89 Ross Watt Road, Gisborne

Transport Impact Assessment

210473TIA001N-F.docx

31 January 2023

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1 INTRODUCTION

onemile**grid** has been requested by ID Ross Watt Pty Ltd to undertake a Transport Impact Assessment of the proposed residential subdivision at 89 Ross Watt Road, Gisborne.

As part of this assessment the subject site has been inspected with due consideration of the development proposal, traffic data has been sourced and relevant background reports have been reviewed.

This report has been updated in response to ongoing discussions with the Department of Transport and Macedon Ranges Shire Council, and the Request for Further Information issued by Department of Transport (DoT).

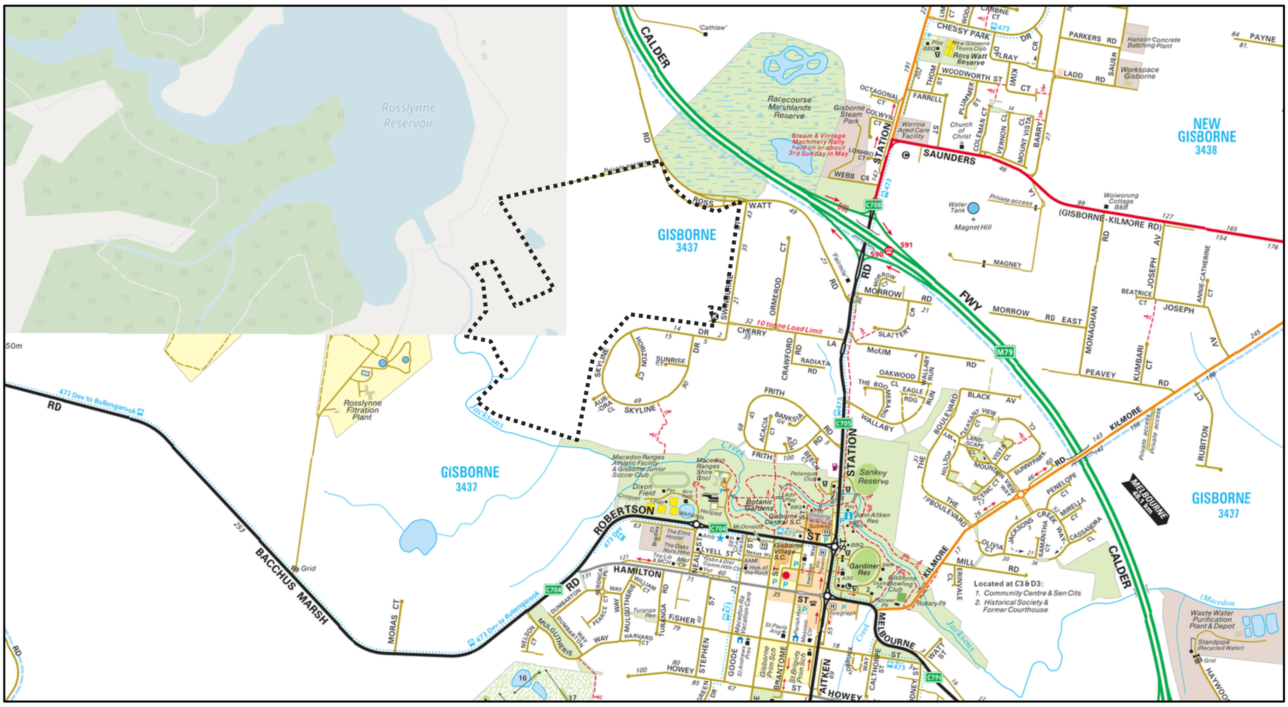
2 EXISTING CONDITIONS

2.1 Site Location

The subject site is located on the southern side of Ross Watt Road and is irregularly shaped with abuttals to Swinburne Avenue to the east, existing residential dwellings to the southeast, Jacksons Creek to the south and southwest, and rural land to the west and northwest.

A view of the site location is shown in Figure 1.

Figure 1 Site Location



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The site has a frontage to Ross Watt Road for approximately 529 metres, and a frontage to Swinburne Avenue for approximately 466 metres, with a total site area of 85.57 Ha.

The site has a dwelling located along the site's northern boundary, with the remainder of the site generally rural.

Vehicular access to the site is currently provided along the Ross Watt Road gravel service road, as summarised below:

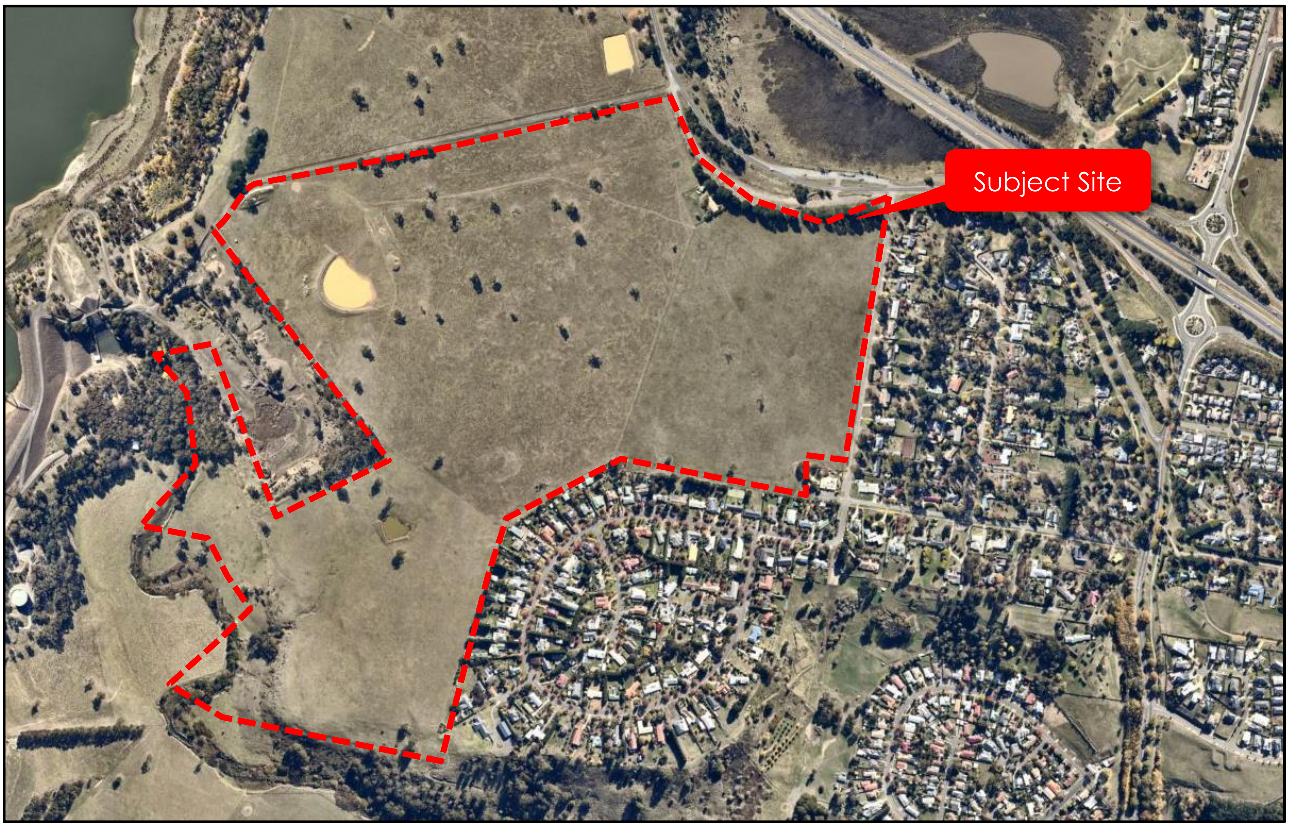
➢ A gravel crossover located centrally along the service road providing access to the dwelling; and
➢ A gravel crossover located in the northern corner providing access to an internal gravel road which runs along the site's north-western boundary.

No vehicular access is provided along the site's frontage to Swinburne Avenue.

The site abuts residential land uses, with the east being occupied by standard density residential lots and the west being occupied by rural residential lots. In addition, a child care centre is located in the southeast corner of the site, at the intersection of Swinburne Avenue and Cherry Lane.

An aerial view of the subject site is included in Figure 2 below.

Figure 2 Site Context (29 April 2021)



Copyright Nearmap

2.2 Planning Zones and Overlays

It is shown in Figure 3 that the site is located within a General Residential Zone – Schedule 1 (GRZ1). In addition, the site is subject to the following Planning Overlays:

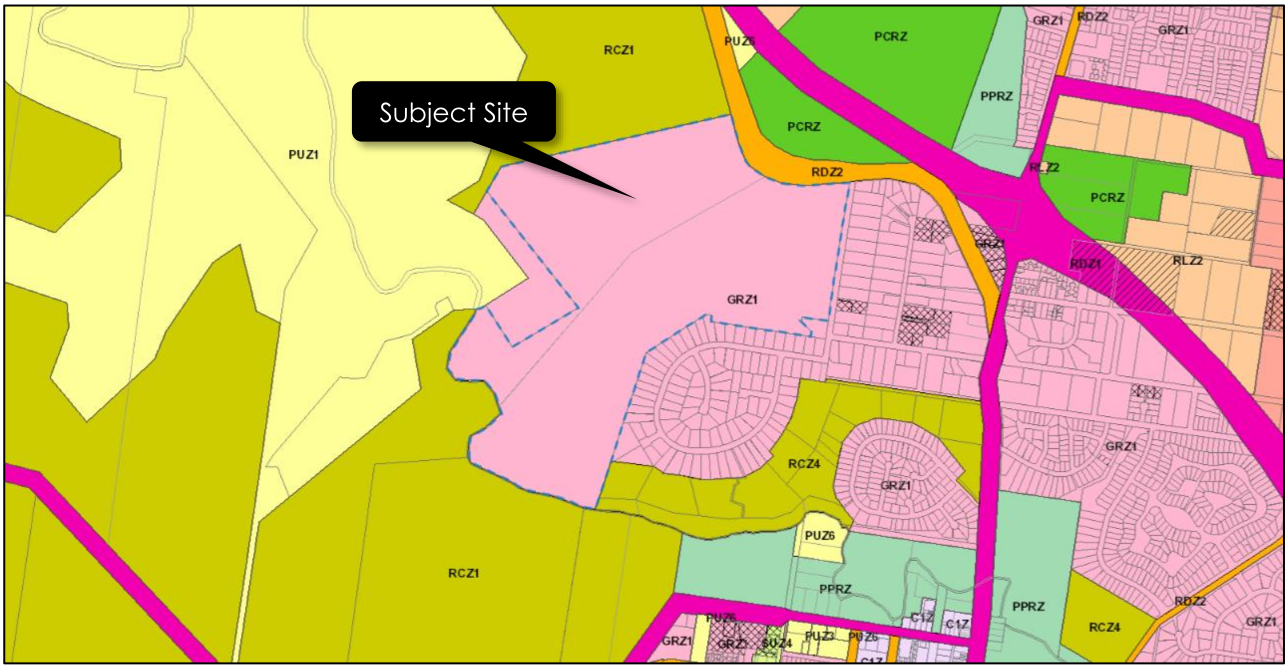
- Development Plan Overlay – Schedule 4;
- Land Subject to Inundation Overlay; and
- Development Contributions Plan Overlay – Schedule 2.

It is noted that DPO4 which applies to the subject site is required to provide the following for any proposed Development Plan's:

"A detailed traffic assessment and management plan addressing the impact of the development on the arterial and local road network, including mitigation works required on the road network in addition to funding responsibilities. The plan must show typical road cross sections and integration with the existing and proposed road, bicycle and pedestrian networks and public transport."

Additionally, the site abuts Ross Watt Road which is within a Road Zone – Category 2 (RDZ2).

Figure 3 Planning Scheme Zones



2.3 Road Network

2.3.1 Ross Watt Road

Ross Watt Road is a local Council road aligned northwest to east from Mount Macedon Road through to Station Road. Ross Watt Road currently provides a single traffic lane with grassed / gravel shoulders in each direction adjacent the site. In addition, a gravel service road is provided on the southern side of Ross Watt Road (along the site's frontage), which connects informally to the main carriageway in the northwest and east.

A signed 80km/h speed limit applies to Ross Watt Road in the vicinity of the site.

The intersection with Station Road is arranged as a T-intersection with priority provided to Station Road with fully directional movements permitted. A short right turn lane is provided for southbound motorists from Station Road into Ross Watt Road.

2.3.2 Swinburne Avenue

Swinburne Avenue is a local Council road aligned north to south from Ross Watt Road through to Cherry Lane where it continues as Skyline Drive. Swinburne Avenue currently provides a 6m wide pavement width which accommodates traffic in both directions, with the eastern side urbanised with kerb and channel, whilst the western side includes a gravel shoulder only.

The default 50km/h speed limit applies to Swinburne Avenue in the vicinity of the site.

The intersection with Ross Watt Road is arranged as a T-intersection with priority provided to Ross Watt Road.

2.3.3 Cherry Lane

Cherry Lane is a local Council road aligned east to west from Swinburne Avenue through to Station Road. Cherry Lane operates with a 6.7 metre wide pavement which offers a single traffic lane in each direction with gravel / grassed shoulders on each side. A 1.5 metre wide footpath is provided along the length of Cherry Lane on the southern side which links to a bus stop to the south of the intersection with Station Road.

The default 50km/h speed limit applies to Cherry Lane in the vicinity of the site.

The intersection with Station Road is arranged as a T-intersection with priority provided to Station Road. A short right turn lane is provided for southbound motorists and a short left turn lane is provided for northbound motorists from Station Road into Cherry Lane.

2.4 Traffic Volumes

2.4.1 Mid-Block Traffic Volumes

Traffic volume surveys were undertaken by Trans Traffic Survey on behalf of **one**mile**grid** at several locations in the vicinity of the site, for a one-week period from Wednesday 23rd February 2022 to Tuesday 1st March 2022 inclusive.

A summary of the existing traffic volumes surveyed along the road's surveyed are shown in Table 1.

Table 1 Existing Traffic Volumes

Direction	*AM Peak*	*PM Peak*	*Weekday Average*
Station Road (north of McKim Road)			
Northbound	605 vph	686 vph	8,155 vpd
Southbound	735 vph	763 vph	8,070 vpd
Total	**1,340 vph**	**1,449 vph**	**16,225 vpd**
Ross Watt Road			
North-westbound	68 vph	96 vph	953 vpd
South-eastbound	57 vph	68 vph	754 vpd
Total	**125 vph**	**164 vph**	**1,707 vpd**
Cherry Lane			
Westbound	53 vph	61 vph	591 vpd
Eastbound	64 vph	48 vph	570 vpd
Total	**117 vph**	**109 vph**	**1,161 vpd**
Swinburne Avenue			
Northbound	33 vph	17 vph	140 vpd
Southbound	13 vph	16 vph	113 vpd
Total	**46 vph**	**33 vph**	**253 vpd**

2.4.2 Turning Movement Counts

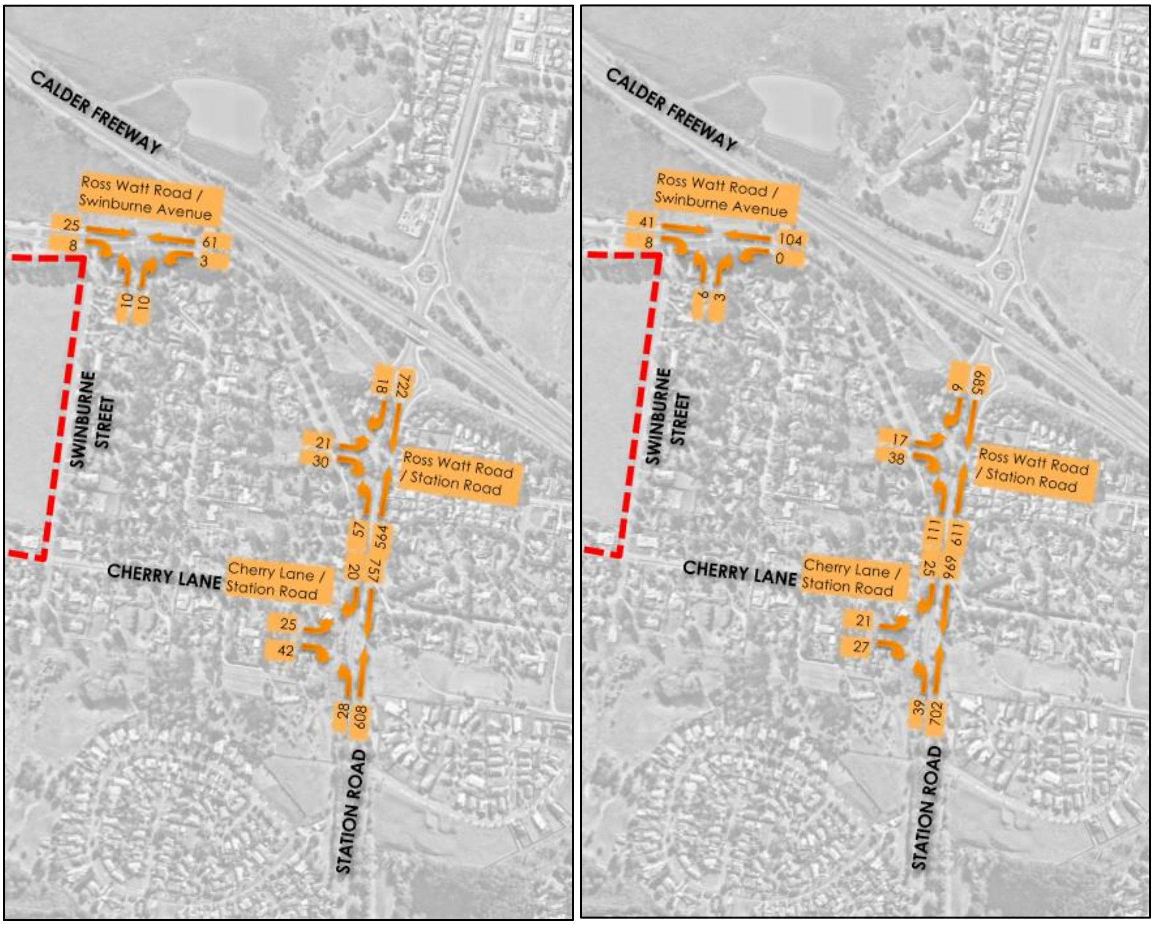
Traffic volume surveys were undertaken by Trans Traffic Survey on behalf of **one**mile**grid** on Wednesday 9th February 2022, between 7:00am and 9:30am, and between 3:00pm and 7:00pm, at the following intersections in Gisborne:

- Ross Watt Road / Swinburne Avenue;
- Ross Watt Road / Station Road; and
- Station Road / Cherry Lane.

The results of the above surveys are shown in Figure 4.

Figure 4 Existing Traffic Volumes – 9th February 2022

AM Peak PM Peak



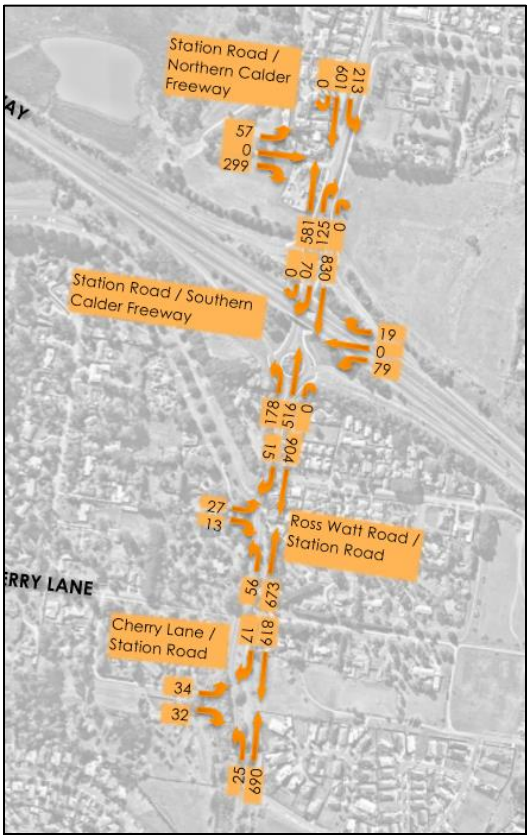
In addition, traffic volume surveys were undertaken by Trans Traffic Survey on Wednesday 9th March 2022, between 7:00am and 9:30am, and between 2:00pm and 6:30pm, at the following intersections in Gisborne:

- Station Road / Ross Watt Road;
- Station Road / Cherry Lane;
- Station Road / Calder Freeway Eastbound Lane On/Off Ramp; and
- Station Road / Calder Freeway Westbound Lane On/Off Ramp.

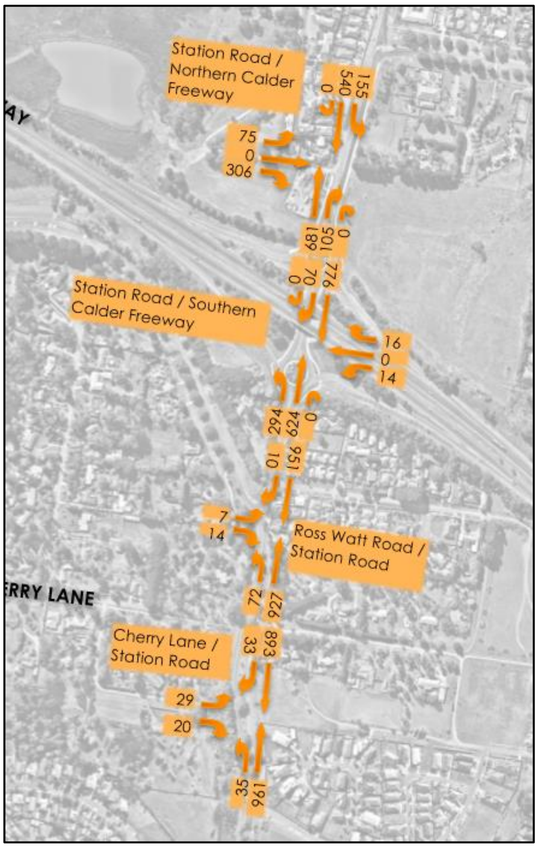
The results of the above surveys are shown in Figure 4.

Figure 5 Existing Traffic Volumes – 9th March 2022

AM Peak



PM Peak



An analysis of the February and March traffic volumes shows that there was significantly more through traffic along Station Road during both the AM and PM peak period. It was later identified that upgrade works were occurring at the intersection of Melbourne Road / Kilmore Road which involved the Kilmore Road leg being closed with a significant amount of traffic from the Gisborne township and Riddells Creek (and beyond) being diverted along Station Road as shown in Figure 6. It is understood that these works began on the 6th of March and are expected to continue until late 2022.

Figure 6 Traffic Diversion

A comparison between the Station Road traffic volumes showed that the March traffic volumes had 202 additional movements during the AM peak period and 466 additional movements during the PM peak period compared to the February volumes. Therefore, it is expected that the north-south through movements are over-represented in the March surveys, and therefore the difference between the two survey periods have been removed from the Station Road traffic volumes obtained in March. The modified traffic volumes are shown below in Figure 7.

Figure 7 Modified Traffic Volumes – 2022

AM Peak PM Peak

To confirm the validity of the above traffic volumes, **one**mile**grid** has reviewed the above Station Road traffic volumes against the tube count volumes undertaken between Wednesday 23rd February 2022 to Tuesday 1st March 2022 inclusive (previously shown in Table 1). A comparison of the Station Road traffic volumes to the north of Ross Watt Road is shown in Table 2.

Table 2 Traffic Volume Comparison – Station Road

Source	*AM Peak*	*PM Peak*
Modified Turning Movement Surveys	1,422 vph	1,462 vph
Tube Count – Weekday Average	1,340 vph	1,449 vph
Difference	**+6%**	**+1%**

As shown above, the modified turning movement volumes are marginally higher than the tube count volumes and therefore expected to be representative of typical traffic volumes in the vicinity.

2.5 Sustainable Transport

Public transport in the immediate vicinity of the subject site is limited to bus services. The 473 Gisborne – Gisborne Station bus service operates along Station Road (550 metres east of the subject site) and provides access to Gisborne Train Station and to the Gisborne township.

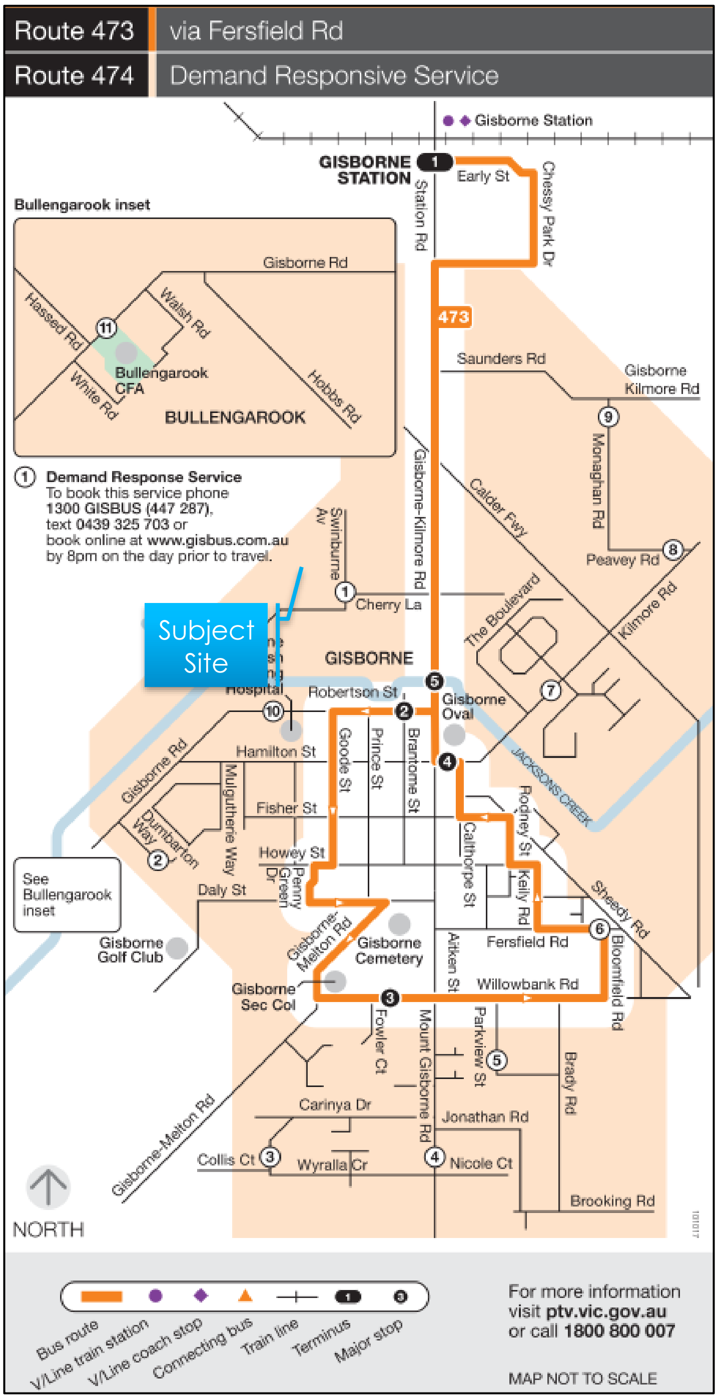
Gisborne Train Station is located in 'New Gisborne', approximately 2km north of the subject site, and provides access to the Melbourne CBD, as well as other regional areas by train.

In addition, areas outside of the 473 bus route benefit from a Demand Responsive Service that operates in the shaded areas in Figure 8, and includes the childcare located at the intersection of Swinburne Avenue and Cherry Lane. To use this service, it is required to book by phone or online the day before travel.

The Gisborne bus network map has been provided in Figure 8.

An off-road shared path runs along Station Road, to connect the Gisborne Township with New Gisborne.

Figure 8 Gisborne Bus Network



3 PLANNING BACKGROUND

3.1 Gisborne Outline Development Plan

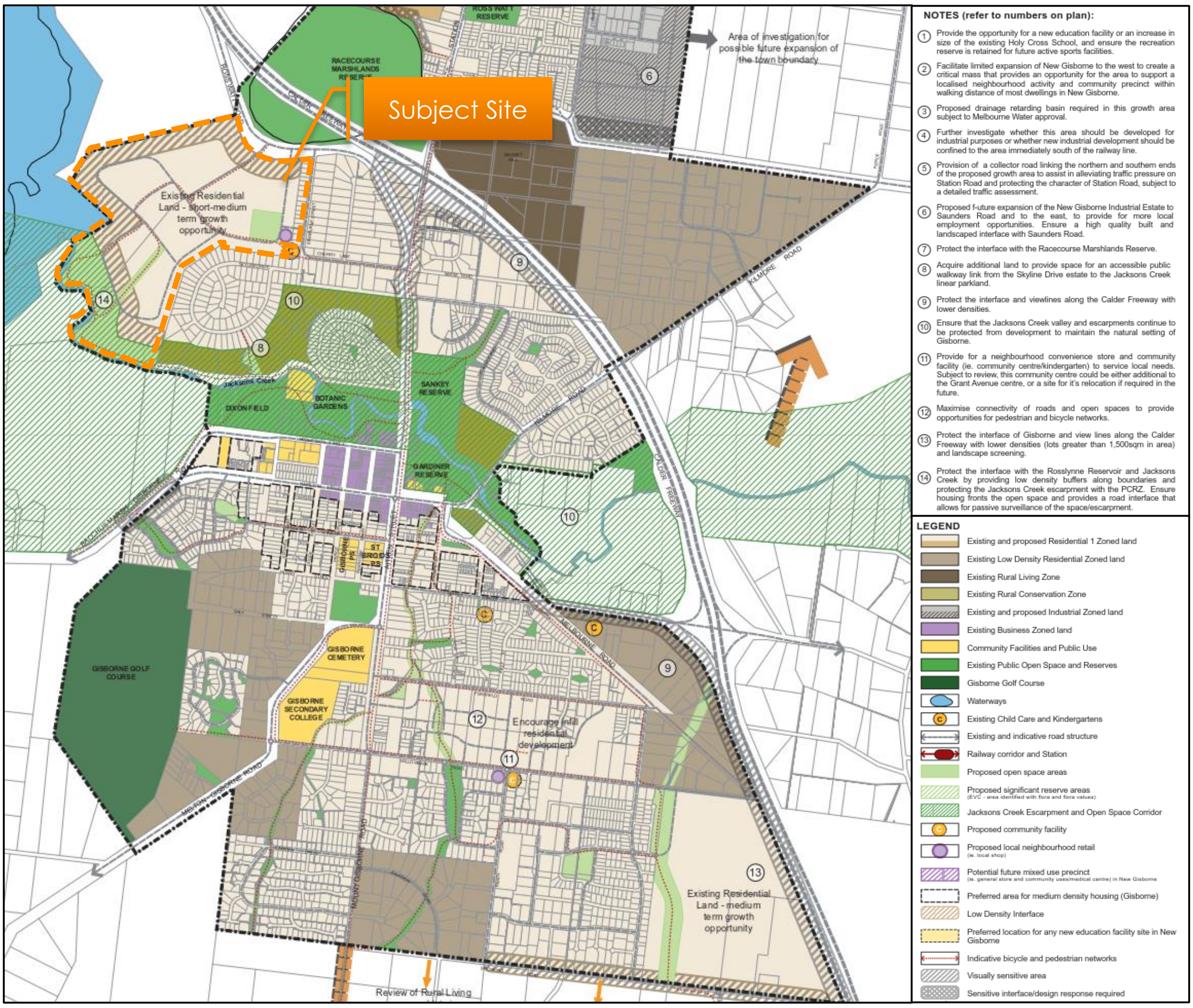
3.1.1 Overview

The site is located within the Gisborne Outline Development Plan (Amendment C67 Part 1 – September 2012) for which an extract is shown in Figure 9.

