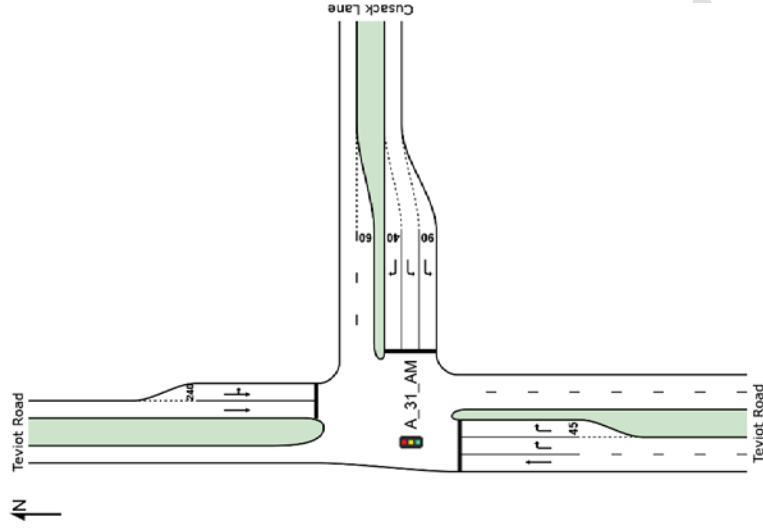
Figure 2 AIMSUN Model Area – 2066 Design Year

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2031 Intersection A



With Glynton			
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.813	18.5	242.8
PM	0.836	26.4	235.5

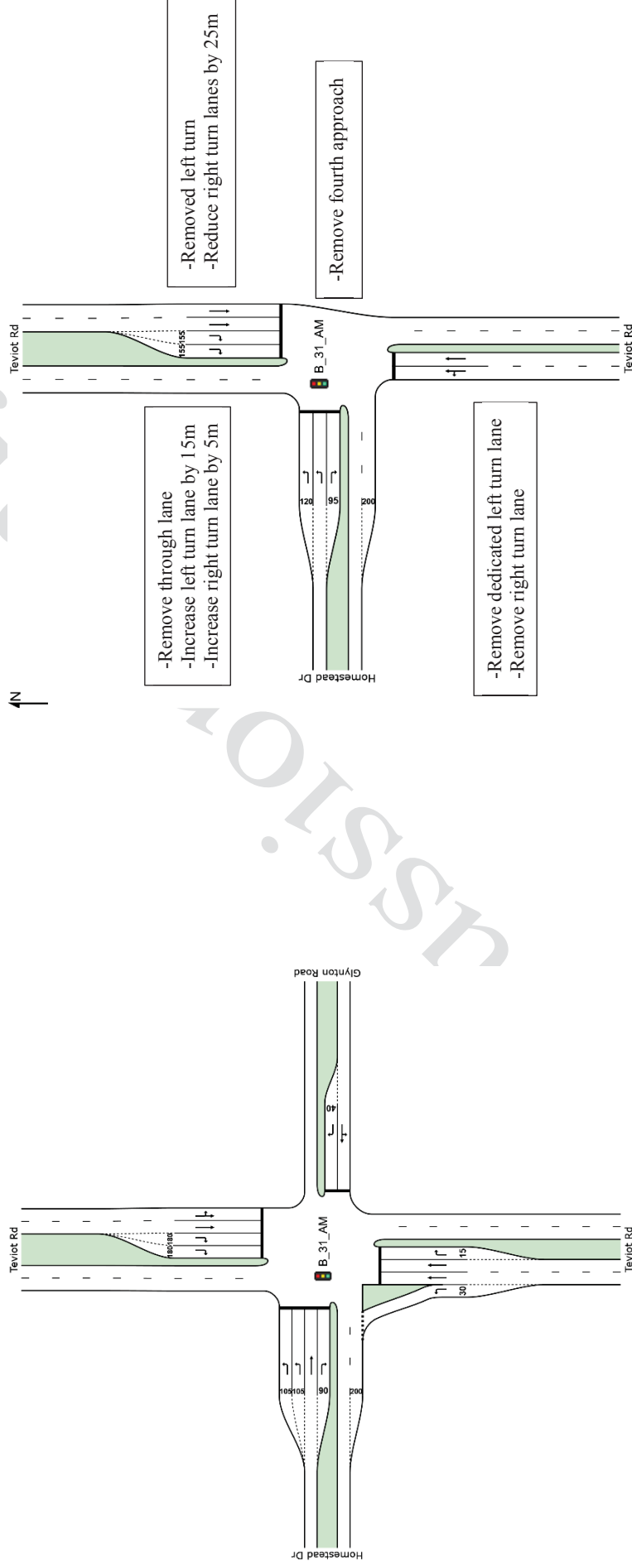
Without Glynton			
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.868	24.3	337.3
PM	0.907	36.6	282.1

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2031 Intersection B



	With Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.884	38.4	182.7
PM	0.800	33.4	177.2

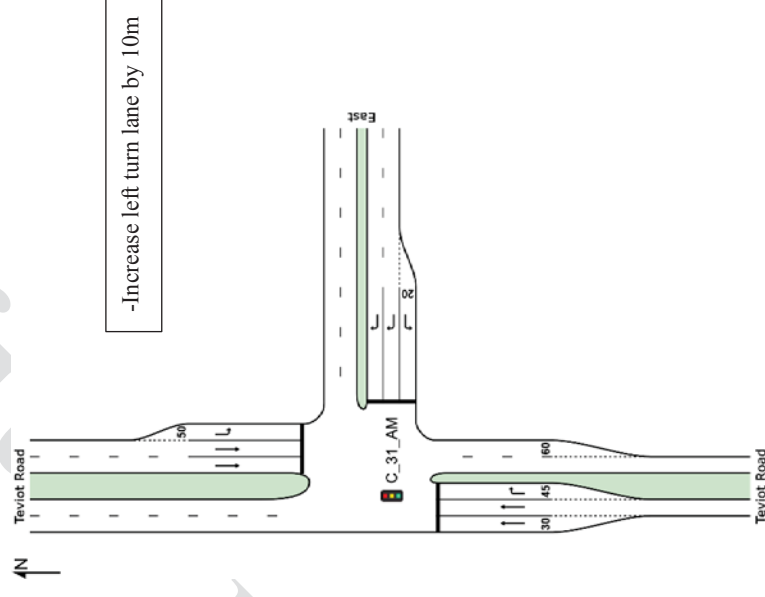
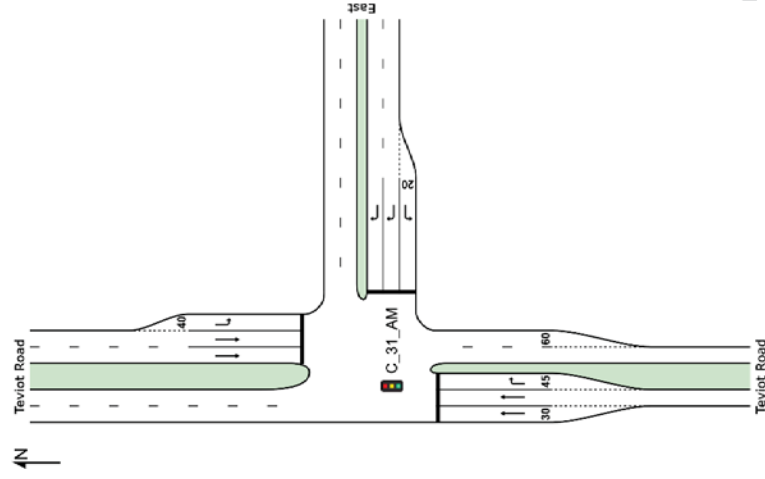
	Without Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.855	32.3	236.5
PM	0.879	26.9	153.5

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2031 Intersection C



	With Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.592	17.0	52.9
PM	0.670	18.1	58.7

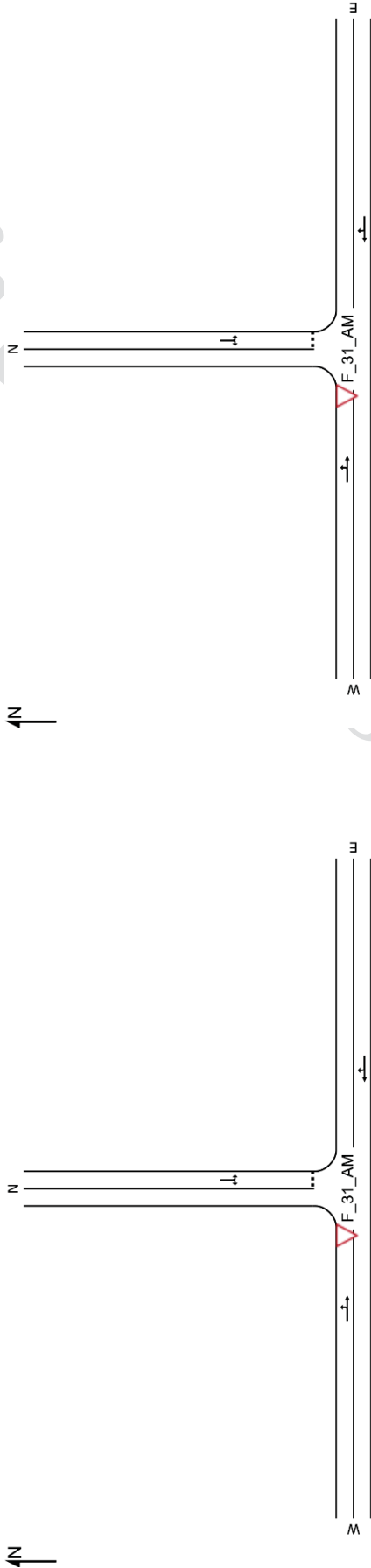
	Without Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.706	18.3	72.4
PM	0.711	18.2	65.4

File Note

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10 May 2018

2031 Intersection F



	With Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.011	5.1	0.1
PM	0.017	5.1	0.4

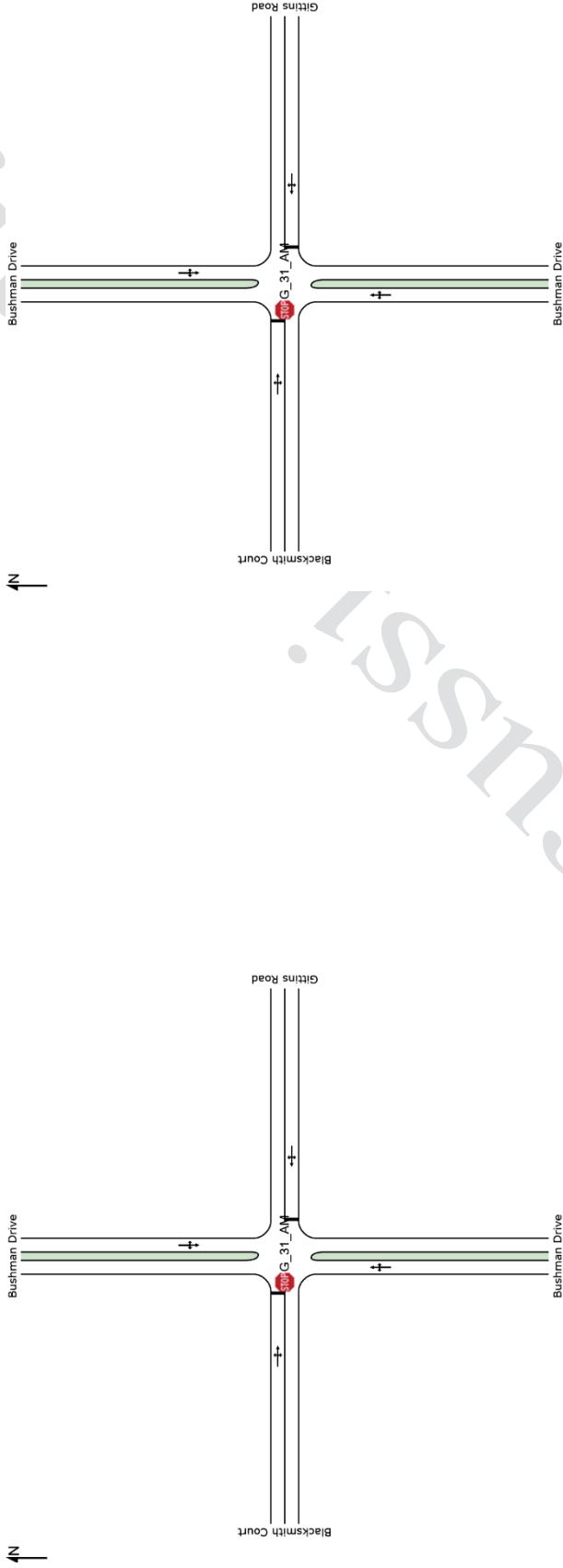
	Without Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.010	4.6	0.1
PM	0.016	4.7	0.4

File Note

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10 May 2018

2031 Intersection G



	With Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.337	0.5	1.3
PM	0.323	0.3	0.7

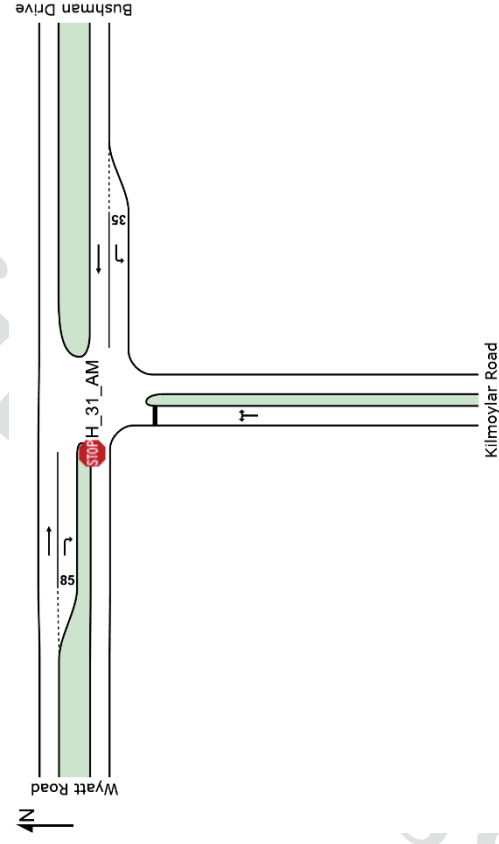
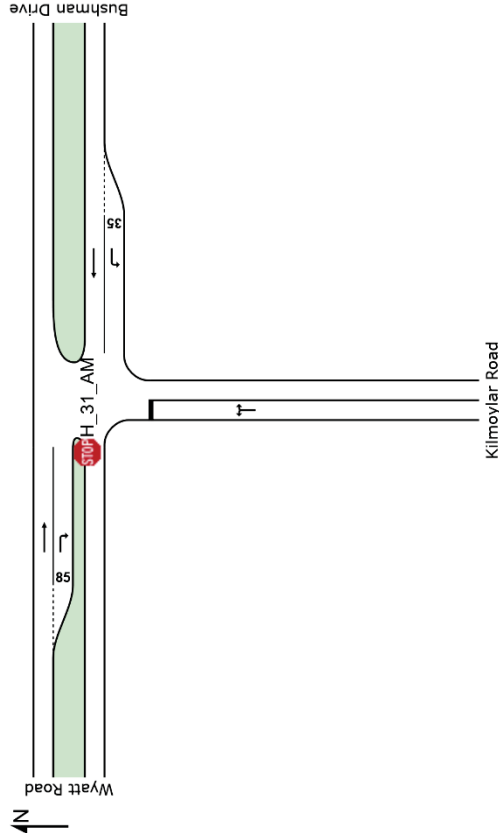
	Without Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.336	0.7	1.5
PM	0.324	0.4	0.7

File Note

250633

10 May 2018

2031 Intersection H



	With Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.480	4.6	18.3
PM	0.571	5.6	25.3

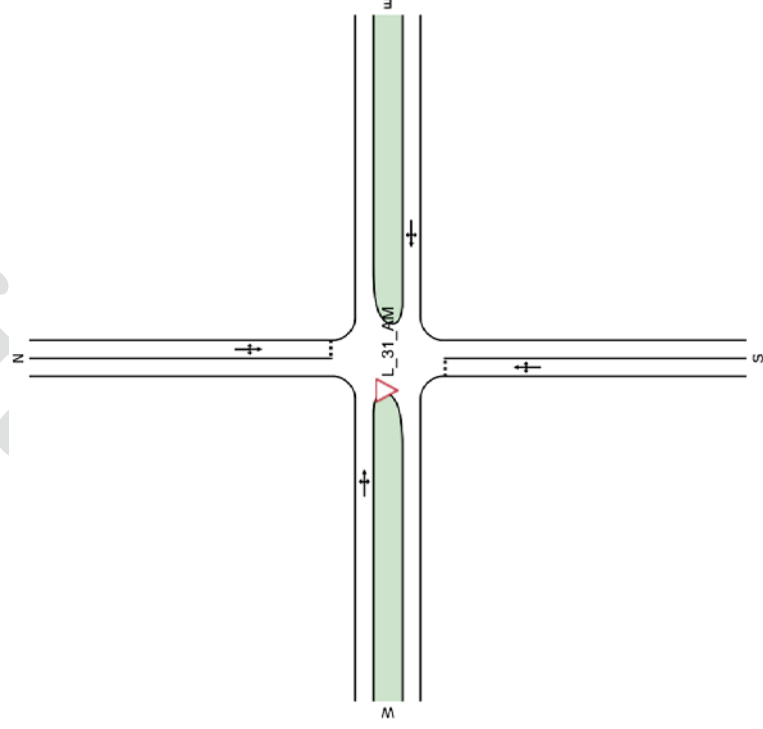
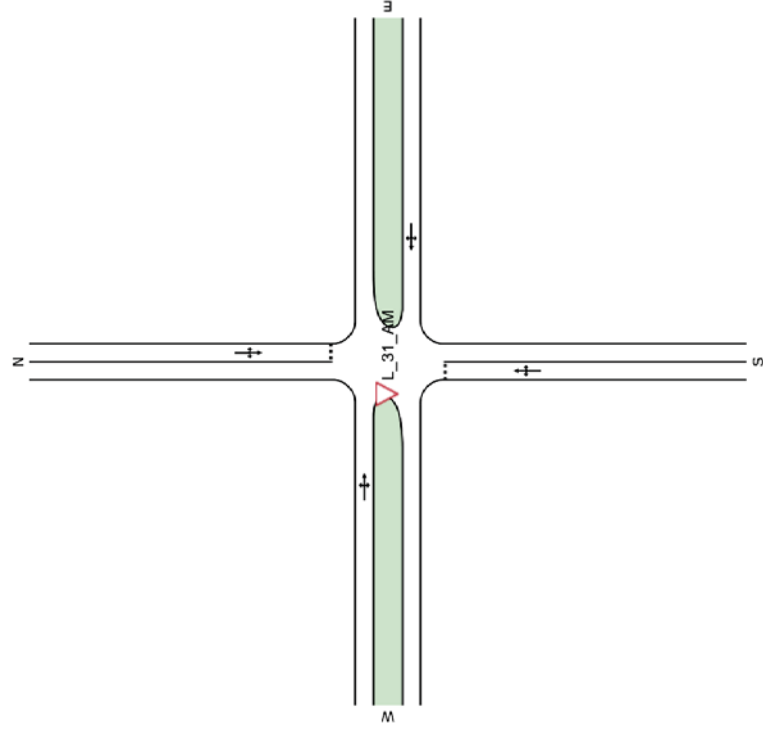
	Without Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.480	4.6	18.3
PM	0.572	5.6	25.3

File Note

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10 May 2018

2031 Intersection L



	With Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.094	4.3	2.6
PM	0.081	4.2	2.2

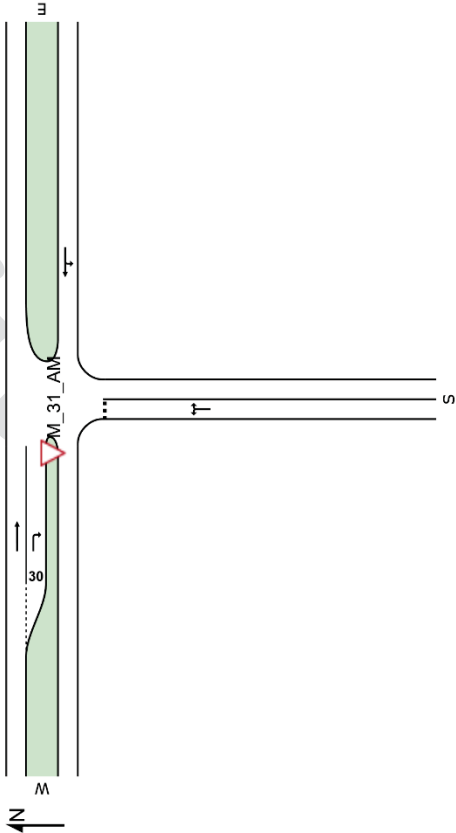
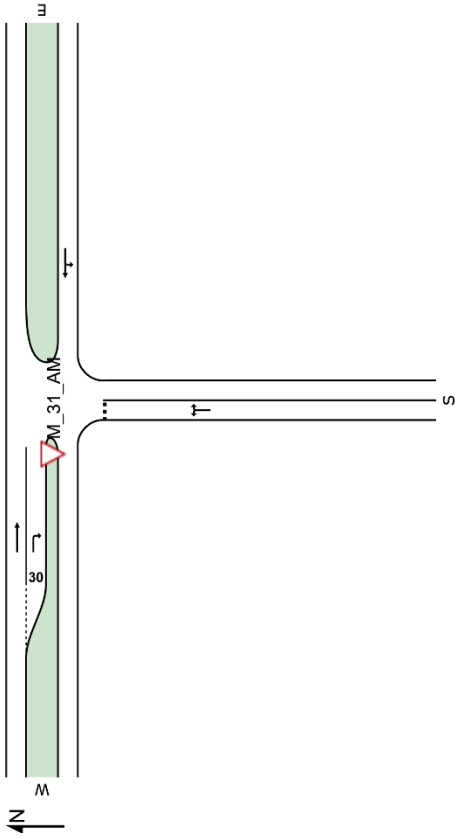
	Without Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.094	4.3	2.6
PM	0.083	4.3	2.3