The outline development plan provides a framework for future growth and development of Gisborne, including future land uses, transport networks, open space and environmental features. As shown in the below figure, the site is located in the north-western corner of the site.

The site is nominated in the structure plan largely as residential land, with a local neighbourhood retail centre proposed in the south-eastern corner of the site.

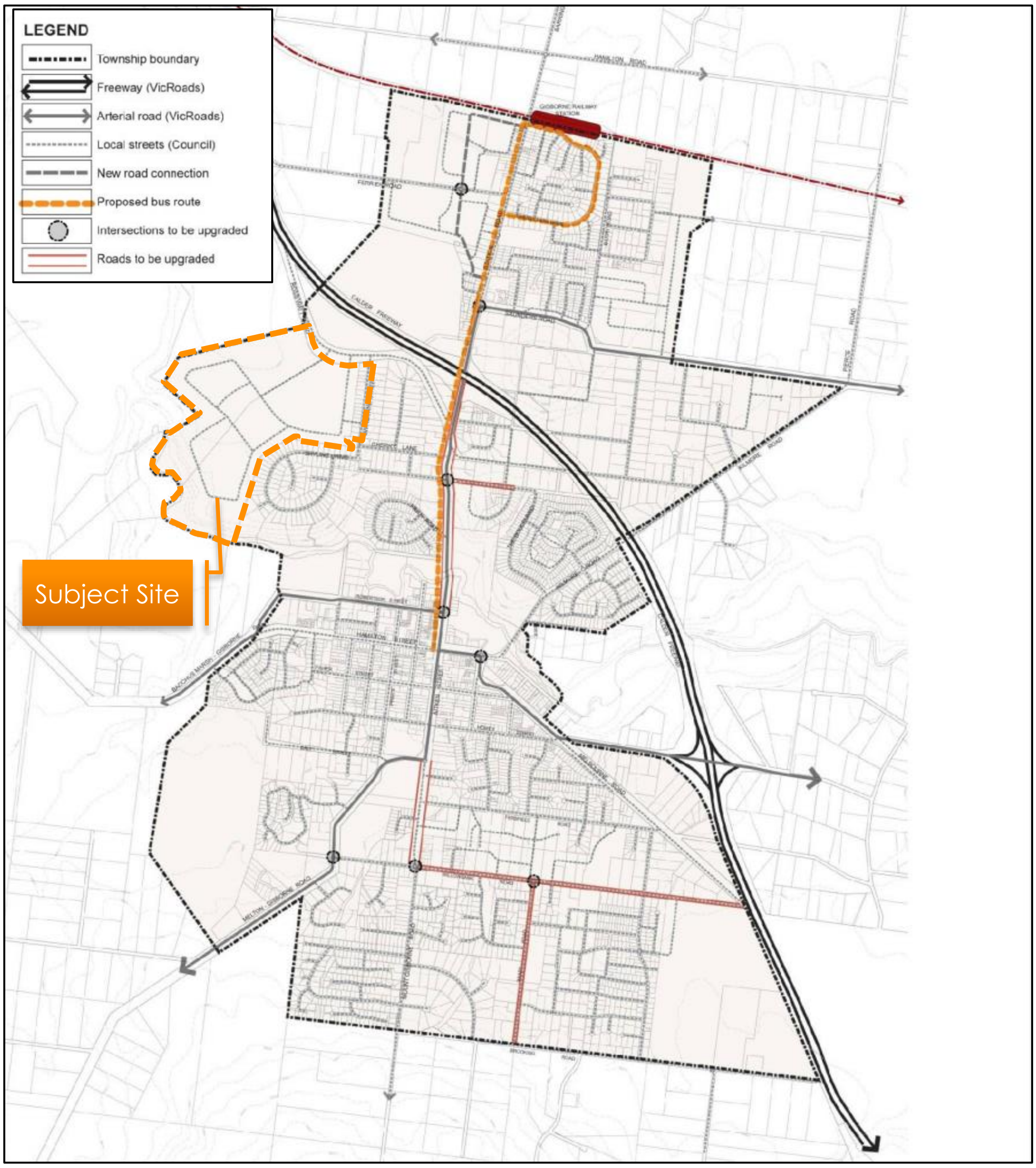
Figure 9 Gisborne / New Gisborne Structure Plan



The ODP had recommended to realign Ross Watt Road so that it aligns with Morrow Road and it becomes a major four-leg intersection with Station Road.

A view of the ODP road network is shown in Figure 10.

Figure 10 Structure Plan Road Network



3.1.2 Gisborne Movement Network Study

In 2016 a traffic study was prepared for Macedon Ranges Shire Council for the township of Gisborne. This study was to replace the 2009 traffic study which was adopted in the above Gisborne Outline Development Plan. The updated study is based on new information regarding yields for new developments within Gisborne.

Extracts of the network study are shown below, indicating the road network, walking and cycling network proposed in the vicinity of the site.

Figure 11 Recommended Road Infrastructure Upgrades

As shown above, a major road upgrade is proposed along Station Road which is to duplicate Station Road between Robertson Street and Saunders Road.

Figure 12 Recommended Future Road Hierarchy

The recommended future road hierarchy above identifies Ross Watt Road at the frontage of the site as a 'Council Secondary Traffic Road'.

3.2 Traffic and Transport Recommendations Report

Council engaged Cardno to prepare a 'Traffic and Transport Recommendations Report' which assessed the Gisborne development area. Of relevance to the subject site, the following was noted / recommended:

Station Road does not have the capacity to manage future traffic volumes without either significantly increasing the capacity through duplication, or providing alternative routes for traffic to relieve pressure on that link. In order to operate at an acceptable level of service without full duplication, a number of additional improvements are recommended:

- Local widening to two lanes at key intersections to increase capacity, particularly on the approach to Robertson Street, including the widening of the bridge over Jackson's Creek;
- Intersection safety and capacity improvements at **Ross Watt Road / Morrow Road, Cherry Lane**, and Frith Road; and
- Improved layouts at direct property access points such as Caltex Garage and Sankey Reserve.

Cherry Lane should be upgraded to a collector road to provide access to the vacant residential land west of Swinburne Avene and Skyline Drive, and upgrade the intersection at Station Road (the upgrade of Cherry Lane has been included in future traffic model scenarios).

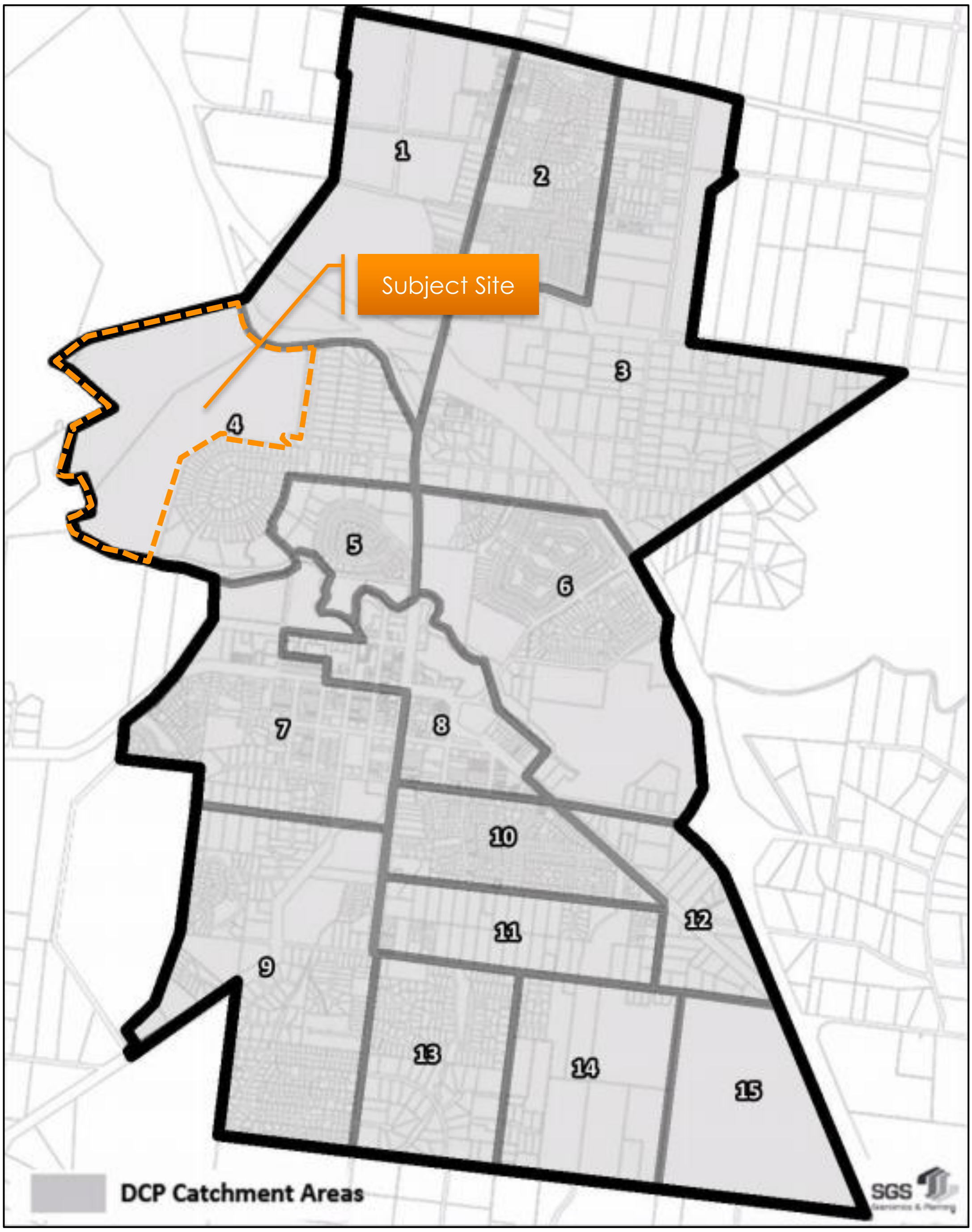
Ross Watt Road should be upgraded east of Swinburne Avenue along with the intersection at Station Road.

3.3 Gisborne Development Contributions Plan (DCP)

The subject site is located within the Gisborne Development Contributions Plan which has been prepared by the MPA (now the VPA) in partnership with the Shire of Macedon Ranges. The DCP has been prepared to outline the projects, framework and financial contribution required to deliver the infrastructure projects necessary for future residents. It includes the land and cost to fund road network upgrades, intersection construction and community facilities. The subject site is located within Area 4.

An extract of the Gisborne DCP is provided in Figure 13.

Figure 13 Gisborne DCP



4 Development Proposal

4.1 General

It is proposed to develop the subject site for the purposes of a residential subdivision, comprising of mixed-density residential lots (low, medium and standard density), a potential lifestyle community village, a local convenience centre and a childcare centre, as summarised below in Table 3.

The ultimate development of the site is expected to be in the order of 775-800 lots (yield expected to vary depending on density). However, as noted above, a lifestyle community may be delivered on-site which could yield approximately 180-190 lots and would retrospectively reduce the number of standard density resident lots by 100 lots. It is noted that any application for the lifestyle community village will be as part of a separate and future planning application process.

Table 3 Proposed Development

Component	No/Area
Dwellings	775-800 lots (65.31Ha)
Local Convenience Centre	0.80Ha
Childcare Centre	0.2Ha

It is envisaged that the residential development will be delivered in stages.

A view of the indicative lot layout is provided in Figure 14.

Figure 14 Proposed Lot Layout

4.2 Vehicle Access

Vehicular access to the subject site is to be provided at two access points along the northern and eastern boundaries, as summarised below.

- Unsignalised T-intersection to Ross Watt Road along the site's northern boundary; and
- Fully-directional unsignalised T-intersection to Swinburne Avenue along the site's eastern boundary.

4.3 Internal Road Layout

The proposed internal road network is generally consistent with that identified within the Gisborne ODP. A Connector Street with a road reserve of 24m bisects the site, running southwest from Ross Watt Road to approximately midway in the site, before realigning and running east to Swinburne Avenue.

The remainder of the site provides for a connected road network which includes Local Access Streets which link to the Connector Street network or Swinburne Avenue. Generally, all Local Access Streets have a 7.3m wide carriageway capable of providing kerbside parking and traffic in both directions within an 18 metre cross-section. In addition, a 20m modified Local Access Street with an off-road shared path is located to the south of the realigned connector street.

All internal roads fronting open spaces (including the Jacksons Creek open space) will incorporate the footpath or shared path (subject to confirmation on Council's shared path strategy) within the open space network and thus the formal road reserve will be reduced in width by up to 4 metres to acknowledge the effective verge and path within the open space area, in accordance with the cross-section shown in Figure 20.

Laneways are proposed to provide access to rear loaded lots as required.

With regard to intersections across the internal road network, a roundabout is proposed to manage movements at the 4-way intersection between the realigned connector road and the modified Local Access Streets. All other internal intersections will be controlled by unsignalised T-intersections.

Speed control measures will be required to be implemented along roads exceeding 240m in length. It is recommended that threshold treatments be proposed at the location of T-intersections as an effective means of speed control.

A view of the proposed internal road network is provided in Figure 15, with the corresponding cross-sections shown within Figure 16 to Figure 21 Local Access Street – Open Space Interface / Townhouse Cross Section – Opt 2 (16m)

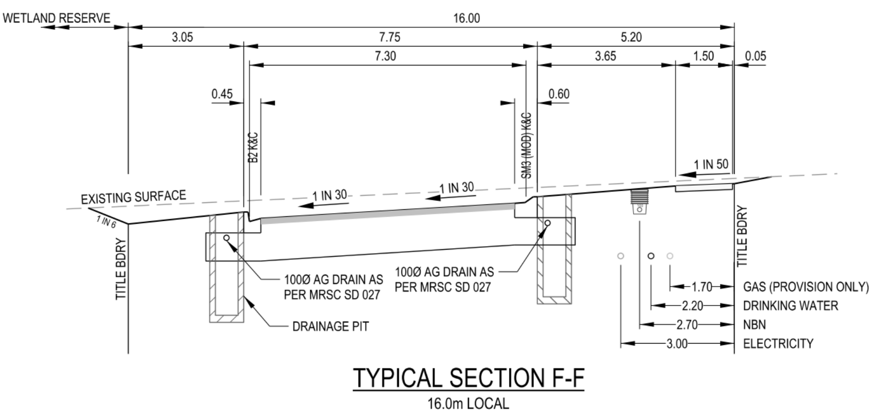


Figure 22 Local Access Street – Open Space Interface / Townhouse Cross Section – Opt 3 (16.5m)

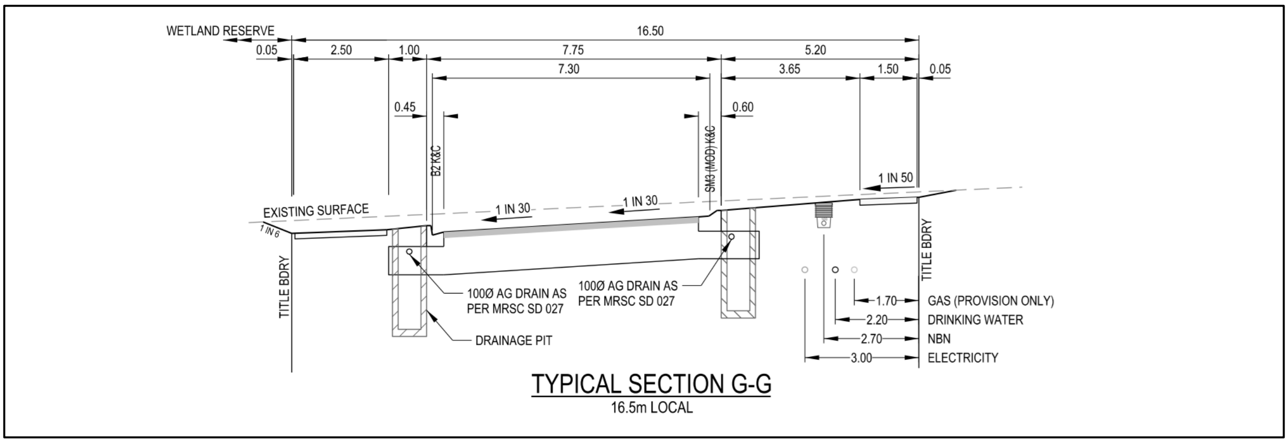


Figure 23.

Figure 15 Proposed Internal Road Layout

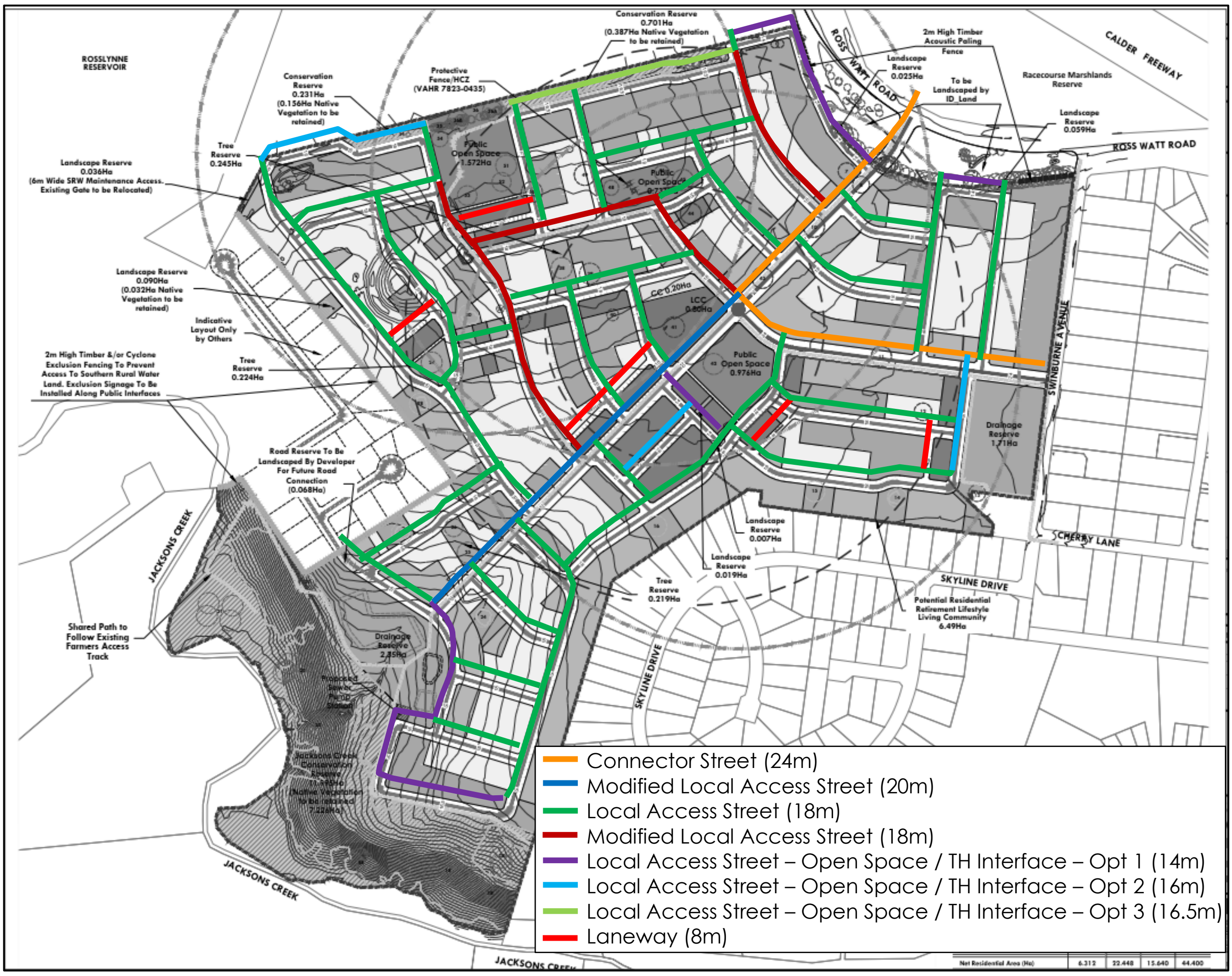


Figure 16 Connector Street Cross Section (24m)

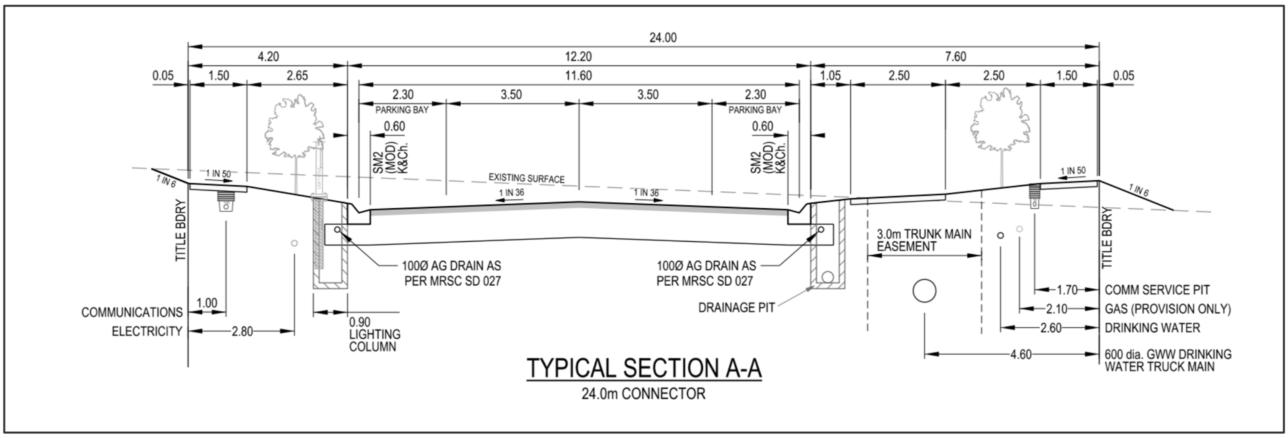


Figure 17 Modified Local Access Street Cross Section (20m)

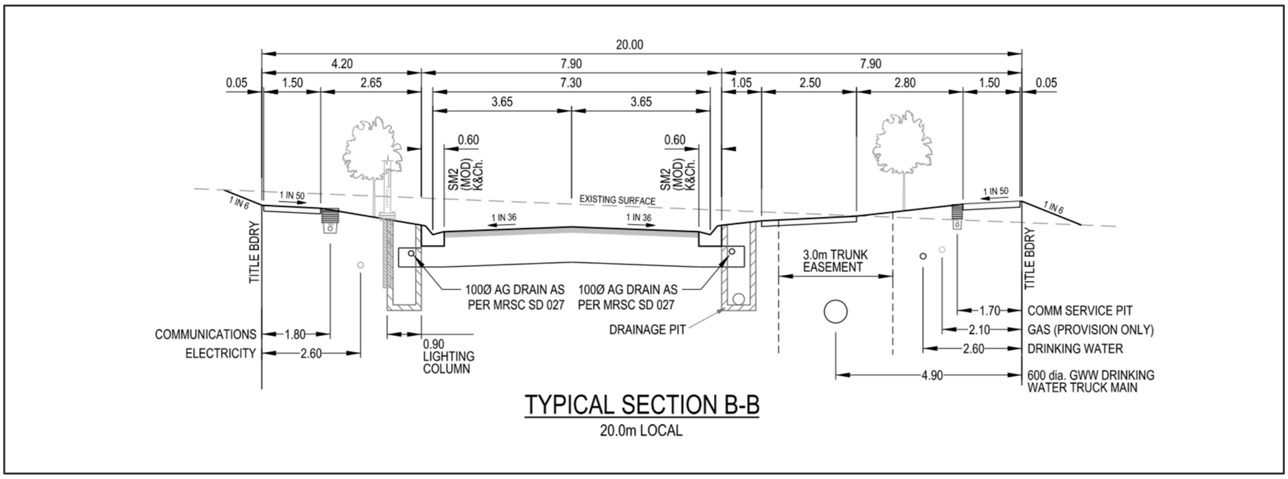


Figure 18 Local Access Street Cross Section (18m)

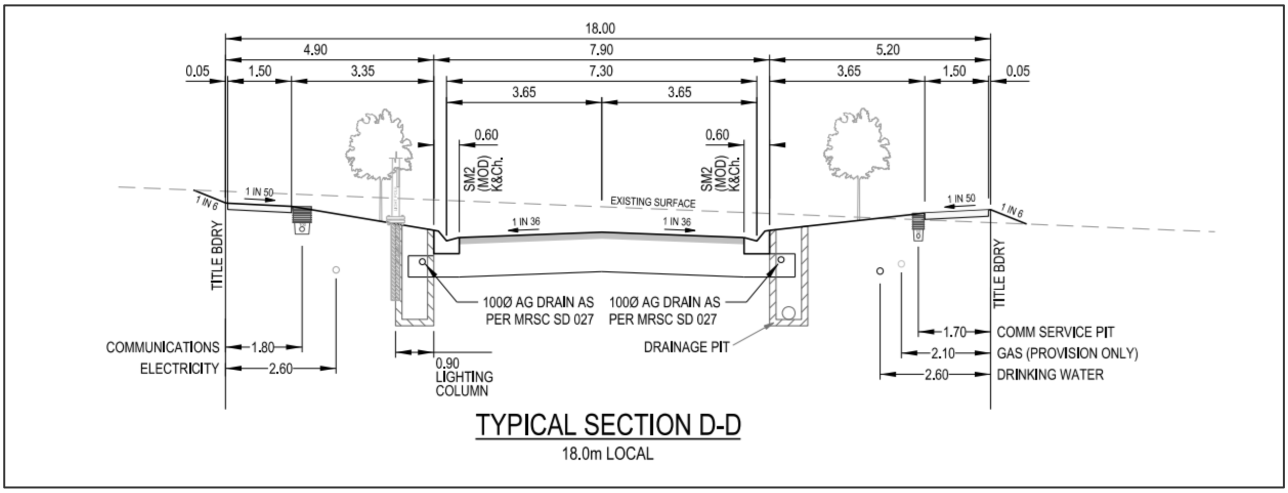


Figure 19 Modified Local Access Street Cross Section (18m)

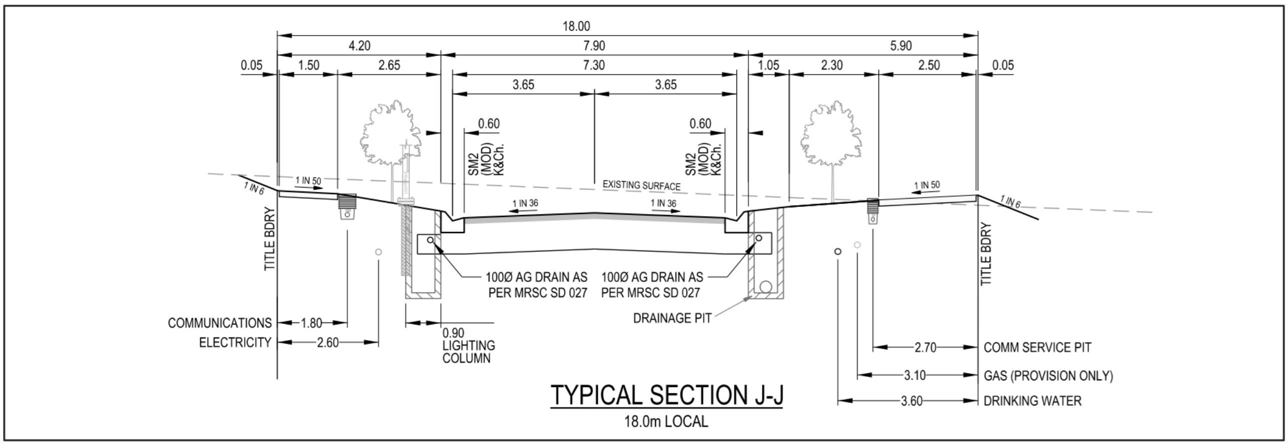


Figure 20 Local Access Street – Open Space Interface / Townhouse Cross Section – Opt 1 (14m)

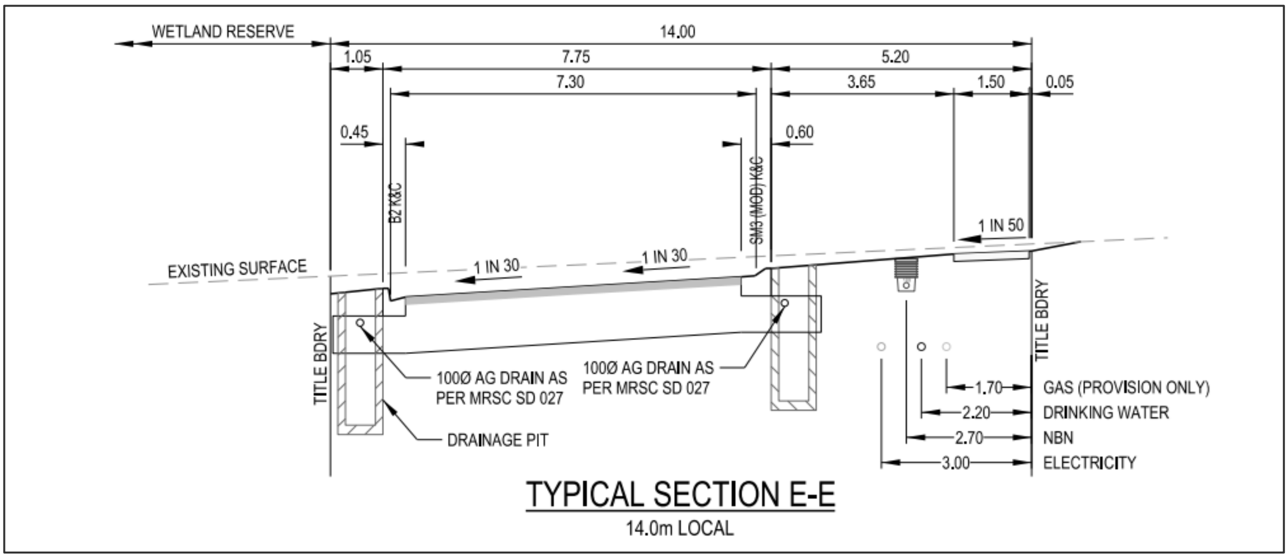


Figure 21 Local Access Street – Open Space Interface / Townhouse Cross Section – Opt 2 (16m)