File Note

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10 May 2018

2031 Intersection M



	With Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.343	4.8	13.0
PM	0.222	4.5	8.6

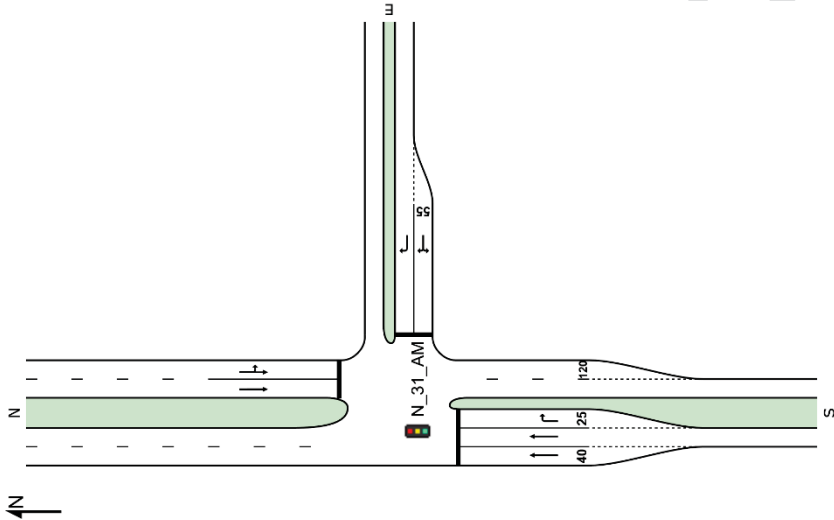
	Without Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.395	4.5	16.6
PM	0.232	3.8	8.9

File Note

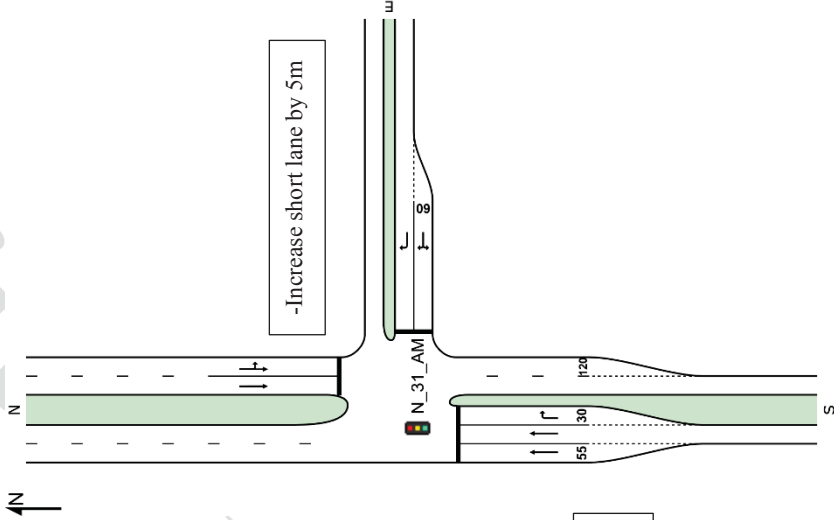
250633

10 May 2018

2031 Intersection N



With Glynton			
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.512	21.9	38.0
PM	0.720	23.2	59.2



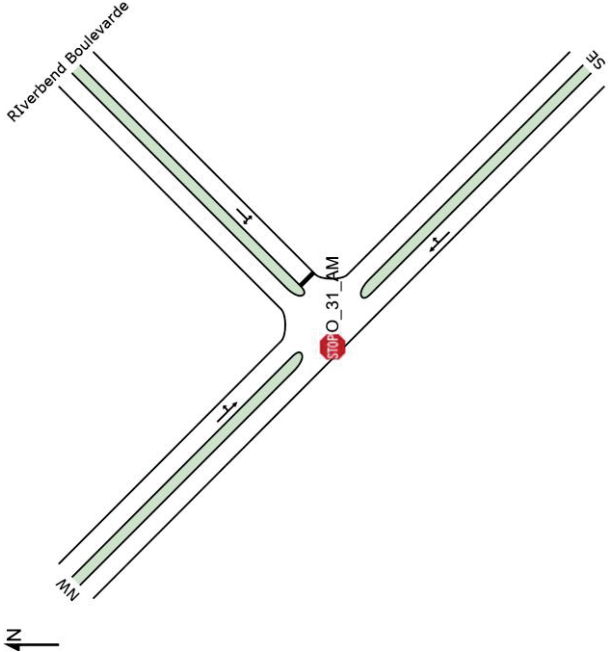
Without Glynton			
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.643	21.9	50.1
PM	0.829	24.0	82.7

File Note

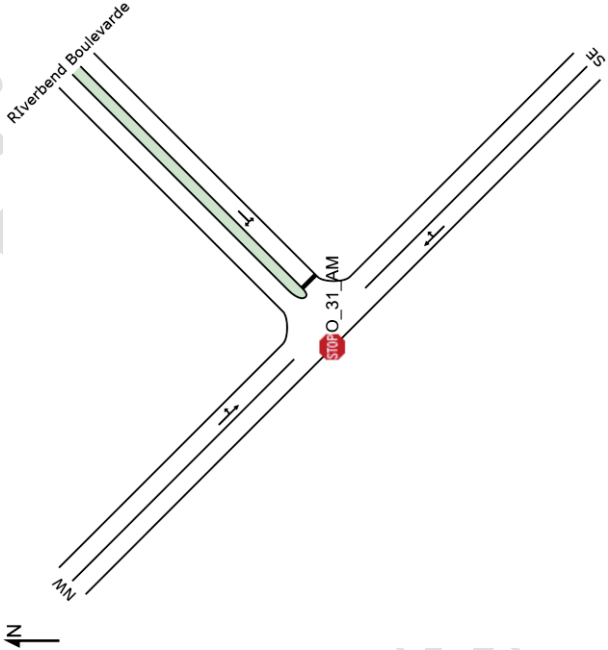
250633

10 May 2018

2031 Intersection O



	With Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.146	6.9	3.8
PM	0.113	6.8	2.9



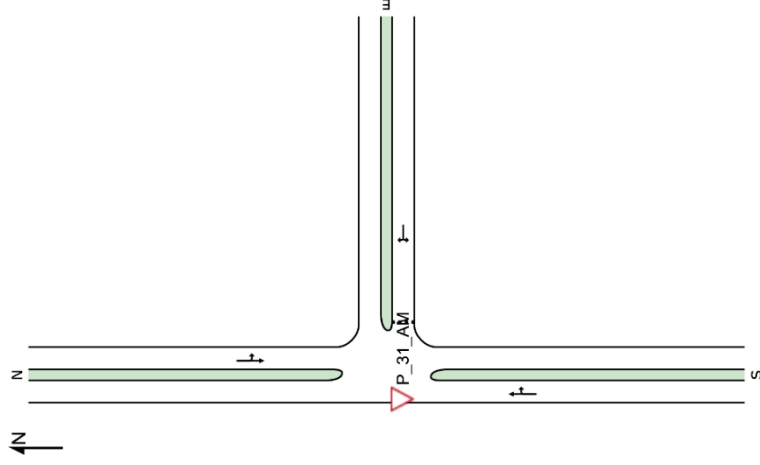
	Without Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.289	7.3	8.8
PM	0.164	6.7	4.4

File Note

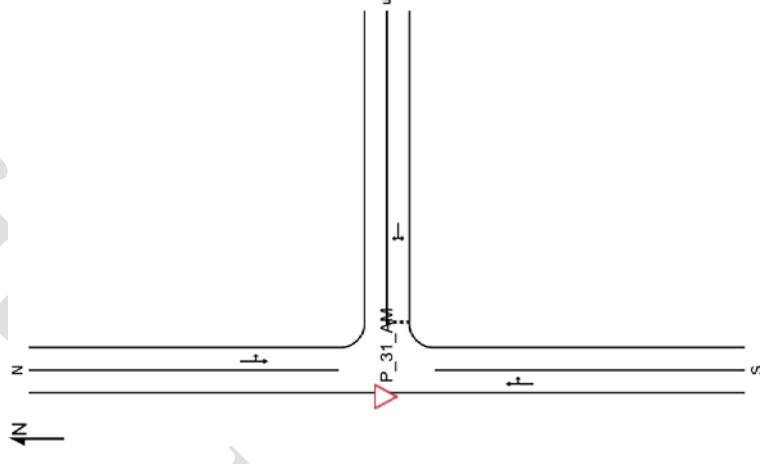
250633

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2031 Intersection P



	With Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.011	0.9	0.0
PM	0.011	0.8	0.0



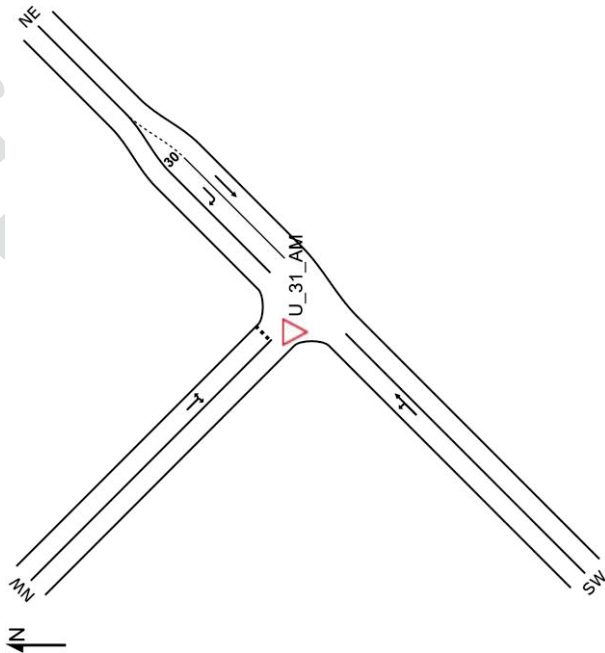
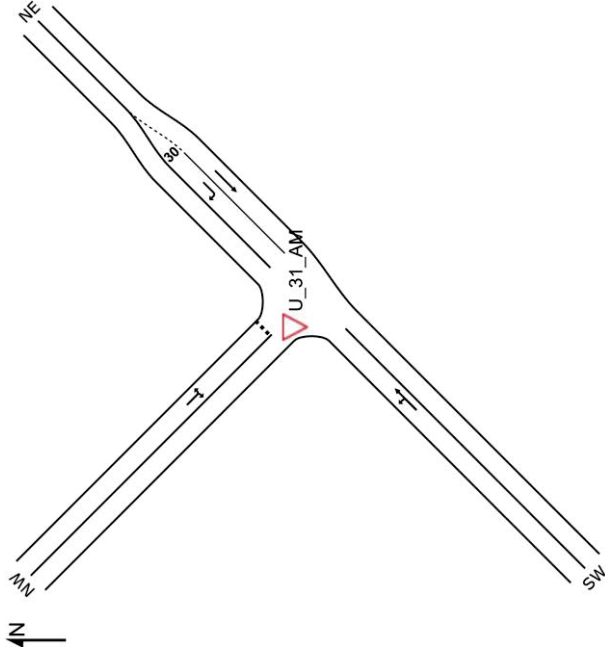
	Without Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.010	1.9	0.1
PM	0.012	1.6	0.1

File Note

250633

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2031 Intersection U



	With Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.106	2.6	3.2
PM	0.095	2.3	2.6

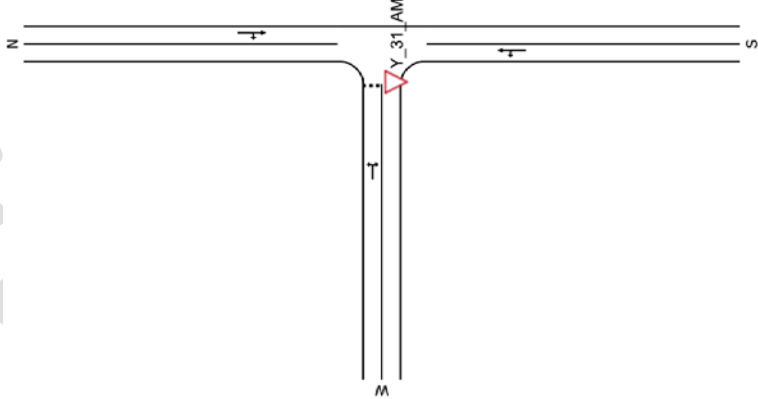
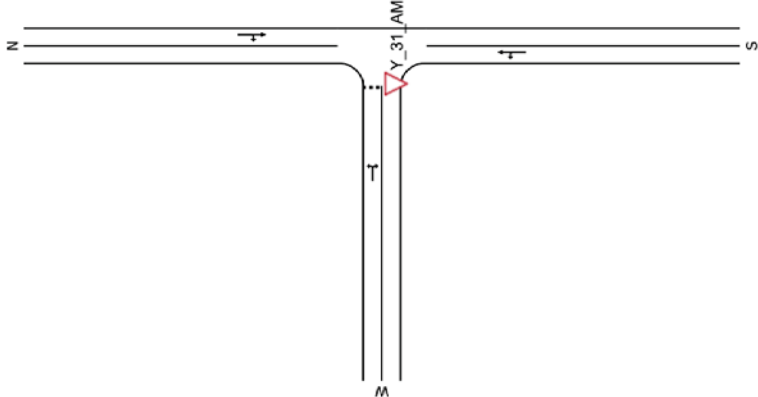
	Without Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.108	2.6	3.2
PM	0.096	2.4	2.6

File Note

250633

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2031 Intersection Y



	With Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.141	5.0	3.7
PM	0.291	4.3	8.8

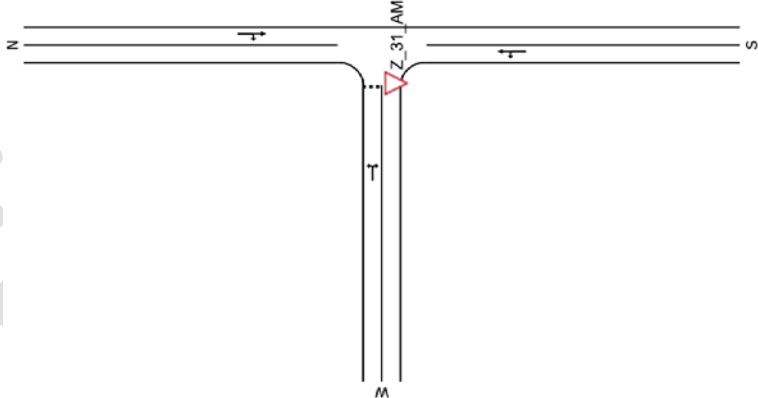
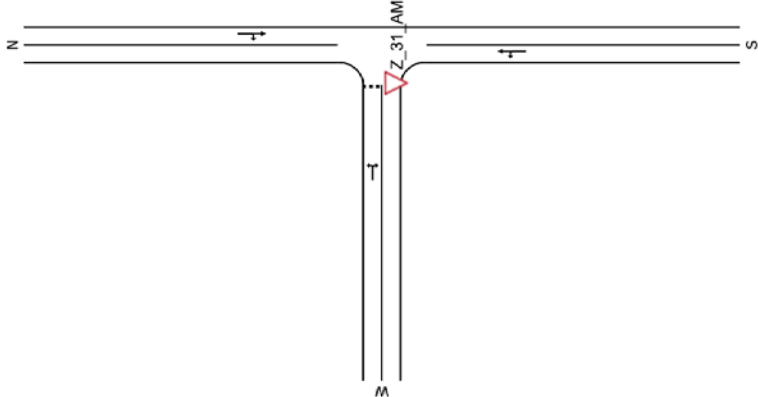
	Without Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.141	4.9	3.7
PM	0.295	4.3	9.0

File Note

250633

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2031 Intersection Z



	With Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.156	5.2	5.7
PM	0.209	4.7	8.3

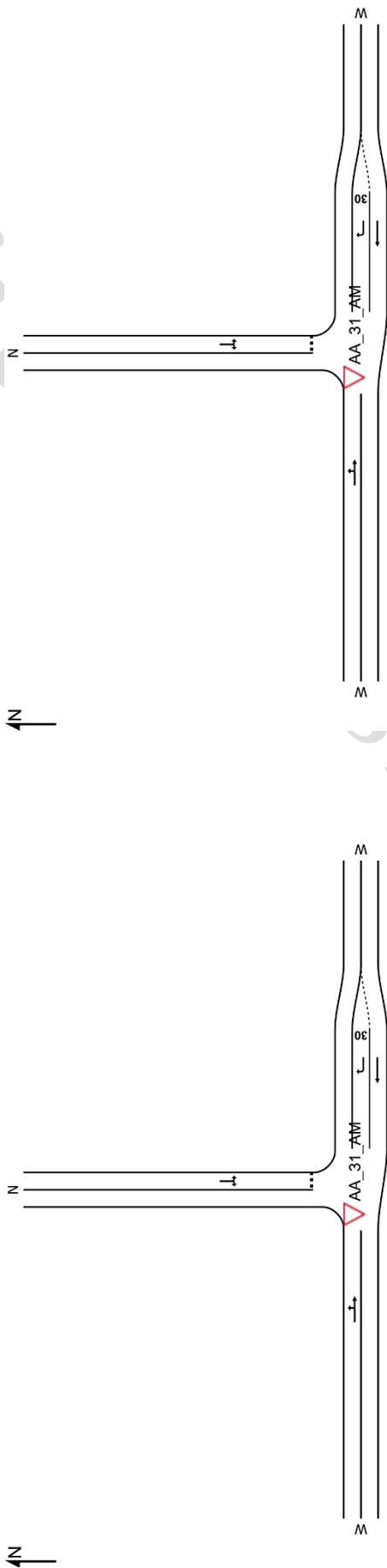
	Without Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.157	5.2	5.8
PM	0.209	4.7	8.3

File Note

250633

10 May 2018

2031 Intersection AA



	With Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.090	3.9	2.7
PM	0.143	2.4	3.1

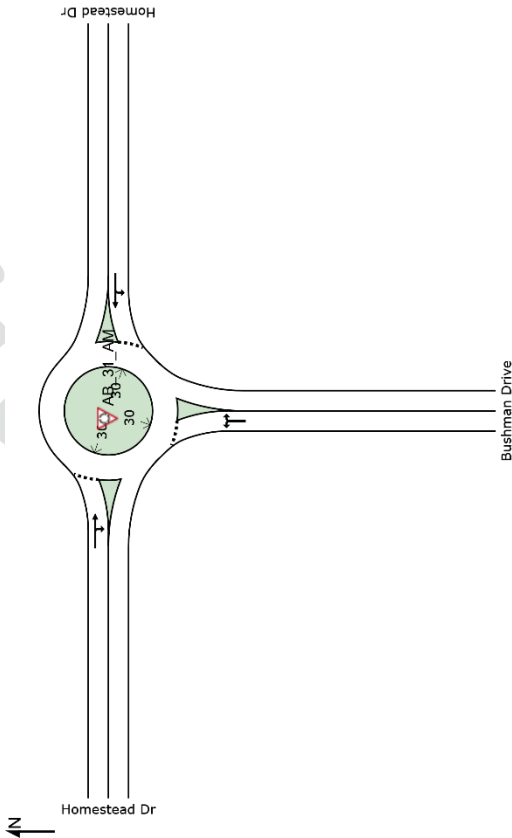
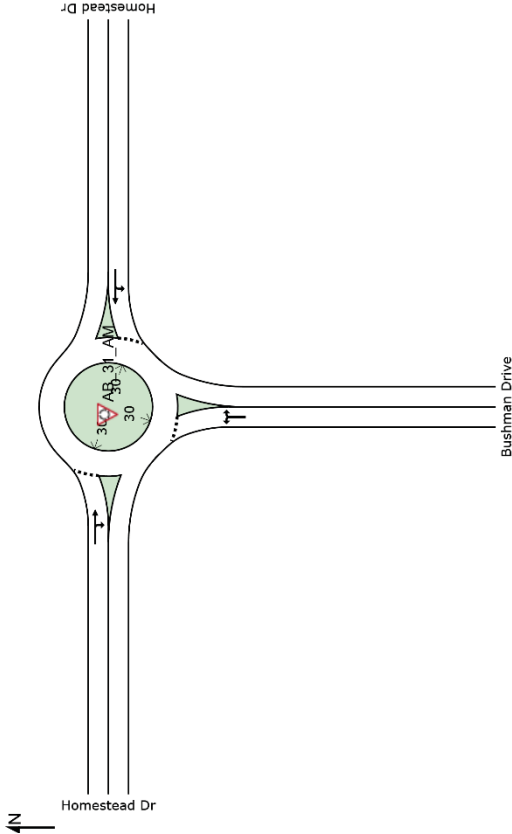
	Without Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.096	4.0	2.6
PM	0.146	2.4	3.1

File Note

250633

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2031 Intersection AB



	With Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.806	5.7	87.5
PM	0.811	5.5	109.1

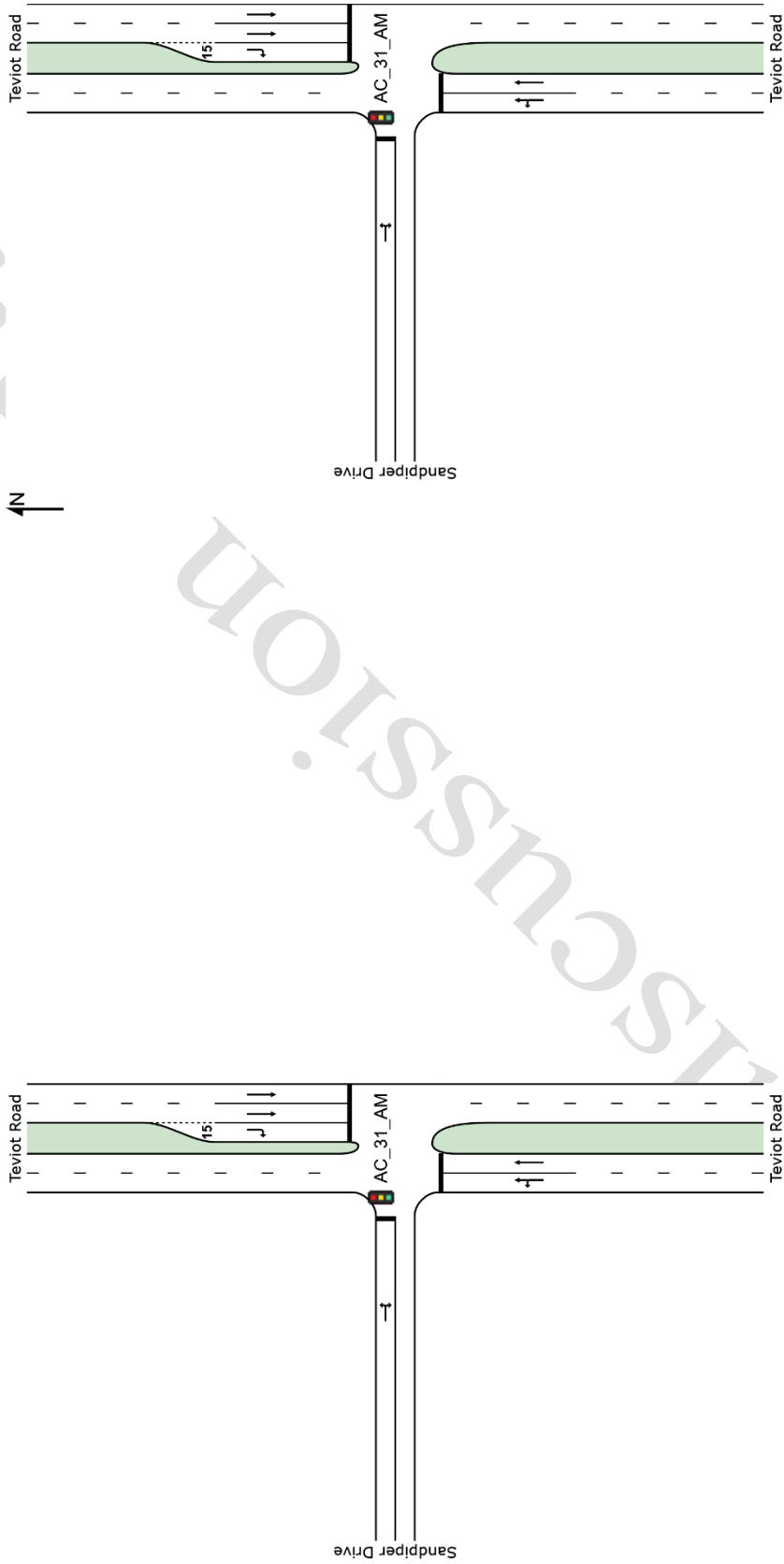
	Without Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.781	5.5	84.5
PM	0.777	5.5	93.7

File Note

250633

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2031 Intersection AC



With Glynton			
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.730	9.2	209.5
PM	0.645	6.4	141.2

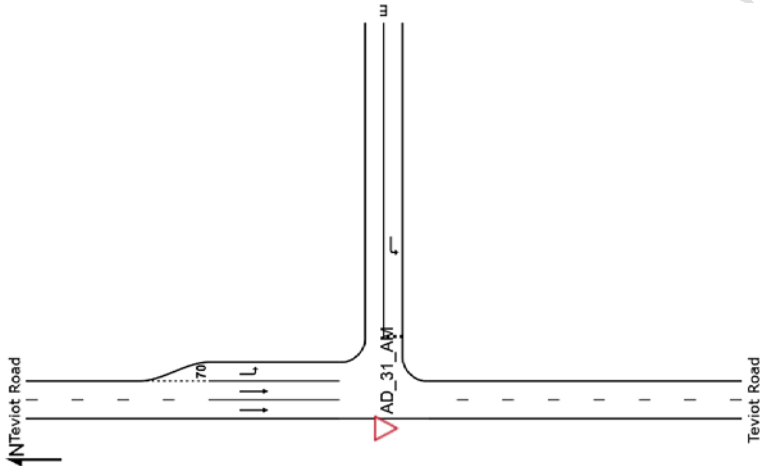
Without Glynton			
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.743	9.3	217.2
PM	0.653	6.4	144.4

File Note

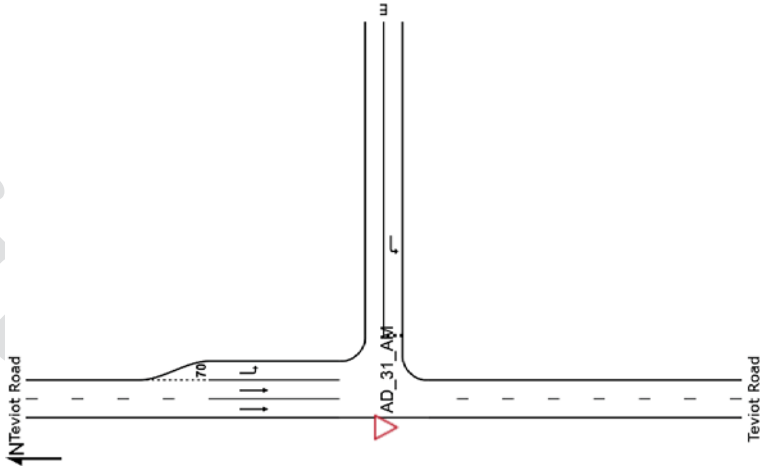
250633

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2031 Intersection AD



	With Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.112	1.8	1.0
PM	0.220	1.6	2.4



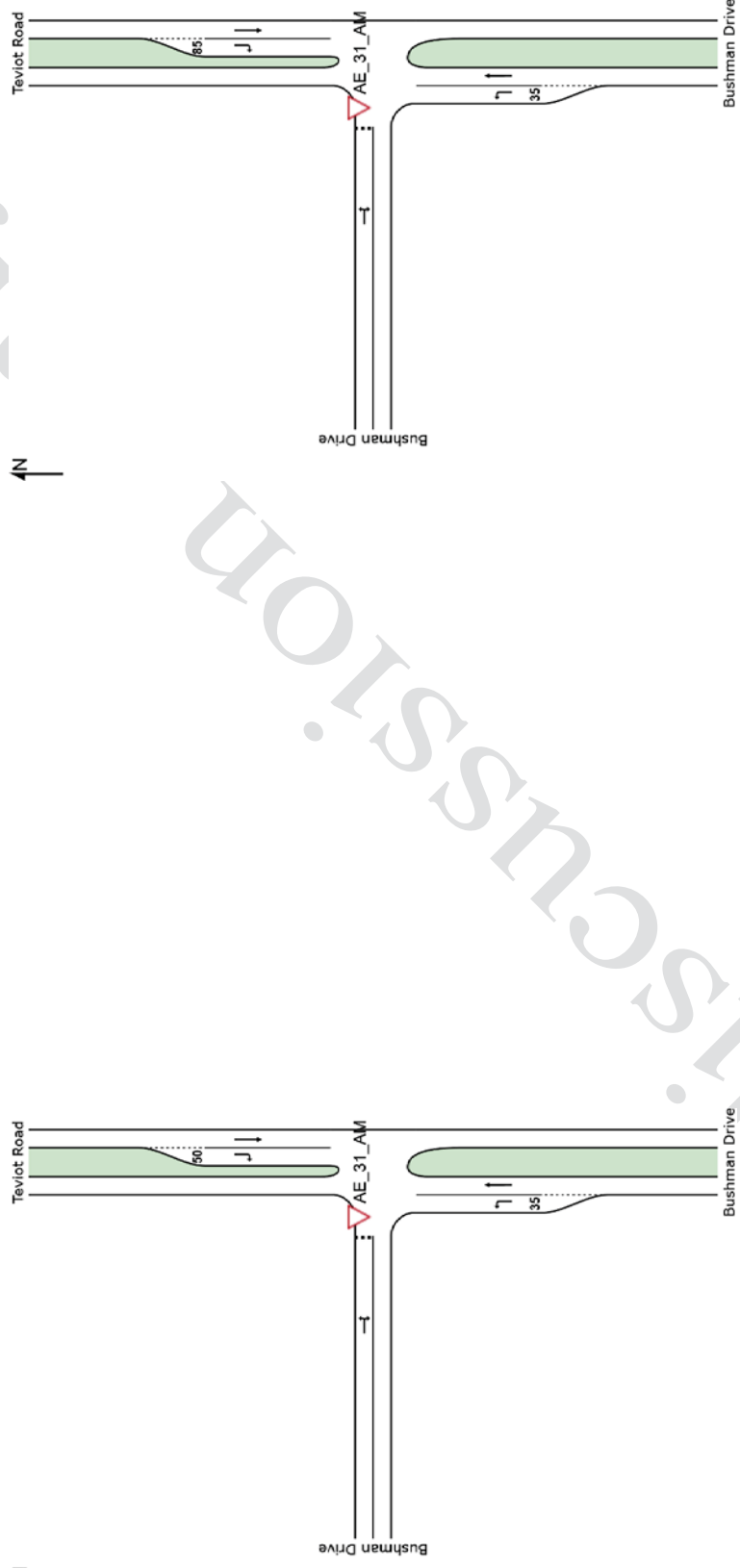
	Without Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.120	1.7	1.0
PM	0.256	1.6	3.1

File Note

250633

10 May 2018

2031 Intersection AE



	With Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.320	1.9	7.3
PM	0.302	1.3	3.5

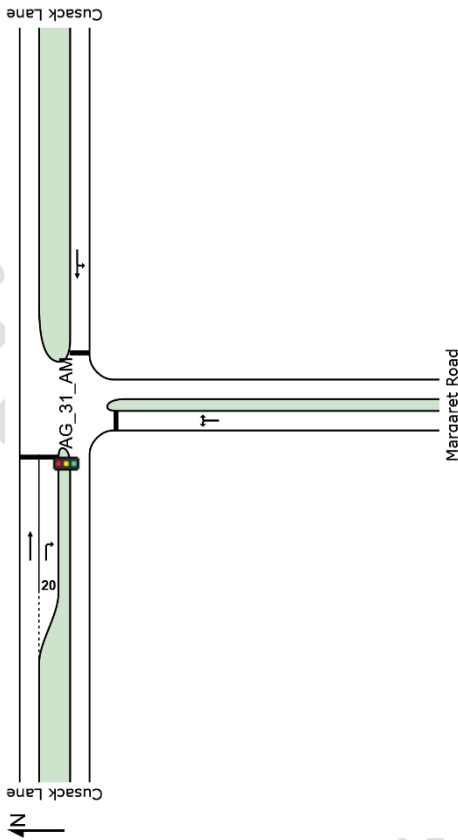
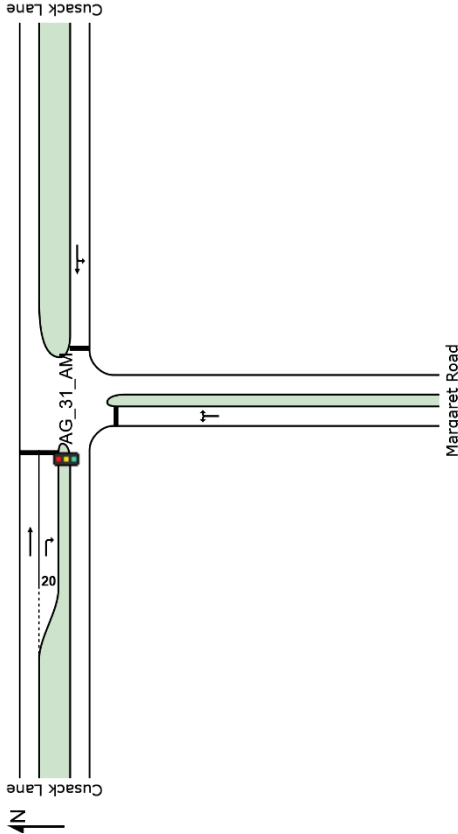
	Without Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.355	2.5	10.3
PM	0.304	1.6	3.4

File Note

250633

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2031 Intersection AG



	With Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.683	15.4	129.8
PM	0.754	10.5	220.7

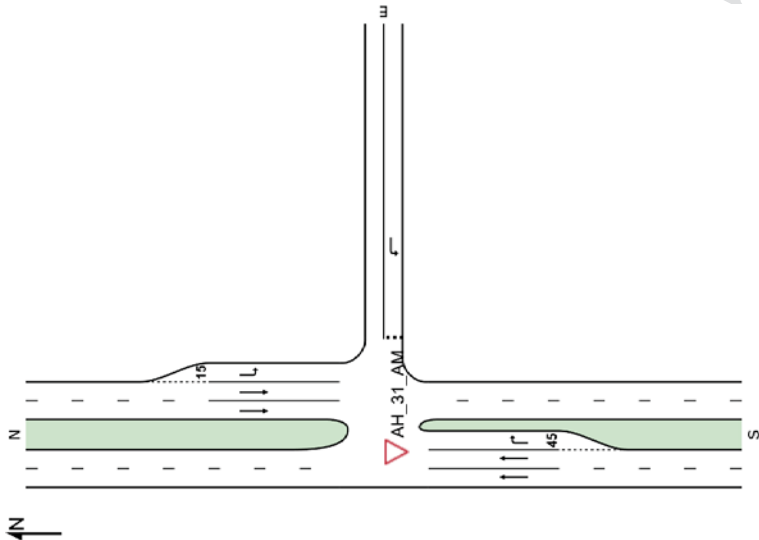
	Without Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.605	15.3	124.3
PM	0.741	11.0	213.2

File Note

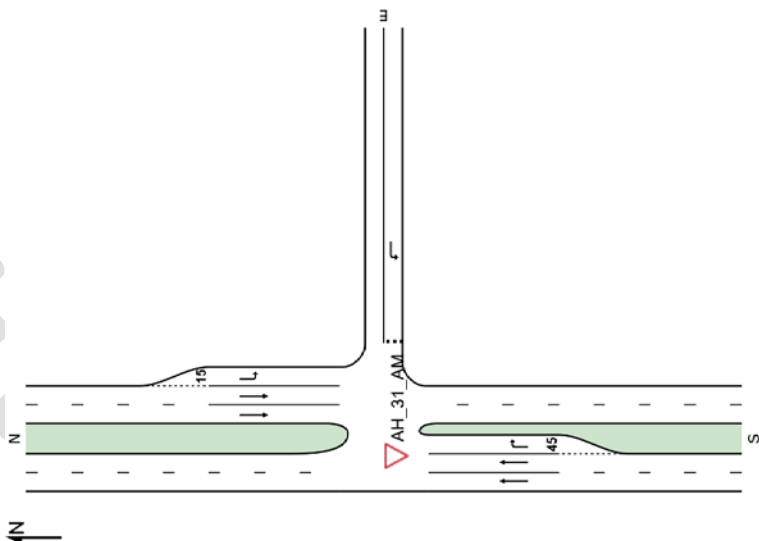
250633

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2031 Intersection AH



	With Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.259	2.1	7.3
PM	0.165	1.8	4.6



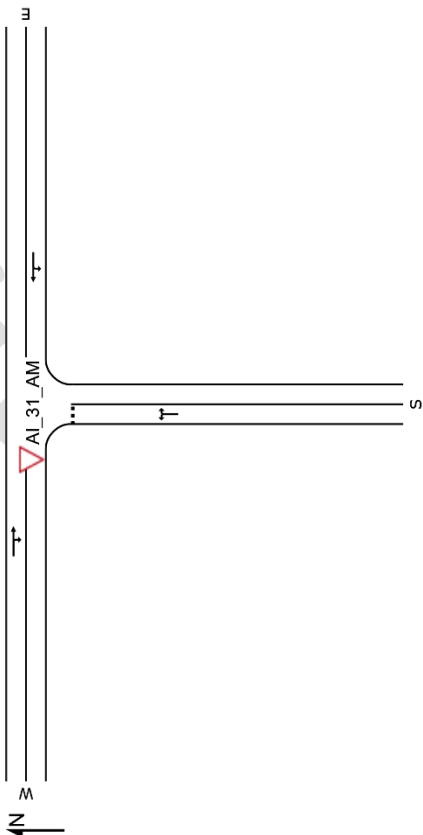
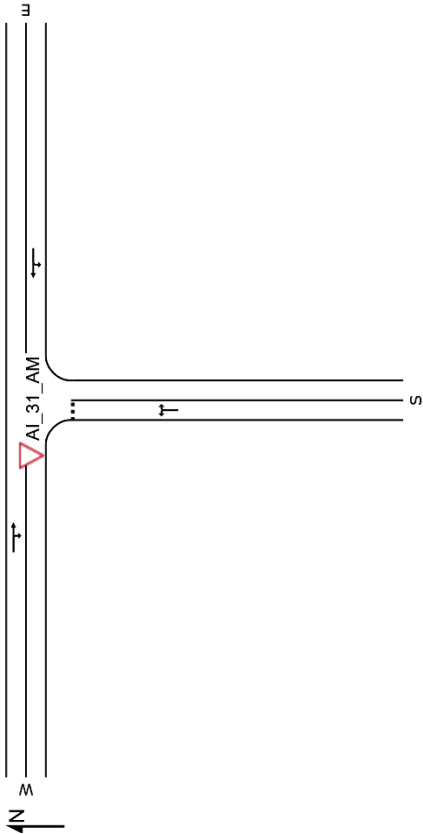
	Without Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.308	2.0	9.2
PM	0.175	1.7	4.8

File Note

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2031 Intersection AI



	With Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.298	0.1	0.3
PM	0.253	0.2	0.3

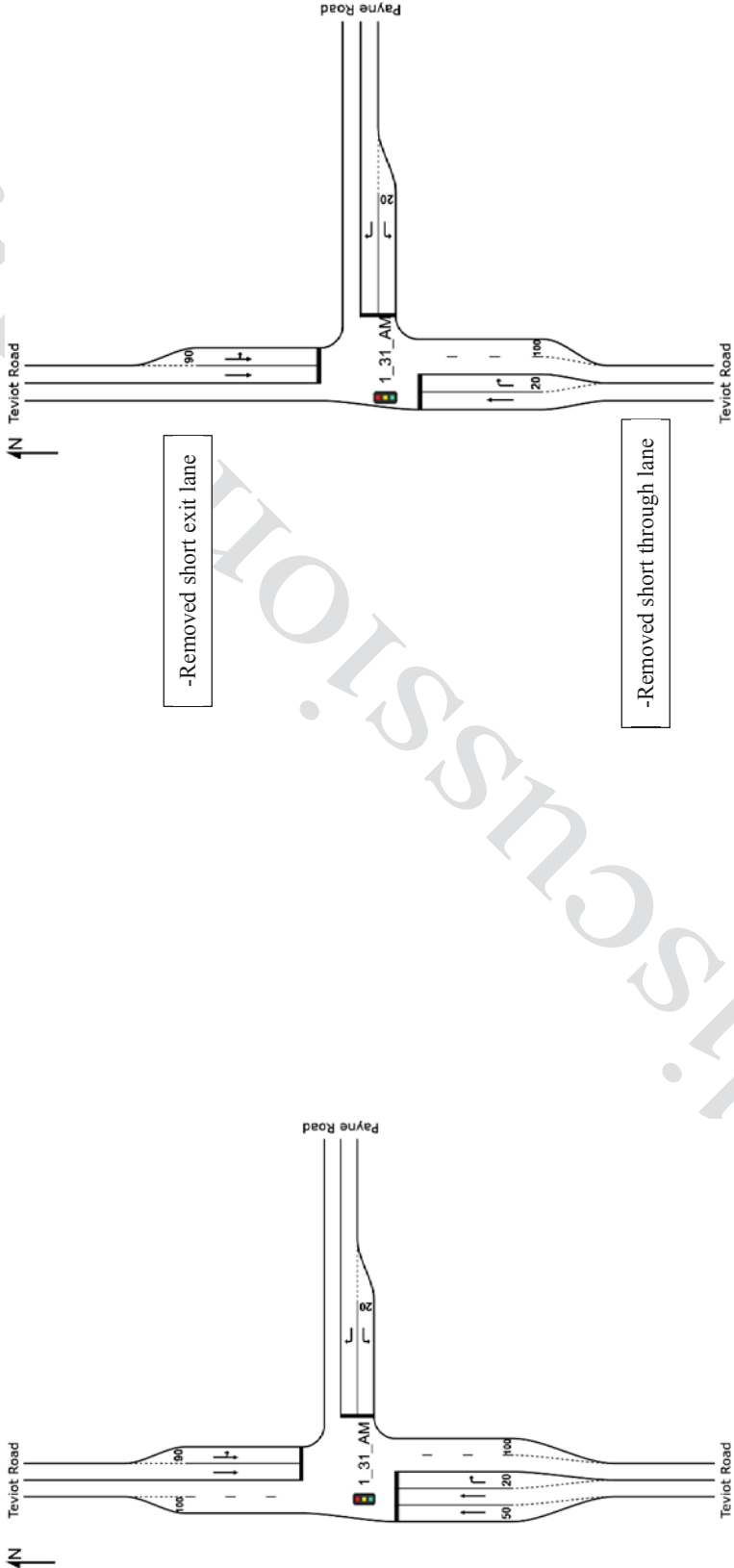
	Without Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.386	0.1	0.4
PM	0.321	0.1	0.4

File Note

250633

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2031 Intersection 1



	With Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.608	5.8	97.8
PM	0.809	8.4	190.2

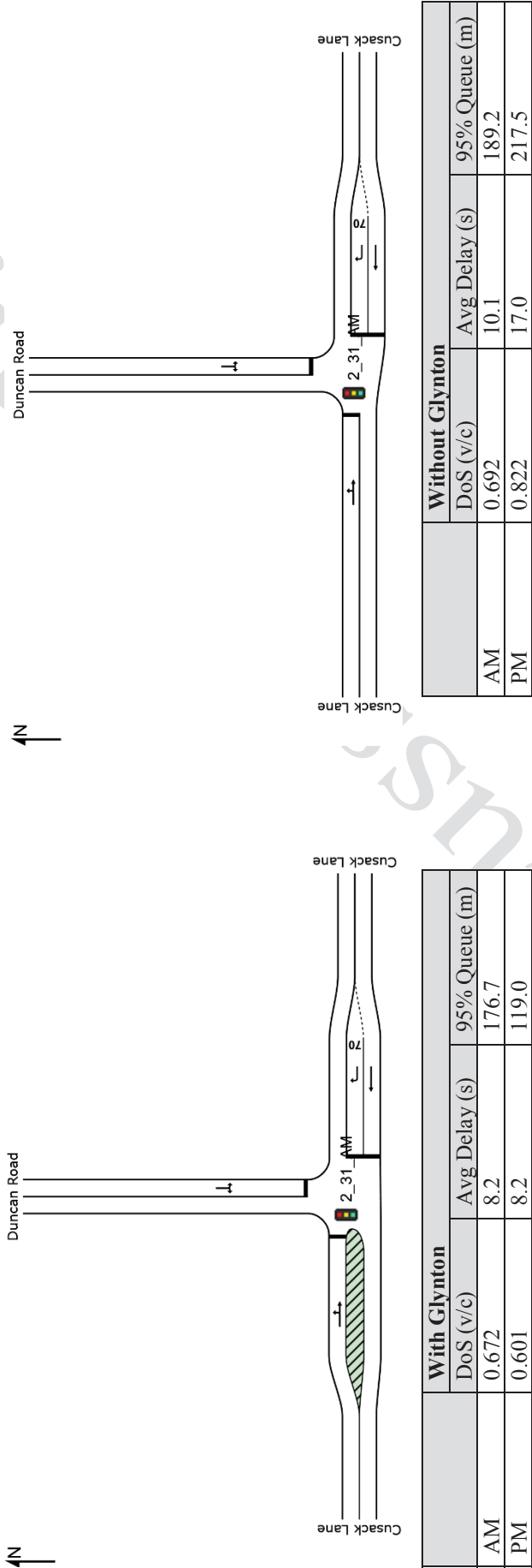
	Without Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.868	10.4	309.7
PM	0.790	7.8	179.9