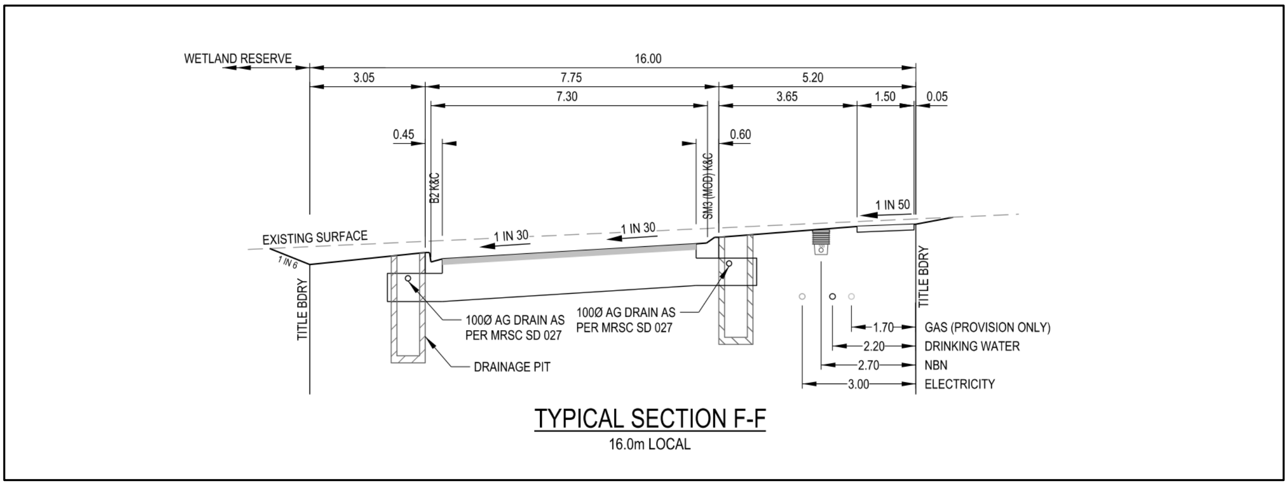


Figure 22 Local Access Street – Open Space Interface / Townhouse Cross Section – Opt 3 (16.5m)

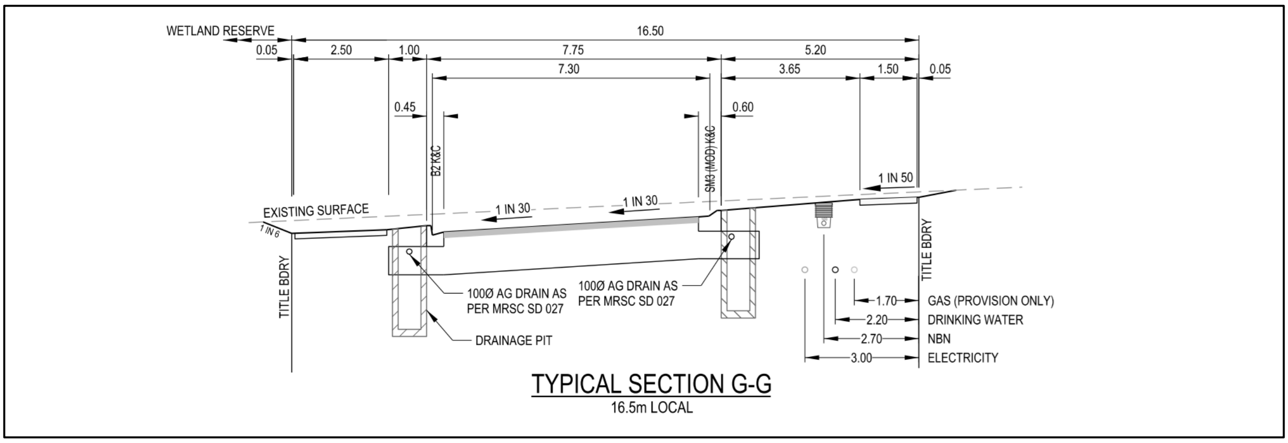
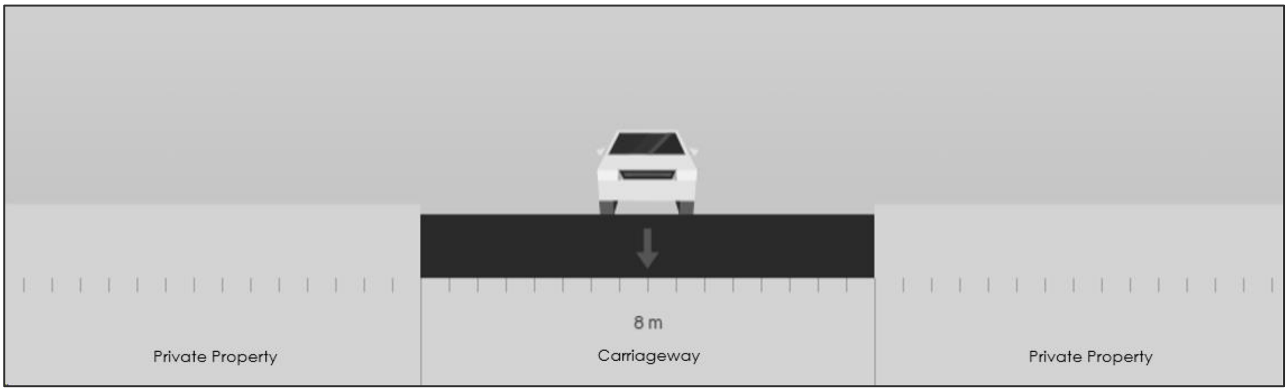


Figure 23 Laneway Cross Section (8m)



4.4 External Road Infrastructure Upgrades

4.4.1 Intersections

4.4.1.1 Interim

It is proposed to upgrade the intersections of Cherry Lane / Station Road and Ross Watt Road / Station to allow for not only traffic generated by the proposed development but also allow for the relatively high through traffic volumes on Station Road. As part of planning for the area, Station Road has been identified for upgrades regardless of development of the subject site.

Both intersections are currently provided as unsignalised T-intersections with the upgrades proposed consisting of either roundabouts, signalised intersections, or a combination of both. The interim intersection arrangements have been designed to, where practical minimise the works that are required to accommodate the ultimate intersection configuration, with the majority of works comprising of the actual duplication of Station Road.

It is understood that the interim intersection arrangement will be determined in consultation with both the Department of Transport and Macedon Ranges Shire Council. Further commentary on the benefits of both intersections and the respective traffic analysis is provided in Section 7.6.

It is noted that as part of the proposed signalised intersection arrangement, it is proposed to realign Ross Watt Road to form a four-way signalised intersection arrangement between Ross Watt Road / Station Road / Morrow Road. It is noted that the re-alignment of Ross Watt Road was considered as part of the McKim Road Development Plan, however, the status of these works is unknown and therefore the works will be undertaken as part of this Development Plan to ensure that access to Morrow Road is not restricted in the future.

A view of the interim Station Road intersection works is shown below in the figures below.

Figure 24 Proposed Interim Roundabout Upgrades – Station Road

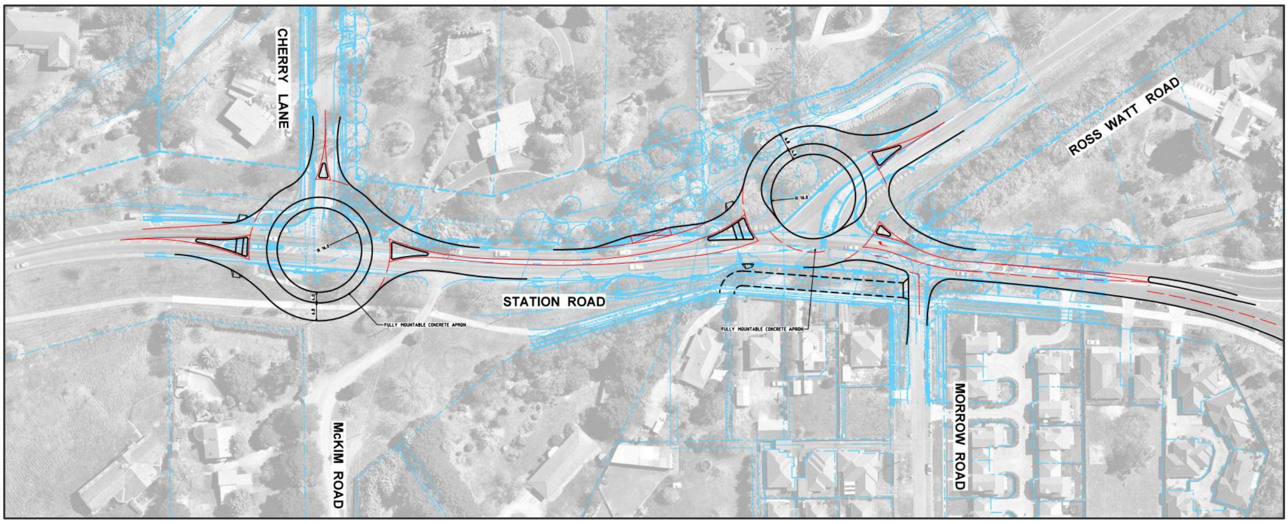
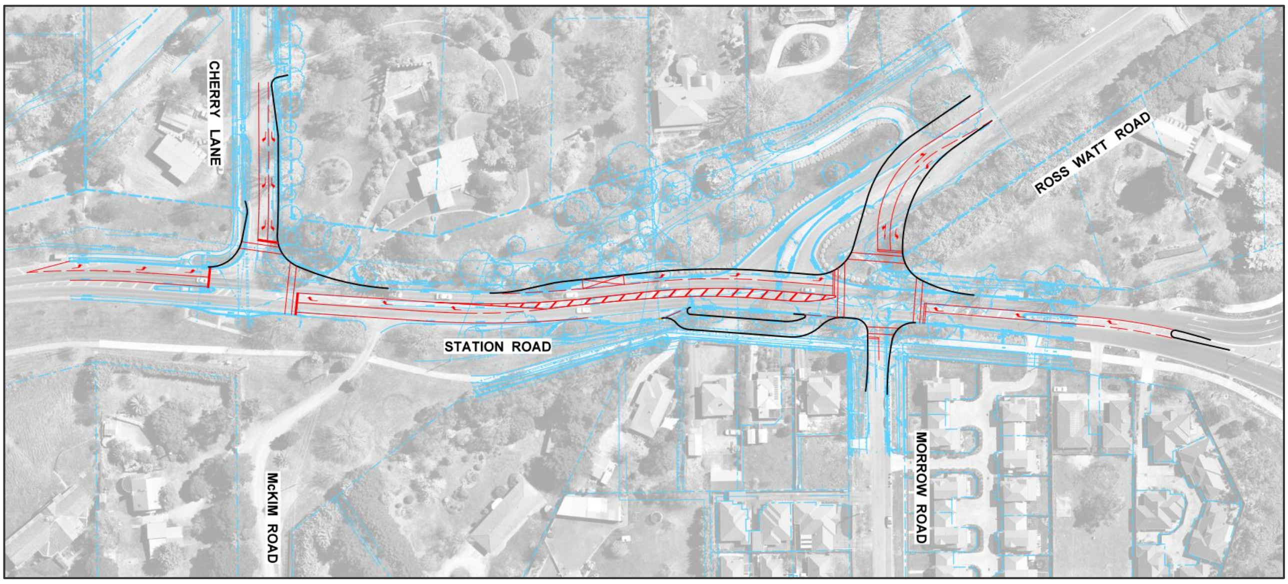


Figure 25 Proposed Interim Signalised Upgrades – Station Road



4.4.1.2 Ultimate

The overall preliminary planning for the area included in the Cardno traffic report contemplates the widening of Station Road to provide additional through capacity (i.e 2 lanes in each direction). In addition, based on discussions with the Department of Transport and Macedon Ranges Shire Council, the duplication of Station Road may be provided at some stage in the near future, however, is currently not funded or included in any works proposed by the Department of Transport. It is noted that existing traffic volumes along Station Road are operating near the theoretical capacity for a two lane arterial road.

Noting the above, an ultimate intersection design has been prepared for the Cherry Lane / Station Road and Ross Watt Road / Station Road intersections which includes the duplication of Station Road, if funded/provided by the Department of Transport in the future. The ultimate intersection treatments have been designed to minimise construction works at the intersections.

A view of the ultimate Station Road intersection works is shown below in the figures below.

Figure 26 Proposed Ultimate Roundabout Upgrades – Station Road

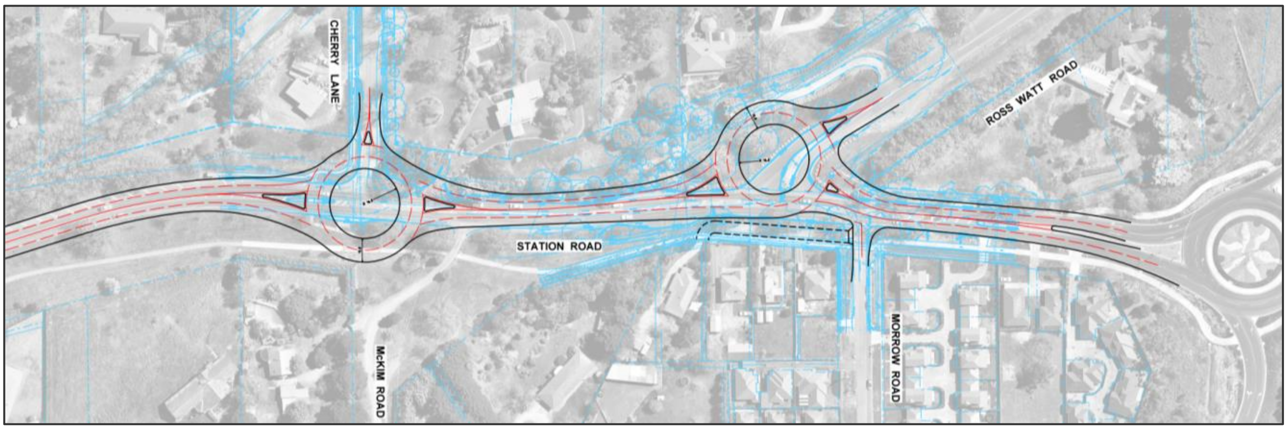
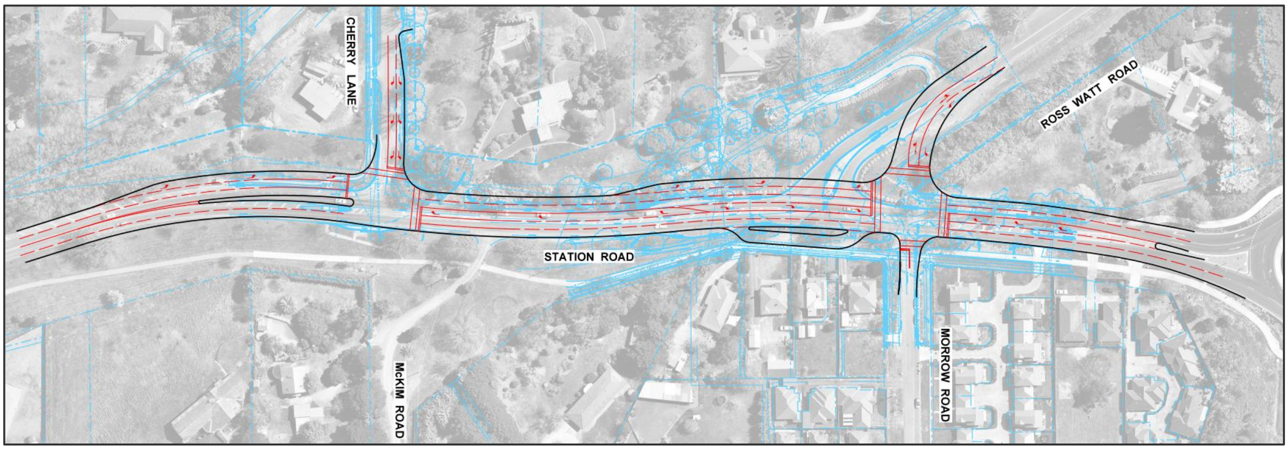


Figure 27 Proposed Ultimate Signalised Upgrades – Station Road



4.4.2 Cherry Lane

As part of the proposed development, it is proposed to upgrade Cherry Lane. The road will be upgraded to have a 7.3m carriageway with kerb and channel on both sides of the road.

The road upgrade should be undertaken prior to the 322nd lot of the proposed subdivision, as outlined in Section 7.7.2.

A view of the existing and proposed Cherry Lane cross-sections is provided below.

Figure 28 Existing Cherry Lane Cross-Section

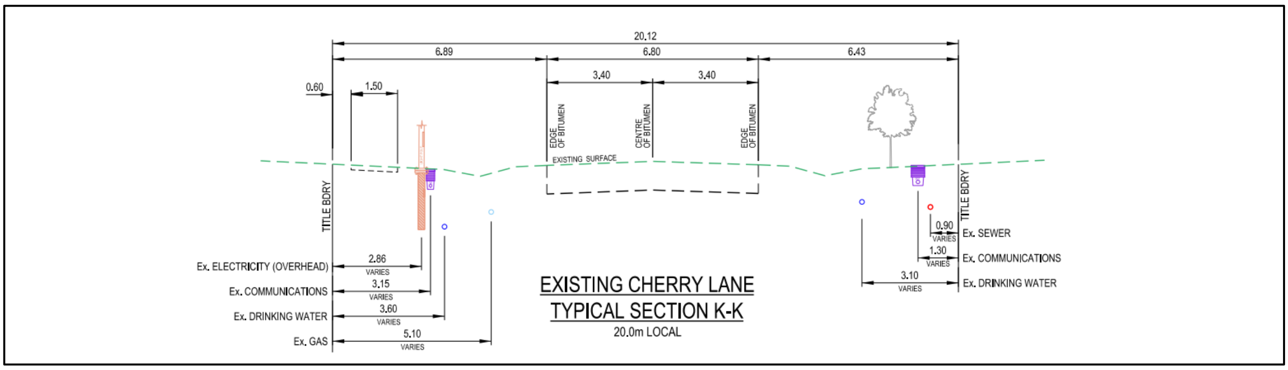
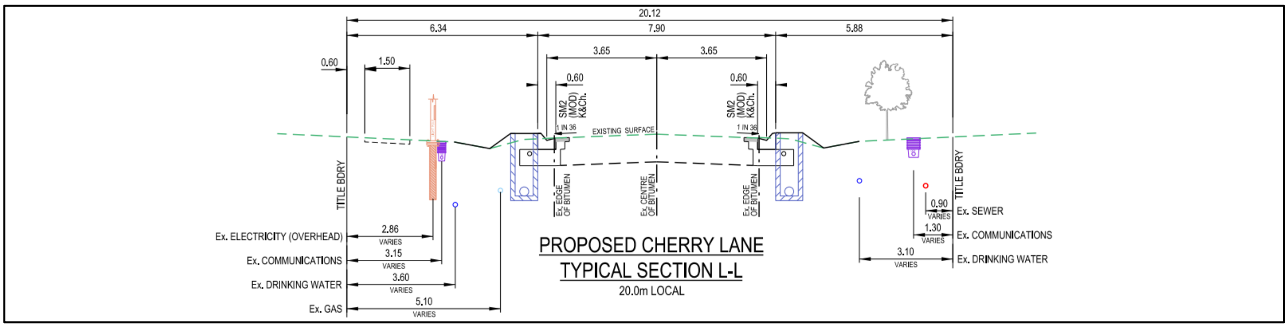


Figure 29 Proposed Cherry Lane Cross-Section



4.5 Pedestrian and Bicycle Network

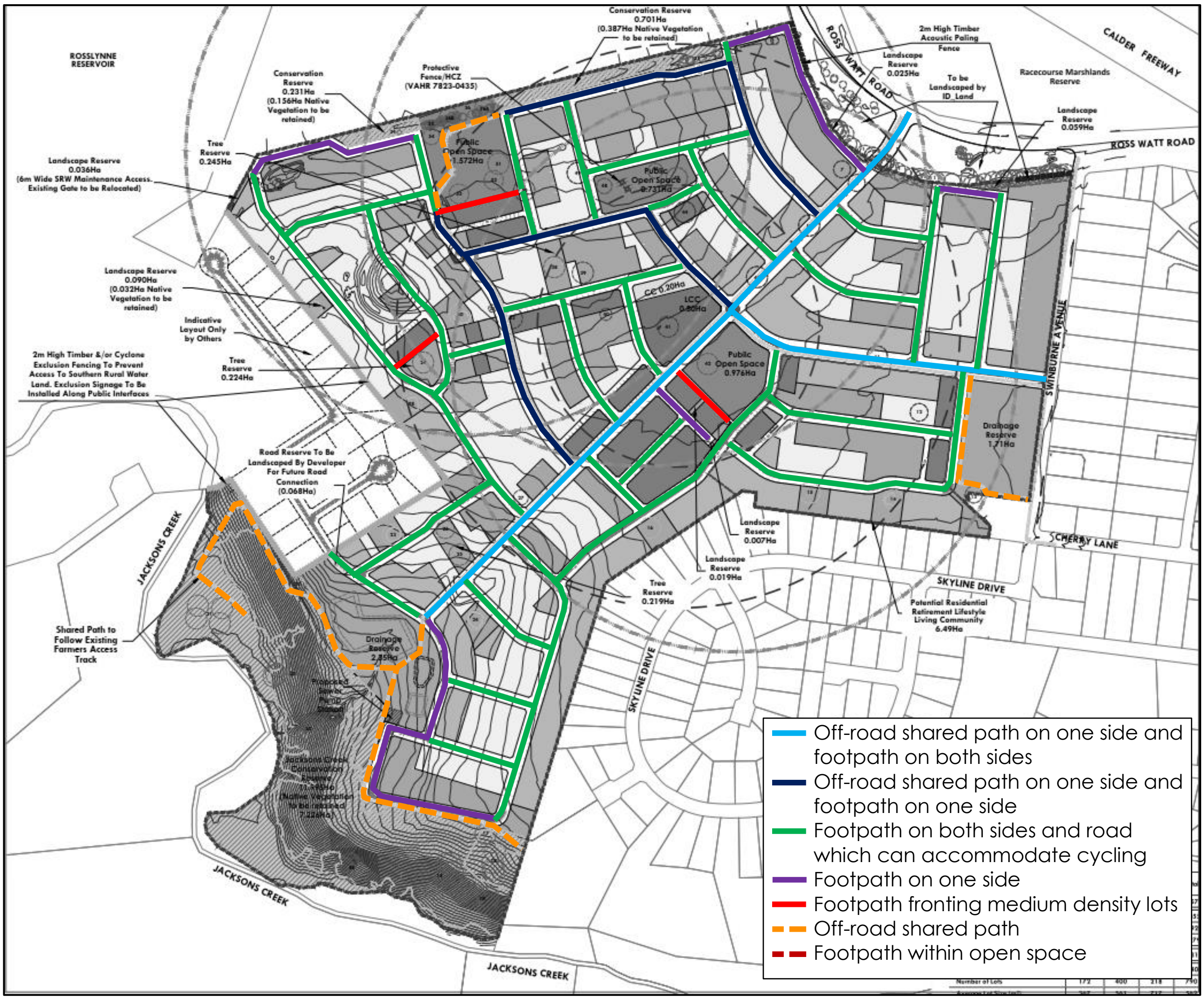
The proposed road network includes footpaths on both sides of all access streets and connector roads, with the exception of all roads adjacent to Jacksons Creek and the open spaces, where a footpath or shared path (subject to Council's shared path strategy) will be provided within the open space. In addition, the connector roads and the 20m modified local access street will be provided with an off-road shared path on one side of the road reserve which will supplement the footpaths on both sides of the road. Whilst the 18m modified local access street will be provided with an off-road shared path on one side of the road reserve in lieu of a standard footpath.

It is noted that laneways will not be provided with a dedicated footpath, as they will operate as a shared environment. At the frontage of the rear loaded lots, a footpath will be provided.

The proposed access streets are designed to form a low speed and low traffic volume network, which can comfortably accommodate bicycle movements on-road within their cross-sections.

The subject sites pedestrian and bicycle network is shown below in Figure 30.

Figure 30 Proposed Pedestrian and Bicycle Network



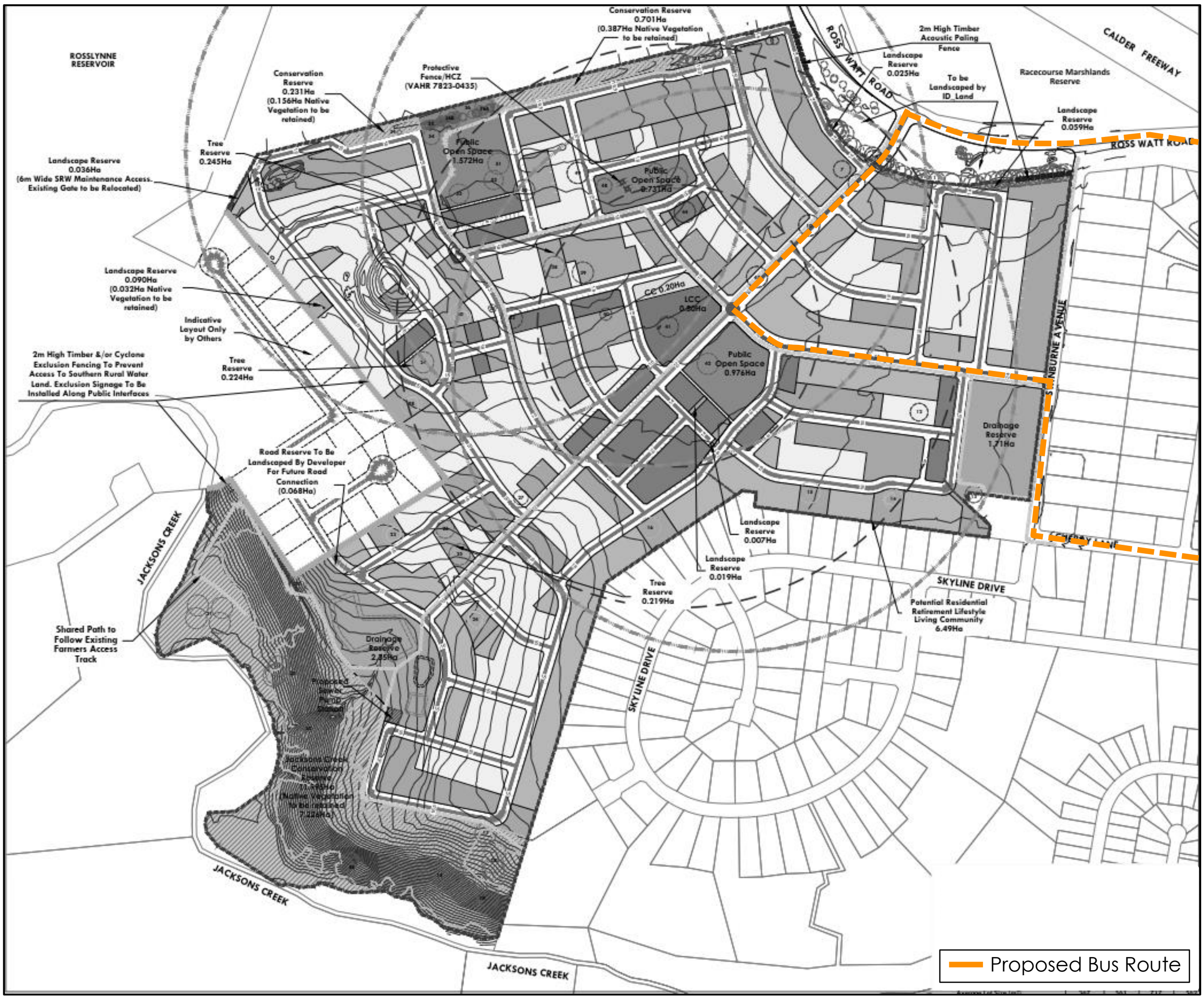
4.6 Public Transport

It is proposed for the connector road to have a 24m road reserve which is appropriately sized to accommodate any future bus routes.

The proposed bus capable connector road will provide access to Cherry Lane.

The proposed bus route will ensure that the entire development is situated within close proximity to public transport and is shown below in Figure 31.

Figure 31 Proposed Public Transport



5 ACCESS REVIEW

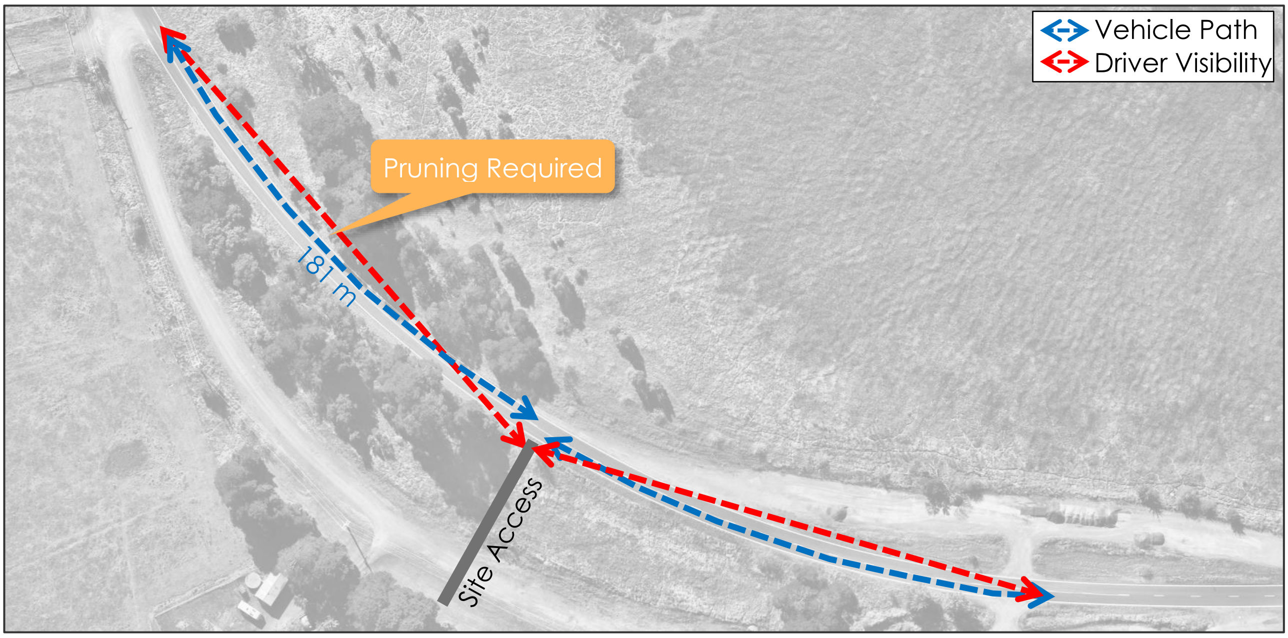
The development proposes a new intersection to Ross Watt Road which has a curved alignment in the vicinity of the subject site. To verify the suitability of the proposed T-intersection, a review has been undertaken with regard to sight distance and intersection configuration.

5.1 Sight Distances

A sight distance assessment has been undertaken with Austroads Guide to Road Design Part 4A, Table 3.2 which specifies that a 181 m safe intersection sight distance is required for an 80km/h road.