File Note

250633

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2031 Intersection 2

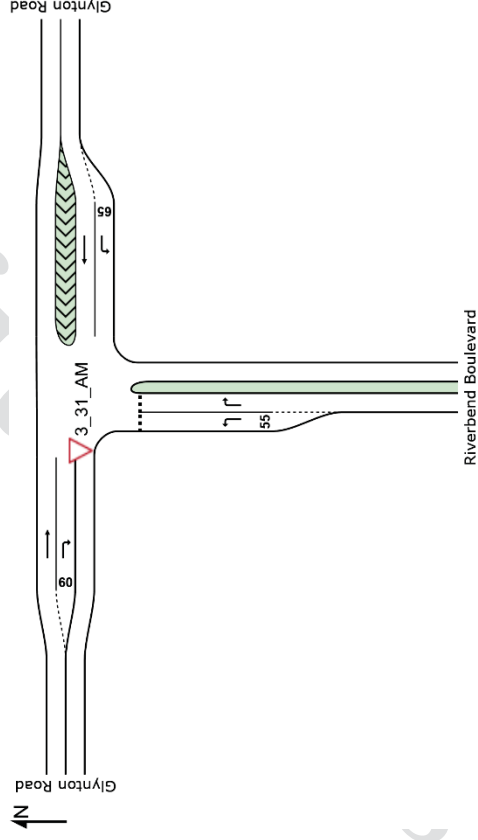
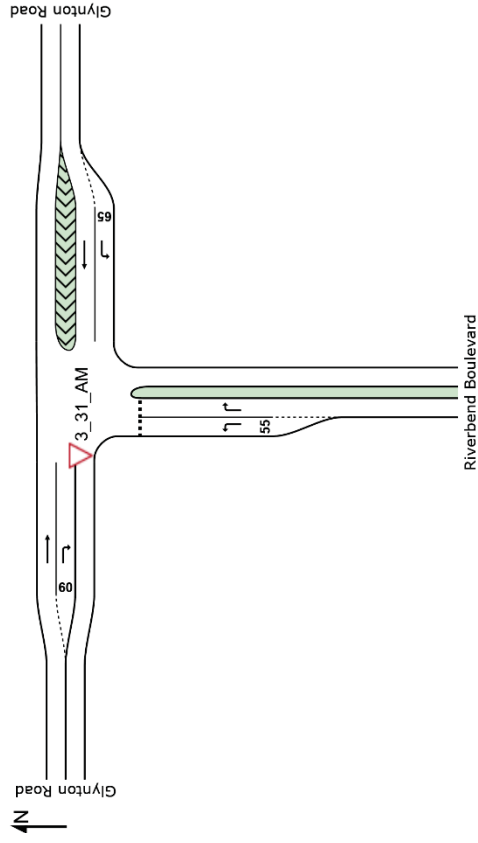


File Note

250633

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2031 Intersection 3



	With Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.173	5.4	5.5
PM	0.132	5.7	4.0

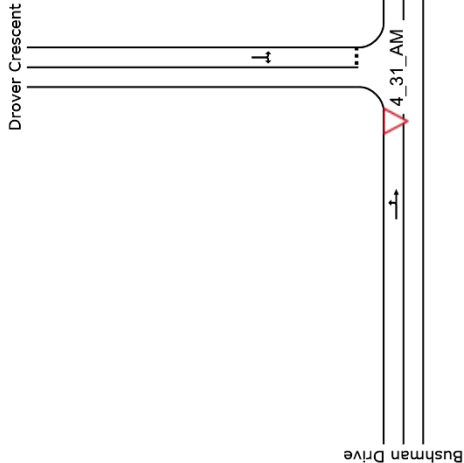
	Without Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.147	5.6	4.7
PM	0.112	5.7	1.5

File Note

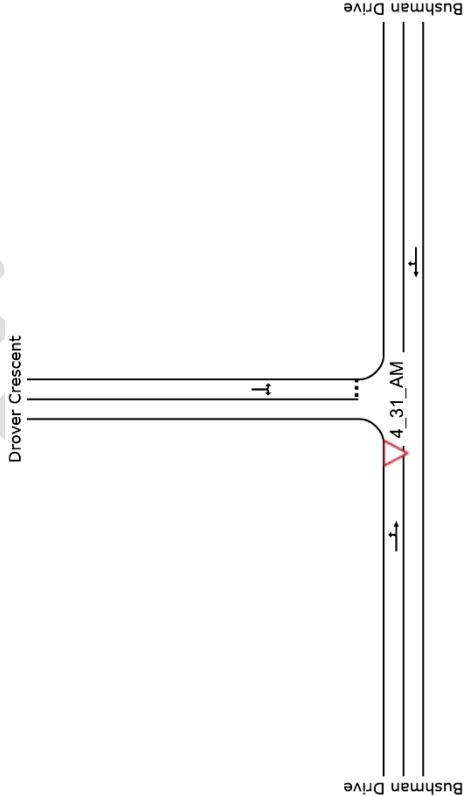
250633

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2031 Intersection 4



	With Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.051	3.8	1.3
PM	0.032	3.5	0.4



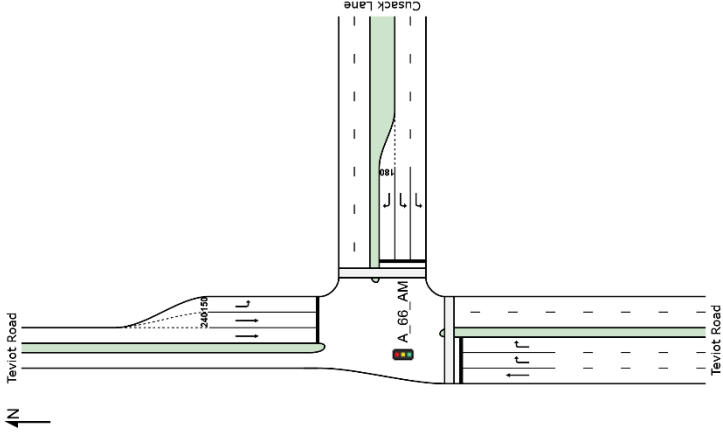
	Without Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.064	3.4	1.6
PM	0.058	3.5	0.4

File Note

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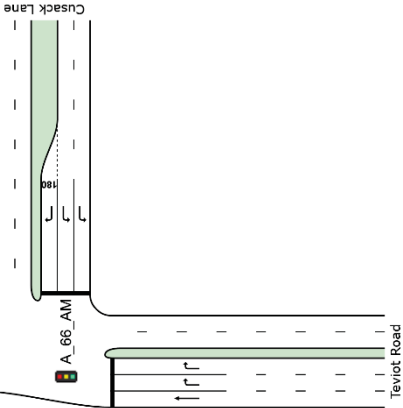
10 May 2018

2066 Intersection A



	With Glynton			
	DoS (v/c)	Avg Delay (s)	95% Queue (m)	
AM	0.954	35.6	564.4	
PM	0.901	33.4	304.3	

-Reduce left turn lane by 10m
-Increase second through lane by 25m



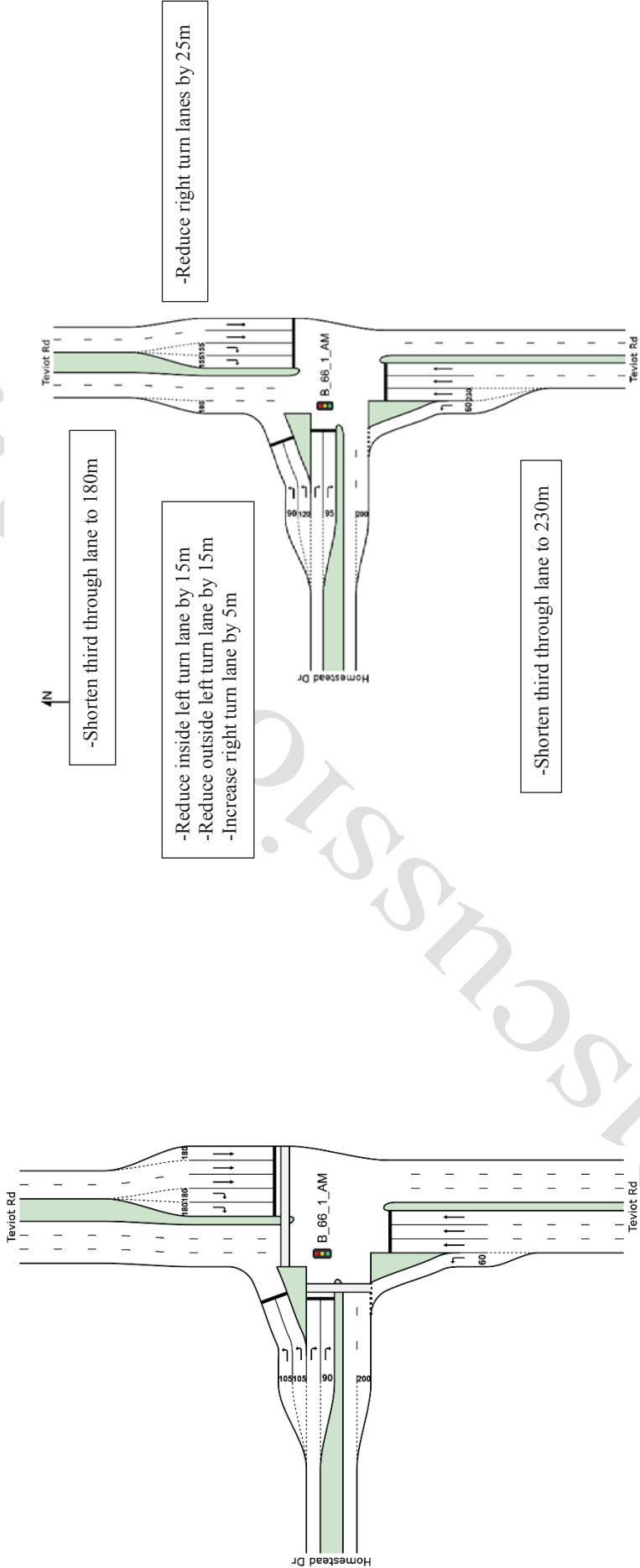
	Without Glynton			
	DoS (v/c)	Avg Delay (s)	95% Queue (m)	
AM	0.993	46.5	688.3	
PM	0.895	32.7	317.6	

File Note

250633

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2066 Intersection B1



	With Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.911	30.6	163.2
PM	0.894	23.0	171.9

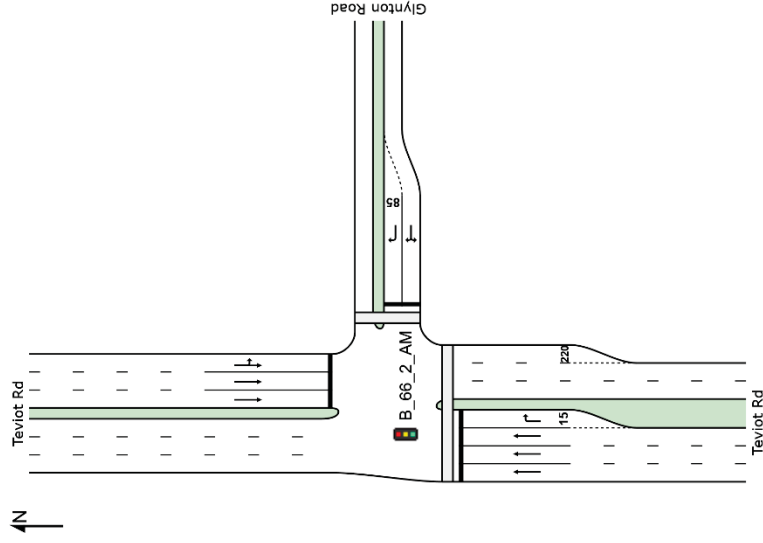
	Without Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.922	36.0	329.4
PM	0.80	22.4	253.4

File Note

250633

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2066 Intersection B2



	With Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	1.110	86.7	758.9
PM	0.613	5.8	135.5

	Without Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	-	-	-
PM	-	-	-

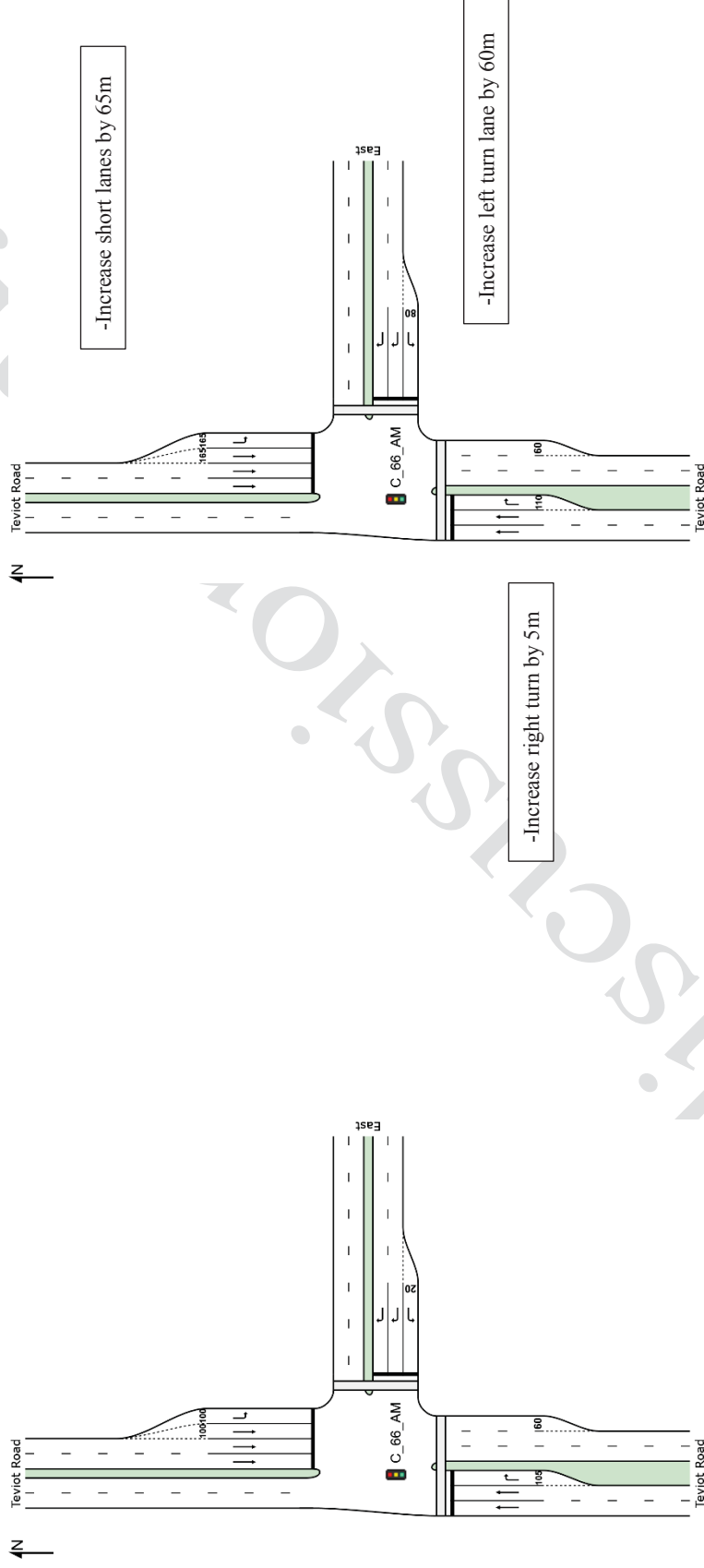
For with Glynton Road, in the AM period for intersection B2, blockage downstream (Intersection B1) on the southern approach results in excessive queue lengths as vehicles cannot clear intersection B1.

File Note

250633

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2066 Intersection C



With Glynton			
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.823	26.2	190.5
PM	0.797	23.3	160.8

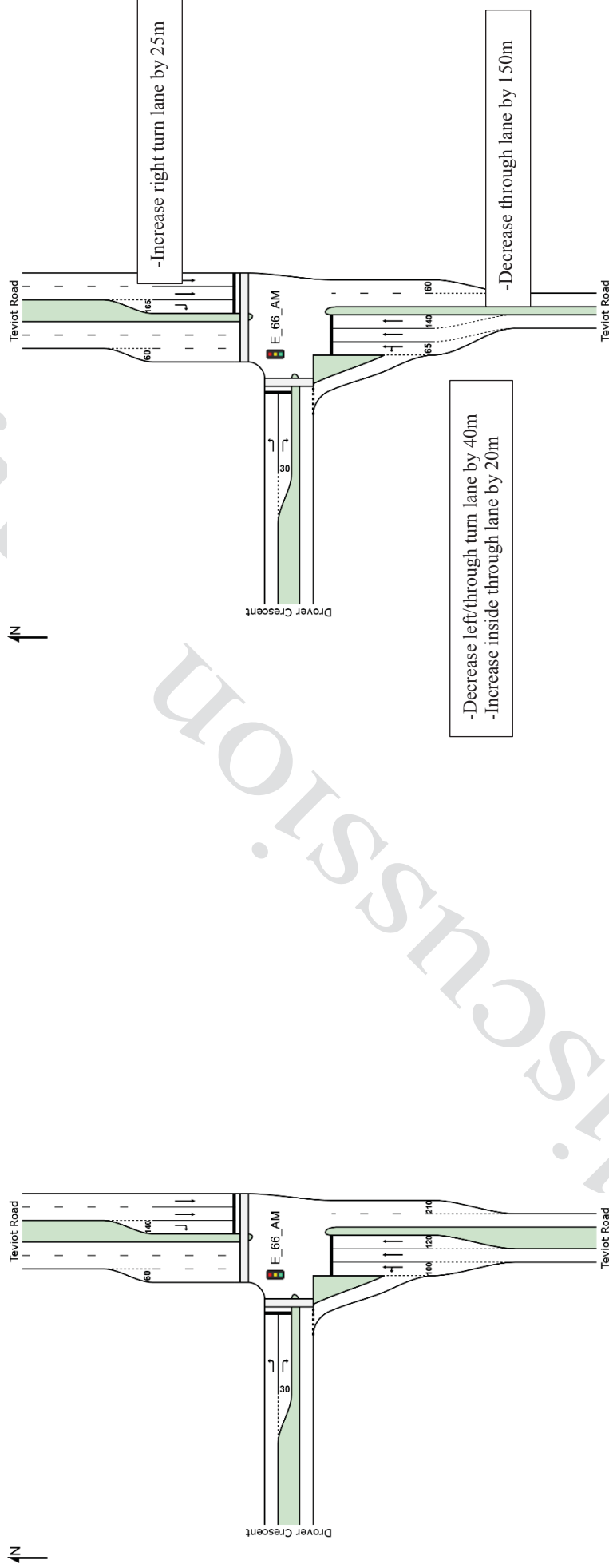
Without Glynton			
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.838	27.3	200.2
PM	0.831	24.2	177.8

File Note

250633

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2066 Intersection E



	With Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.883	24.7	135.6
PM	0.736	13.3	94.0

	Without Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.850	23.4	162.9
PM	0.890	15.2	84.6

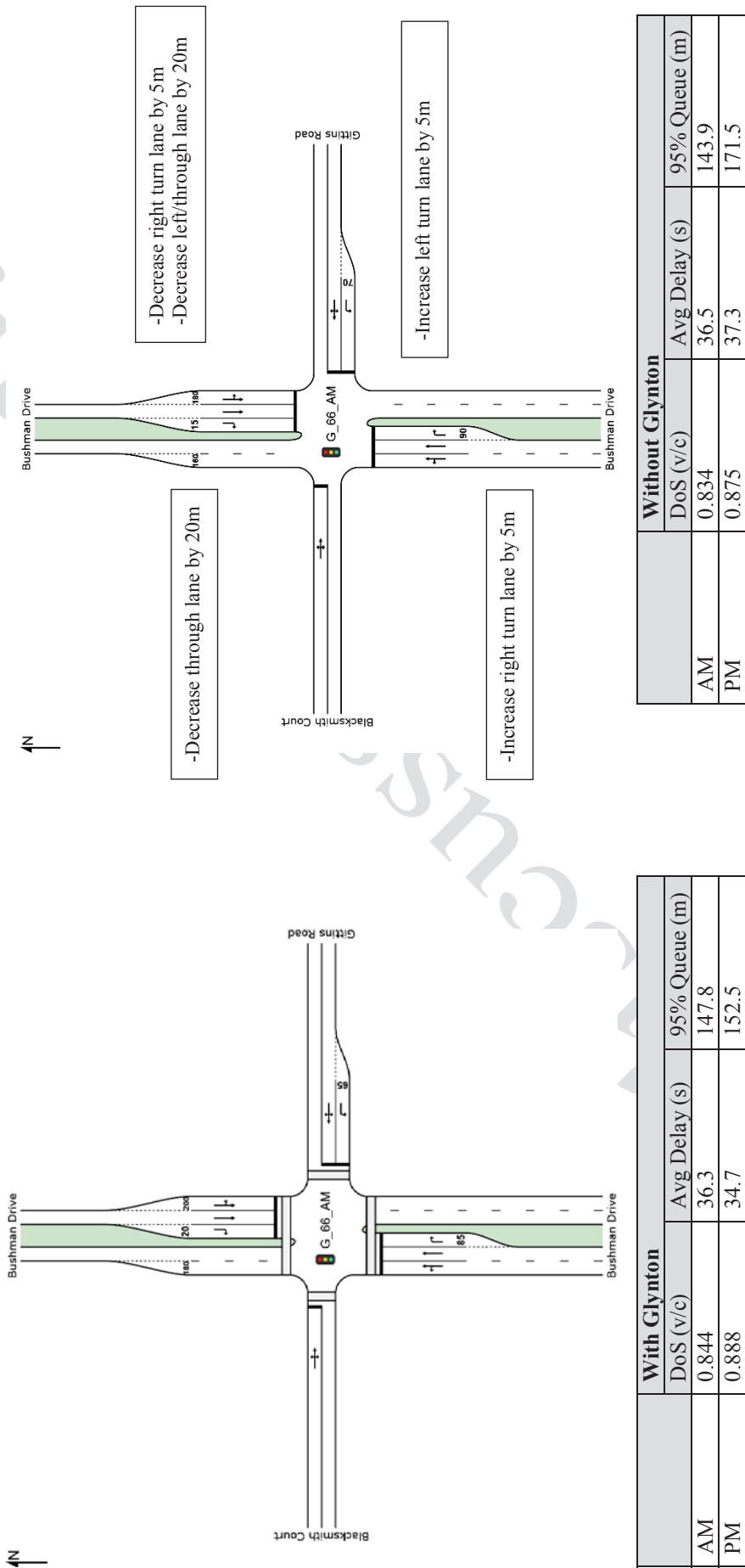
For both scenarios, intersections D and E have been modelled as a network.