A SISD assessment is provided below for the T-intersection treatment at the Ross Watt Road site access. As shown, pruning would be required on the northern approach (within the road reserve) to meet the sight distance requirements.

Figure 32 Safe Intersection Sight Distance Assessment

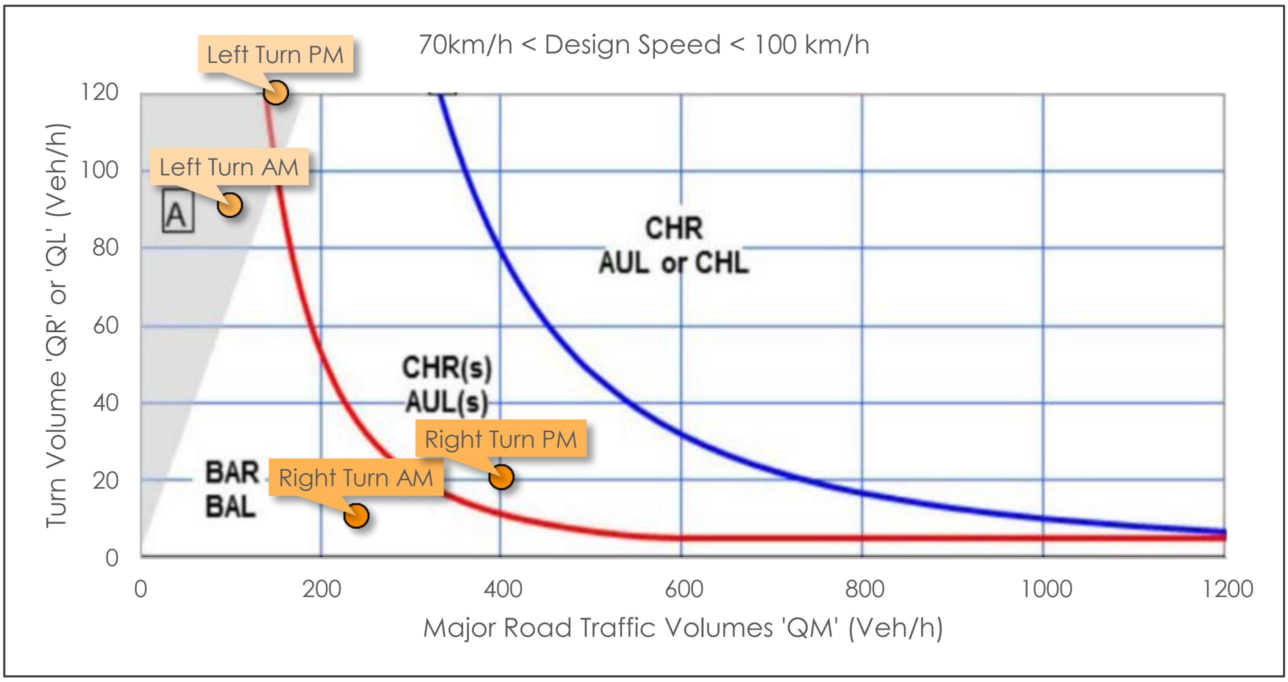


5.2 Austroads Turn Lane Warrants

In determining an appropriate intersection configuration, the anticipated post-development peak hour volumes were assessed against the turn lane treatment warrants specified in the *Austroads Guide to Traffic Management Part 6: Intersections, Interchanges and Crossings.*

Based on the anticipated post-development traffic volumes (as shown Figure 38 and Figure 39), the turn lane requirements for the Ross Watt Road access are demonstrated in Figure 33.

Figure 33 Austroads Turn Treatment Warrants



As identified in the figure above, the anticipated turning movements at the site access indicate that a short channelised right-turn treatment (CHR(S)) and a short auxiliary left-turn treatment (AUL(S)) would be required.

Based on the above assessment, a T-intersection configuration to Ross Watt Road is considered appropriate.

6 RESIDENTIAL SUBDIVISION DESIGN ASSESSMENT

6.1 General

The design of the proposed residential subdivision has been assessed, in relation to the Gisborne/New Gisborne Outline Development Plan and the Clause 56 of the Macedon Ranges Planning Scheme (Residential Subdivision).

6.2 Gisborne/New Gisborne Outline Development Plan

In reference to the ODP documents summarised in Section 3.1, the proposed road network is generally in accordance with the ODP, with an internal road network proposed which connects to both Ross Watt Road and Cherry Lane and comprising of local streets

Based on the above, the proposed residential subdivision is considered to be generally in accordance with the ODP.

6.3 Macedon Ranges Planning Scheme – Clause 56

Clause 56.06 identifies Access and Mobility Management requirements for residential subdivisions such as that proposed at the site. The following Clauses are applicable.

6.3.1 Clause 56.06-2, Walking and cycling network objectives

Standard C15

The walking and cycling network should be designed to:

- *Implement any relevant regional and local walking and cycling strategy, plan or policy for the area set out in this scheme.*
- *Link to any existing pedestrian and cycling networks.*
- *Provide safe walkable distances to activity centres, community facilities, public transport stops and public open spaces.*
- *Provide an interconnected and continuous network of safe, efficient and convenient footpaths, shared paths, cycle paths and cycle lanes based primarily on the network of arterial roads, neighbourhood streets and regional public open spaces.*
- *Provide direct cycling routes for regional journeys to major activity centres, community facilities, public transport and other regional activities and for regional recreational cycling.*
- *Ensure safe street and road crossings including the provision of traffic controls where required.*
- *Provide an appropriate level of priority for pedestrians and cyclists.*
- *Have natural surveillance along streets and from abutting dwellings and be designed for personal safety and security particularly at night.*
- *Be accessible to people with disabilities.*

The proposed development includes footpaths on both sides of all internal roads as well as providing off-street bicycle paths along the connector roads and modified local access streets.

Access streets are expected to have minimal traffic volumes and low speeds, and are considered suitable for cyclists.

All roads and paths are provided with natural surveillance. The proposed rear access laneways are short, with side abuttals to adjacent lots, enabling appropriate surveillance.

It is therefore considered that the subdivision satisfies the objectives of Clause 56.06-2.

6.3.2 Clause 56.06-3, Public transport network objectives

Standard C16

The public transport network should be designed to:

- *Implement any relevant public transport strategy, plan or policy for the area set out in this scheme.*
- *Connect new public transport routes to existing and proposed routes to the satisfaction of the relevant public transport authority.*
- *Provide for public transport links between activity centres and other locations that attract people using the Principal Public Transport Network in Metropolitan Melbourne and the regional public transport network outside Metropolitan Melbourne.*
- *Locate regional bus routes principally on arterial roads and locate local bus services principally on connector streets to provide:*
  - *Safe and direct movement between activity centres without complicated turning manoeuvres.*
  - *Direct travel between neighbourhoods and neighbourhood activity centres.*
  - *A short and safe walk to a public transport stop from most dwellings.*

The internal connector roads are designed to accommodate future public transport routes, ensuring that the entire development is situated within close proximity to public transport. Externally to the site, Cherry Lane is slated for an upgrade to a connector road, and Ross Watt Road has a sealed road width to accommodate bus movements.

It is therefore considered that the subdivision satisfies the objectives of Clause 56.06-3.

6.3.3 Clause 56.06-4, Neighbourhood street network objective

Standard C17

The neighbourhood street network must:

- *Take account of the existing mobility network of arterial roads, neighbourhood streets, cycle paths, cycle paths, footpaths and public transport routes.*
- *Provide clear physical distinctions between arterial roads and neighbourhood street types.*
- *Comply with the Roads Corporation's arterial road access management policies.*
- *Provide an appropriate speed environment and movement priority for the safe and easy movement of pedestrians and cyclists and for accessing public transport.*
- *Provide safe and efficient access to activity centres for commercial and freight vehicles.*
- *Provide safe and efficient access to all lots for service and emergency vehicles.*
- *Provide safe movement for all vehicles.*
- *Incorporate any necessary traffic control measures and traffic management infrastructure.*

The neighbourhood street network should be designed to:

- *Implement any relevant transport strategy, plan or policy for the area set out in this scheme.*

- *Include arterial roads at intervals of approximately 1.6 kilometres that have adequate reservation widths to accommodate long term movement demand.*
- *Include connector streets approximately halfway between arterial roads and provide adequate reservation widths to accommodate long term movement demand.*
- *Ensure connector streets align between neighbourhoods for direct and efficient movement of pedestrians, cyclists, public transport and other motor vehicles.*
- *Provide an interconnected and continuous network of streets within and between neighbourhoods for use by pedestrians, cyclists, public transport and other vehicles.*
- *Provide an appropriate level of local traffic dispersal.*
- *Indicate the appropriate street type.*
- *Provide a speed environment that is appropriate to the street type.*
- *Provide a street environment that appropriately manages movement demand (volume, type and mix of pedestrians, cyclists, public transport and other motor vehicles).*
- *Encourage appropriate and safe pedestrian, cyclist and driver behaviour.*
- *Provide safe sharing of access lanes and access places by pedestrians, cyclists and vehicles.*
- *Minimise the provision of culs-de-sac.*
- *Provide for service and emergency vehicles to safely turn at the end of a dead-end street.*
- *Facilitate solar orientation of lots.*
- *Facilitate the provision of the walking and cycling network, integrated water management systems, utilities and planting of trees.*
- *Contribute to the area's character and identity.*
- *Take account of any identified significant features.*

It is considered that the layout proposed and the cross-sections of internal roads is appropriate to promote safe and easy movement throughout the subdivision for all road users.

Furthermore, the proposed road network will provide adequate clearances to cater for the access requirements of service and emergency vehicles (e.g. typically up to a 9.8m truck).

The forecast daily traffic volumes for the internal subdivision roads will be well within the recommended volume limits specified in Table C1 of Clause 56.06.

To ensure speeds are controlled, street lengths are limited and where longer streets are required speed control devices are proposed to be implemented.

It is therefore considered that the subdivision generally satisfies the objectives of Clause 56.06-4.

6.3.4 Clause 56.06-5, Walking and cycling detail network objectives

Standard C18

Footpaths, shared paths, cycle paths and cycle lanes should be designed to:

- *Be part of a comprehensive design of the road or street reservation.*
- *Be continuous and connect.*
- *Provide for public transport stops, street crossings for pedestrians and cyclists and kerb crossovers for access to lots.*
- *Accommodate projected user volumes and mix.*
- *Meet the requirements of Table C1.*
- *Provide pavement edge, kerb, channel and crossover details that support safe travel for pedestrians, footpath bound vehicles and cyclists, perform required drainage functions and are structurally sound.*

- *Provide appropriate signage.*
- *Be constructed to allow access to lots without damage to the footpath or shared path surfaces.*
- *Be constructed with a durable, non-skid surface.*
- *Be of a quality and durability to ensure:*
  - *Safe passage for pedestrians, cyclists, footpath bound vehicles and vehicles.*
  - *Discharge of urban run-off.*
  - *Preservation of all-weather access.*
  - *Maintenance of a reasonable, comfortable riding quality.*
  - *A minimum 20 year life span.*
- *Be accessible to people with disabilities and include tactile ground surface indicators, audible signals and kerb ramps required for the movement of people with disabilities.*

The proposal includes continuous footpath connections along the proposed Access Streets and Connector Roads, generally satisfying the objectives of Clause 56.06-5. In addition, the Connector Roads and modified Access Street will have a shared path on one side of the road allowing safe travel for cyclists along the primary thoroughfares.

The Access Streets will be low speed environments and suitable for on road bicycle traffic.

Additionally, a shared path network may potentially be provided along the Jacksons Creek open space (subject to confirmation on Council's shared path strategy) allowing increased pedestrian and cyclist permeability throughout the site.

It is therefore considered that the subdivision satisfies the objectives of Clause 56.06-5.

6.3.5 Clause 56.06-6, Public transport network detail objectives

Standard C19

Bus priority measures must be provided along arterial roads forming part of the existing or proposed Principal Public Transport Network in Metropolitan Melbourne and the regional public transport network outside Metropolitan Melbourne to the requirements of the relevant roads authority.

Road alignment and geometry along bus routes should provide for the efficient, unimpeded movement of buses and the safety and comfort of passengers.

The design of public transport stops should not impede the movement of pedestrians.

Bus and tram stops should have:

- *Surveillance from streets and adjacent lots.*
- *Safe street crossing conditions for pedestrians and cyclists.*
- *Safe pedestrian crossings on arterial roads and at schools including the provision of traffic controls as required by the roads authority.*
- *Continuous hard pavement from the footpath to the kerb.*
- *Sufficient lighting and paved, sheltered waiting areas for forecast user volume at neighbourhood centres, schools and other locations with expected high patronage.*
- *Appropriate signage.*

The connector roads have been designed to cater for buses, satisfying the objectives of Clause 56.06-6.

6.3.6 Clause 56.06-7, Neighbourhood street network detail objective

Standard C20

The design of streets and roads should:

- *Meet the requirements of Table C1. Where the widths of access lanes, access places, and access streets do not comply with the requirements of Table C1, the requirements of the relevant fire authority and roads authority must be met.*
- *Provide street blocks that are generally between 120 metres and 240 metres in length and generally between 60 metres to 120 metres in width to facilitate pedestrian movement and control traffic speed.*
- *Have verges of sufficient width to accommodate footpaths, shared paths, cycle paths, integrated water management, street tree planting, lighting and utility needs.*
- *Have street geometry appropriate to the street type and function, the physical land characteristics and achieve a safe environment for all users.*
- *Provide a low-speed environment while allowing all road users to proceed without unreasonable inconvenience or delay.*
- *Provide a safe environment for all street users applying speed control measures where appropriate.*
- *Ensure intersection layouts clearly indicate the travel path and priority of movement for pedestrians, cyclists and vehicles.*
- *Provide a minimum 5 metre by 5 metre corner splay at junctions with arterial roads and a minimum 3 metre by 3 metre corner splay at other junctions unless site conditions justify a variation to achieve safe sight lines across corners.*
- *Ensure streets are of sufficient strength to:*
  - Enable the carriage of vehicles.
  - Avoid damage by construction vehicles and equipment.
- *Ensure street pavements are of sufficient quality and durability for the:*
  - Safe passage of pedestrians, cyclists and vehicles.
  - Discharge of urban run-off.
  - Preservation of all-weather access and maintenance of a reasonable, comfortable riding quality.
- *Ensure carriageways of planned arterial roads are designed to the requirements of the relevant road authority.*
- *Ensure carriageways of neighbourhood streets are designed for a minimum 20 year life span.*
- *Provide pavement edges, kerbs, channel and crossover details designed to:*
  - Perform the required integrated water management functions.
  - Delineate the edge of the carriageway for all street users.
  - Provide efficient and comfortable access to abutting lots at appropriate locations.
  - Contribute to streetscape design.
- *Provide for the safe and efficient collection of waste and recycling materials from lots.*
- *Be accessible to people with disabilities.*
- *Meet the requirements of Table C1. Where the widths of access lanes, access places, and access streets do not comply with the requirements of Table C1, the requirements of the relevant fire authority and roads authority must be met. Where the widths of connector streets do not comply with the requirements of Table C1, the requirements of the relevant public transport authority must be met.*

A street detail plan should be prepared that shows, as appropriate:

- *The street hierarchy and typical cross-sections for all street types.*
- *Location of carriageway pavement, parking, bus stops, kerbs, crossovers, footpaths, tactile surface indicators, cycle paths and speed control and traffic management devices.*
- *Water sensitive urban design features.*
- *Location and species of proposed street trees and other vegetation.*
- *Location of existing vegetation to be retained and proposed treatment to ensure its health.*
- *Any relevant details for the design and location of street furniture, lighting, seats, bus stops, telephone boxes and mailboxes.*

Table C1 Design of roads and neighbourhood streets

Element	Access Lane	Access Place	Access Street – Level 1	Access Street – Level 2	Connector Street – Level 1	Connector Street – Level 2
Traffic Volume	300 vpd	300-1000 vpd	1000-2000 vpd	2000-3000 vpd	3000 vpd	3000-7000 vpd
Target Speed	10 km/h	15 km/h	30 km/h	40 km/h	50 km/h (40 km/h at schools, 20km/h at crossing points)	60 km/h or 50 km/h (40 km/h at schools)
Carriageway Width	5.5m	5.5m	5.5m	7 – 7.5m	3.5m per lane (4.0m at intersections)	3.5m per lane (4.0m at intersections)
Parking Within Street	None	1 verge space per 2 lots, or one-side on carriageway	1 verge space per 2 lots	Both sides	Dedicated lane 2.3m where required	Dedicated lane 2.3m where required
Verge Width	Not required	7.5m (3.5m / 2.5m min)	4.0 / 4.0m	4.5 / 4.5m	4.5 / 4.5m	6.0 / 6.0m
Footpath Provision	Shared Zone	1.5m (Not required if < 5 dwellings)	2 x 1.5m (2.0m at schools, shop, activity centre)	2 x 1.5m (2.0m at schools, shop, activity centre)	2 x 1.5m (2.0m at schools, shop, activity centre)	2 x 1.5m (2.0m at schools, shop, activity centre)
Cycle Path Provision	None	None	Shared Zone	Shared Zone	0.7 - 1.7m	0.7 - 1.7m or shared path

Appropriate splays are provided on the corner of intersections.

Road cross-sections are generally in accordance with Table C1 of the Planning Scheme.

It is therefore considered that the subdivision satisfies the objectives of Clause 56.06-7.

6.3.7 Clause 56.06-8, Lot access objective

Standard C21

Vehicle access to lots abutting arterial roads should be provided from service roads, side or rear access lanes, access places or access streets where appropriate and in accordance with the access management requirements of the relevant roads authority.

Vehicle access to lots of 300 square metres or less in area and lots with a frontage of 7.5 metres or less should be provided via rear or side access lanes, places or streets.

The design and construction of a crossover should meet the requirements of the relevant road authority.

No lots are provided with direct access to an arterial road, and all lots with a frontage of less than 7.5m are provided with rear access.

Whilst some lots are less than 300m^2 in area (north of the Public Open Space), they have a frontage of greater than 7.5 metres, and therefore access via the frontage road is considered to be appropriate.

It is therefore considered that the subdivision satisfies the objectives of Clause 56.06-8.

7 TRAFFIC

7.1 Traffic Generation

7.1.1 Residential Subdivision

Considering the size of the lots proposed and the proximity of the site to public transport, it is anticipated that the proposed development may initially generate up to 9 vehicle trips per day per lot. Following full development of the area, including recreational facilities, retail developments and public transport routes, a reduction in traffic generation is expected.

Application of the above traffic generation rates to the maximum lot yield of 800 lots equates to a total traffic generation of approximately 7,200 vehicle trips per day, and approximately 720 vehicle trips per hour during both the AM and PM peak hours.

Traffic volumes generated by residential uses is typically tidal, with the majority of movements generated during the AM peak hour occurring in the outbound direction and the majority of movements during the PM peak hour occurring in the inbound direction.

For the purposes of this assessment, the following directional splits will be adopted:

- AM peak hour: 70% outbound, 30% inbound; and
- PM peak hour: 40% outbound, 60% inbound.

The peak hour traffic volumes anticipated to be generated by the proposed residential subdivision are outlined in Table 4.

Table 4 Anticipated Peak Hour Traffic Generation

Period	Outbound	Inbound	Two-Way
AM Peak Hour	504	216	720
PM Peak Hour	288	432	720

7.1.2 Lifestyle Community Village

As mentioned in Section 4, a lifestyle community village may ultimately be provided on a portion the site, subject to a future and separate planning application. It is envisaged that the lifestyle village may accommodate 180-190 lifestyle dwellings which would replace 100 standard density lots that are currently proposed on-site.

Reference is made to traffic volume surveys undertaken by Traffix Group at the existing Lifestyle Village in Bittern. The Lifestyle Village in Bittern is very similar to the proposed Lifestyle Village in Gisborne, and provides 210 independent living units for over 55s, in addition to private community facilities. The traffic surveys were undertaken between 5th February and 11th February 2020, at the access point to the site, which contained 210 completed dwellings, however only 202 dwellings were occupied at the time of the surveys. The results of the traffic study of the existing Lifestyle Village in Bittern are summarised in Table 5.

Table 5 Surveyed Traffic Generation Rate – Existing Lifestyle Village Site

Period	Inbound	Outbound	Total
AM Peak Hour	0.07	0.15	0.22
PM Peak Hour	0.15	0.07	0.22
Daily	1.72	1.71	3.43

Applying the above rates to the potential 190 lifestyle dwellings gives the anticipated traffic generation below.

Table 6 Residential Village Traffic Generation

Period	Inbound	Outbound	Total
AM Peak Hour	13	29	42
PM Peak Hour	29	13	42
Daily	326	325	651

As shown above, delivering 190 lifestyle dwellings on-site will generate in the order of 651 vehicle movements per day. Comparatively, applying the traffic generation rate of 9 movements per dwellings to 100 standard density residential lots results in a total traffic generation of 900 movements per day.

Noting the above, the site is expected to generate less vehicle movements if a portion of the site was delivered as a lifestyle village. Therefore, the standard density total traffic generation will be adopted for the below analysis.

7.2 Traffic Distribution

The adopted traffic distribution has been derived using the existing traffic volumes shown in 2.4.1. The traffic volumes showed that traffic along the external road network is distributed as follows:

- 5% west along Ross Watt Road;
- 51% south along Station Road; and
- 44% north along Station Road.

North of Ross Watt Road, the traffic has been distributed generally in accordance with the existing traffic distribution onto Calder Freeway.

7.3 Generated Traffic Volumes

Based on the above, the expected traffic volumes generated by the development for AM and PM peak periods are shown below in Figure 34 and Figure 35.

Figure 34 Generated Traffic Volumes – AM Peak

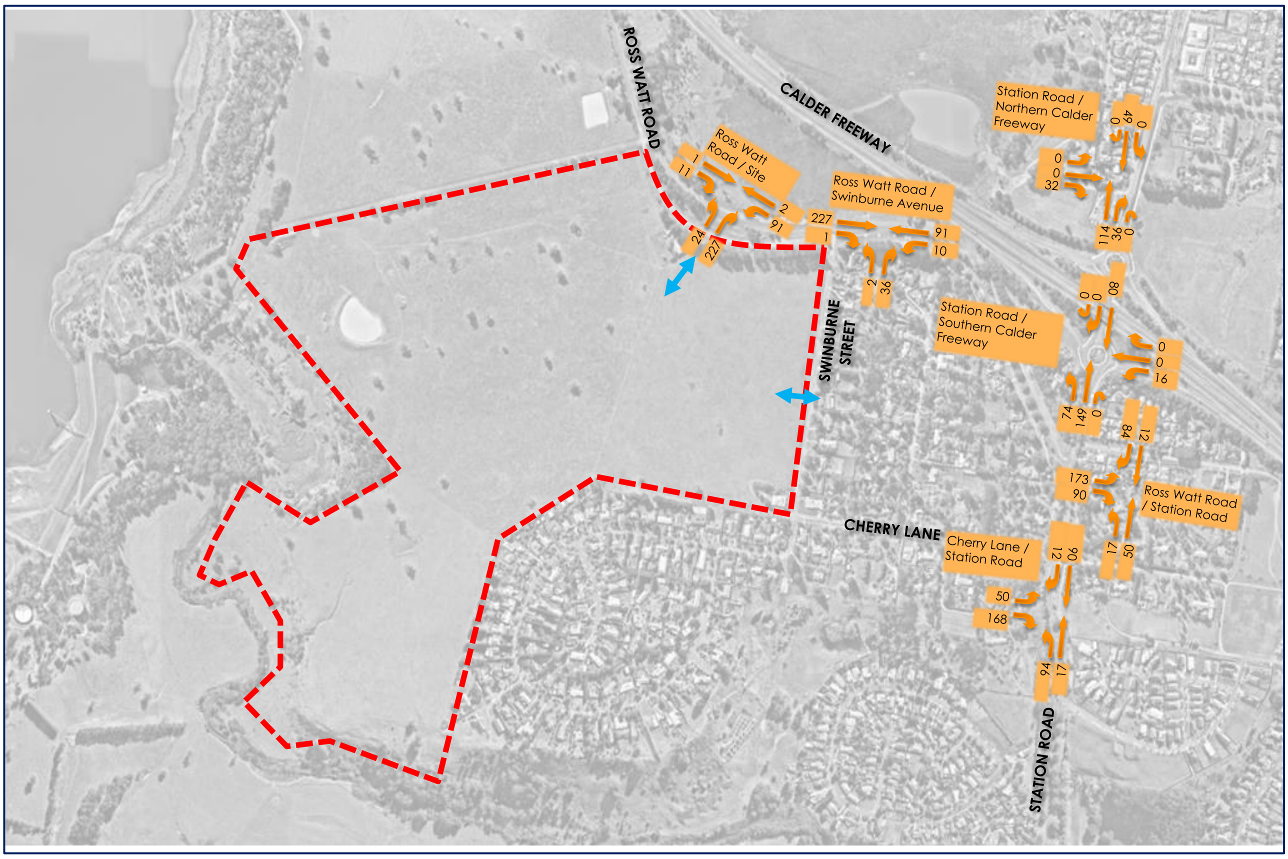
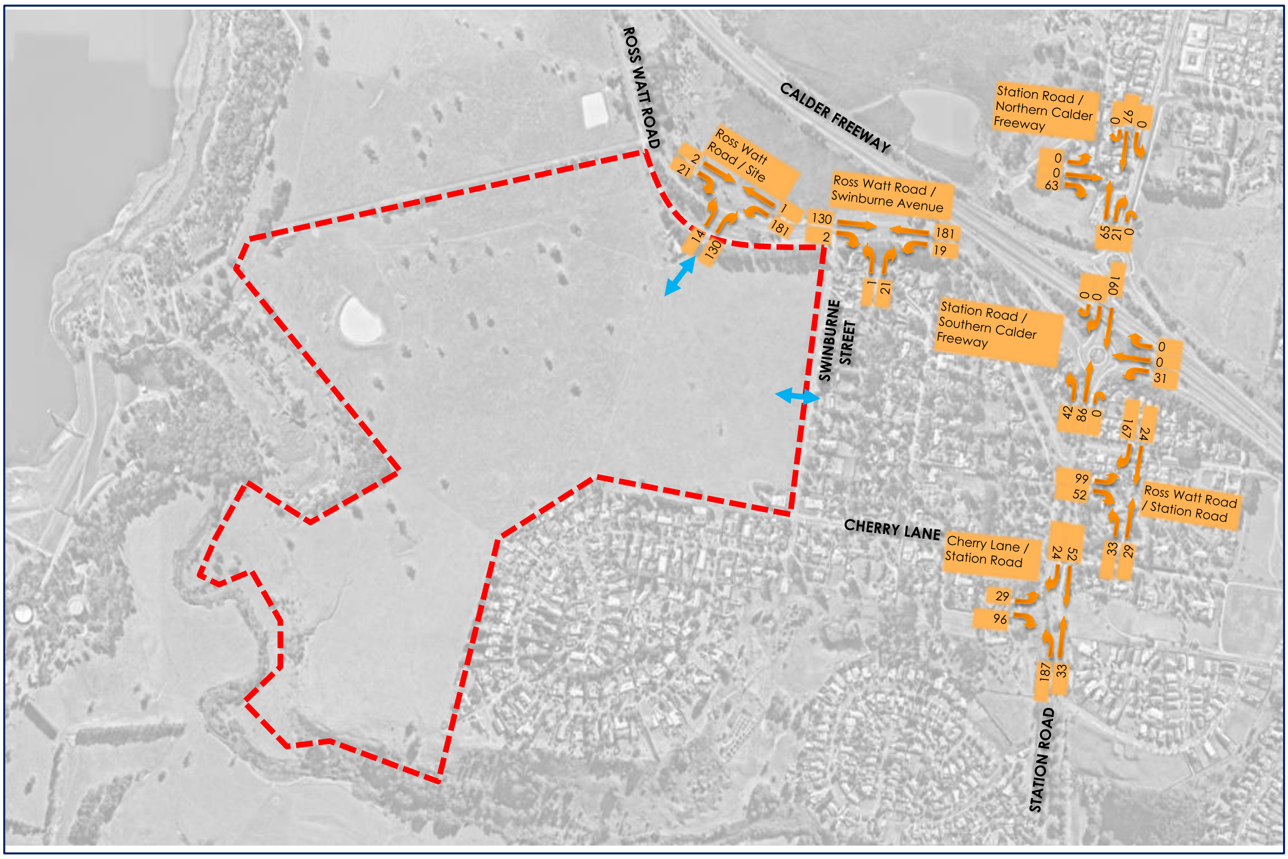


Figure 35 Generated Traffic Volumes – PM Peak



7.4 Expected Traffic Volume Growth

To confirm that the operation of surrounding intersections will operate appropriately into the future, it is considered appropriate to include future traffic volume growth.

It is noted that the Cardno report (ref: V180578) contemplates several significant road upgrades in the vicinity which will significantly impact the operation of Station Road, these include the duplication of Station Road. In addition, several other residential developments are proposed or under construction within Gisborne.

Noting the above, a growth rate of 2% per year (compound) has been applied to the existing traffic volumes along Station Road and Ross Watt Road over a 15-year period, equivalent to a 34.6% increase in traffic volumes respectively. The 15-year period equates to 5 years of development and 10 years post-development. The 2% growth rate and 15-year analysis is as agreed with the Department of Transport at meetings held between **one**mile**grid** and the Department of Transport.

It is expected that no traffic growth is required for Swinburne Avenue and Cherry Lane, as the area is fully developed apart from the subject site's land which will be included in the analysis regardless.

The below traffic volumes are based on the modified 2022 traffic volumes previously shown in Figure 7.

Based on the above, the existing traffic volumes with growth are shown below in the figures below.

Figure 36 Traffic Volumes with 15yr Growth – AM Peak

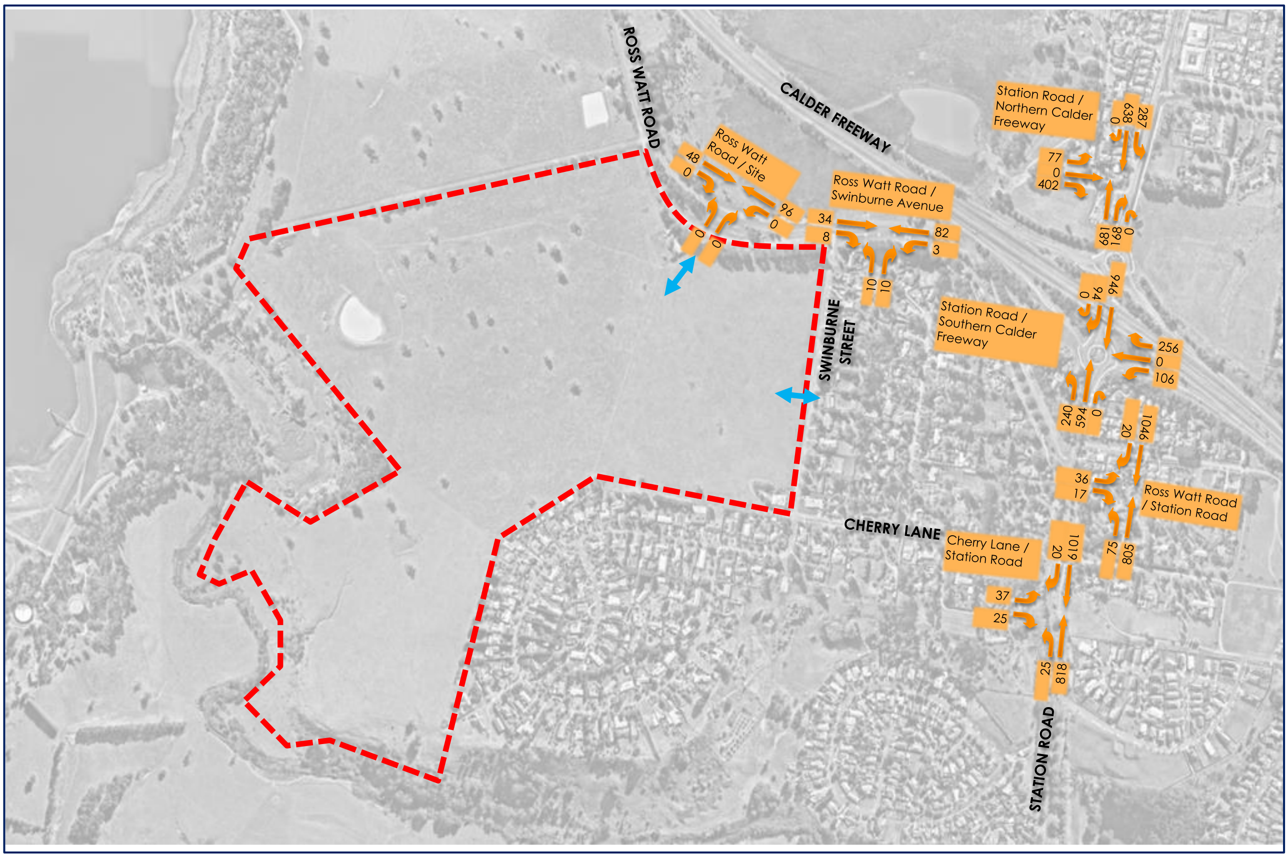
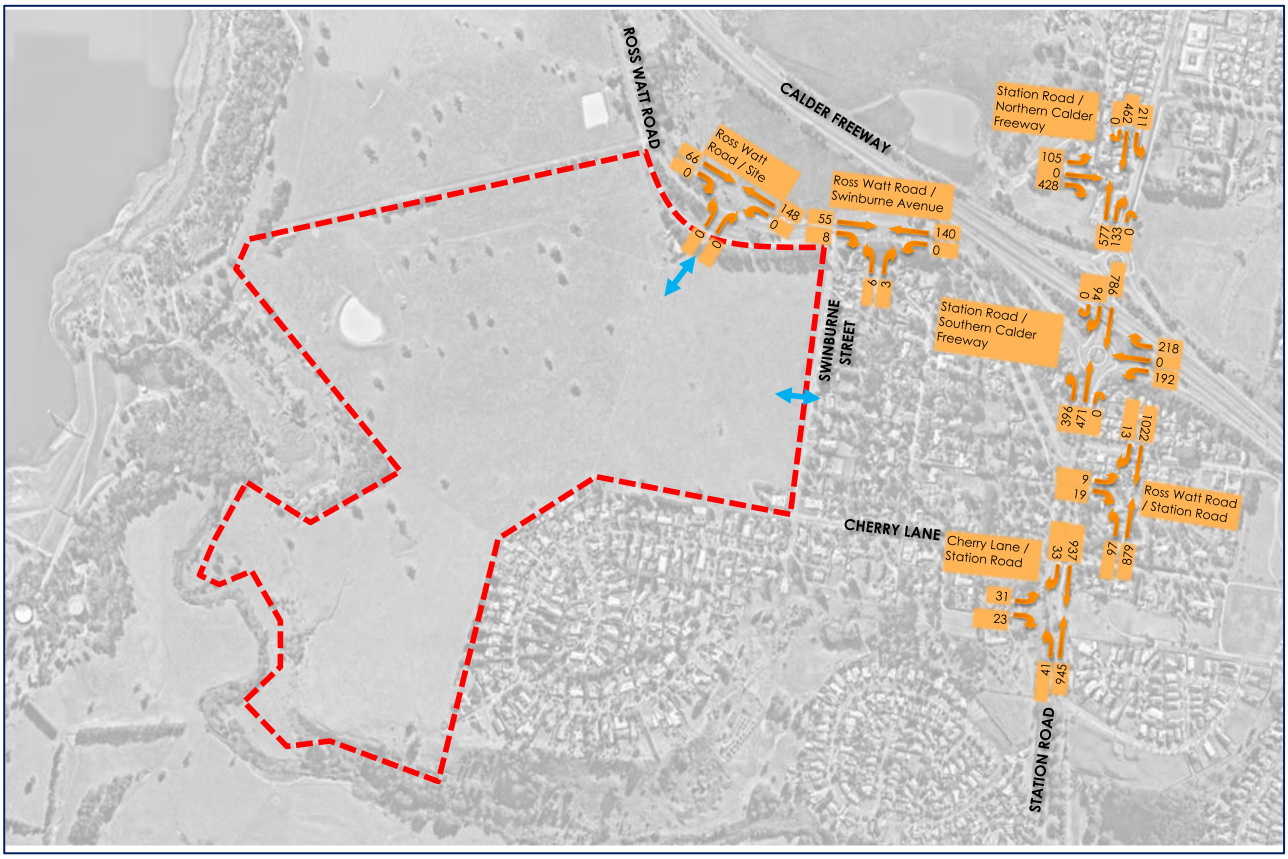


Figure 37 Traffic Volumes with 15yr Growth – PM Peak



7.5 Resultant Future Traffic Volumes

Based on the above, the future volumes at intersections within the vicinity of the site can be calculated by combining the existing volumes with the expected traffic volume growth, and superimposing the traffic anticipated to be generated by the proposed development.

The resultant peak hour traffic volumes are shown in the figure below.

Figure 38 Resultant Future Traffic Volumes with 15yr Growth – AM Peak

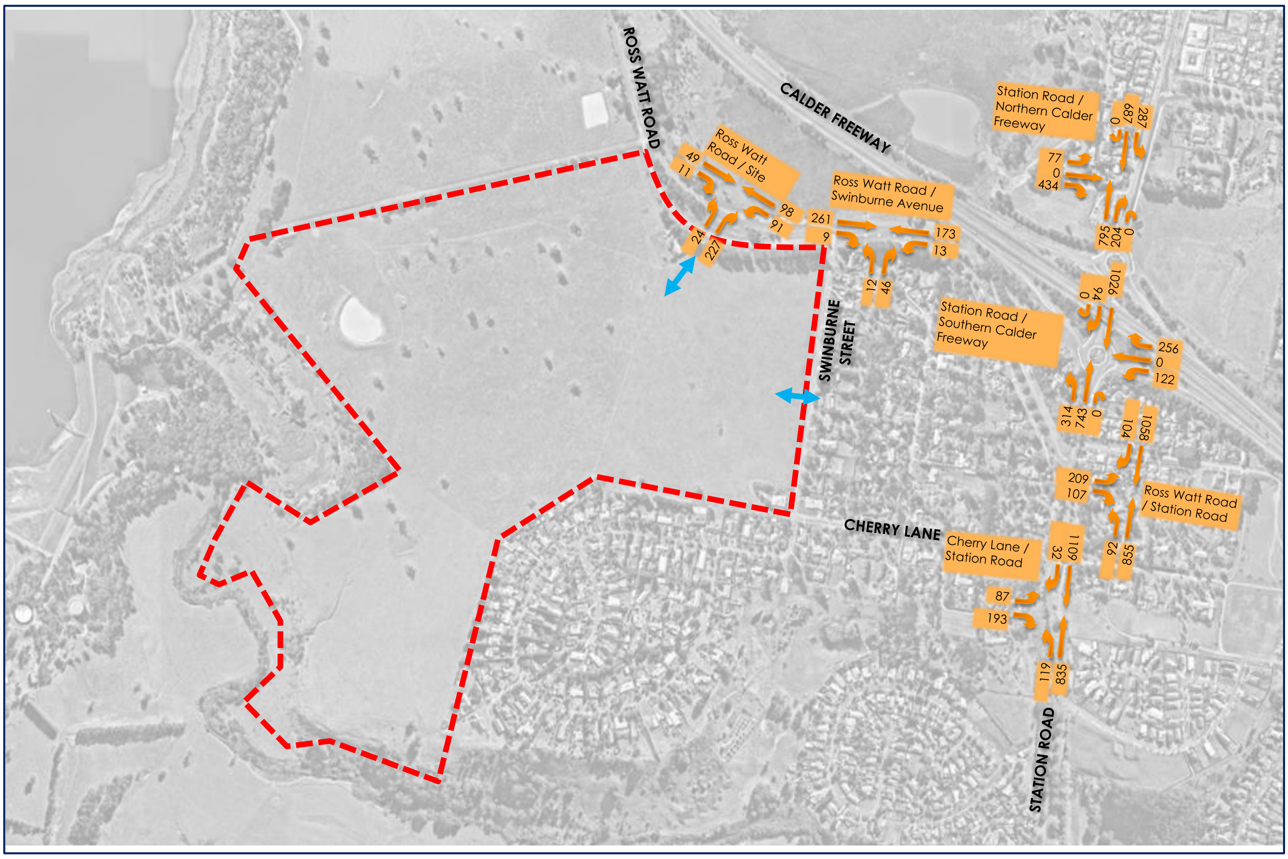
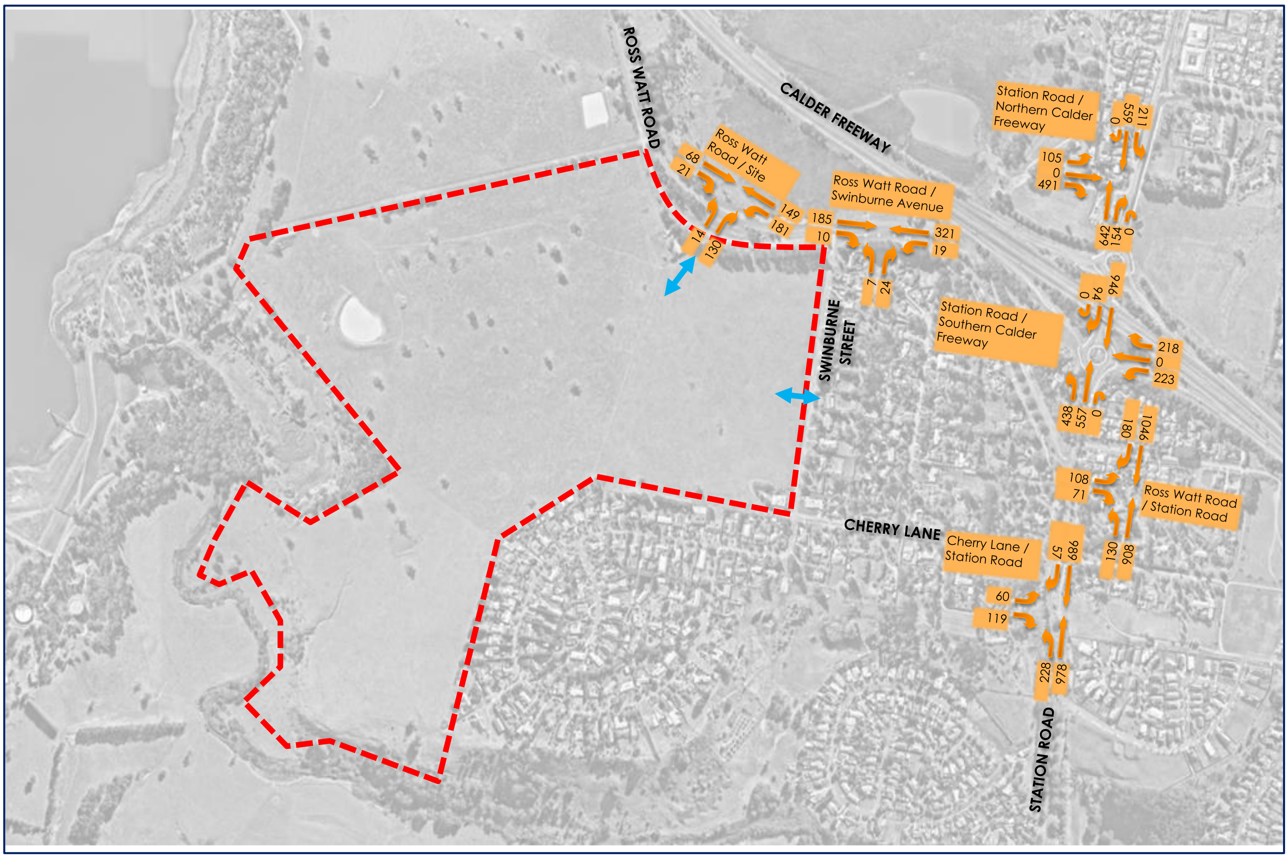


Figure 39 Resultant Future Traffic Volumes with 15yr Growth – PM Peak



7.6 Traffic Impact

7.6.1 Overview

Given the proximity of the Station Road / Cherry Lane, Station Road / Ross Watt Road and the Station Road / Calder Freeway intersections, the four intersections have been modelled as a network model to accommodate any capacity reductions caused by downstream queueing effects.

It is noted that much of the traffic travelling through these intersections are associated with background general traffic rather than specifically development generated traffic. In this regard, an assessment of the operation of the intersections in the vicinity of the site has been undertaken firstly assessing the base conditions over a 15-year horizon without development and then the ultimate configuration of the intersections over a 15-year horizon with development.

7.6.2 Intersection Capacity Assessment

To assess the operation of the intersections the future traffic volumes have been input into SIDRA Intersection, a traffic modelling software package.

The SIDRA Intersection software package has been developed to provide information on the capacity of an intersection with regard to a number of parameters. Those parameters considered relevant are, Degree of Saturation (DoS), 95th Percentile Queue, and Average Delay as described below.

Table 7 SIDRA Intersection Parameters

<table>
<tr><th>Parameter</th><th>Description</th></tr>
<tr><td>Degree of Saturation (DoS)</td><td>The DoS represents the ratio of the traffic volume making a particular movement compared to the maximum capacity for that particular movement. The value of the DoS has a corresponding rating depending on the ratio as shown below.
<table>
<tr><th>Degree of Saturation</th><th>Rating</th></tr>
<tr><td>Up to 0.60</td><td>Excellent</td></tr>
<tr><td>0.61 – 0.70</td><td>Very Good</td></tr>
<tr><td>0.71 – 0.80</td><td>Good</td></tr>
<tr><td>0.81 – 0.90</td><td>Fair</td></tr>
<tr><td>0.91 – 1.00</td><td>Poor</td></tr>
<tr><td>Above 1.00</td><td>Very Poor</td></tr>
</table>
It is noted that whilst the range of 0.91 – 1.00 is rated as ‘poor’, it is acceptable for critical movements at an intersection to be operating within this range during high peak periods, reflecting actual conditions in a significant number of suburban signalised intersections.</td></tr>
<tr><td>Average Delay (seconds)</td><td>Average delay is the time delay that can be expected for all vehicles undertaking a particular movement in seconds.</td></tr>
<tr><td>95th Percentile (95%ile) Queue</td><td>95%ile queue represents the maximum queue length in metres that can be expected in 95% of observed queue lengths in the peak hour</td></tr>
</table>

7.6.2.1 Growth Only

Prior to analysing the proposed developments impact on the existing intersections in the vicinity. It is considered necessary to analyse the existing intersections with growth applied. The results of the analysis using the 15-year growth traffic volumes shown in Figure 36 and Figure 37 are shown below for the critical intersections in the vicinity. Detailed SIDRA results are attached in Appendix D.

Table 8 SIDRA 15 Year Growth Conditions – Ross Watt Rd / Station Rd

Approach	Existing Conditions			Growth Only		
	DoS	Avg Delay (sec)	Queue (m)	DoS	Avg Delay (sec)	Queue (m)
AM Peak						
Station Road - South	0.363	0.5	0	0.480	0.5	0
Station Road – North	0.430	0.2	0.5	0.579	0.3	1.0
Ross Watt Road - West	0.143	19.5	2.8	0.783	90.0	15.8
PM Peak						
Station Road – South	0.403	0.6	0	0.536	0.6	0
Station Road - North	0.420	0.2	0.4	0.566	0.3	0
Ross Watt Road - West	0.166	33.8	3.3	0.968	245.9	23.3

Table 9 SIDRA 15 Year Growth Conditions – Station Rd / Cherry Ln

Approach	Existing Conditions			Growth Only		
	DoS	Avg Delay (sec)	Queue (m)	DoS	Avg Delay (sec)	Queue (m)
AM Peak						
Station Road - South	0.332	0.3	0	0.453	0.3	0
Station Road - North	0.414	0.3	0.8	0.554	0.3	1.2
Cherry Lane - West	0.420	34.2	10.1	1.736	784.5	142.7
PM Peak						
Station Road - South	0.389	0.4	0	0.523	0.5	0
Station Road - North	0.385	0.5	1.6	0.519	0.6	2.6
Cherry Lane - West	0.389	35.5	9.3	1.673	745.3	121.3

Table 10 SIDRA 10 Year Growth Conditions – Station Rd / Calder FWY Westbound Ramp

Approach	Existing Conditions			Growth Only		
	DoS	Avg Delay (sec)	Queue (m)	DoS	Avg Delay (sec)	Queue (m)
AM Peak						
Station Road - South	0.254	3.8	8.8	0.358	4.2	13.6
Calder Freeway Off-ramp - East	0.135	10.2	4.0	0.201	11.6	6.6
Station Road - North	0.308	3.9	0	0.415	4.3	0
PM Peak						
Station Road - South	0.259	3.8	9.1	0.362	4.2	13.8
Calder Freeway Off-ramp - East	0.146	8.9	4.3	0.214	10.2	6.8
Station Road - North	0.261	3.9	0	0.351	4.2	0

Table 11 SIDRA 10 Year Growth Conditions – Station Rd / Calder FWY Eastbound Ramp

Approach	Existing Conditions			Growth Only		
	DoS	Avg Delay (sec)	Queue (m)	DoS	Avg Delay (sec)	Queue (m)
AM Peak						
Station Road - South	0.197	4.2	0	0.263	4.2	0
Station Road - North	0.307	4.4	10.9	0.450	5.2	18.6
Calder Freeway Off-ramp - West	0.167	10.1	4.6	0.239	10.7	7.1
PM Peak						
Station Road - South	0.165	4.1	0	0.220	4.1	0
Station Road - North	0.223	4.2	7.3	0.325	4.8	11.7
Calder Freeway Off-ramp - West	0.179	9.7	5.0	0.255	10.2	7.6

As shown above, the Calder Freeway interchanges are expected to operate under 'excellent' conditions with 15 years growth. Whilst the Station Road / Cherry Lane intersection will operate under 'very poor' conditions with a degree of saturation in excess of 1.6 in both the AM and PM peak hour, with an average delay in excess of 12 minutes on the western approach during both the AM and PM peak hour. In addition, the Station Road / Ross Watt Road intersection will operate under 'poor' conditions with a degree of saturation in excess of 0.9 during the PM peak hour, with an average delay in excess of four minutes on the western approach during both the AM and PM peak hour.

Noting the above, the Cherry Lane / Station Road and Ross Watt Road / Station Road intersections are unable to accommodate 15-year growth in the vicinity and should effectively be upgraded without the site generated traffic due to the high through traffic growth along Station Road which impacts the ability for motorists to exit from Cherry Lane and Ross Watt Road.

7.6.2.2 Post-Development Conditions - Ultimate

onemile**grid** has investigated the following potential intersection upgrades along Station Road to accommodate the traffic growth in the area, as well as the subject site's development.

- Option 1 – Roundabout at the intersection of Station Road / Cherry Lane and Station Road / Ross Watt Road.
- Option 2 – Signals at the intersection of Station Road / Cherry Lane and Station Road / Ross Watt Road / Morrow Road.
- Option 3 – Roundabout at the intersection of Station Road / Cherry Lane and signals at the intersection of Station Road / Ross Watt Road / Morrow Road.
- Option 4 – Signals at the intersection of Station Road / Cherry Lane and roundabout at the intersection of Station Road / Ross Watt Road.

In addition, as mentioned earlier in this report, Station Road does not have the capacity to manage future growth along the road and therefore has been assumed to be duplicated for the ultimate traffic analysis.

It is noted that the green split priority has been enabled for several of the through movements at the signalised intersections to prioritise through movements on the major roads.

The results of the analysis are provided below and the detailed SIDRA results are attached in Appendix D.

Table 12 SIDRA Post-Development Conditions (15 Yr Growth) – Ross Watt Rd / Site Access

Approach	Existing Conditions			Future Conditions (10 Year Growth)		
	DoS	Avg Delay (sec)	Queue (m)	DoS	Avg Delay (sec)	Queue (m)
AM Peak						
Site Access - South	N/A	N/A	N/A	0.244	6.4	6.7
Ross Watt Road - East	N/A	N/A	N/A	0.106	2.7	0
Ross Watt Road - West	N/A	N/A	N/A	0.035	1.3	0.5
PM Peak						
Site Access - South	N/A	N/A	N/A	0.159	7.0	4.0
Ross Watt Road - East	N/A	N/A	N/A	0.186	3.1	0
Ross Watt Road - West	N/A	N/A	N/A	0.055	2.0	1.2

Table 13 SIDRA Post-Development Conditions (15 Yr Growth) – Ross Watt Rd/Swinburne Ave

Approach	Existing Conditions			Future Conditions (10 Year Growth)		
	DoS	Avg Delay (sec)	Queue (m)	DoS	Avg Delay (sec)	Queue (m)
AM Peak						
Swinburne Avenue - South	0.016	5.8	0.4	0.069	7.3	1.6
Ross Watt Road - East	0.035	0.3	0	0.102	0.4	0
Ross Watt Road - West	0.019	1.4	0.3	0.149	0.2	0.5
PM Peak						
Swinburne Avenue - South	0.007	5.9	0.2	0.041	7.7	0.9
Ross Watt Road - East	0.057	0.1	0	0.186	0.4	0
Ross Watt Road - West	0.028	1	0.4	0.110	0.5	0.7

As shown above, the site access to Ross Watt Road will operate with excellent conditions. In addition, the intersection of Ross Watt Road / Swinburne Avenue will also operate under excellent conditions.

Table 14 SIDRA Post-Dev Conditions (15 Yr Growth) – Station Rd / Calder FWY E'Bnd Ramp

Approach	Existing Conditions			Future Conditions (Option 1)			Future Conditions (Option 2)			Future Conditions (Option 3)			Future Conditions (Option 4)		
	DoS	Avg Delay (sec)	Queue (m)	DoS	Avg Delay (sec)	Queue (m)	DoS	Avg Delay (sec)	Queue (m)	DoS	Avg Delay (sec)	Queue (m)	DoS	Avg Delay (sec)	Queue (m)
AM Peak															
Station Road - South	0.197	4.2	0	0.312	4.2	0	0.312	4.2	0	0.312	4.2	0	0.312	4.2	0
Station Road - North	0.307	4.4	10.9	0.493	5.7	19.7	0.493	5.7	19.7	0.493	5.7	19.7	0.493	5.7	19.7
Calder Freeway Off-ramp - West	0.167	10.1	4.6	0.267	11.2	8.1	0.267	11.2	8.1	0.267	11.2	8.1	0.267	11.2	8.1
PM Peak															
Station Road - South	0.165	4.1	0	0.249	4.2	0	0.249	4.2	0	0.249	4.2	0	0.249	4.2	0
Station Road - North	0.223	4.2	7.3	0.389	5.1	13.0	0.389	5.1	13.0	0.389	5.1	13.0	0.389	5.1	13.0
Calder Freeway Off-ramp - West	0.179	9.7	5.0	0.294	10.6	8.9	0.294	10.6	8.9	0.294	10.6	8.9	0.294	10.6	8.9

Table 15 SIDRA Post-Dev Conditions (15 Yr Growth) – Station Rd / Calder FWY W'Bnd Ramp

Approach	Existing Conditions			Future Conditions (Option 1)			Future Conditions (Option 2)			Future Conditions (Option 3)			Future Conditions (Option 4)		
	DoS	Avg Delay (sec)	Queue (m)	DoS	Avg Delay (sec)	Queue (m)	DoS	Avg Delay (sec)	Queue (m)	DoS	Avg Delay (sec)	Queue (m)	DoS	Avg Delay (sec)	Queue (m)
AM Peak															
Station Road - South	0.254	3.8	8.8	0.456	4.4	18.9	0.456	4.4	16.9	0.456	4.4	16.9	0.456	4.4	18.9
Calder Freeway Off-ramp - East	0.135	10.2	4.0	0.205	10.3	6.1	0.205	10.3	6.1	0.205	10.3	6.1	0.205	10.3	6.1
Station Road - North	0.308	3.9	0	0.350	3.4	0	0.354	3.4	0	0.350	3.4	0	0.350	3.4	0
PM Peak															
Station Road - South	0.259	3.8	9.1	0.420	4.3	17.1	0.420	4.3	15.4	0.420	4.3	15.2	0.420	4.3	17.1
Calder Freeway Off-ramp - East	0.146	8.9	4.3	0.234	9.0	7.0	0.241	9.0	6.8	0.241	9.0	6.8	0.234	9.0	7.0
Station Road - North	0.261	3.9	0	0.325	3.5	0	0.340	3.5	0	0.340	3.5	0	0.325	3.5	0

Option 1 – Roundabout at the intersection of Station Road / Cherry Lane and Station Road / Ross Watt Road.
Option 2 – Signals at the intersection of Station Road / Cherry Lane and Station Road / Ross Watt Road / Morrow Road.
Option 3 – Roundabout at the intersection of Station Road / Cherry Lane and signals at the intersection of Station Road / Ross Watt Road / Morrow Road .
Option 4 – Signals at the intersection of Station Road / Cherry Lane and roundabout at the intersection of Station Road / Ross Watt Road.

Table 16 SIDRA Post-Development Conditions (15 Yr Growth) – Ross Watt Rd / Station Rd

Approach	Existing Conditions			Future Conditions (Option 1)			Future Conditions (Option 2)			Future Conditions (Option 3)			Future Conditions (Option 4)		
	DoS	Avg Delay (sec)	Queue (m)	DoS	Avg Delay (sec)	Queue (m)	DoS	Avg Delay (sec)	Queue (m)	DoS	Avg Delay (sec)	Queue (m)	DoS	Avg Delay (sec)	Queue (m)
AM Peak															
Station Road - South	0.363	0.5	0	0.365	4.0	18.5	0.460	20.8	119.5	0.452	20.0	117.3	0.434	4.6	20.0
Morrow Road – East	N/A	N/A	N/A	N/A	N/A	N/A	0.433	44.3	20.5	0.479	45.4	20.9	N/A	N/A	N/A
Station Road – North	0.430	0.2	0.5	0.449	4.6	3.8	0.588	26.8	163.2	0.573	25.7	160.5	0.450	4.7	28.0
Ross Watt Road - West	0.143	19.5	2.8	0.522	12.1	3.2	0.593	54.3	77.1	0.593	54.3	77.1	0.281	10.0	10.8
PM Peak															
Station Road – South	0.403	0.6	0	0.434	4.6	22.6	0.503	10.2	86.9	0.507	23.4	134.8	0.415	5.2	22.0
Morrow Road – East	N/A	N/A	N/A	N/A	N/A	N/A	0.295	46.7	13.0	0.295	46.7	13.0	N/A	N/A	N/A
Station Road - North	0.420	0.2	0.4	0.450	4.7	28.1	0.621	29.9	172.8	0.621	29.9	172.8	0.442	5.2	33.3
Ross Watt Road - West	0.166	33.8	3.3	0.315	10.5	11.1	0.580	50.9	35.6	0.580	50.9	35.6	0.331	18.3	24.7

Table 17 SIDRA Post-Development Conditions (15 Yr Growth) – Station Rd / Cherry Lane

Approach	Existing Conditions			Future Conditions (Option 1)			Future Conditions (Option 2)			Future Conditions (Option 3)			Future Conditions (Option 4)		
	DoS	Avg Delay (sec)	Queue (m)	DoS	Avg Delay (sec)	Queue (m)	DoS	Avg Delay (sec)	Queue (m)	DoS	Avg Delay (sec)	Queue (m)	DoS	Avg Delay (sec)	Queue (m)
AM Peak															
Station Road - South	0.332	0.3	0	0.329	3.6	17.4	0.500	23.4	131.1	0.328	3.6	18.4	0.500	23.4	131.1
Station Road - North	0.414	0.3	0.8	0.486	4.9	29.1	0.557	21.6	159.1	0.486	4.9	26.0	0.557	21.6	159.1
Cherry Lane - West	0.420	34.2	10.1	0.414	12.5	16.0	0.510	41.5	100.1	0.414	12.5	15.9	0.510	41.5	100.1
PM Peak															
Station Road - South	0.389	0.4	0	0.431	3.8	24.3	0.486	17.2	130.3	0.428	3.8	26.7	0.486	17.2	130.3
Station Road - North	0.385	.5	1.6	0.411	4.5	23.4	0.396	2.3	39.4	0.411	4.5	20.8	0.426	10.9	105.1
Cherry Lane - West	0.389	35.5	9.3	0.294	12.1	10.0	0.475	50.2	69.3	0.293	12.1	10.0	0.475	50.2	69.3

Option 1 – Roundabout at the intersection of Station Road / Cherry Lane and Station Road / Ross Watt Road.
Option 2 – Signals at the intersection of Station Road / Cherry Lane and Station Road / Ross Watt Road / Morrow Road.
Option 3 – Roundabout at the intersection of Station Road / Cherry Lane and signals at the intersection of Station Road / Ross Watt Road / Morrow Road .
Option 4 – Signals at the intersection of Station Road / Cherry Lane and roundabout at the intersection of Station Road / Ross Watt Road.

As shown above, all four potential intersection upgrades operate under 'excellent' or 'very good' conditions in the ultimate scenario when Station Road is duplicated.

Irrespective that all four intersection upgrade options will operate under satisfactory conditions in the future, the provision of signals at Cherry Lane and Ross Watt Road will increase queuing in the vicinity with the queuing likely to extend up to the Station Rd / Calder Freeway Westbound Ramp. It is noted that the roundabout options do not experience queues to the same extent as the traffic signals due to not being stopped by the traffic signals to allow for turning movements in/out of the minor roads. This is also observed with the average delays on the signalised intersection options, where longer delays are observed on the signalised intersections in comparison to the roundabout options.

As noted previously, the duplication of Station Road is required in the ultimate scenario to relieve the through-traffic issues and improve the operation of the intersections along Station Road. Nevertheless, the timing for this project has not been determined and funding for the project has not been allocated, therefore, the required timing for the ultimate upgrade of these intersections is provided in Section 7.7.1. It is reiterated that the duplication of Station Road is required regardless of development, with through background traffic volumes triggering the upgrade rather than the development of the subject site.