File Note

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2066 Intersection G

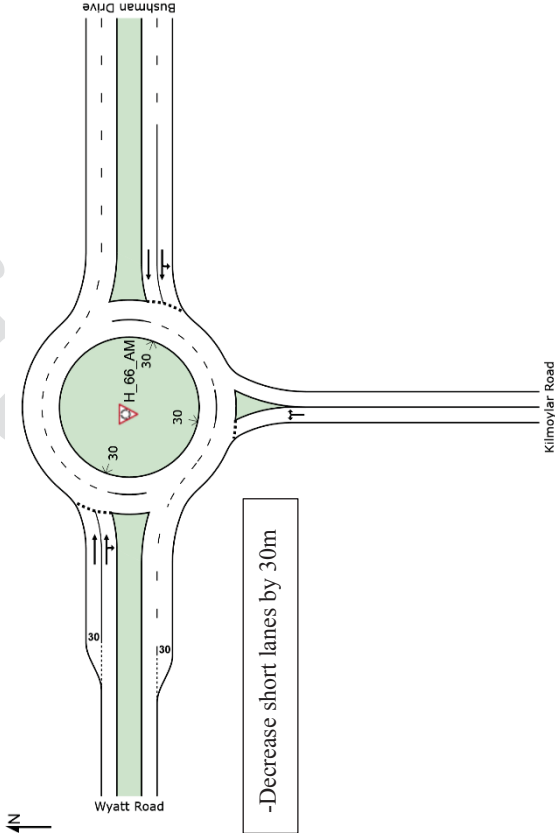
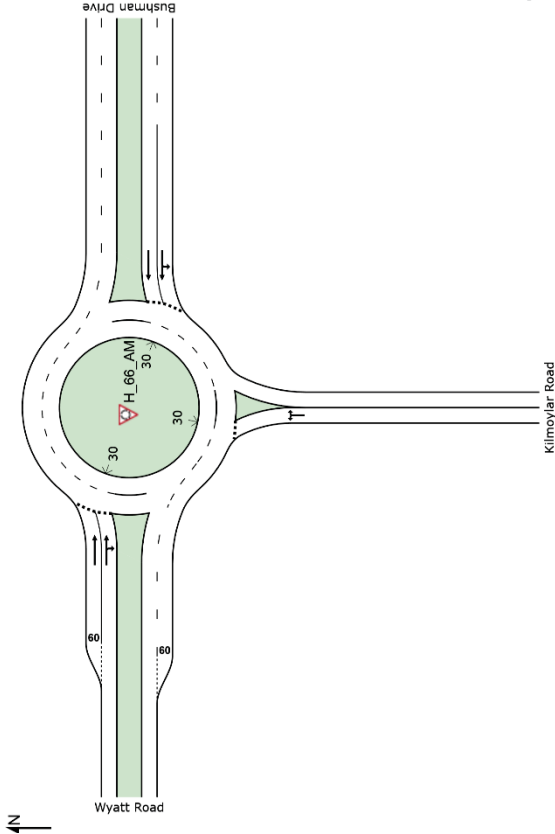


File Note

250633

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2066 Intersection H



	With Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.454	5.4	27.0
PM	0.564	5.8	36.9

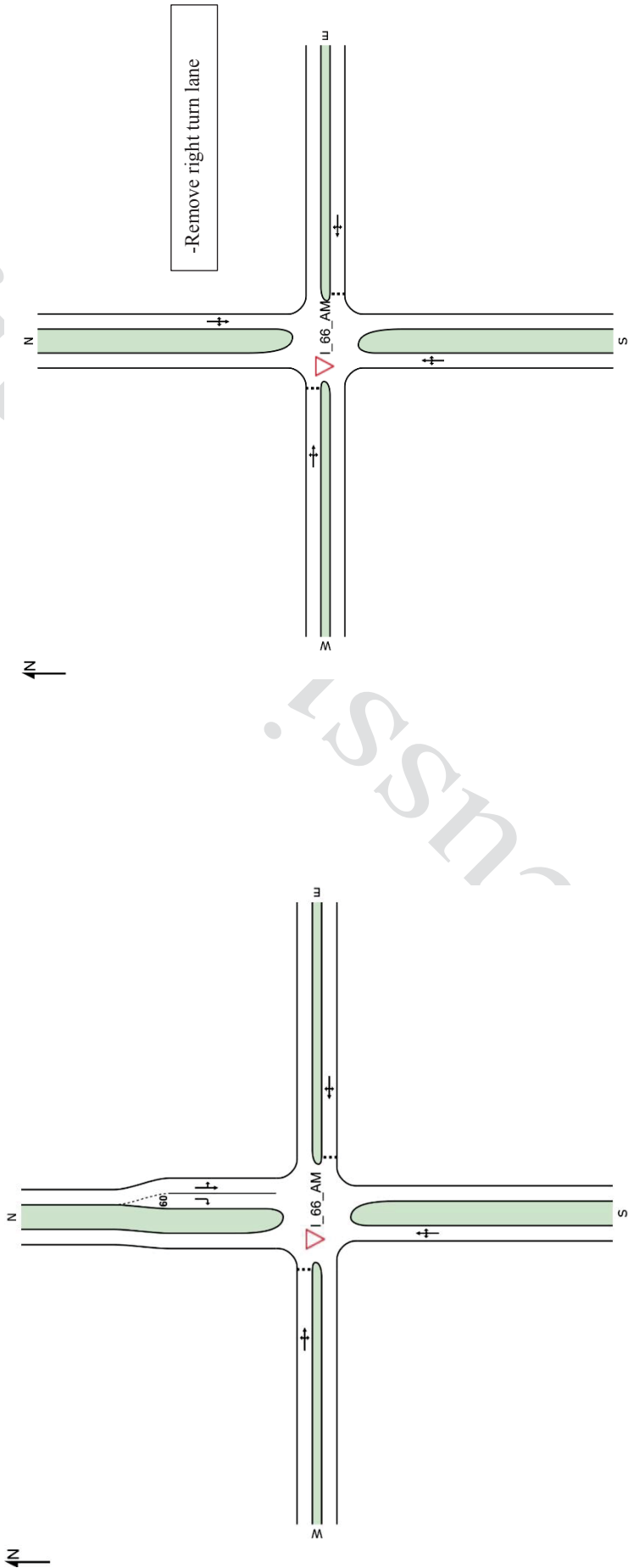
	Without Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.455	5.5	27.3
PM	0.624	6.1	45.2

File Note

250633

10 May 2018

2066 Intersection I



	With Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.205	4.2	5.7
PM	0.486	5.7	26.2

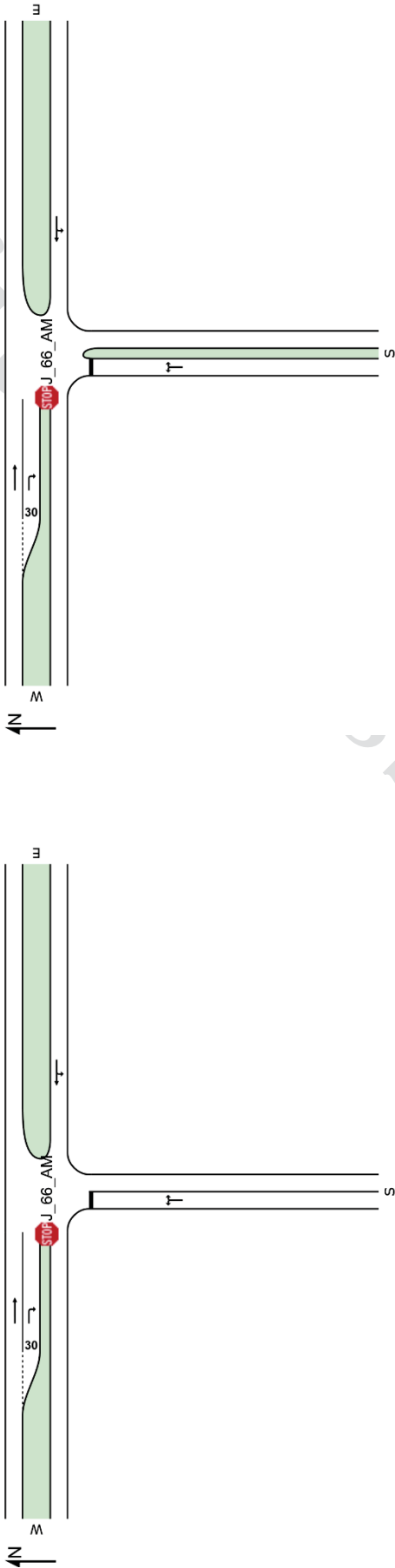
	Without Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.285	4.3	11.8
PM	0.430	5.1	18.8

File Note

250633

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2066 Intersection J



	With Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.429	6.7	20.1
PM	0.552	8.1	35.6

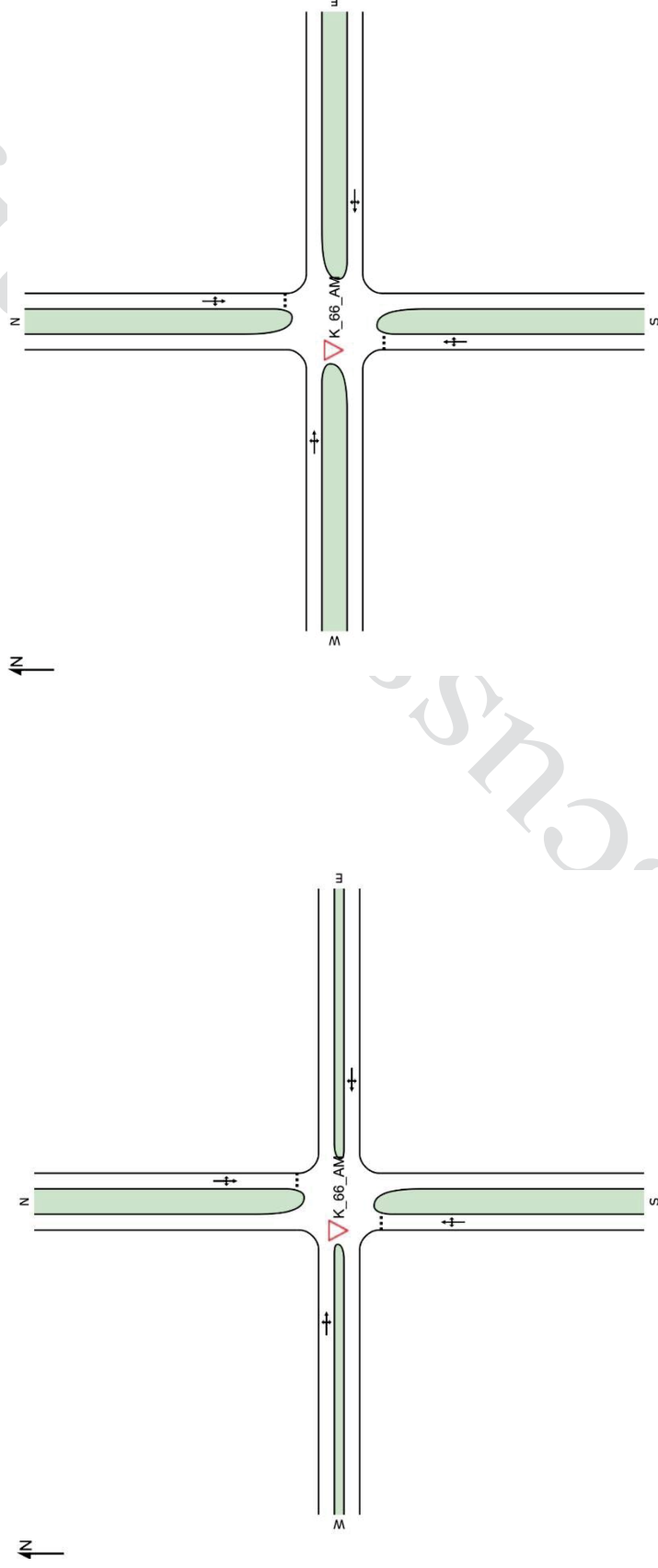
	Without Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.464	7.1	23.9
PM	0.553	8.1	35.2

File Note

250633

10 May 2018

2066 Intersection K



	With Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.181	1.9	2.3
PM	0.189	2.1	2.0

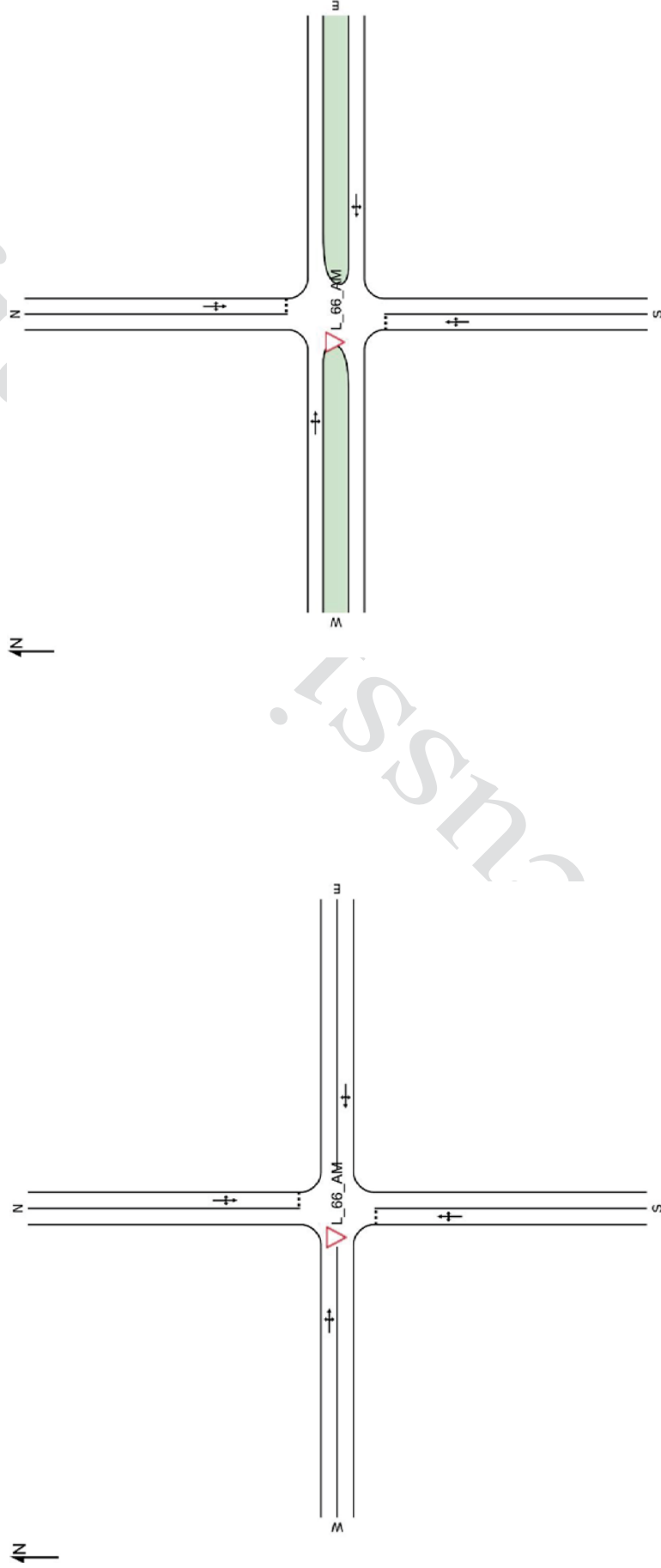
	Without Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.163	2.2	2.6
PM	0.183	2.0	2.0

File Note

250633

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2066 Intersection L



	With Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.146	3.3	3.7
PM	0.152	2.8	3.3

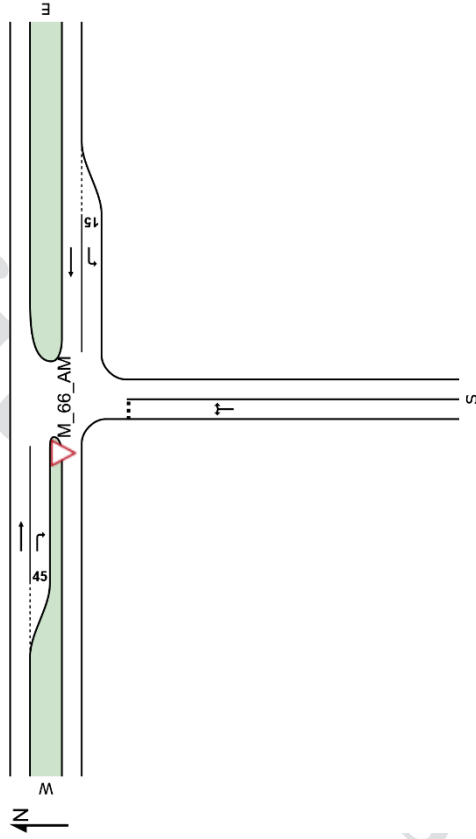
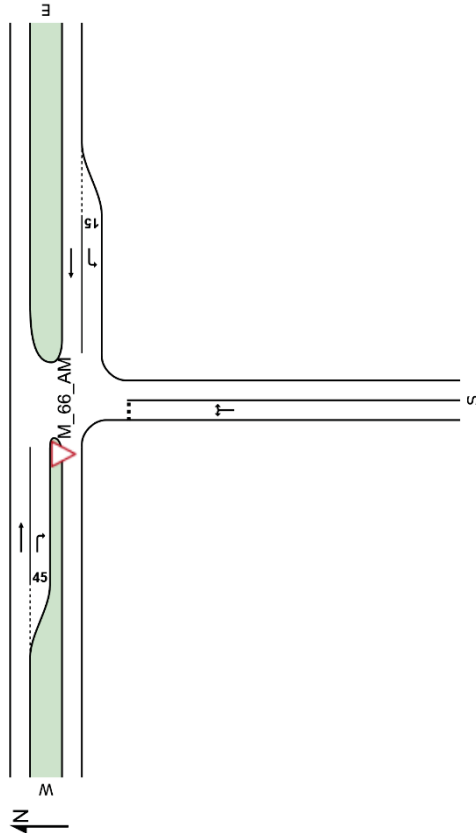
	Without Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.126	3.0	3.0
PM	0.151	2.8	3.5

File Note

250633

10 May 2018

2066 Intersection M



	With Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.591	5.1	29.3
PM	0.256	3.3	7.2

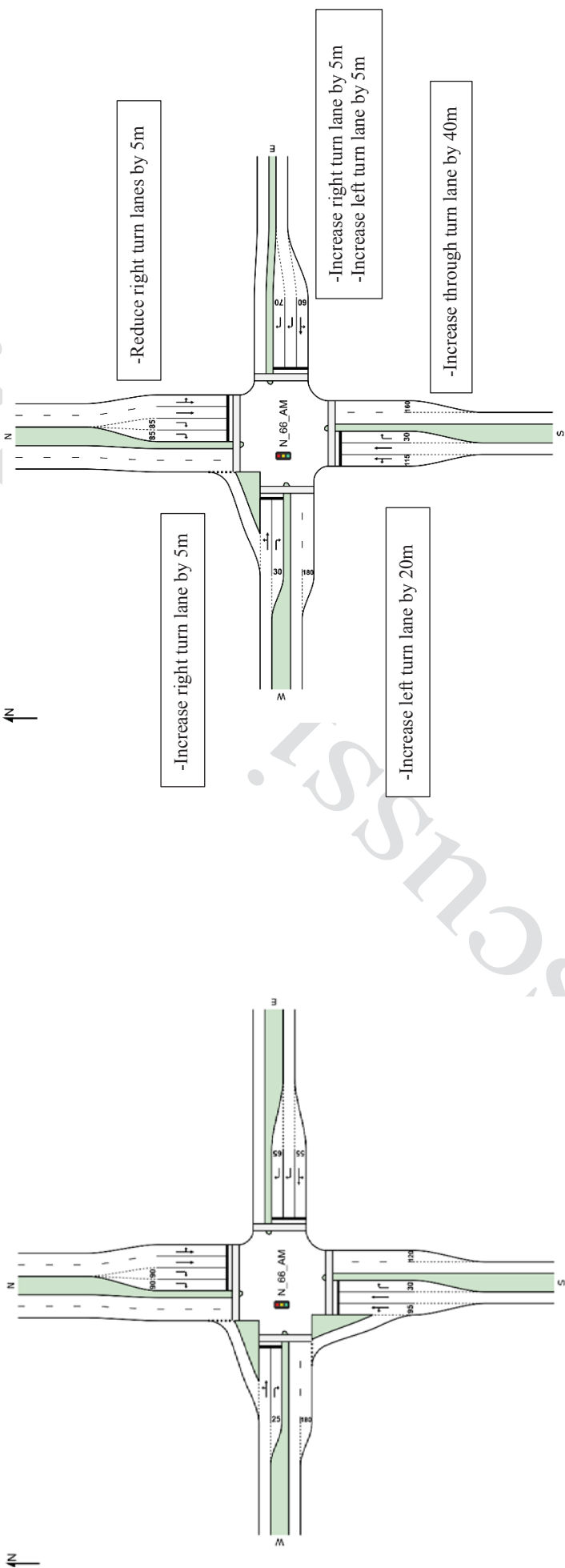
	Without Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.625	5.0	30.9
PM	0.260	3.1	7.6