7.6.3 Other Commentary

It is noted that the proposed development is generally in accordance with the development anticipated and analysed as part of the Gisborne Movement Network Study (2016) and the traffic study undertaken by Cardno (2020).

The traffic generation of the proposed development has therefore been included in the traffic modelling, intersection analysis and therefore road network design in the vicinity which was undertaken by Cardno. This would include:

- The duplication of Station Road; and
- Upgrade of Cherry Lane and Swinburne Avenue to a connector road.

It is noted that the Cardno VITM modelling had assumed that a total of 8,390 daily vehicle movements will be generated by the subject site. Of note, based on the residential yield prepared by Breese Pitt Dixon, it is expected that a total of 7,200 daily vehicles movements will be generated by the subject site which is approximately 14% lower than the VITM modelling.

7.6.4 Midblock Assessment

In order to assess the appropriateness of the external road network, a review of the theoretical road capacity and the expected post-development impact has been undertaken, based on the road classifications identified within the Infrastructure Design Manual and for a single carriageway arterial road accommodating two-way traffic.

Station Road and Ross Watt Road have been assessed with 15-years growth, whilst Cherry Lane and Swinburne Avenue have had no growth applied.

The 2022 traffic volumes previously shown in Section 2.4.1 have been used for the below traffic assessment.

Table 18 Midblock Capacity Assessment

Road Name	IDM Classification	Traffic Capacity (vpd)	Existing Traffic with 15yr Growth	Site Generated Traffic	Future
Station Road (North of Ross Watt Road)	Arterial Road	<18,000 vpd	21,838	+3,169	**25,007**
Ross Watt Road	Trunk Collector	6,000 – 8,000 vpd	2,297	+3,533	5,830
Cherry Lane	Access Street	<2,500 vpd	1,161[1]	+3,310	**4,471**
Swinburne Avenue (North of access)	Access Street	<2,500 vpd	253[1]	+428	681
Swinburne Avenue (South of access)	Access Street	<2,500 vpd	253[1]	+3,310	**3,563**

[1]No growth applied

As shown above, Ross Watt Road and the northern portion of Swinburne Avenue are operating within their theoretical capacity at the completion of the proposed subdivision. Whilst the southern portion of Swinburne Avenue is expected to exceed its theoretical capacity only marginally, and therefore is considered appropriate. Furthermore, Swinburne Avenue will be urbanised along the site's frontage when development commences along the Swinburne Avenue frontage and Ross Watt Road will be urbanised along the site's frontage when the proposed connector road connection is provided to Ross Watt Road. Cherry Lane is anticipated to operate in excess of its theoretical capacity and therefore should be upgraded prior to the completion of the full subdivision. In relation to Station Road, it is also expected to operate in excess of its theoretical capacity and therefore should be upgraded when funding is allocated by the Government / Department of Transport.

7.7 Timing of Road Upgrades

7.7.1 Intersections

7.7.1.1 Interim Upgrade

The intersection upgrades to Station Road / Ross Watt and Station Road / Cherry Lane are recommended to occur before the degree of saturation exceeds 0.8 which is the theoretical capacity for a unsignalised intersection. It is generally accepted that an unsignalised t-intersection is at capacity when the D.o.S exceeds 0.8, a roundabout should be upgraded when the D.o.S exceeds 0.85, whilst a signalised intersection should be upgraded with mitigating works at a D.o.S of 0.9. Naturally every intersection should be assessed on an individual basis to determine the site specific upgrades that are required (if at all).

To determine when each of the above intersections should be upgraded, **one**mile**grid** has undertaken an analysis on the trigger points for the upgrade works and has determined that the Station Road / Ross Watt intersection should be upgraded prior to 280 lots, whilst the Station Road / Cherry Lane intersection should be upgraded prior to 40 lots.

The SIDRA analysis for both of the existing intersections is provided in Table 19 and Table 20.

To provide a conservative analysis, Station Road and Ross Watt Road have been assessed with 5-years growth, whilst Cherry Lane and Swinburne Avenue have had no growth applied.

Table 19 SIDRA Analysis – 280 Lots – Ross Watt Rd / Station Rd

Approach	*Existing Conditions*		
	DoS	Avg Delay (sec)	Queue (m)
AM Peak			
Station Road - South	0.372	0.4	0
Station Road – North	0.469	0.3	1.0
Ross Watt Road - West	0.765	90.6	23.8
PM Peak			
Station Road – South	0.430	0.5	0
Station Road - North	0.429	0.6	1.9
Ross Watt Road - West	0.696	83.1	19.0

Table 20 SIDRA Analysis – 40 Lots – Station Rd / Cherry Ln

Approach	*Existing Conditions*		
	DoS	Avg Delay (sec)	Queue (m)
AM Peak			
Station Road - South	0.415	0.6	0
Station Road – North	0.482	0.6	1.9
Cherry Lane - West	0.797	52.5	21.5
PM Peak			
Station Road – South	0.457	0.7	0
Station Road - North	0.472	0.9	3.3
Cheery Lane - West	0.672	60.8	15.8

As shown above, the existing intersection of Station Rad / Cherry Lane requires an upgrade after 40 lots are delivered. Due to the low level of lots that trigger the upgrade, it is clear that the upgrade is not required as a result of the development, however, as a result of the existing traffic along Cherry Lane and the anticipated through traffic growth along Station Road. It is recognised that the operation of this intersection will decline with the proposed subdivision traffic generation, and therefore the intersection upgrade is proposed to be provided by the developer.

In regard to the Station Road / Ross Watt Road intersection, this intersection upgrade should be provided prior to the completion of the 280th lot. It is noted that the composition of the upgrade should be determined in consultation with Council / Department of Transport to ensure that there are no redundant works packages constructed in light of potential duplication works for Station Road.

7.7.1.2 Ultimate Upgrade

Whilst it is acknowledged that the interim intersections should be upgraded to their interim arrangement prior to the D.o.S exceeding 0.85 for a roundabout and a D.o.S of 0.9 for a signalised intersection. It is expected that funding may not be available at this stage, with other infrastructure upgrades receiving priority over the duplication of Station Road.

Therefore, to determine the timing of the Station Road ultimate upgrade works, all intersections will be assessed at when they reach a Degree of Saturation of 1.0 (when the theoretical capacity is exceeded).

A summary of the required year of upgrade for each intersection arrangement is provided below.

- Option 1 – Roundabout at the intersection of Station Road / Cherry Lane and Station Road / Ross Watt Road – 15 years
- Option 2 – Signals at the intersection of Station Road / Cherry Lane and Station Road / Ross Watt Road / Morrow Road – 9 years
- Option 3 – Roundabout at the intersection of Station Road / Cherry Lane and signals at the intersection of Station Road / Ross Watt Road / Morrow Road – 12 years
- Option 4 – Signals at the intersection of Station Road / Cherry Lane and roundabout at the intersection of Station Road / Ross Watt Road – 10 years

The SIDRA results for the above options are provided below. It is noted that the Calder Freeway will all operate under excellent conditions for the interim intersection arrangements and therefore have been omitted from the below results.

Table 21 SIDRA Post-Dev Conditions – Interim – Station Rd / Calder FWY E'Bnd Ramp

Approach	Existing Conditions			Option 1 – 15yr Growth			Option 2 – 9yr Growth			Option 3 – 12yr Growth			Option 4 – 10yr Growth		
	DoS	Avg Delay (sec)	Queue (m)	DoS	Avg Delay (sec)	Queue (m)	DoS	Avg Delay (sec)	Queue (m)	DoS	Avg Delay (sec)	Queue (m)	DoS	Avg Delay (sec)	Queue (m)
AM Peak															
Station Road - South	0.195	4.2	0	0.307	4.2	0	0.267	4.1	0	0.286	4.0	0	0.278	4.1	0
Station Road - North	0.304	4.3	10.6	0.490	5.7	19.5	0.348	4.7	11.0	0.349	4.7	11.1	0.349	4.7	11.0
Calder Freeway Off-ramp - West	0.163	10	4.5	0.261	11.2	7.9	0.267	9.3	7.9	0.271	9.5	8.1	0.270	9.4	8.0
PM Peak															
Station Road - South	0.163	4.1	0	0.249	4.2	0	0.218	4.0	0	0.221	4.0	0	0.221	4.0	0
Station Road - North	0.22	4.2	7.1	0.389	5.1	13.0	0.278	4.5	8.3	0.278	4.5	8.3	0.278	4.5	8.3
Calder Freeway Off-ramp - West	0.176	9.6	4.9	0.294	10.6	8.9	0.219	10.3	6.3	0.219	10.3	6.3	0.219	10.3	6.3

Table 22 SIDRA Post-Dev Conditions - Interim – Station Rd / Calder FWY W'Bnd Ramp

Approach	Existing Conditions			Option 1 – 15yr Growth			Option 2 – 9yr Growth			Option 3 – 12yr Growth			Option 4 – 10yr Growth		
	DoS	Avg Delay (sec)	Queue (m)	DoS	Avg Delay (sec)	Queue (m)	DoS	Avg Delay (sec)	Queue (m)	DoS	Avg Delay (sec)	Queue (m)	DoS	Avg Delay (sec)	Queue (m)
AM Peak															
Station Road - South	0.252	3.8	8.6	0.450	4.3	18.7	0.385	4.1	13.0	0.430	4.3	15.3	0.413	4.2	16.3
Calder Freeway Off-ramp - East	0.132	10.1	3.9	0.211	12.0	7.1	0.178	10.6	26.1	0.191	10.8	30.4	0.182	10.7	5.2
Station Road - North	0.305	3.9	0	0.439	4.4	0	0.572	4.4	72.3	0.605	4.5	84.7	0.583	4.4	0
PM Peak															
Station Road - South	0.257	3.8	8.8	0.421	4.3	17.3	0.370	4.1	13.0	0.378	4.1	13.0	0.378	4.1	14.9
Calder Freeway Off-ramp - East	0.144	8.7	4.2	0.245	11.3	8.2	0.205	9.7	15.2	0.211	9.9	6.2	0.216	10.5	7.0
Station Road - North	0.258	3.9	0	0.414	4.5	0	0.537	4.4	21.4	0.518	4.4	0	0.380	4.3	0

Option 1 – Roundabout at the intersection of Station Road / Cherry Lane and Station Road / Ross Watt Road.
Option 2 – Signals at the intersection of Station Road / Cherry Lane and Station Road / Ross Watt Road / Morrow Road.
Option 3 – Roundabout at the intersection of Station Road / Cherry Lane and signals at the intersection of Station Road / Ross Watt Road / Morrow Road .
Option 4 – Signals at the intersection of Station Road / Cherry Lane and roundabout at the intersection of Station Road / Ross Watt Road.

Table 23 SIDRA Post-Development Conditions - Interim – Ross Watt Rd / Station Rd

Approach	*Existing Conditions*			*Option 1 – 15yr Growth*			*Option 2 – 9yr Growth*			*Option 3 – 12yr Growth*			*Option 4 – 10yr Growth*		
	DoS	Avg Delay (sec)	Queue (m)	DoS	Avg Delay (sec)	Queue (m)	DoS	Avg Delay (sec)	Queue (m)	DoS	Avg Delay (sec)	Queue (m)	DoS	Avg Delay (sec)	Queue (m)
AM Peak															
Station Road - South	0.359	0.5	0	0.686	4.4	61.9	0.790	20.0	225.9	0.735	18.6	239.8	0.607	11.0	159.5
Morrow Road – East	N/A	N/A	N/A	N/A	N/A	N/A	0.345	47.4	15.5	0.752	75.4	21.3	N/A	N/A	N/A
Station Road – North	0.427	0.2	0.5	0.845	5.6	106.9	0.909	46.1	277.4	0.947	41.6	277.4	0.770	14.6	229.4
Ross Watt Road - West	0.131	18.5	2.7	0.699	25.0	55.6	0.814	69.8	87.1	0.936	83.3	109.3	0.773	67.0	88.5
PM Peak															
Station Road – South	0.398	0.6	0	0.842	8.1	114.9	0.678	4.8	125.8	0.699	9.6	192.4	0.708	9.4	183.6
Morrow Road – East	N/A	N/A	N/A	N/A	N/A	N/A	0.429	71.5	12.0	0.367	70.4	11.8	N/A	N/A	N/A
Station Road - North	0.419	0.2	0.4	0.656	5.1	68.0	0.882	17.5	277.4	0.875	19.1	260.8	0.698	8.7	182.6
Ross Watt Road - West	0.151	31	3.2	0.482	18.8	31.0	0.812	69.7	50.5	0.915	75.7	54.4	0.676	63.4	52.5

Table 24 SIDRA Post-Development Conditions - Interim – Station Rd / Cherry Lane

Approach	*Existing Conditions*			*Option 1 – 15yr Growth*			*Option 2 – 9yr Growth*			*Option 3 – 12yr Growth*			*Option 4 – 10yr Growth*		
	DoS	Avg Delay (sec)	Queue (m)	DoS	Avg Delay (sec)	Queue (m)	DoS	Avg Delay (sec)	Queue (m)	DoS	Avg Delay (sec)	Queue (m)	DoS	Avg Delay (sec)	Queue (m)
AM Peak															
Station Road - South	0.332	0.3	0	0.616	3.6	63.8	0.921	40.2	365.7	0.893	4.2	174.5	0.635	4.2	49.4
Station Road - North	0.417	0.3	0.8	0.955	18.3	252.7	0.827	8.4	80.3	0.923	11.3	173.6	0.976	13.4	251.0
Cherry Lane - West	0.398	33.8	10.1	0.478	17.7	30.0	0.926	70.7	107.9	0.662	22.0	45.3	0.599	20.5	48.9
PM Peak															
Station Road - South	0.384	0.4	0	0.827	4.3	137.6	0.693	9.1	175.3	0.898	4.8	178.8	0.764	5.9	72.4
Station Road - North	0.384	0.5	1.6	0.807	5.4	100.5	0.620	4.8	121.7	0.738	5.1	77.1	0.691	5.2	69.3
Cherry Lane - West	0.391	36.9	9.5	0.452	20.9	28.6	0.676	63.4	52.5	0.476	19.2	28.7	0.361	14.1	20.9

Option 1 – Roundabout at the intersection of Station Road / Cherry Lane and Station Road / Ross Watt Road.
Option 2 – Signals at the intersection of Station Road / Cherry Lane and Station Road / Ross Watt Road / Morrow Road.
Option 3 – Roundabout at the intersection of Station Road / Cherry Lane and signals at the intersection of Station Road / Ross Watt Road / Morrow Road .
Option 4 – Signals at the intersection of Station Road / Cherry Lane and roundabout at the intersection of Station Road / Ross Watt Road.

As shown above, all intersections are able to accommodate traffic until the designated failure year. However, it must be acknowledged that the queues extend well past the Calder Freeway when a signalised intersection is provided at the intersection of Station Road / Ross Watt / Morrow Road and therefore duplication of Station Road should occur earlier if possible.

7.7.2 Mid-block

In order to determine when any upgrades are required Cherry Lane, the road has been assessed with the maximum number of lots that can be delivered before an upgrade is required.

Table 25 Midblock Capacity Assessment

Road Name	Road Classification	Traffic Capacity (vpd)	Existing Traffic with 5yr Growth	No. Of Lots Delivered	Site Generated Traffic	Future
Cherry Lane	Access Street	<2,500 vpd	1,161[1]	322	+1,3434	2,495

As shown above, Cherry Lane should be upgraded to an urban standard road prior to the delivery of the 322nd lot, whilst Station Road is to be upgraded by Regional Roads Victoria when the appropriate funding is allocated to the upgrade.

7.7.3 Summary

A summary of the upgrades required as a result of the proposed residential subdivision is provided in Table 26.

Table 26 Intersection/Road Upgrades

Proposed Upgrade	Lot Trigger
Upgrade Ross Watt Road along site's frontage to urban standard	When internal connector road connection is provided to Ross Watt Road to facilitate development of stages in the northern portion of the site.
Upgrade Swinburne Avenue along site's frontage to urban standard	When development commences on stages adjacent to Swinburne Avenue.
Upgrade Station Road / Cherry Lane intersection to interim arrangement	40th Lot
Upgrade Cherry Lane to an urban standard road	322nd Lot
Upgrade Station Road / Ross Watt Road intersection to interim arrangement	280th Lot

7.8 Recommended Intersection Upgrade Discussion

The SIDRA analysis presented in the tables above shows that both the roundabout option and signalised intersection option will be adequate for the ultimate scenario when Station Road is duplicated. As noted above, the signalised option does result in longer queues in the ultimate which extend to the Calder Freeway interchange, however, the queuing does not extend past the freeway and therefore is still considered a feasible option should Council / Department of Transport wish to proceed with the signalised option.

Nevertheless, the SIDRA analysis of the interim arrangements show that the proposed roundabout design is generally able to accommodate traffic with 15 years of growth, with no queues extending past the Calder Freeway. Conversely, the interim signalised intersection arrangement is only able to accommodate 9 years of growth with queues extending 270 metres north of Ross Watt Road, past the Calder Freeway. Therefore, without commitment from the Department of Transport to provide funding for the duplication of Station Road in the next 10 years, the roundabout treatment option may be the most appropriate to ensure Station Road is able to operate satisfactorily until the duplication of Station Road occurs (by the authorities).

Irrespective of the operation of the intersection, the proposed ultimate roundabout treatment results in a marginally increased tree loss with at least 26 trees required to be removed for the roundabout option compared to 24 trees for the ultimate signalised option. This is due to the size of the roundabout required to accommodate two traffic lanes in each direction. It is noted that additional trees may be required to be removed for both the ultimate roundabout (up to 14 trees) and ultimate signals (up to 17 trees) options as per the plans on pages 74 and 75 respectively, subject to findings by an arborist on encroachment into each tree's protection zone (TPZ). Furthermore, the tree loss for the interim roundabout option is more extensive compared to the interim signals option, where a total of 13 trees are required to be removed for the roundabout option (with up to 15 additional trees to be removed subject to the arborist findings) compared to 11 trees for the signals option (with up to 10 additional trees to be removed subject to the arborist findings).

Whilst Macedon Ranges is considered a regional area and the provision of a roundabout is generally preferred to not alter the character of the township, the proposed roundabout design may seem extensive with limited opportunity to provide additional landscaping adjacent to the intersection. Therefore, in this case the signals may be preferred to allow for additional landscaping opportunities and reduce the loss of existing trees.

Additionally, the signalised treatment provides a significant improvement on pedestrian and cyclist safety with all pedestrian movements across Station Road, Ross Watt Road, Morrow Road and Cherry Lane being controlled by pedestrian operated signals which ensures that vehicles are stopped to allow for the safe crossing of pedestrians. Whilst the roundabout treatment option will rely on vehicles stopping to allow for the safe passage of pedestrians.

Based on the above, it is considered that the signalised intersection treatment is the preferred treatment noting that there will be operational issues if the Station Road is not duplicated in the next 10 years.

7.9 Cost Apportionment

As noted in the traffic analysis above, both the proposed Development Plan and traffic growth on existing traffic in the vicinity will contribute to the required intersection upgrades along Station Road. Therefore, it is recommended to apportion the costs of the upgrade works for both Station Road intersection treatments (Cherry Lane and Ross Watt Road) to the proposed Development Plan and the Department of Transport proportionally to the additional traffic generated to the intersections.

A summary of the anticipated increase in traffic volumes contributed by the proposed Development Plan and traffic growth (2% compounding growth for 15 years) is shown below in Table 27.

Table 27 Traffic Generation Split

Intersection	AM Peak			PM Peak		
	Development Plan	Traffic Growth	Total	Development Plan	Traffic Growth	Total
Station Road / Ross Watt Road	426 vph	513 vph	939 vph	404 vph	524 vph	928 vph
Station Road / Cherry Lane	431 vph	472 vph	903 vph	421 vph	484 vph	905 vph

Based on the above table, it can be expected that the proposed Development Plan will contribute the following amount of additional traffic during the AM and PM peak.

Table 28 Development Plan Traffic Contribution

Intersection	AM Peak	PM Peak	Average
Station Road / Ross Watt Road	45.4%	43.5%	44.5%
Station Road / Cherry Lane	47.7%	46.5%	47.1%

The above table shows that the Development Plan should contribute 44.5% for the ultimate construction costs of the Station Road / Ross Watt Road intersection and 47.1% for the Station Road / Cherry Lane intersection.

Breese Pitt Dixon has been requested to undertake high-level costing of the proposed interim and ultimate signalised intersection treatments, with the expected construction costs summarised below:

- Existing Intersections to Interim Signalised Intersections (210473CLP1004) - $1,462,710
- Existing Intersections to Ultimate Signalised Intersection (210473CLP1005) - $2,585,359

The above costings are attached in Appendix C, however, it is again noted that these are high-level estimates, to understand the anticipated cost differences between the interim and ultimate intersection treatments.

The costings show that the interim intersection upgrade is approximately 56.6% of the ultimate intersection costs. The applicant has committed to deliver the interim intersection upgrades to each intersection as part of the development despite the Development Plan's traffic contribution to the intersections at Ross Watt Road and Cherry Lane only being 44.5% and 47.1% respectively. It is noted that the interim intersection has been designed to reduce redundant works for the ultimate design, effectively only requiring widening of the carriageway for the ultimate design (as would be the case regardless of the two intersections). Nevertheless, the applicant has provided further commitment to provide an additional cash contribution to the Department of Transport for the ultimate intersection upgrades or any other upgrades the Department of Transport requires. To determine the financial contribution to the ultimate works, we have adopted the following assumptions.

- The difference in cost has been calculated between the construction of the interim and ultimate signalised upgrade works (based on BPD high level costings).
- It is acknowledged that the Cherry Lane / Station Road and Ross Watt Road / Station Road intersection will reach capacity with background growth irrespective of the additional traffic generated by the development. It is expected that the Cherry Lane / Station Road will reach capacity and require an upgrade in 7 years (based on 2% compounding growth), whilst the Ross Watt Road / Station Road will reach capacity and require an upgrade in 13 years (based on 2% compounding growth).

- The intersections of Cherry Lane / Station Road and Ross Watt Road / Station Road will be upgraded to an interim signalised arrangement at the developers cost.
- The interim signalised intersections of Cherry Lane / Station Road and Ross Watt Road is expected to reach theoretical capacity at the full build-out of the development with 9 years of growth (2% compounding growth).
- The development seeks to financially contribute the difference between the Department of Transport's requested 15 years of analysis (5 years of development with growth plus 10 years of additional growth) and the year the interim signalised intersection reaches theoretical capacity (9 years).
- Based on the above, the ultimate signalised intersection upgrade is required 6 years earlier than DoT's requested year of analysis.
- To determine the contribution cost by the development, an indexation rate of 2.26% has been adopted. The indexation rate has been determined using ABS historical data for the Producer Price Index (PPI). The rate of 2.26% is using the average indexation rate per annum between December 1998 to September 2022.
- The cost for the ultimate signalised intersection is estimated to be $2,585,359 (GST excl) and the cost for the interim signalised intersection is estimated to be $1,462,710 (GST excl).
- The difference in cost to upgrade from an Interim to an Ultimate arrangement is $1,122,412 (GST excl).
- The contribution has been calculated by indexing the $1,122,412 by the PPI index rate. The cost has been compounded on an annual basis over a period of 6 years (the bring forward time).
- The contribution by the developer is proposed to be $161,284 (GST excl) as shown below.

Table 29 Contribution Costs

Term	*Indexed Cost*	*Contribution*
Year 1	1,148,049	25,400
Year 2	1,174,024	51,375
Year 3	1,200,586	77,937
Year 4	1,227,749	105,100
Year 5	1,255,527	132,878
Year 6	1,283,933	161,284

It should be noted that the developer has already exceeded its portion of contribution based on the percentage of additional traffic volumes along Station Road towards the required duplication works in the area with the delivery of the interim intersection upgrades. However, they are working in good faith with the Department of Transport & Macedon Ranges Shire Council to achieve a good outcome for the community by contributing to the duplication works of Station Road or other road projects in the vicinity.

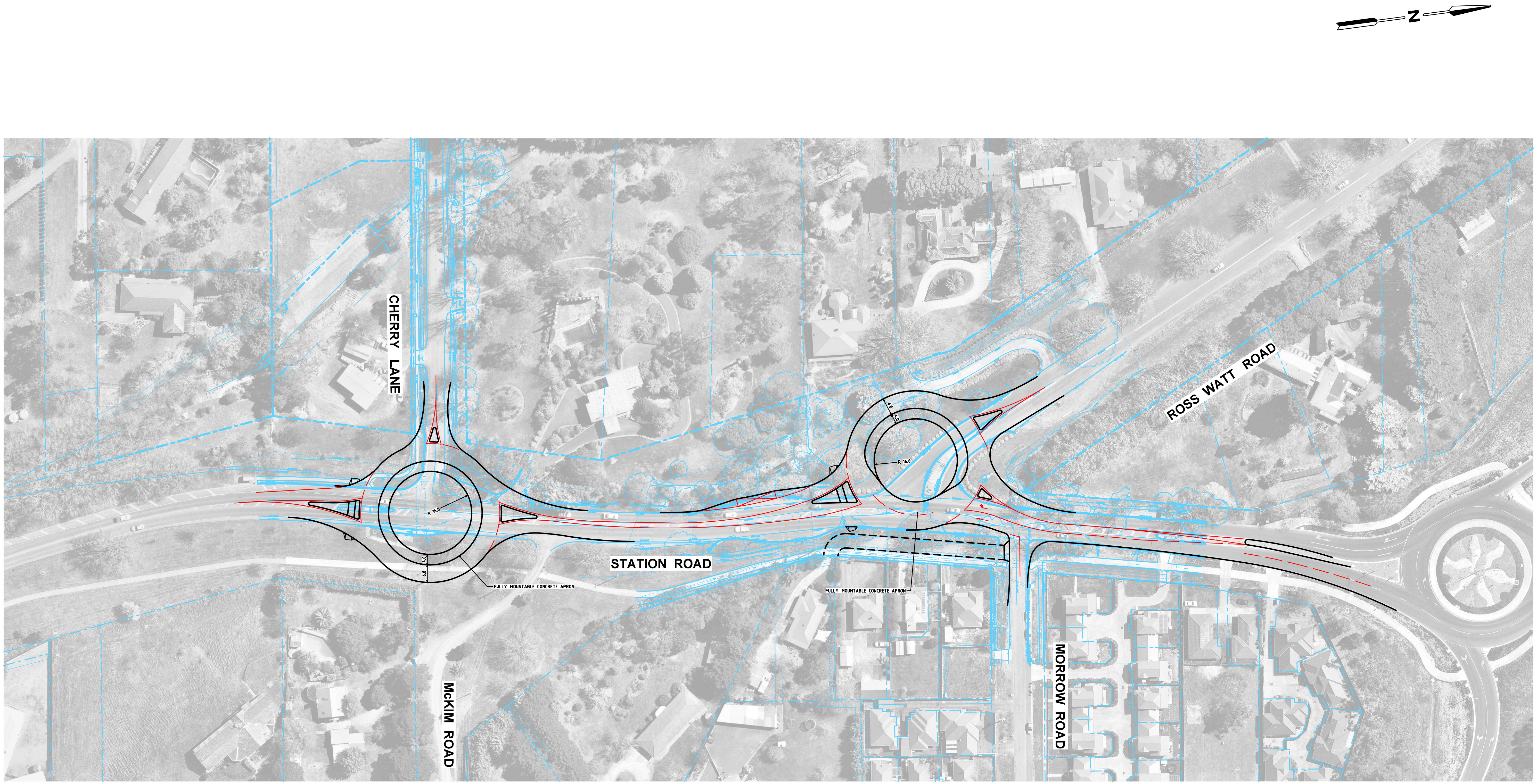
8 CONCLUSIONS

It is proposed to develop the subject site for the purposes of a residential subdivision comprising of approximately 800 residential lots, a Local Convenience Centre and a Childcare Centre.

Considering the analysis presented above, it is concluded that:

- The site is located within the Gisborne ODP, and is largely earmarked for residential land-uses;
- The site is able to gain access to Ross Watt Road via a unsignalised T-intersection;
- The design of the internal road network is generally in accordance with the Gisborne ODP and the requirements of Clause 56 of the Macedon Ranges Panning Scheme;
- The development is expected to generate 7,200 vehicles per day which will be comfortably accommodated by the proposed external road network, and is less than what was previously modelled by Cardno;
- It is proposed to upgrade Cherry Lane to an urban standard prior to the delivery of the 322nd lot, whilst Station Road is to be upgraded by Regional Roads Victoria when the appropriate funding is allocated to the upgrade;
- Is it proposed to upgrade the intersection of Station Road / Cherry Lane to an interim arrangement prior to the delivery of the 40th lot of the subdivision and the intersection of Ross Watt Road / Station Road to an interim arrangement prior to the delivery of the 280th lot of the subdivision; and
- There are no traffic engineering reasons which would preclude a permit from being issued for this proposal.