File Note

250633

10 May 2018

2066 Intersection N



With Glynton			
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.713	31.6	92.4
PM	0.761	34.6	84.8

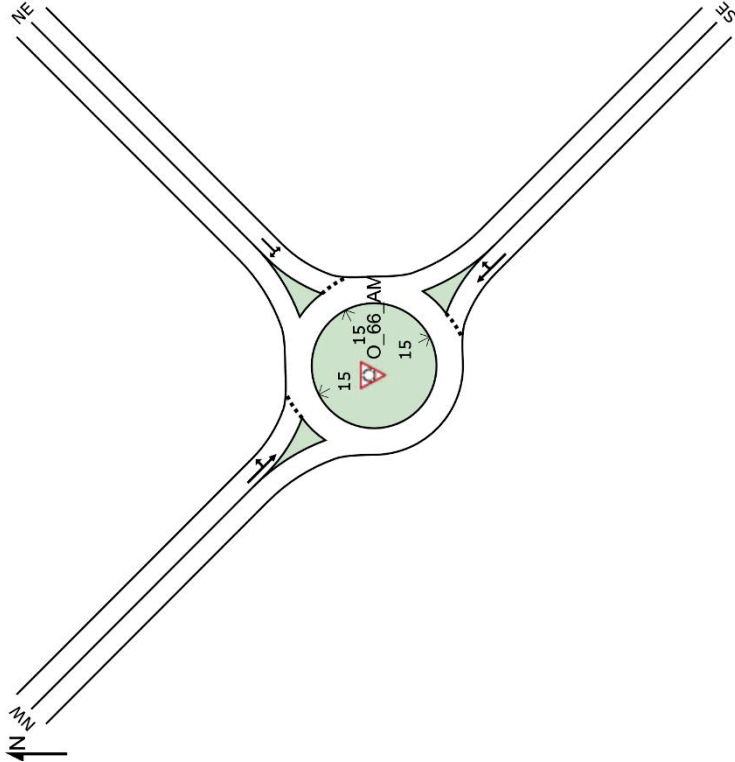
Without Glynton			
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.773	32.2	112.3
PM	0.827	36.3	102.9

File Note

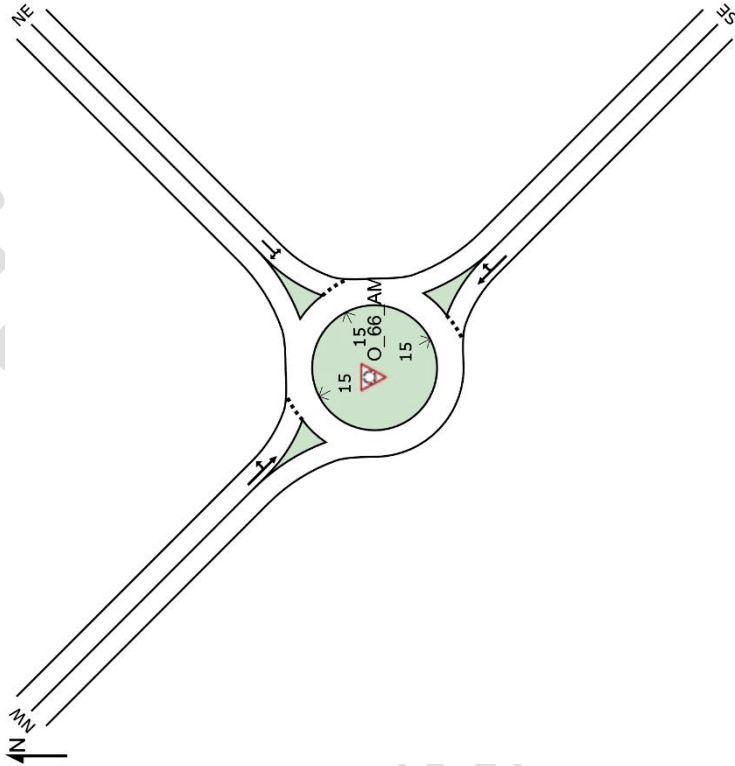
250633

10 May 2018

2066 Intersection O



	With Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.615	9.0	46.1
PM	0.542	7.3	34.7



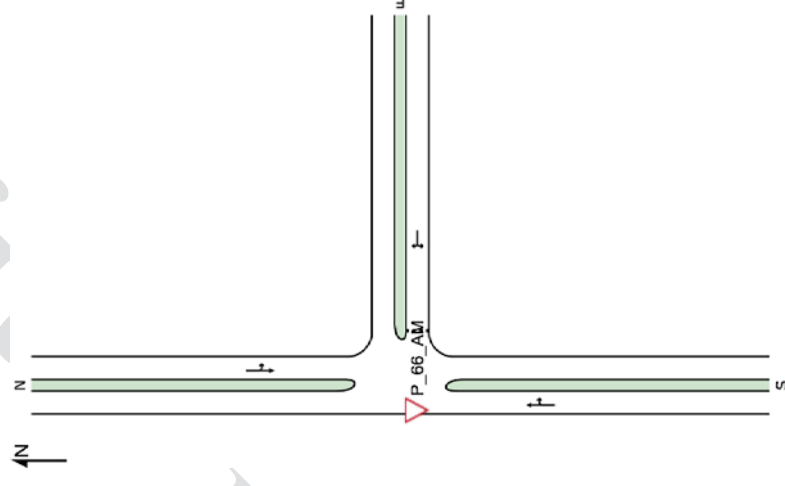
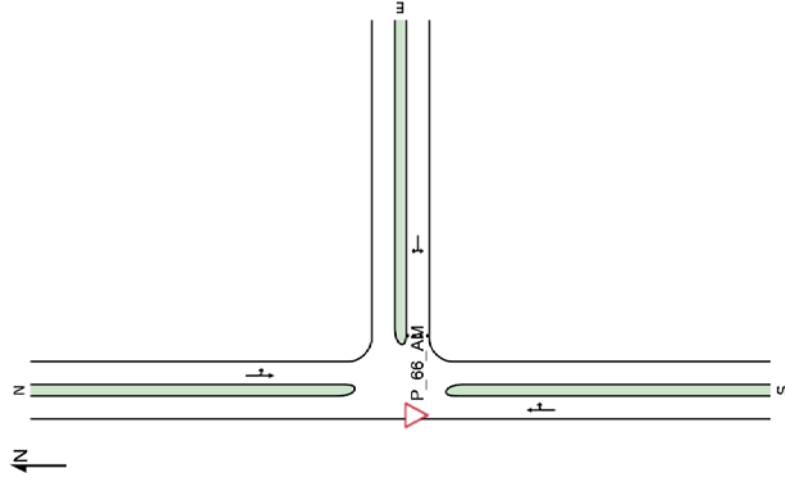
	Without Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.651	9.7	54.4
PM	0.508	7.0	31.7

File Note

250633

10 May 2018

2066 Intersection P



	With Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.503	5.7	22.5
PM	0.427	5.5	15.8

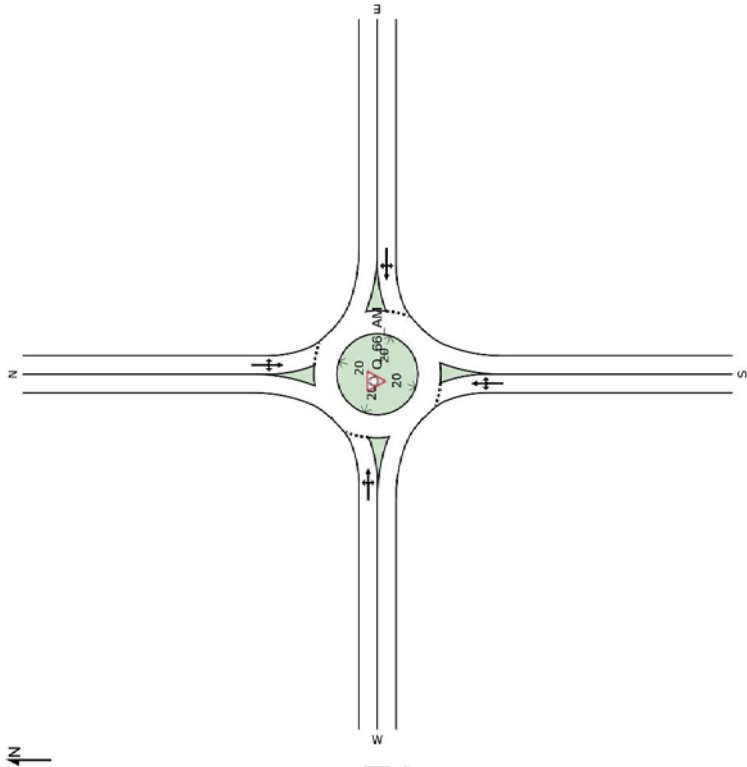
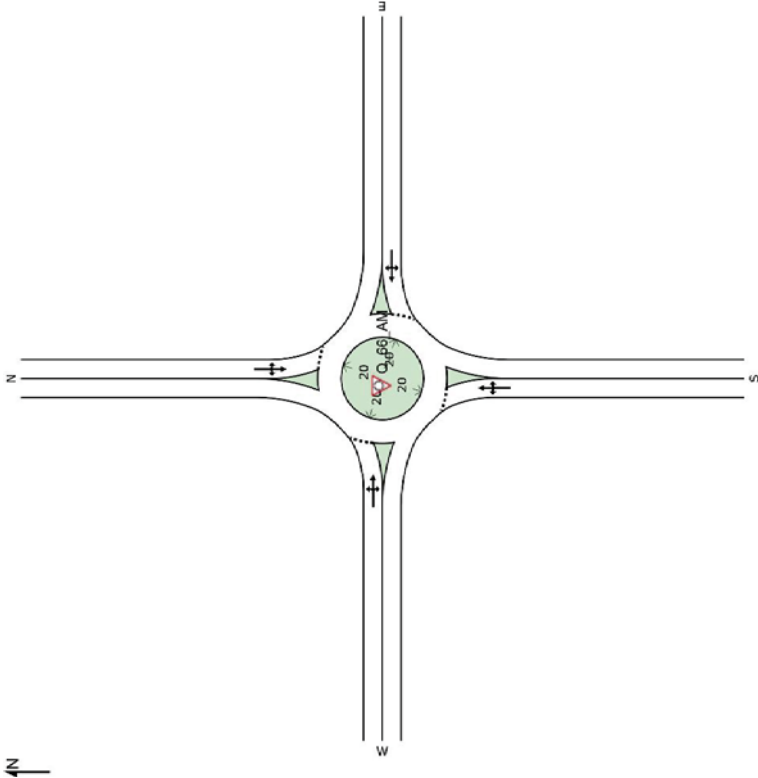
	Without Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.517	5.8	23.5
PM	0.391	5.4	13.7

File Note

250633

10 May 2018

2066 Intersection Q



	With Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.260	6.1	11.2
PM	0.338	6.8	16.4

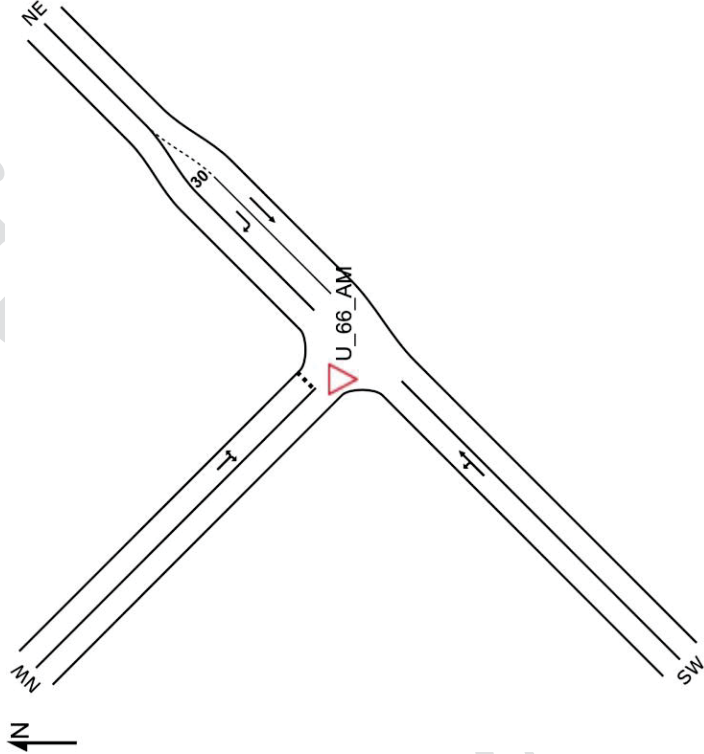
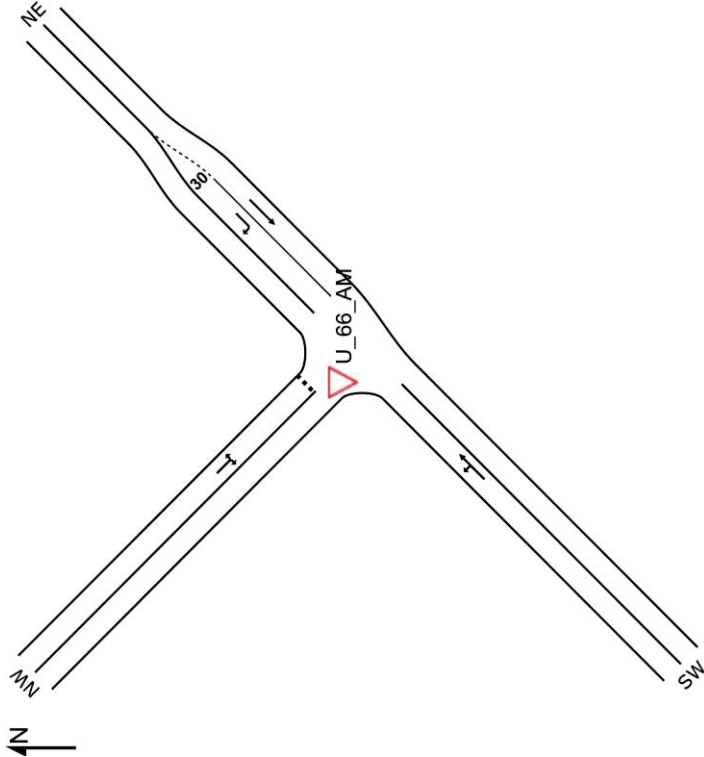
	Without Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.262	6.0	11.2
PM	0.335	6.6	16.1

File Note

250633

10 May 2018

2066 Intersection U



	With Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.091	2.7	2.4
PM	0.068	2.6	2.2

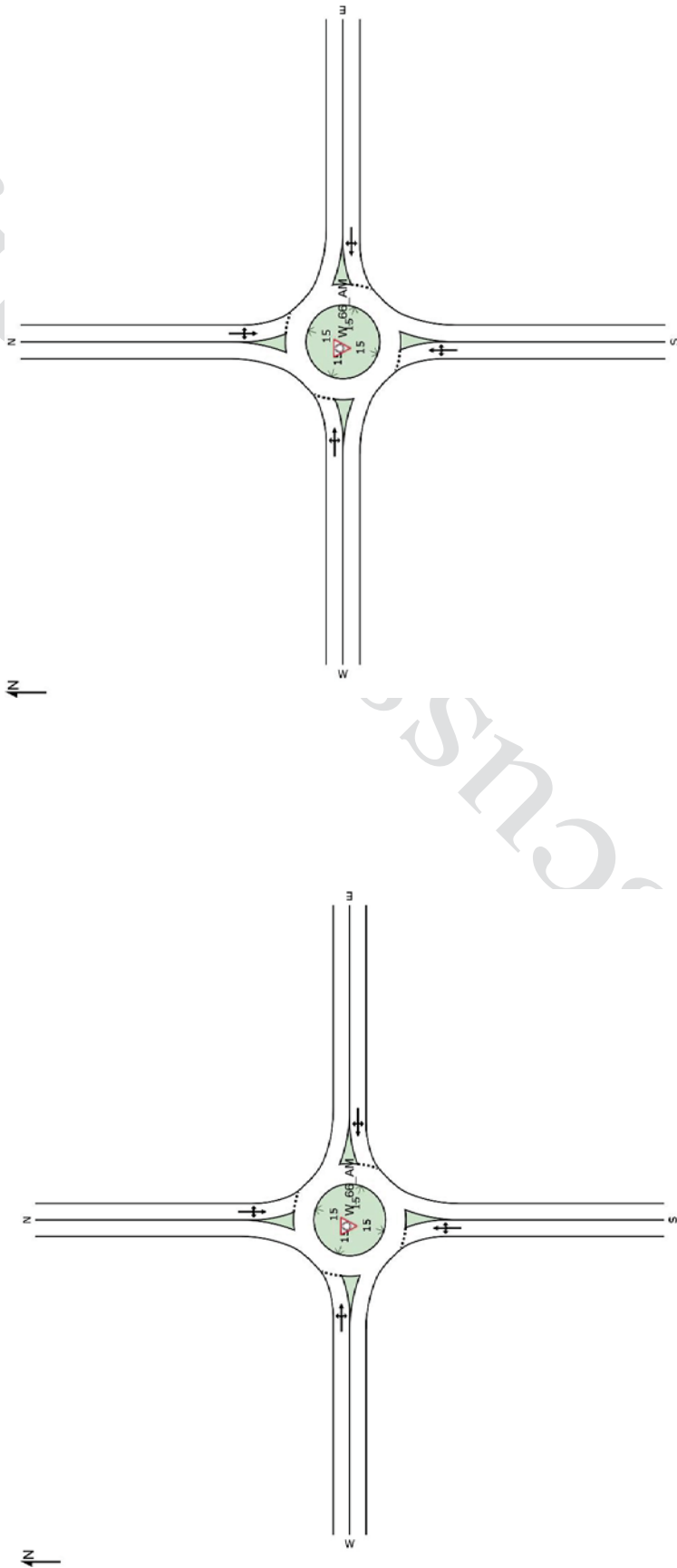
	Without Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.090	2.58	2.4
PM	0.081	2.2	1.9

File Note

250633

10 May 2018

2066 Interseccion W



	With Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.608	9.9	43.6
PM	0.658	9.8	54.4

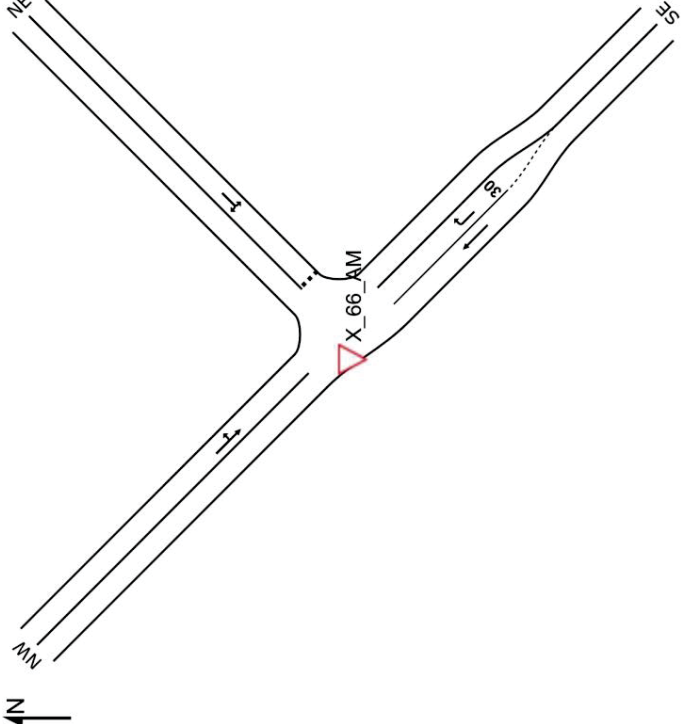
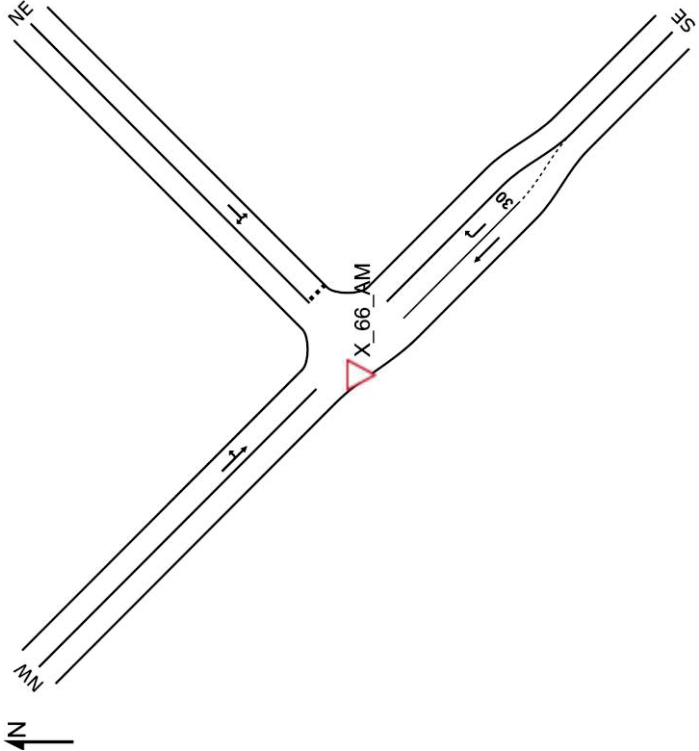
	Without Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.692	10.7	57.6
PM	0.633	8.0	49.1

File Note

250633

10 May 2018

2066 Intersestion X



	With Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.171	3.1	5.0
PM	0.195	3.1	5.9