Appendix A Concept Intersection Plans



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Drawing Title		
ROSS WATT ROAD SUBDIVISION DUPLICATED STATION RD - ROUNDABOUT CONCEPT LAYOUT PLAN - INTERIM		
Designed	Approved	Melway Ref
TCW	VG	NA
Project Number	Drawing Number	Revision
210473	CLP1000	A

Scale
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0 7.5 15 30

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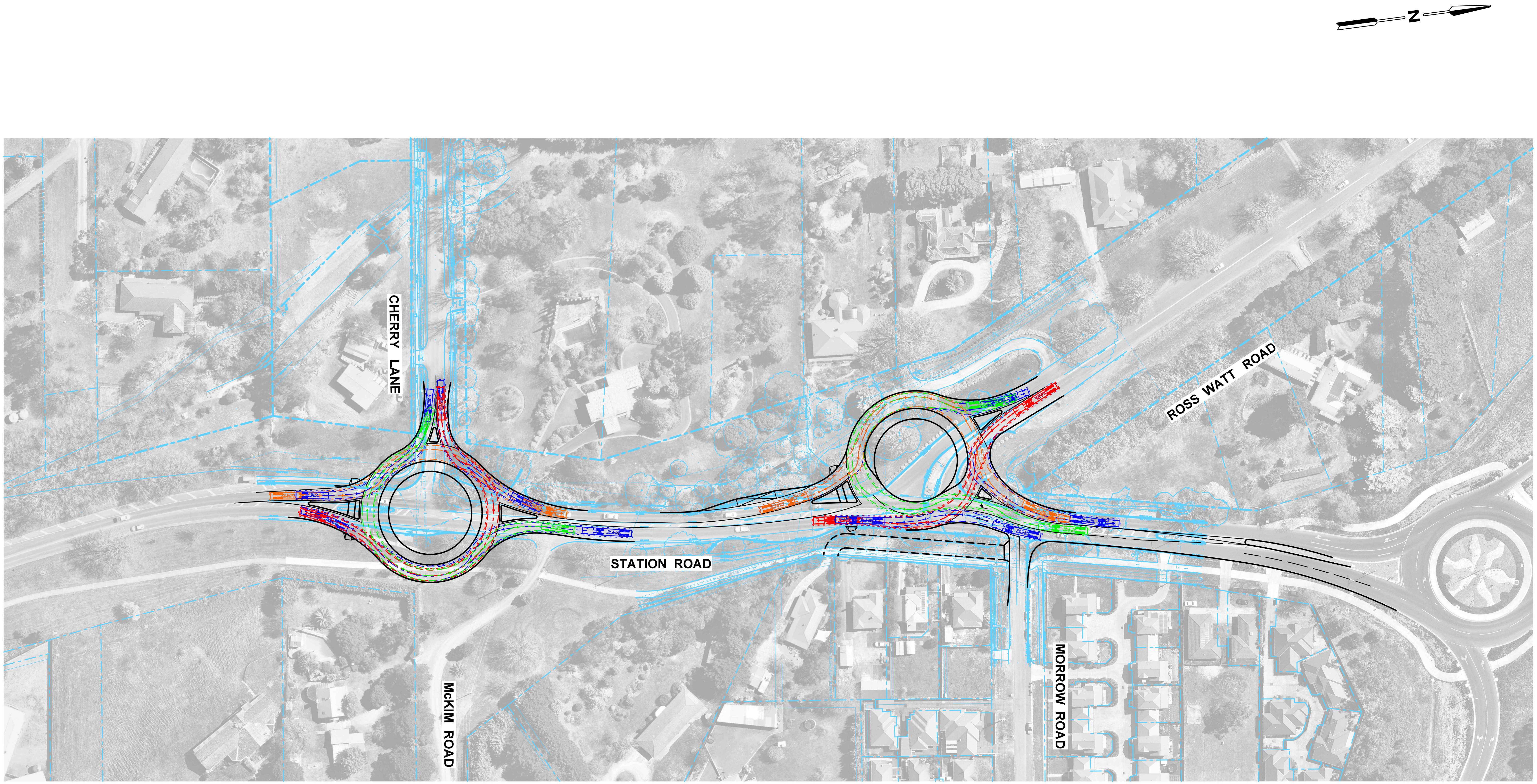

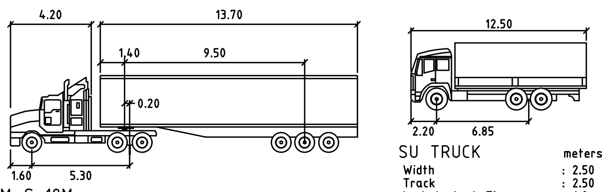

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SU TRUCK

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SWEPT PATH LEGEND

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ROSS WATT ROAD SUBDIVISION DUPLICATED STATION RD - ROUNDABOUT SWEPT PATH ANALYSIS - INTERIM		
Designed TCW	Approved VG	Melway Ref NA
Project Number 210473	Drawing Number SPA1000	Revision A

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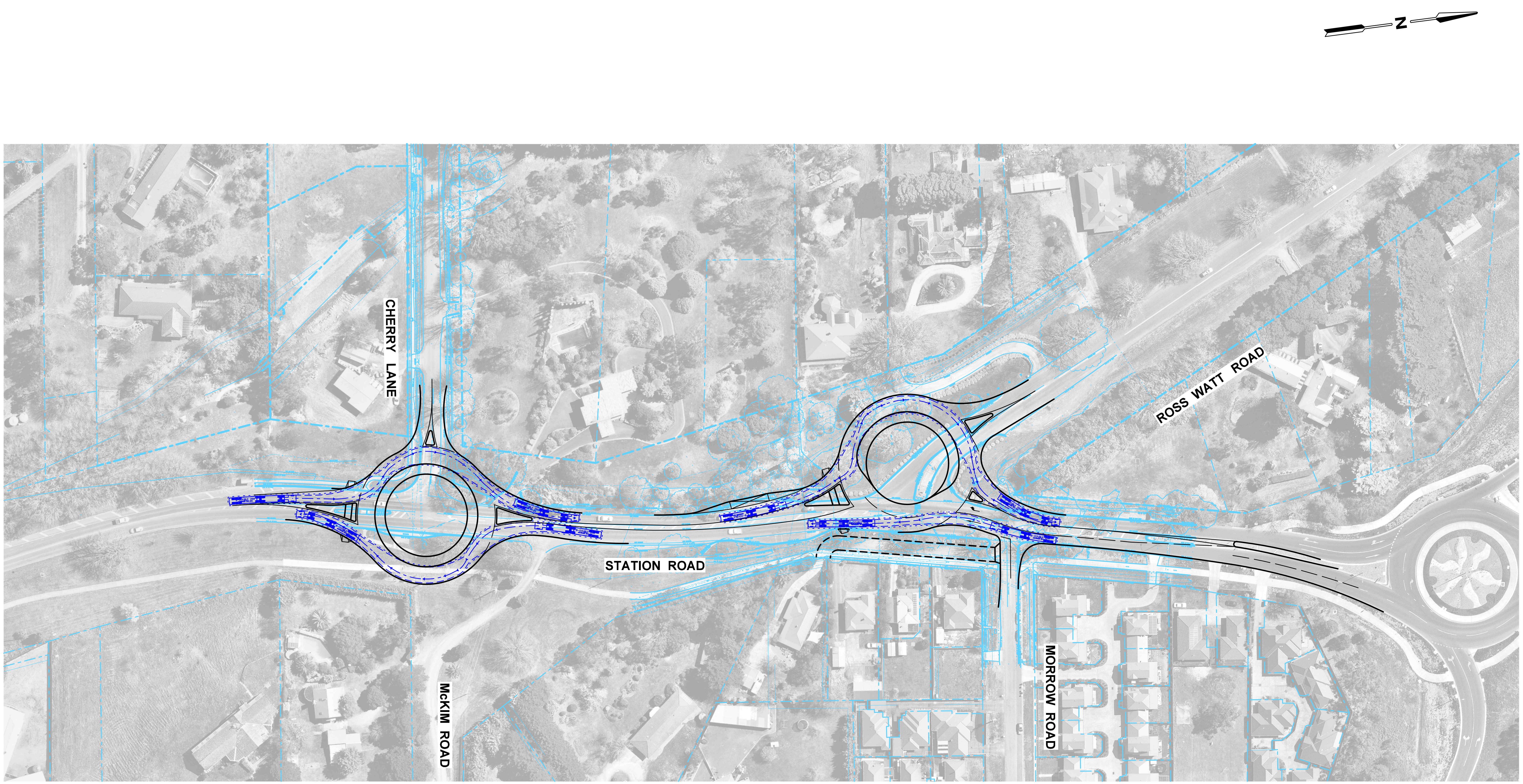

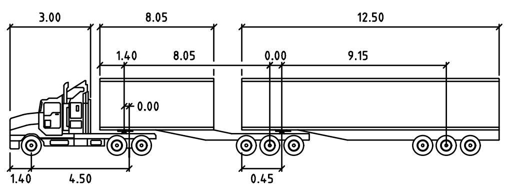

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SWEPT PATH LEGEND

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Drawing Title
ROSS WATT ROAD SUBDIVISION
DUPLICATED STATION RD - ROUNDABOUT
SWEPT PATH ANALYSIS - INTERIM

Designed	Approved	Melway Ref
TCW	VG	NA

Project Number	Drawing Number	Revision
210473	SPA1001	A

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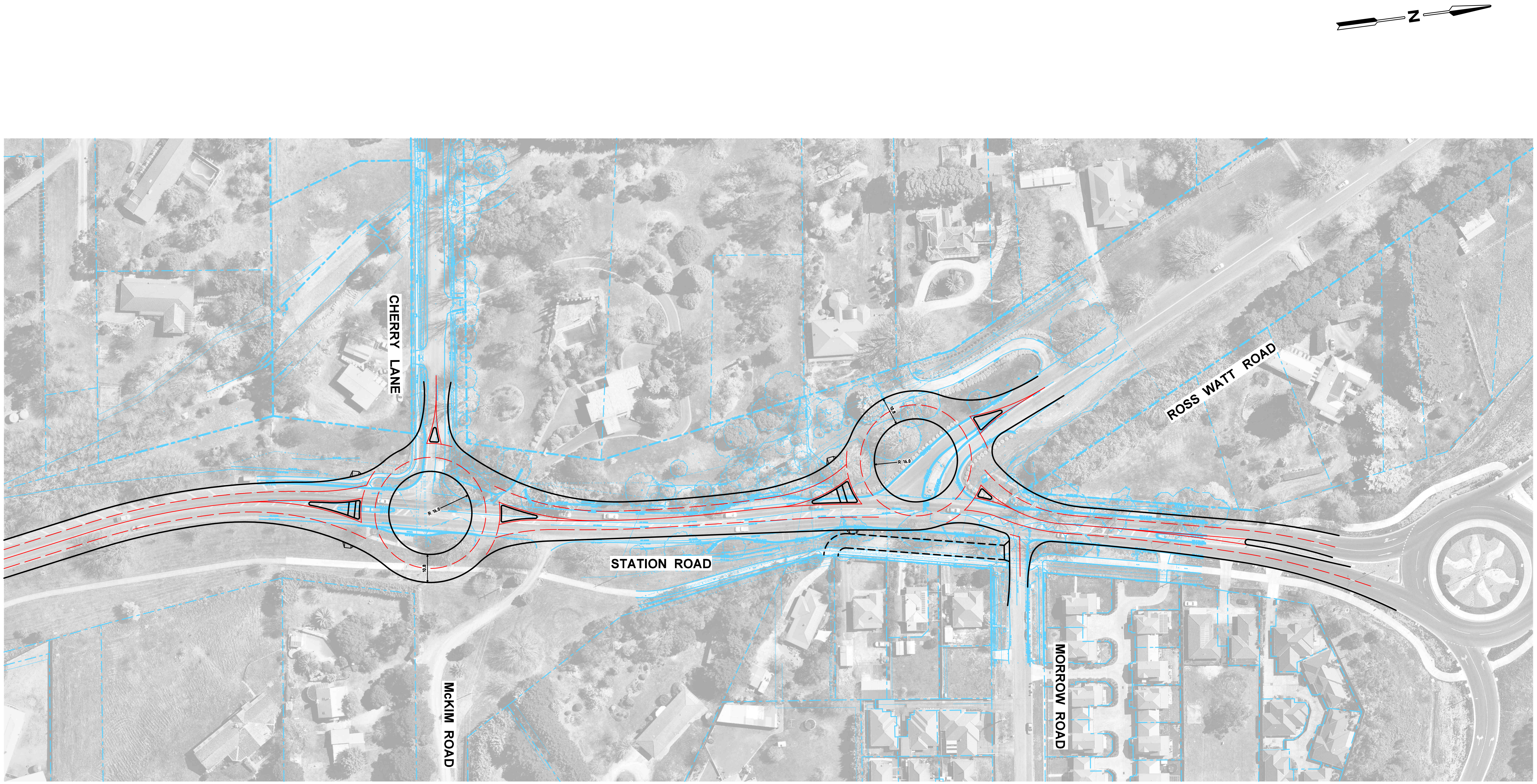

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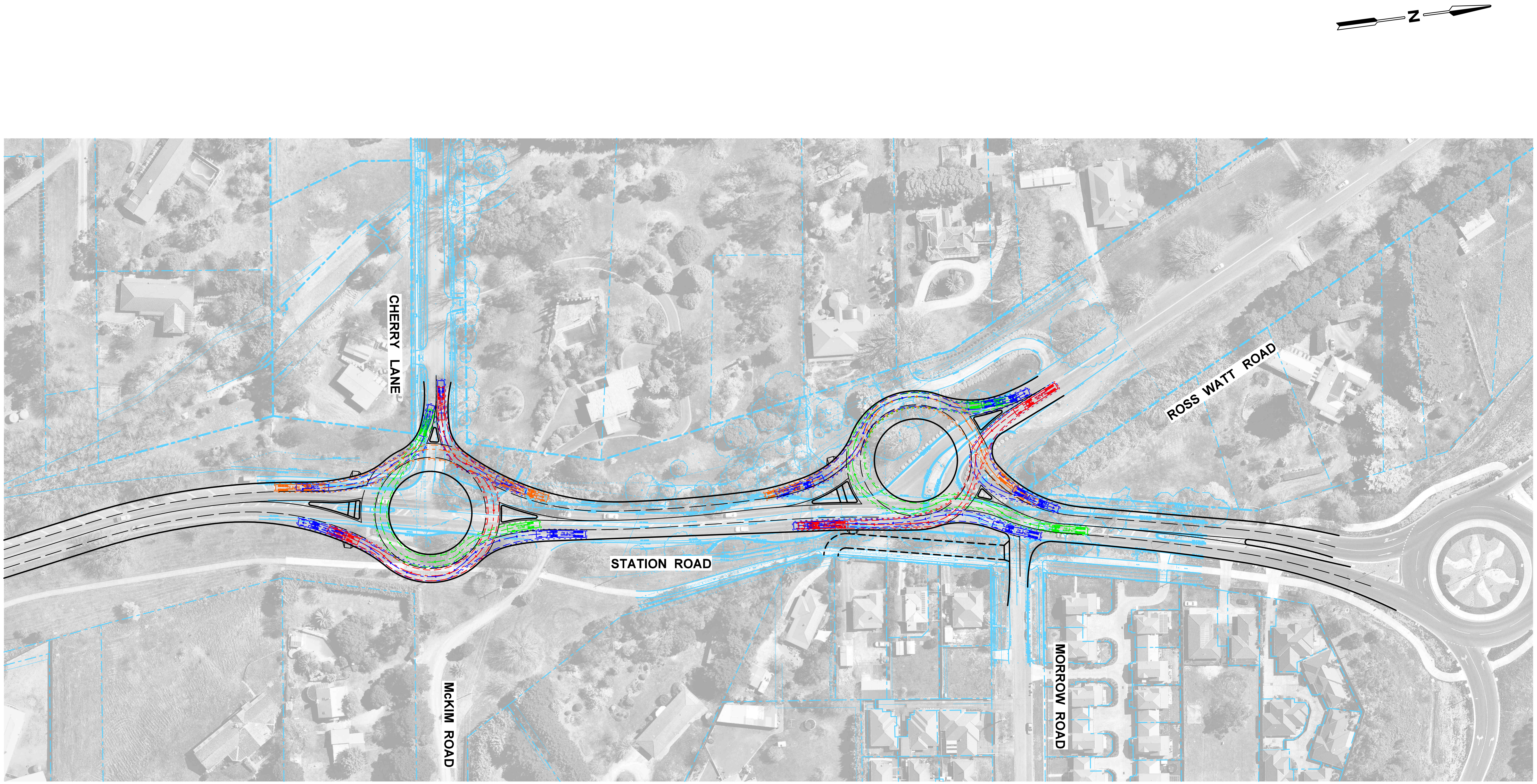

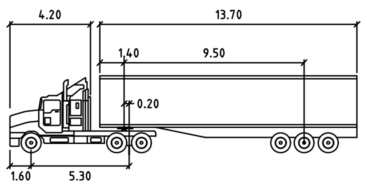

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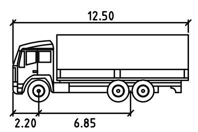

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Project Number 210473	Drawing Number SPA1002	Revision B

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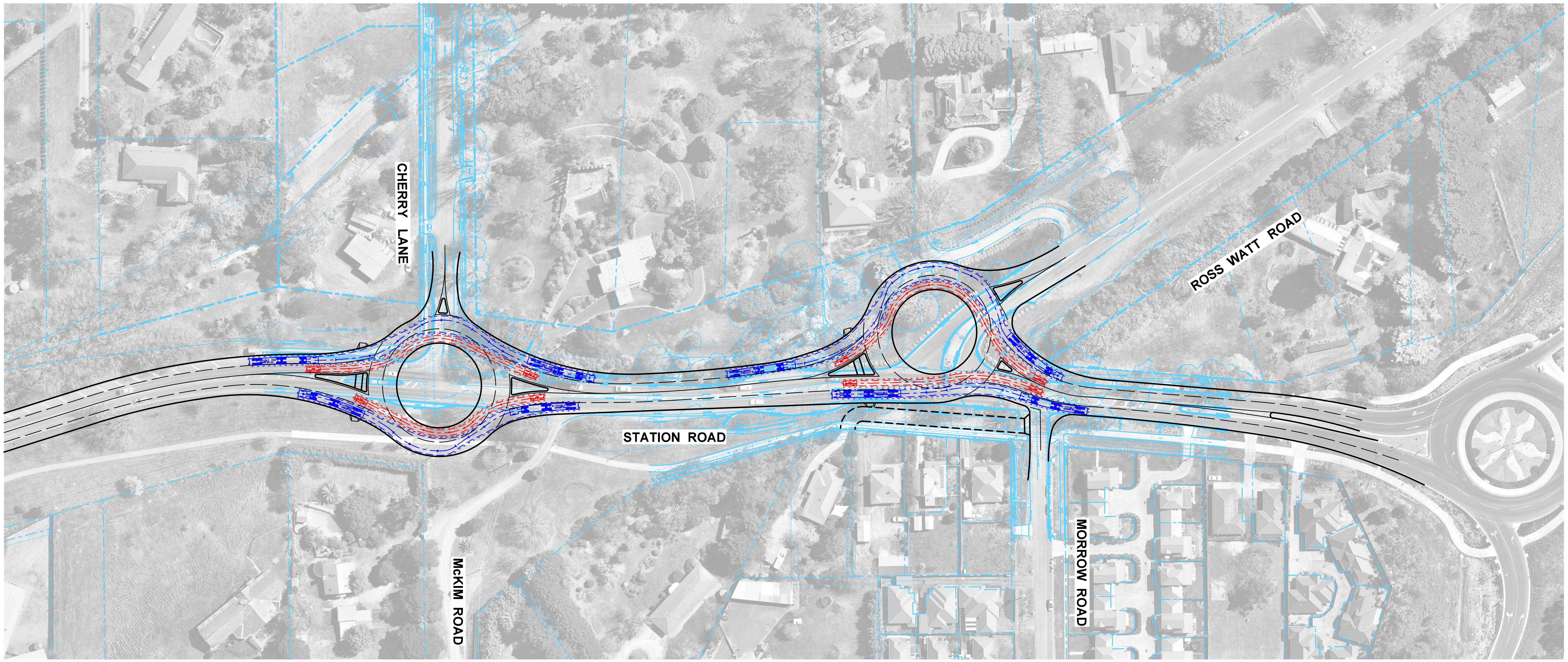

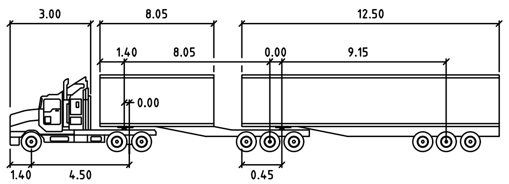

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B99

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SWEPT PATH LEGEND

VEHICLE SWEPT PATHS SHOWN DASHED
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Drawing Title
ROSS WATT ROAD SUBDIVISION
DUPLICATED STATION RD - ROUNDABOUT
SWEPT PATH ANALYSIS - ULTIMATE

Designed	Approved	Melway Ref
TCW	VG	NA

Project Number	Drawing Number	Revision
210473	SPA1003	B

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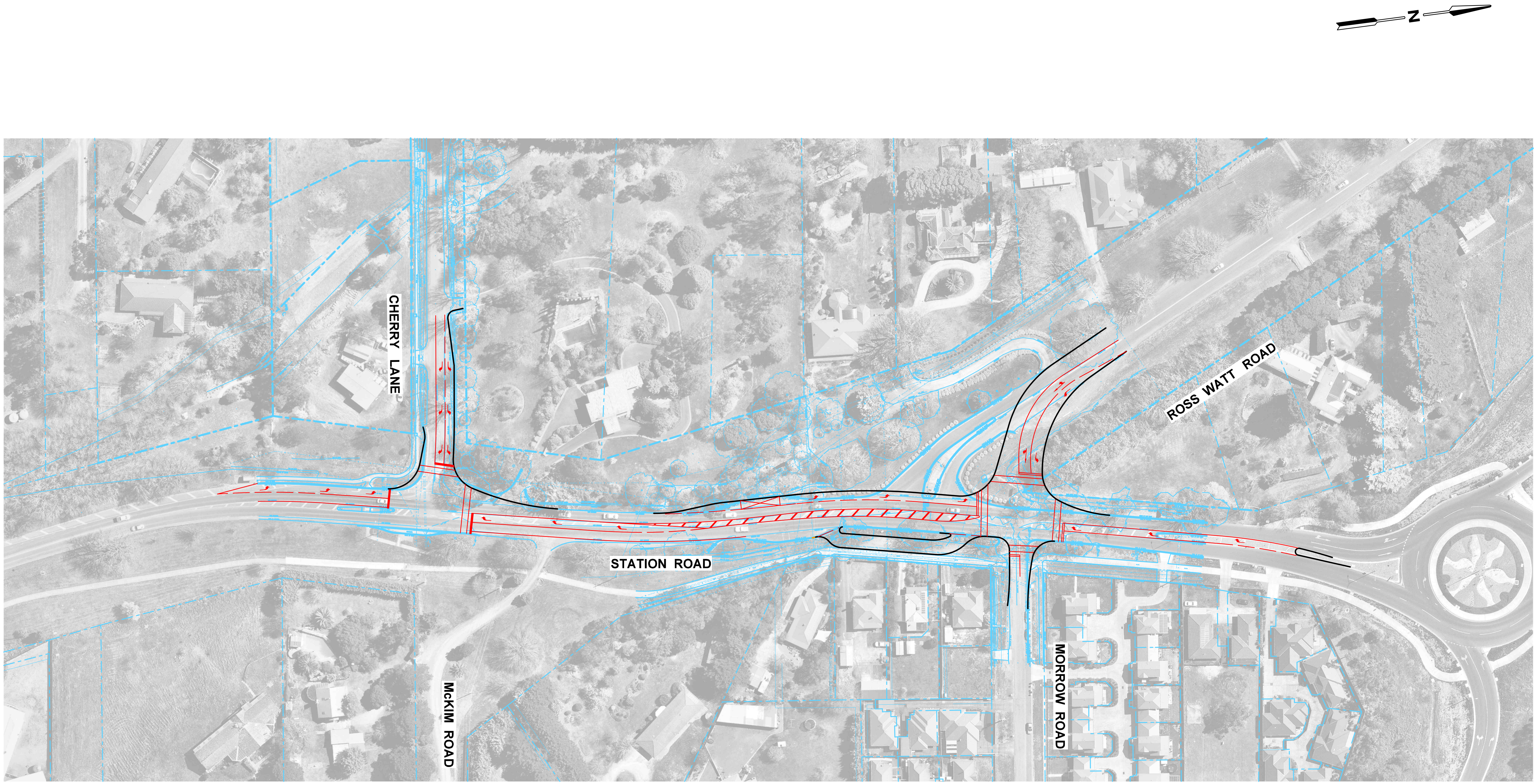

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Drawing Title: ROSS WATT ROAD SUBDIVISION SIGNALISED INTERSECTION DESIGN CONCEPT LAYOUT PLAN - INTERIM		
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Project Number: 210473	Drawing Number: CLP1004	Revision: B

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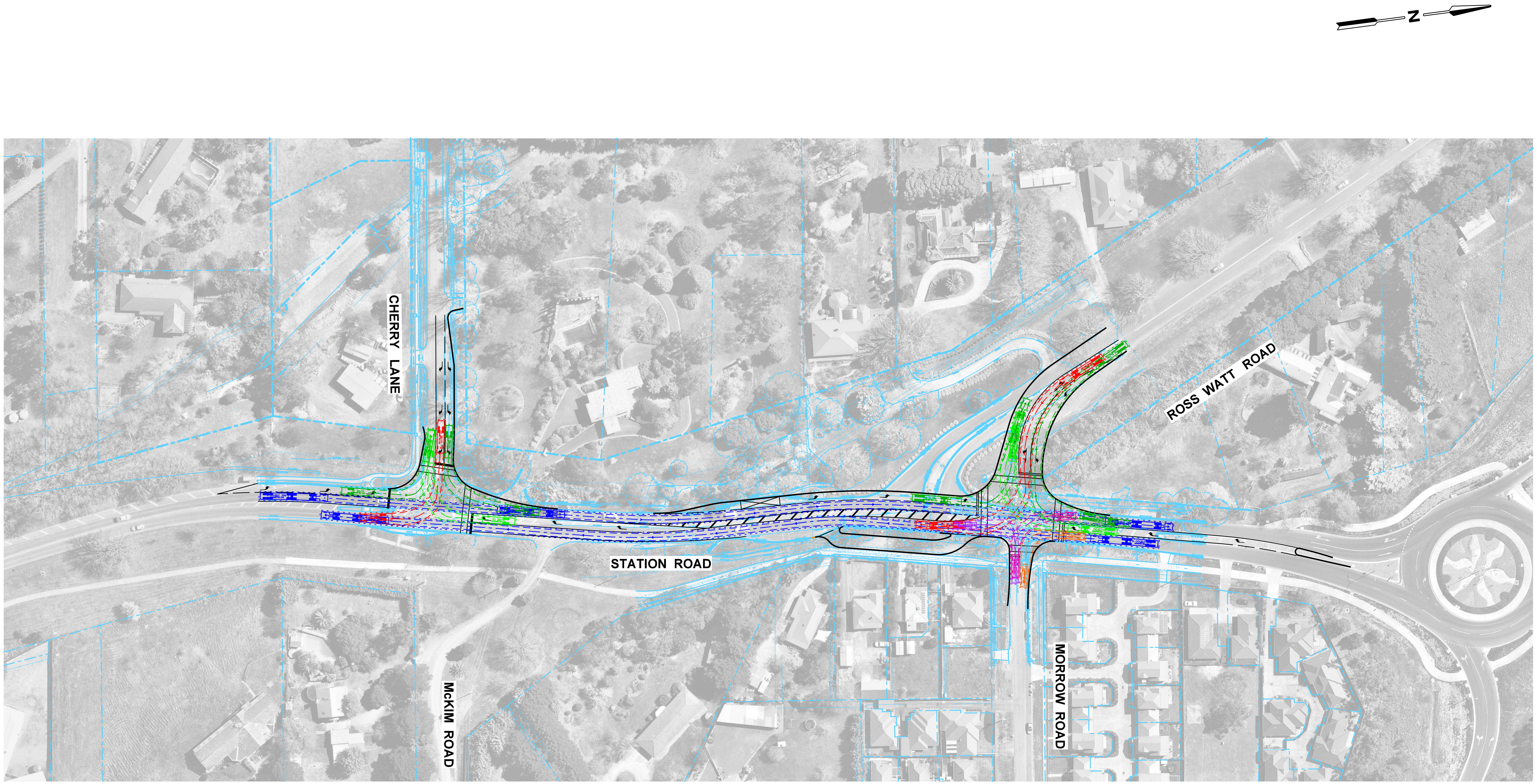

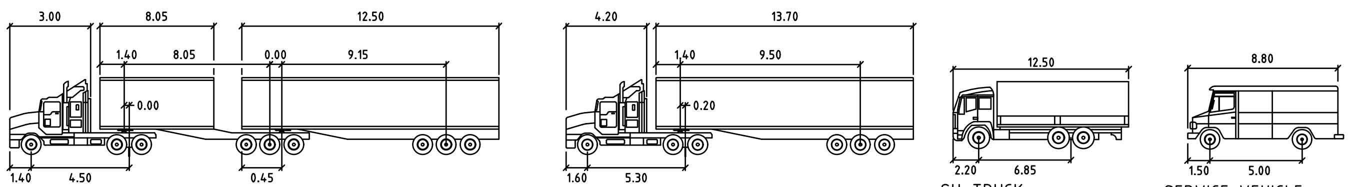

B-DOUBLE 26M

	meters		meters
Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 23.4
Tractor Track	: 2.50	Articulating Angle	: 70.0
Trailer Track	: 2.50		

PM S 19M

	meters		meters
Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 27.8
Tractor Track	: 2.50	Articulating Angle	: 70.0
Trailer Track	: 2.50		

SU TRUCK

	meters
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 36.6

SERVICE VEHICLE

	meters
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 38.7

SWEPT PATH LEGEND

— — — VEHICLE SWEPT PATHS SHOWN DASHED
- - - - - - 500mm CLEARANCE ENVELOPE SHOWN DOTTED

WORK IN PROGRESS
FOR DISCUSSION PURPOSES ONLY

onemilegrid
Wurundjeri Woiworung Country
56 Down Street, Collingwood, VIC 3066
Email:info@onemilegrid.com.au Web:www.onemilegrid.com.au
Phone (03) 9939 8250

Drawing Title
ROSS WATT ROAD SUBDIVISION
SIGNALISED INTERSECTION DESIGN
SWEPT PATH ANALYSIS - INTERIM

Designed	Approved	Melway Ref
TCW	VG	NA

Scale	Project Number	Drawing Number	Revision
1:1500 @ A3 (0 7.5 15 30)	210473	SPA1004	B

CAD File: N:\Projects\2021\210473\Drawings\210473SPA1004.dgn
Date Plotted: 23-11-2022 7:37:27 AM

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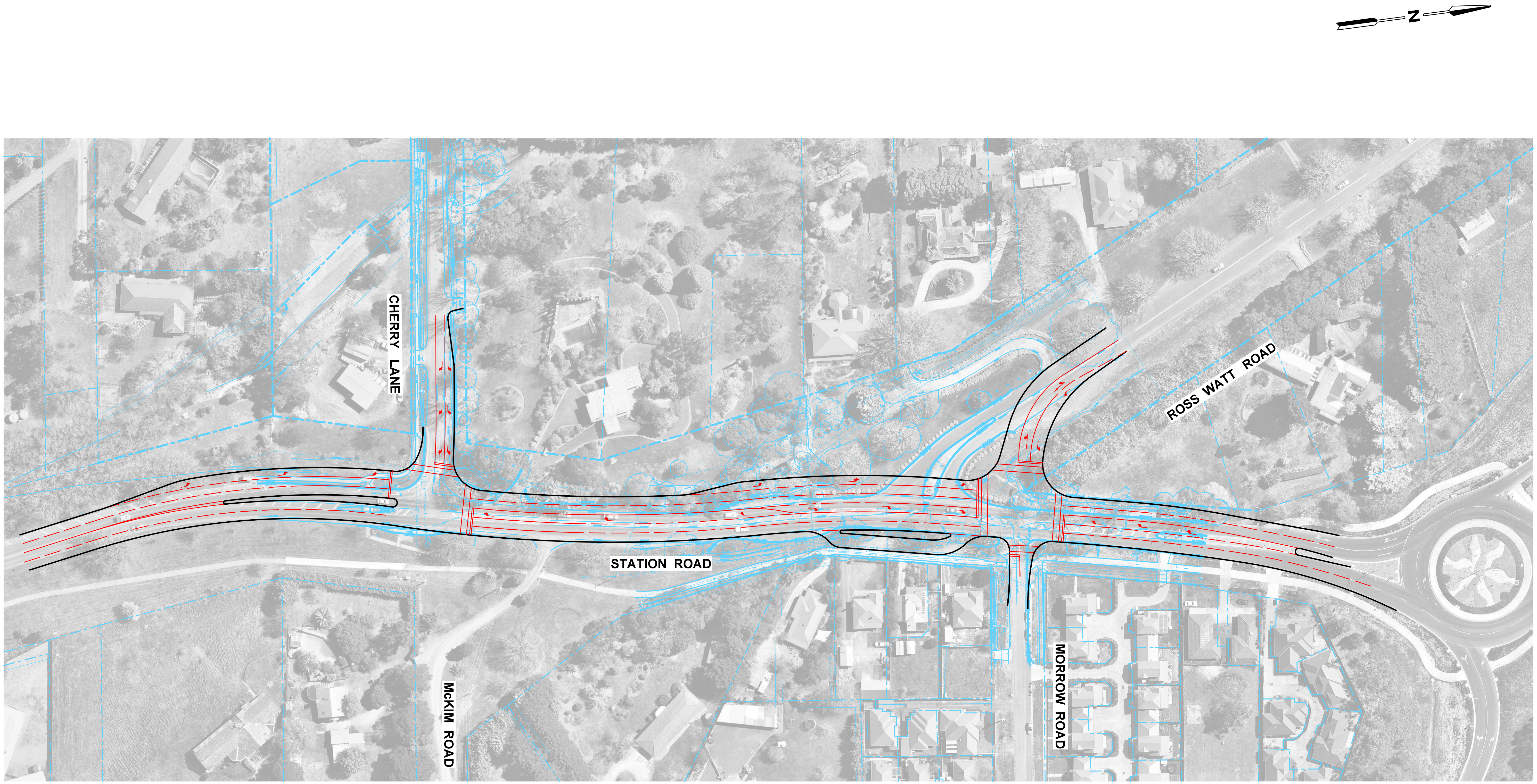
Aerial Photography
Aerial photography provided by Nearmap