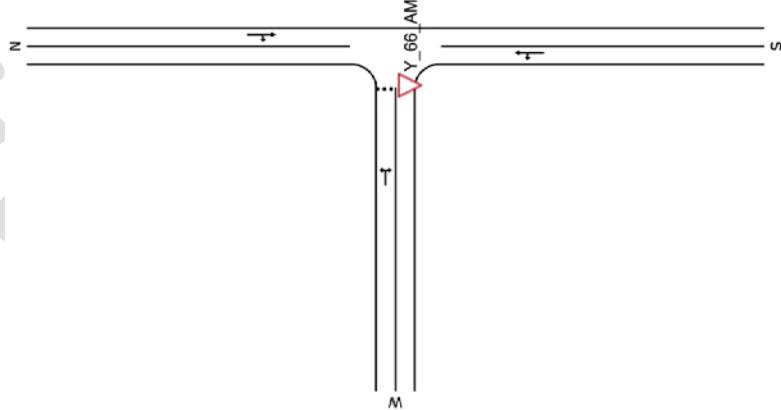
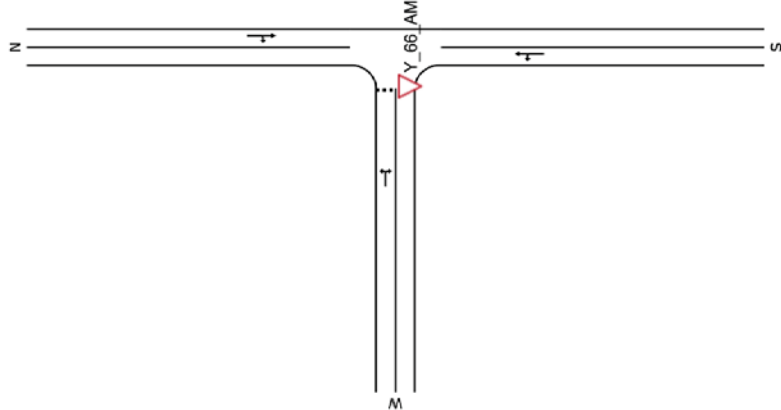
	Without Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.220	3.6	6.5
PM	0.188	3.0	5.6

File Note

250633

10 May 2018

2066 Intersection Y



	With Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.121	5.0	3.1
PM	0.241	4.1	6.8

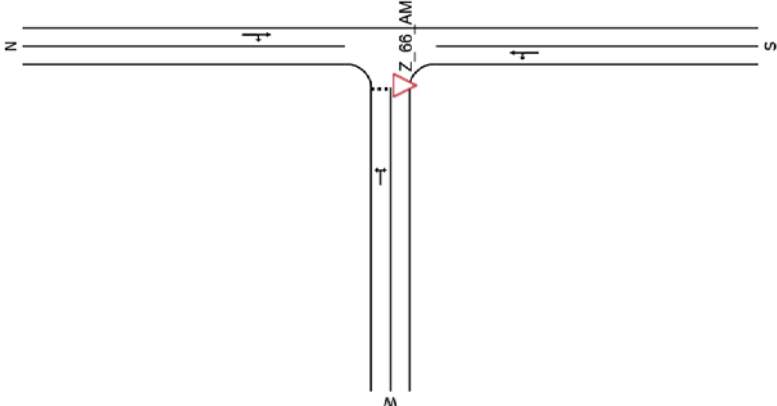
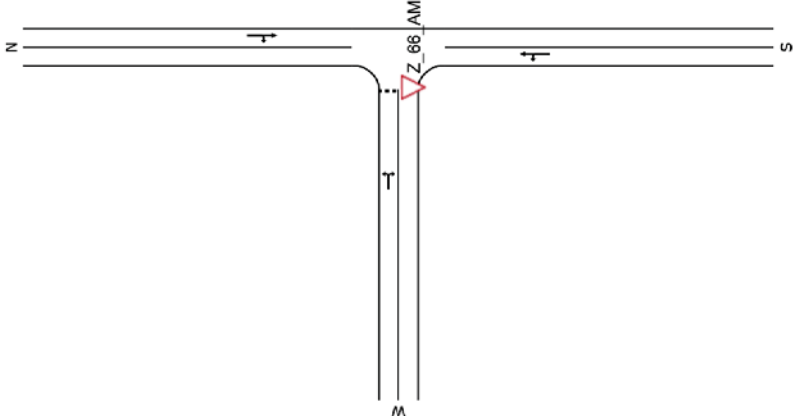
	Without Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.126	4.7	3.4
PM	0.275	4.2	8.3

File Note

250633

10 May 2018

2066 Intersection Z



	With Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.127	5.3	4.6
PM	0.204	4.8	8.1

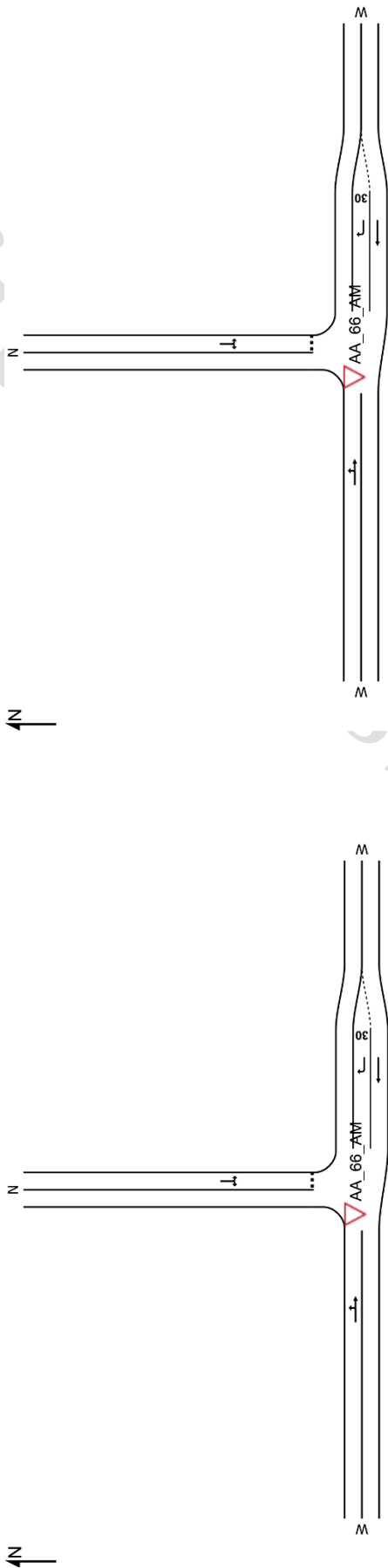
	Without Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.127	5.2	4.6
PM	0.203	4.8	8.0

File Note

250633

10 May 2018

2066 Intersection AA



	With Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.134	4.9	4.1
PM	0.135	3.3	4.1

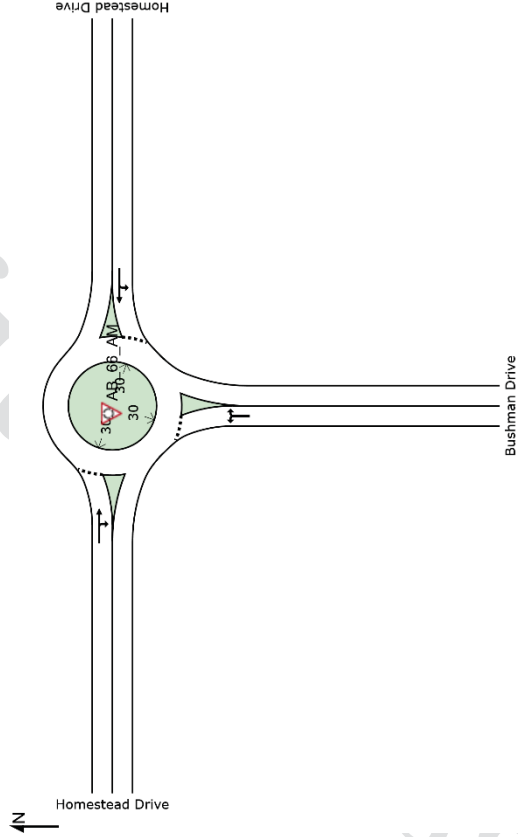
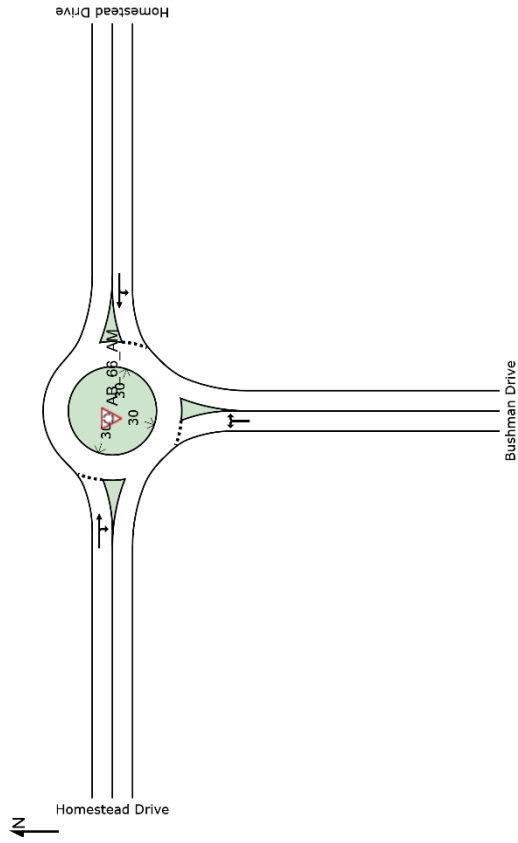
	Without Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.155	4.8	3.8
PM	0.159	3.0	4.2

File Note

250633

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2066 Intersection AB



	With Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.708	6.7	80.3
PM	0.691	4.1	72.8

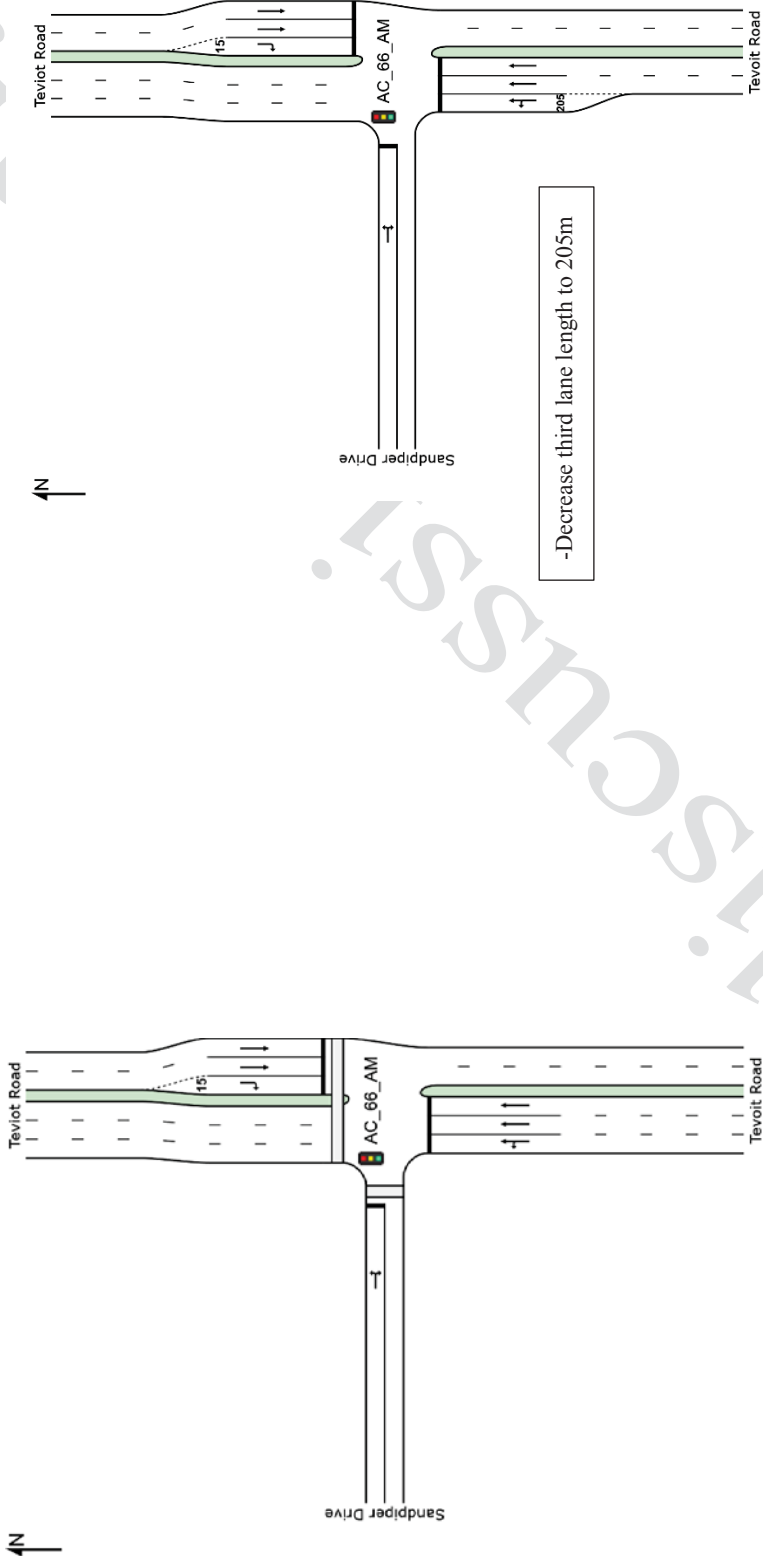
	Without Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.703	5.9	78.1
PM	0.691	4.0	72.6

File Note

250633

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2066 Intersection AC



	With Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.686	7.2	191.9
PM	0.849	6.2	290.9

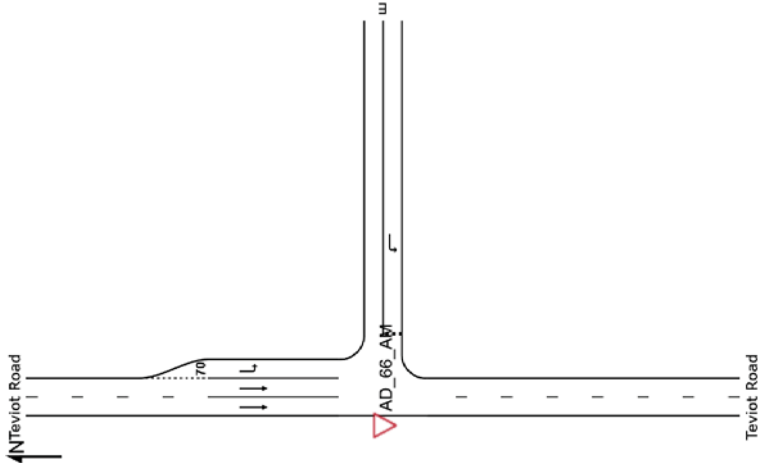
	Without Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.689	7.7	200.8
PM	0.888	9.0	375.1

File Note

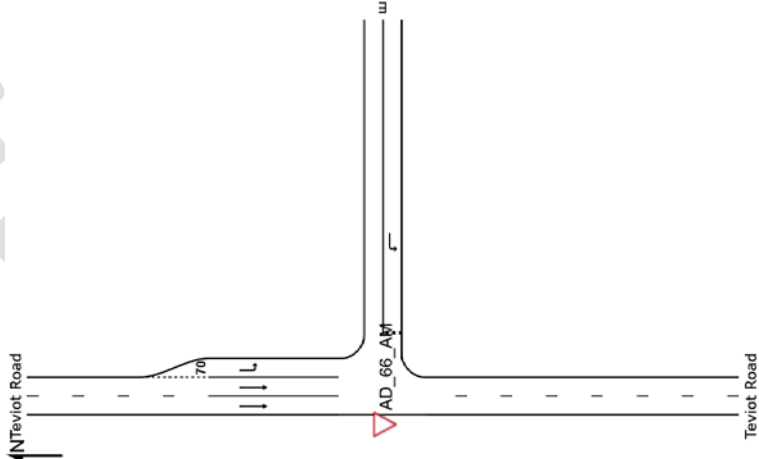
250633

10 May 2018

2066 Intersection AD



With Glynton			
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.247	1.0	1.3
PM	0.559	0.9	2.9



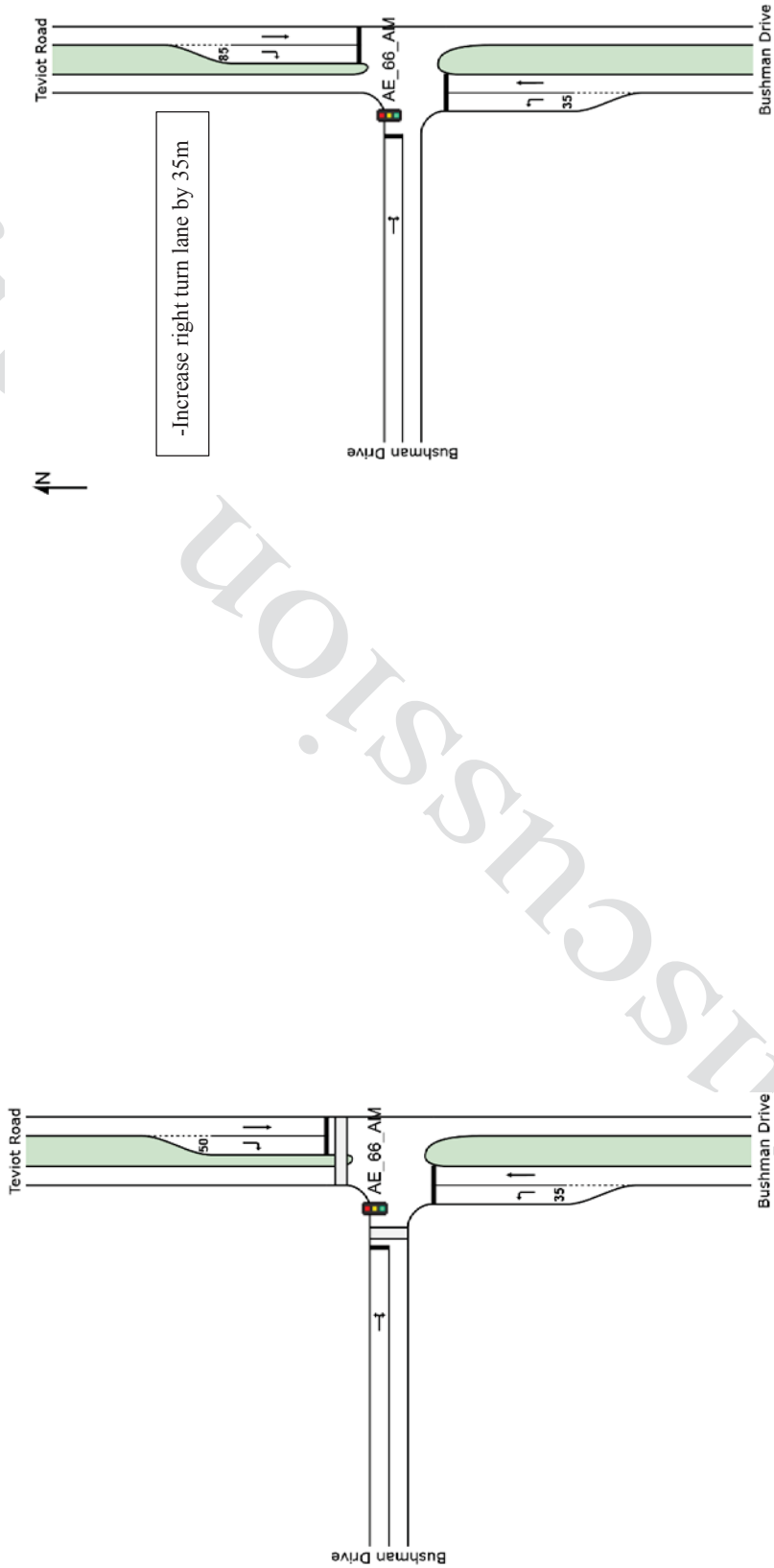
Without Glynton			
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.282	0.8	2.0
PM	0.604	1.3	9.3

File Note

250633

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2066 Intersection AE



With Glynton			
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.893	17.3	267.1
PM	0.689	8.4	128.8

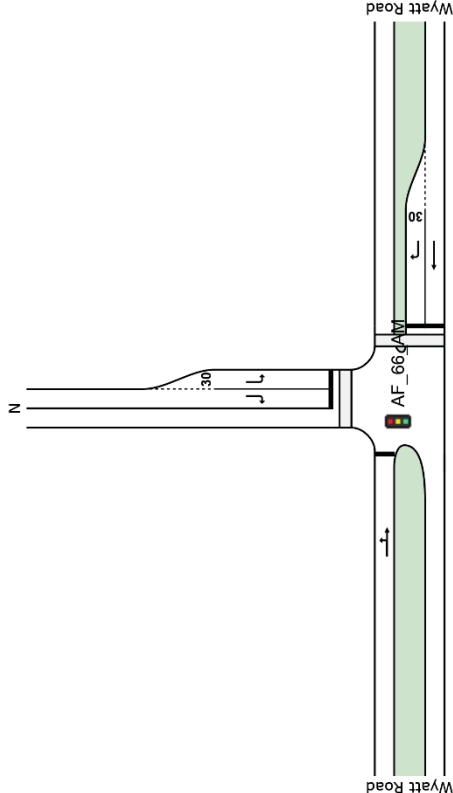
Without Glynton			
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.819	11.7	212.2
PM	0.740	8.6	126.4

File Note

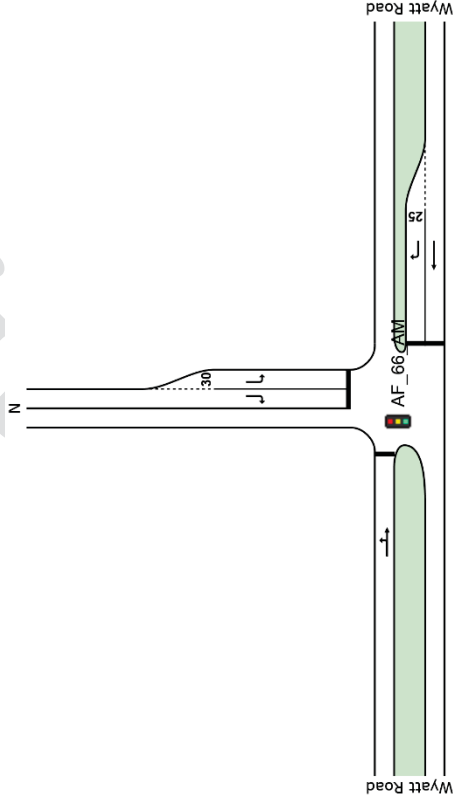
250633

10 May 2018

2066 Intersection AF



	With Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.833	13.4	330.2
PM	0.788	9.8	163.0



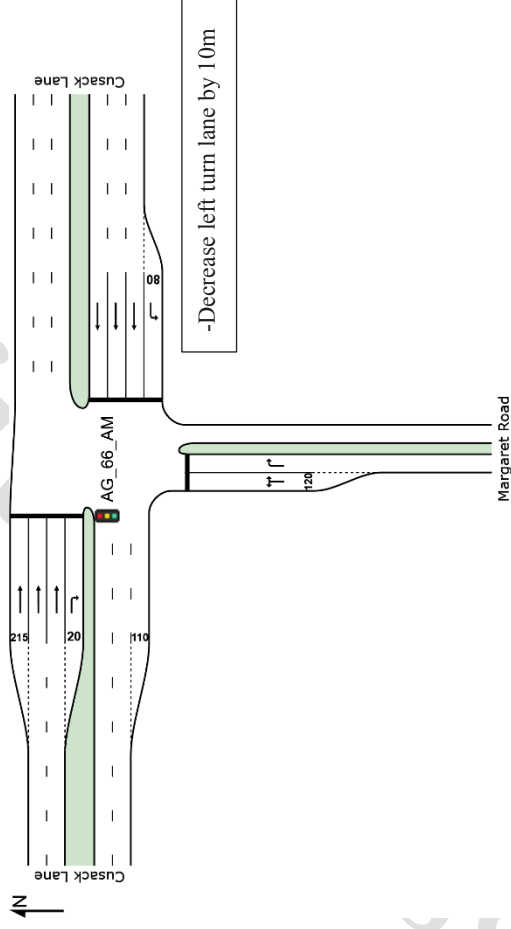
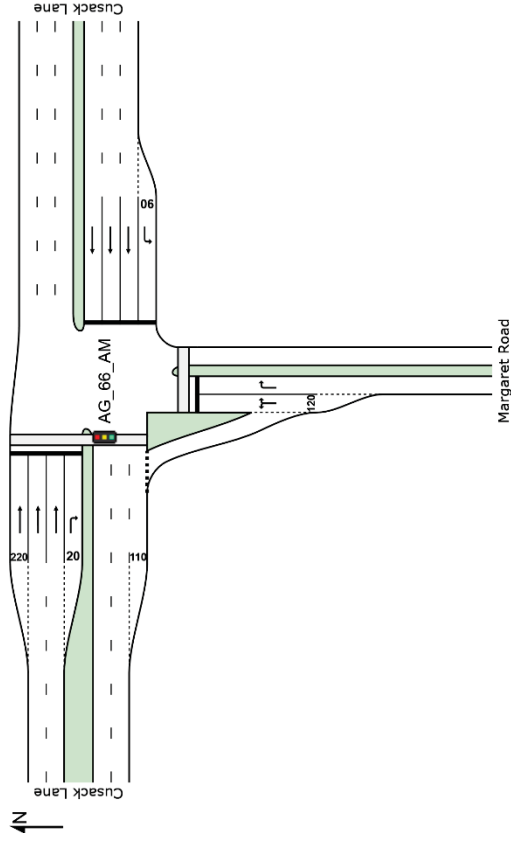
	Without Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.842	13.6	340.0
PM	0.790	9.5	163.4

File Note

250633

10 May 2018

2066 Intersestion AG



	With Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.709	18.7	216.4
PM	0.738	9.3	232.6

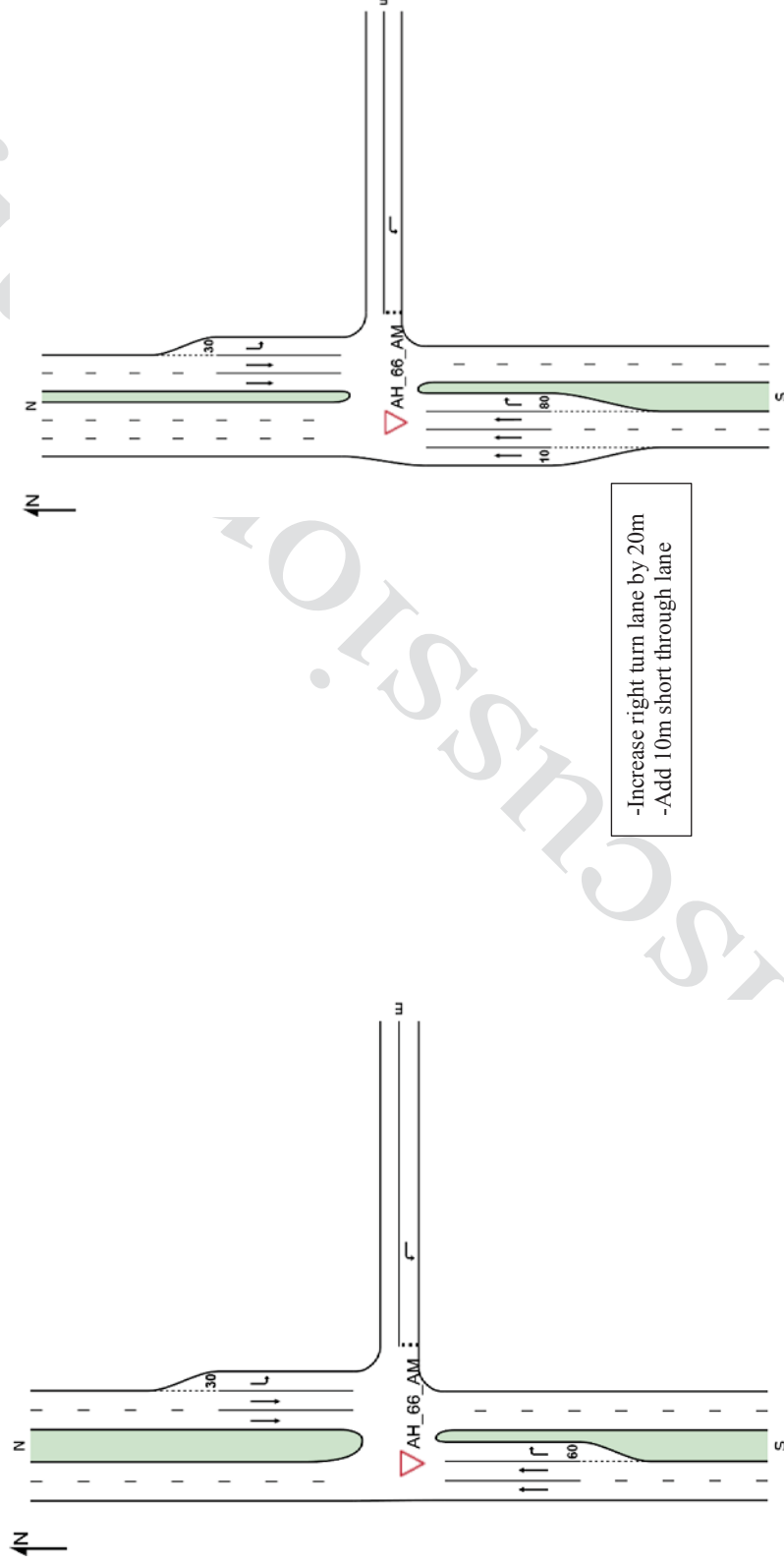
	Without Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.768	17.8	211.2
PM	0.783	10.3	265.2

File Note

250633

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2066 Intersection AH



With Glynton			
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.413	2.2	12.9
PM	0.276	2.0	8.2

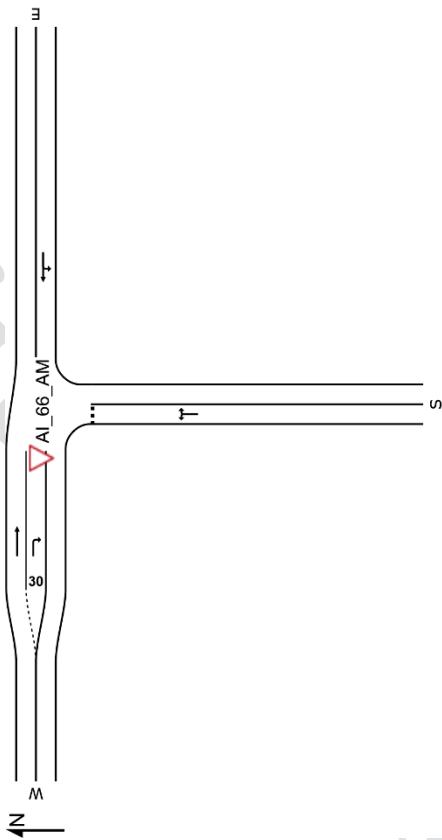
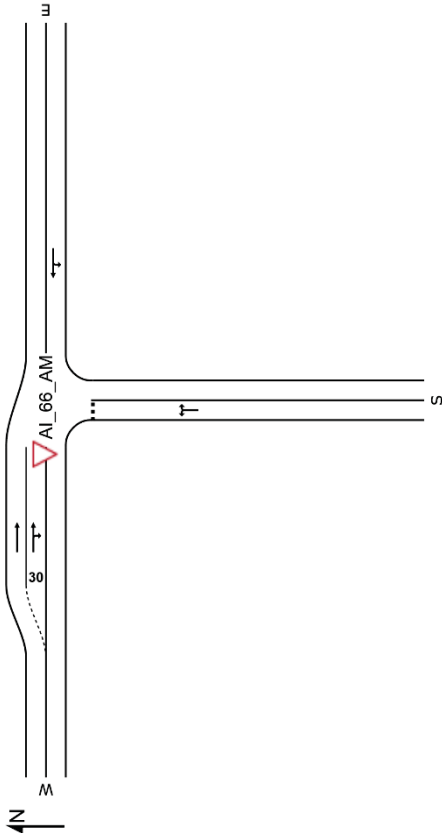
Without Glynton			
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	50.7	2.4	16.2
PM	31.4	1.9	7.9

File Note

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2066 Intersection AI



	With Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.397	0.1	0.4
PM	0.240	0.2	0.5

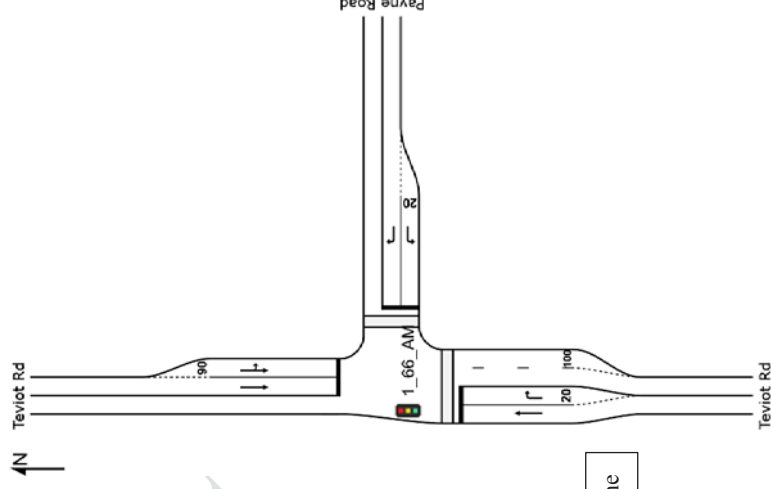
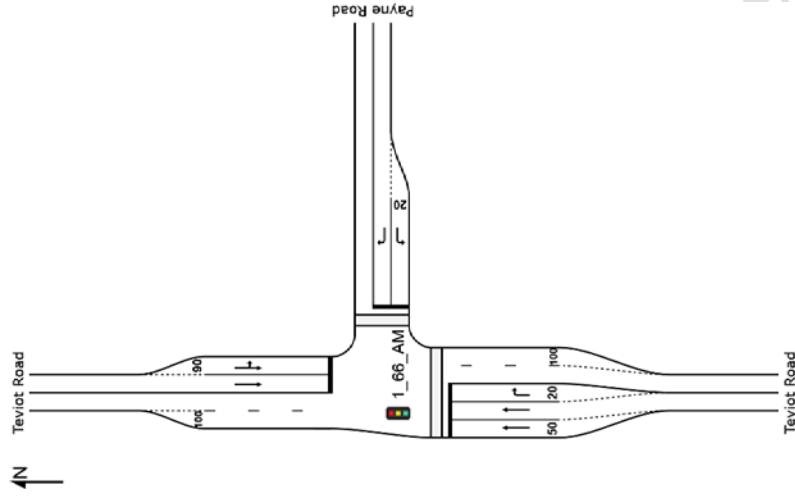
	Without Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.440	0.1	0.2
PM	0.372	0.2	0.4

File Note

250633

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2066 Intersection 1



With Glynton			
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.309	5.6	54.6
PM	0.354	7.4	66.2

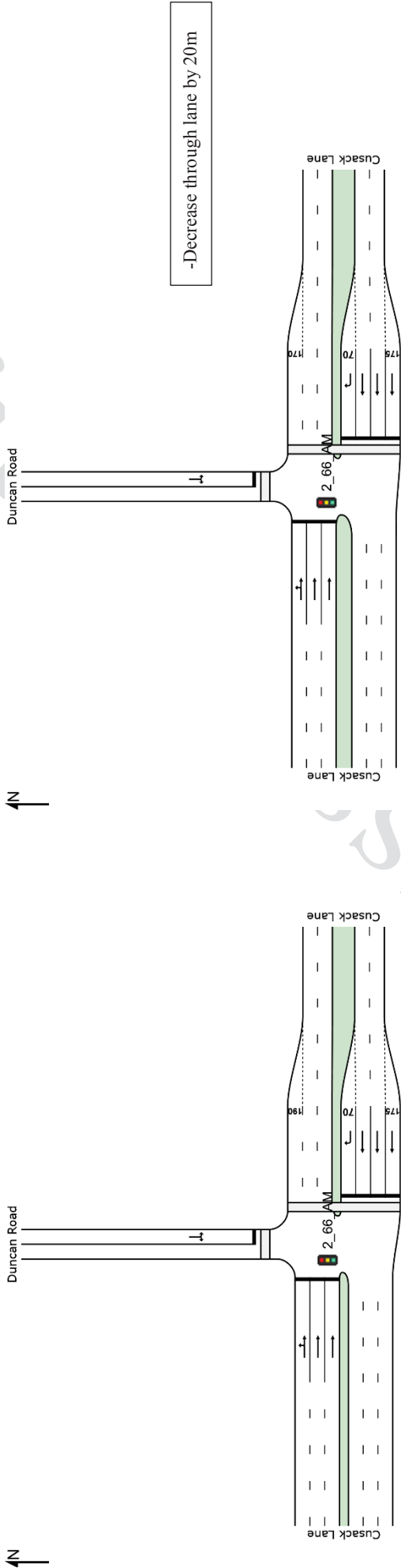
Without Glynton			
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.456	7.5	81.0
PM	0.40	10.2	74.7

File Note

250633

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2066 Intersection 2



	With Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.886	11.1	297.2
PM	0.707	6.2	171.5

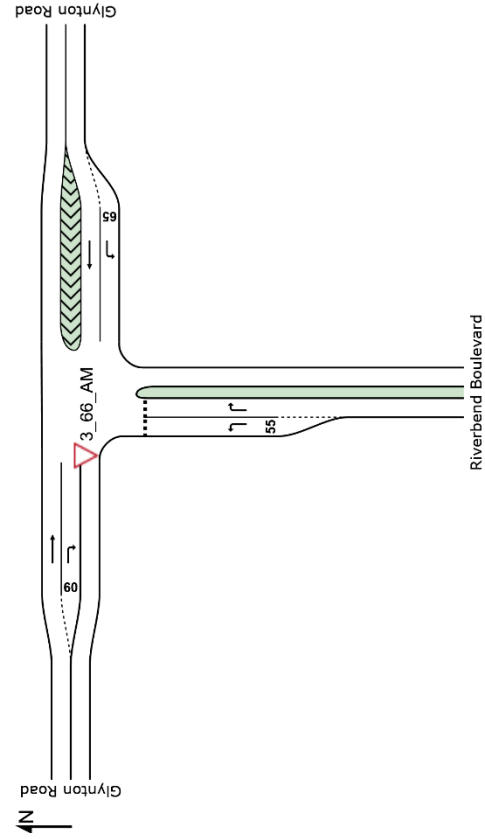
	Without Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.817	8.6	290.5
PM	0.706	6.4	171.2

File Note

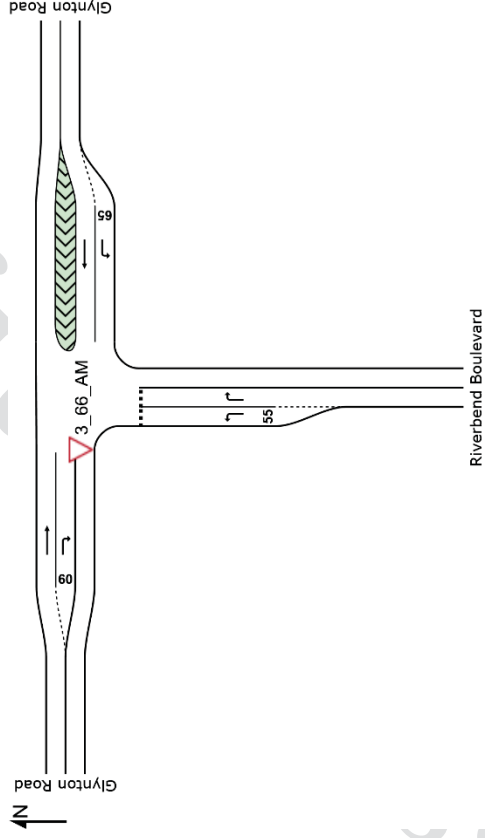
250633

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2066 Intersection 3



	With Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.693	8.9	69.7
PM	0.394	7.4	15.3



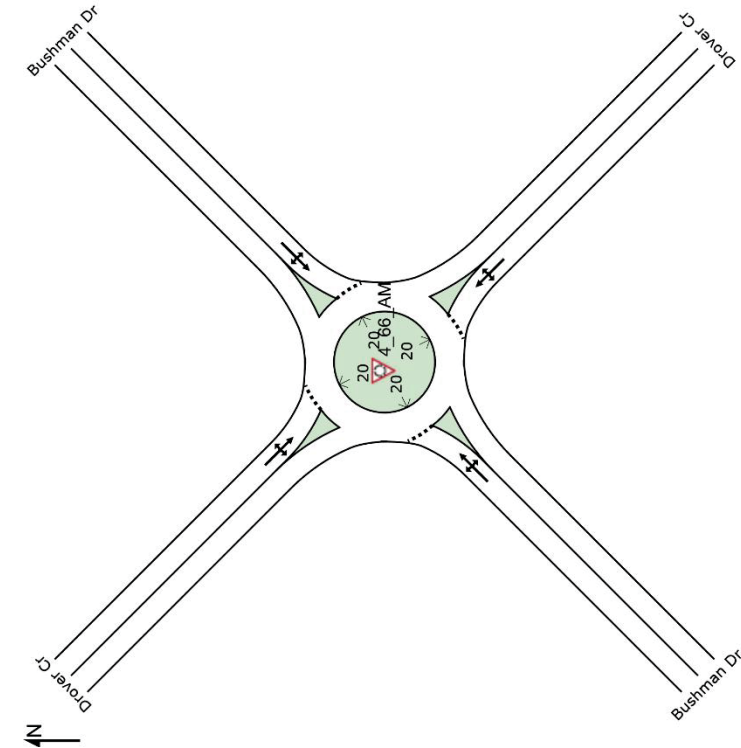
	Without Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.617	6.9	42.4
PM	0.357	6.4	10.0

File Note

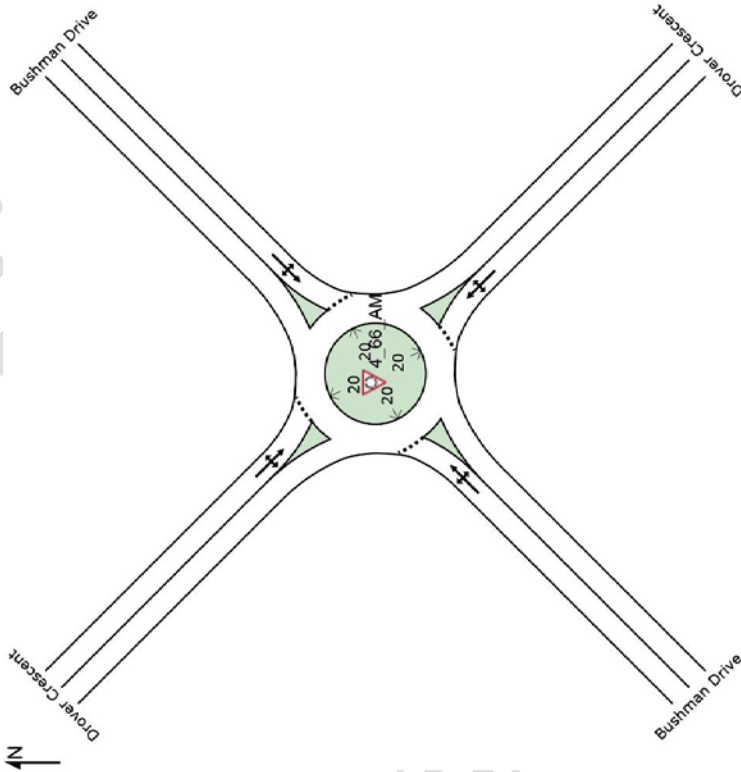
250633

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2066 Intersection 4



	With Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.548	5.2	36.5
PM	0.534	5.0	32.3



	Without Glynton		
	DoS (v/c)	Avg Delay (s)	95% Queue (m)
AM	0.512	4.8	31.5
PM	0.540	5.5	32.3