CAD File: N:\Projects\2021\210473\Drawings\210473CLP1005.dgn

Date Plotted: 23-11-2022 7:37:15 AM

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Drawing Title		
ROSS WATT ROAD SUBDIVISION DUPLICATED STATION RD - SIGNALS CONCEPT LAYOUT PLAN - ULTIMATE		
Designed: TCW	Approved: VG	Melway Ref: NA
Project Number: 210473	Drawing Number: CLP1005	Revision: B

Scale
1:1500 @ A3
0 7.5 15 30

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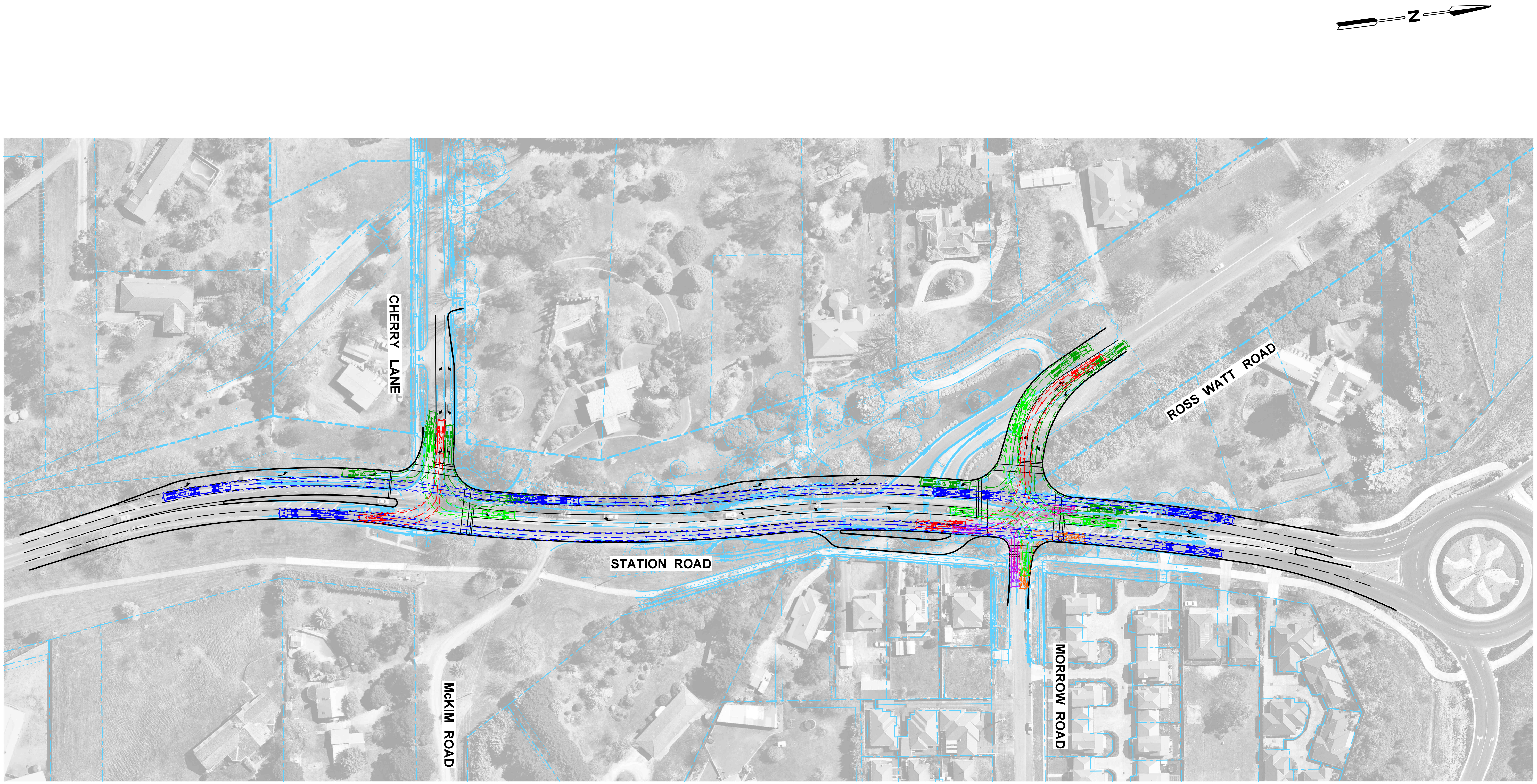
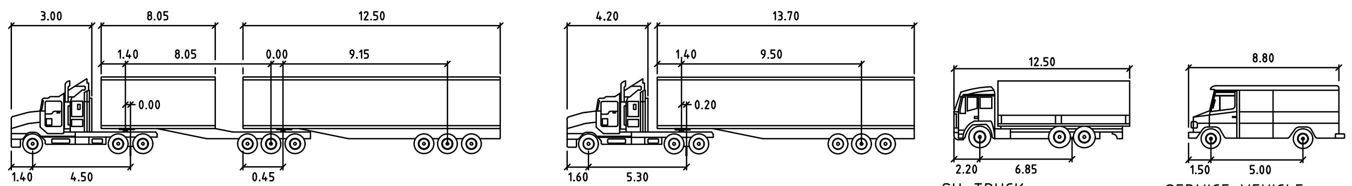
Aerial Photography
Aerial photography provided by Nearmap





B-DOUBLE 26M

	meters		meters
Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 23.4
Tractor Track	: 2.50	Articulating Angle	: 70.0
Trailer Track	: 2.50		

PM S 19M

	meters		meters
Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 27.8
Tractor Track	: 2.50	Articulating Angle	: 70.0
Trailer Track	: 2.50		

SU TRUCK

	meters
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 36.6

SERVICE VEHICLE

	meters
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 38.7

SWEPT PATH LEGEND

— — — VEHICLE SWEPT PATHS SHOWN DASHED
- - - - - - 500mm CLEARANCE ENVELOPE SHOWN DOTTED

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Scale
1:1500 @ A3
0 7.5 15 30

Drawing Title
ROSS WATT ROAD SUBDIVISION
DUPLICATED STATION RD - SIGNALS
SWEPT PATH ANALYSIS - ULTIMATE

Designed	Approved	Melway Ref
TCW	VG	NA

Project Number	Drawing Number	Revision
210473	SPA1005	B

CAD File: N:\Projects\2021\210473\Drawings\210473SPA1005.dgn
Date Plotted: 23-11-2022 7:37:30 AM

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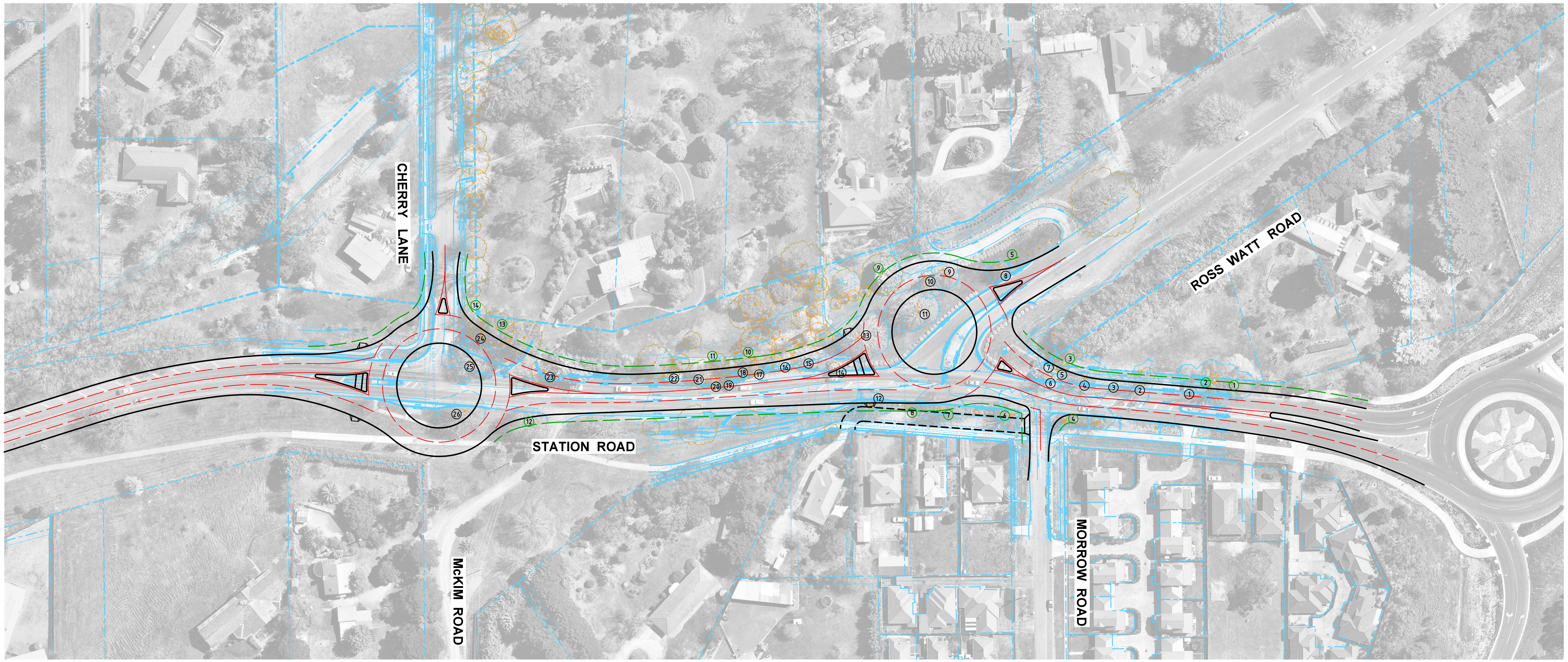
Aerial Photography
Aerial photography provided by Nearmap

Appendix B Tree Removal Plans



LEGEND

(1)	NUMBER OF EXISTING TREES WITHIN THE PROPOSED KERB
(1)	NUMBER OF EXISTING TREES WITHIN 3m FROM THE PROPOSED KERB
— –	3m ZONE FROM THE PROPOSED KERB

TREE COUNT:

26 - TOTAL NUMBER OF TREES TO BE REMOVED

14 - TOTAL NUMBER OF TREES TO BE REMOVED SUBJECT TO ABORIST'S FINDINGS

CAD File: N:\Projects\2021\210473\Drawings\210473CLP1101.dgn

Date Plotted: 29-11-2022 3:59:16 PM

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Drawing Title		
ROSS WATT ROAD SUBDIVISION TREE REMOVAL COUNT CONCEPT LAYOUT PLAN - ULTIMATE ROUNDABOUT		
Designed: JPB	Approved: VG	Melway Ref: NA
Project Number: 210473	Drawing Number: CLP1101	Revision: A

Scale
1:1500 @ A3
0 7.5 15 30

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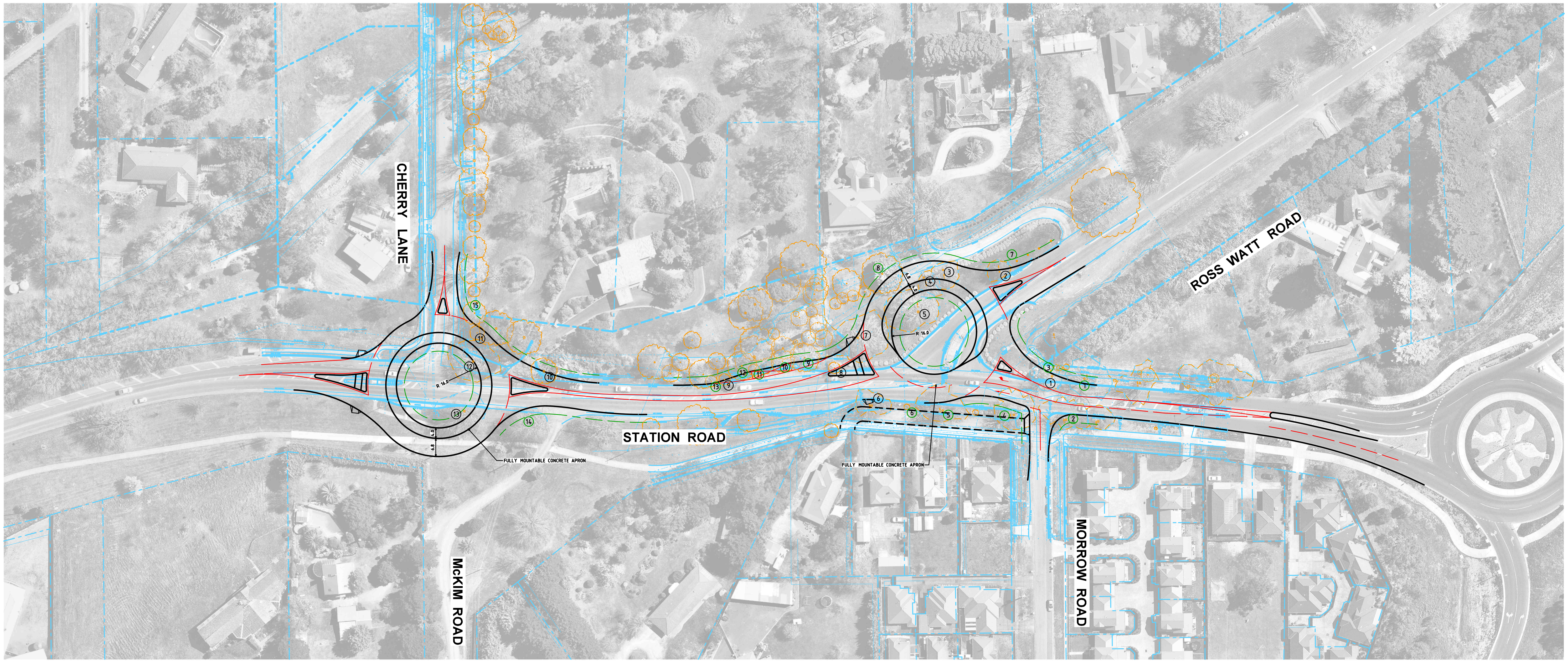
Aerial Photography
Aerial photography provided by Nearmap



LEGEND

①	NUMBER OF EXISTING TREES WITHIN THE PROPOSED KERB
①	NUMBER OF EXISTING TREES WITHIN 3m FROM THE PROPOSED KERB
— –	3m ZONE FROM THE PROPOSED KERB

TREE COUNT:

13 - TOTAL NUMBER OF TREES TO BE REMOVED

15 - TOTAL NUMBER OF TREES TO BE REMOVED SUBJECT TO ABORIST'S FINDINGS

CAD File: \\auvicsvr01\Company\Projects\2021\210473\Drawings\210473CLP1102.dgn

Date Plotted: 31-01-2023 9:11:13 AM

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Drawing Title		
ROSS WATT ROAD SUBDIVISION TREE REMOVAL COUNT CONCEPT LAYOUT PLAN - INTERIM		
Designed	Approved	Melway Ref
JPB	VG	NA
Project Number	Drawing Number	Revision
210473	CLP1102	A

Scale
1:1500 @ A3
0 7.5 15 30

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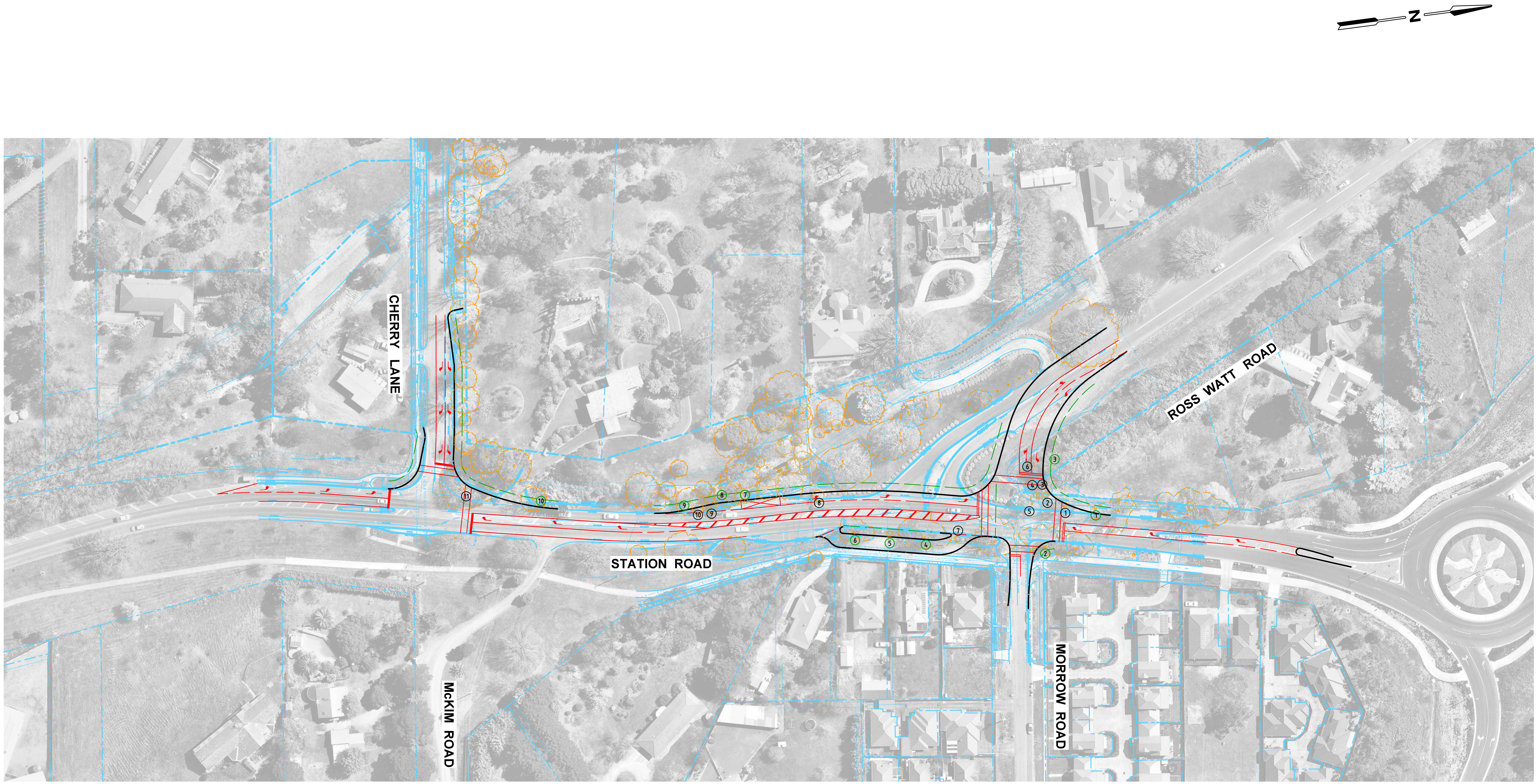
Aerial Photography
Aerial photography provided by Nearmap



LEGEND

1	NUMBER OF EXISTING TREES WITHIN THE PROPOSED KERB
1	NUMBER OF EXISTING TREES WITHIN 3m FROM THE PROPOSED KERB
— –	3m ZONE FROM THE PROPOSED KERB

TREE COUNT:

11 – TOTAL NUMBER OF TREES TO BE REMOVED

10 – TOTAL NUMBER OF TREES TO BE REMOVED SUBJECT TO ABORIST'S FINDINGS

CAD File: \\auvicsvr01\Company\Projects\2021\210473\Drawings\210473CLP1103.dgn

Date Plotted: 31-01-2023 9:00:50 AM

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Scale
1:1500 @ A3
0 7.5 15 30

Drawing Title
ROSS WATT ROAD SUBDIVISION
TREE REMOVAL COUNT
CONCEPT LAYOUT PLAN - INTERIM

Designed	Approved	Melway Ref
JPB	VG	NA

Project Number	Drawing Number	Revision
210473	CLP1103	A

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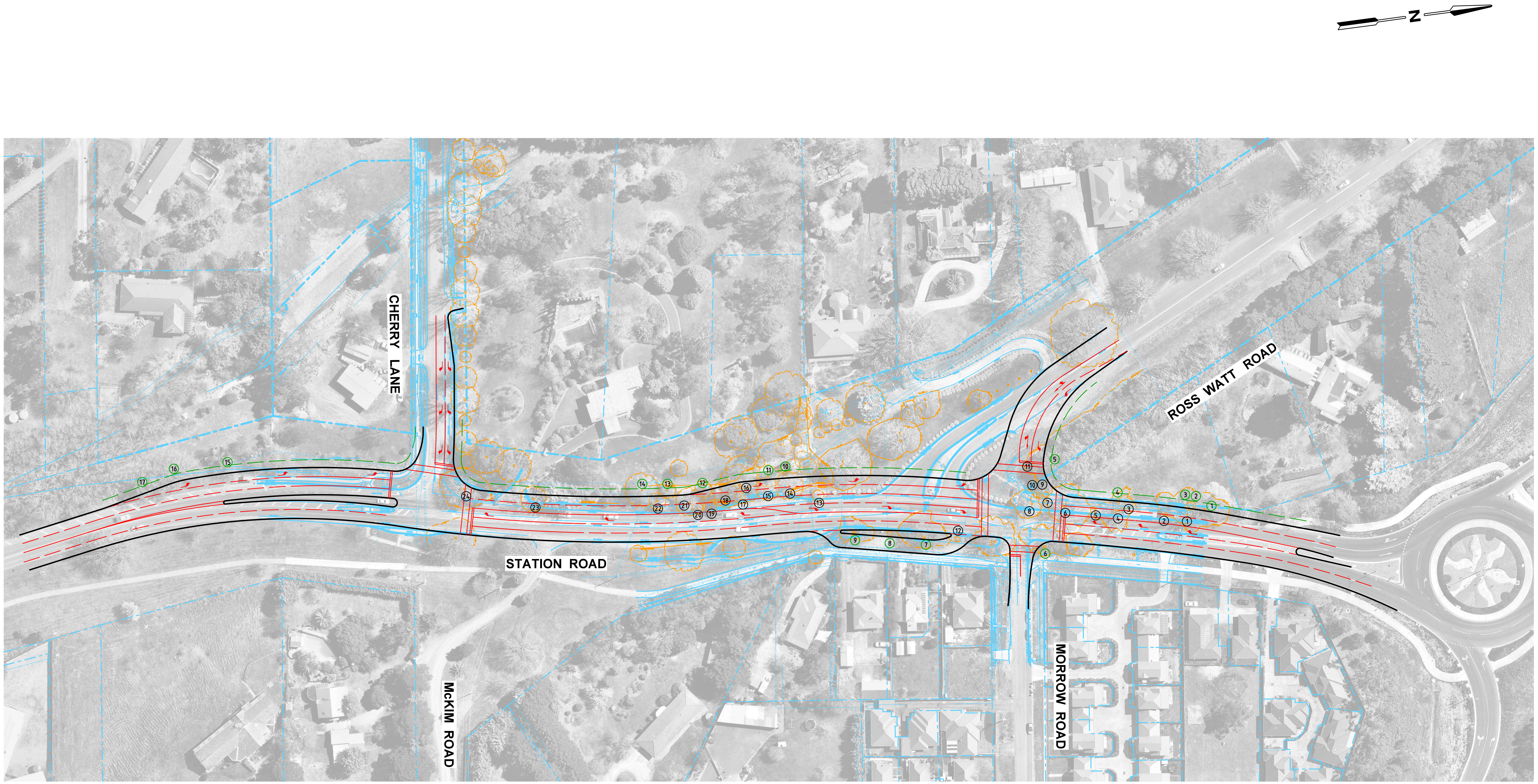
Aerial Photography
Aerial photography provided by Nearmap



LEGEND

①	NUMBER OF EXISTING TREES WITHIN THE PROPOSED KERB
①	NUMBER OF EXISTING TREES WITHIN 3m FROM THE PROPOSED KERB
— –	3m ZONE FROM THE PROPOSED KERB

TREE COUNT:

24 - TOTAL NUMBER OF TREES TO BE REMOVED

17 - TOTAL NUMBER OF TREES TO BE REMOVED SUBJECT TO ABORIST'S FINDINGS

CAD File: N:\Projects\2021\210473\Drawings\210473CLP1100.dgn

Date Plotted: 29-11-2022 3:58:38 PM

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Phone (03) 9939 8250

Drawing Title
ROSS WATT ROAD SUBDIVISION
TREE REMOVAL COUNT
CONCEPT LAYOUT PLAN - ULTIMATE SIGNALS

Designed	Approved	Melway Ref
JPB	VG	NA

Scale	Project Number	Drawing Number	Revision
1:1500 @ A3 (0, 7.5, 15, 30)	210473	CLP1100	A

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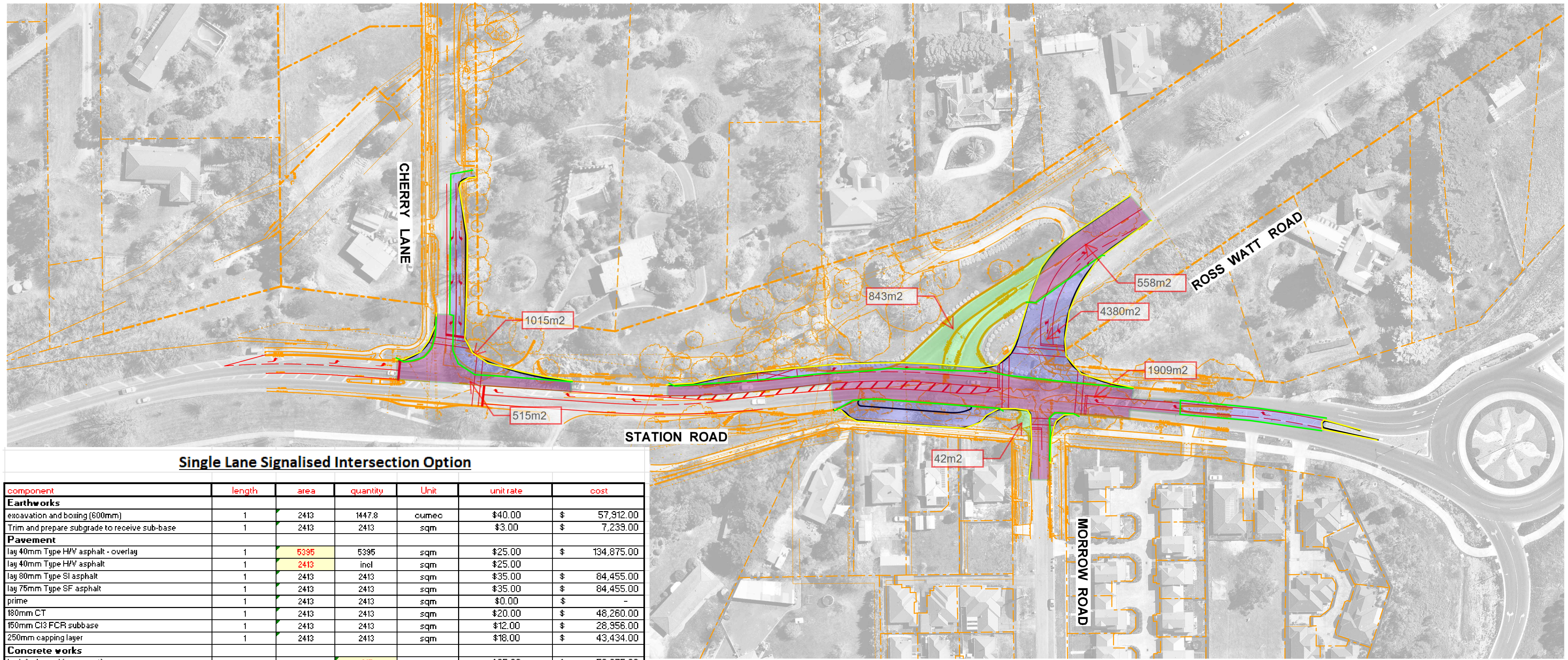
Aerial Photography
Aerial photography provided by Nearmap

Appendix C High Level Intersection Costings



Single Lane Signalised Intersection Option

component	length	area	quantity	Unit	unit rate	cost
Earthworks						
excavation and boxing (600mm)	1	2413	1447.8	cumec	$40.00	$ 57,912.00
Trim and prepare subgrade to receive sub-base	1	2413	2413	sqm	$3.00	$ 7,239.00
Pavement						
lay 40mm Type H/V asphalt - overlay	1	5395	5395	sqm	$25.00	$ 134,875.00
lay 40mm Type H/V asphalt	1	2413	incl	sqm	$25.00	
lay 80mm Type SI asphalt	1	2413	2413	sqm	$35.00	$ 84,455.00
lay 75mm Type SF asphalt	1	2413	2413	sqm	$35.00	$ 84,455.00
prime	1	2413	2413	sqm	$0.00	$ -
180mm CT	1	2413	2413	sqm	$20.00	$ 48,260.00
150mm Cl3 FCR subbase	1	2413	2413	sqm	$12.00	$ 28,956.00
250mm capping layer	1	2413	2413	sqm	$18.00	$ 43,434.00
Concrete works						
kerb & channel (pavement)			615	m	$85.00	$ 52,275.00
Traffic Islands			2	Item	$25,000.00	$ 50,000.00
Traffic Signals						
Signage & linemarking			1	Item	$10,000.00	$ 10,000.00
Signals			2	Item	$75,000.00	$ 150,000.00
Lighting / JUP			6	No.	$6,000.00	$ 36,000.00
Electrical / lighting			1	No.	$100,000.00	$ 100,000.00
Vicroads Fees			1	No.	$60,000.00	$ 60,000.00
Demolition Works						
Pavement and Kerb			843	m	$100.00	$ 84,300.00
125mm thick concrete foot path				m	$60.00	$ -
drainage pipe + Pit				Item	$2,860.00	$ -
Drainage						
drainage pipe + CR backfill (say 450mm dia)			246	m	$450.00	$ 110,700.00
drainage road x-ing + CR backfill (say 375mm dia)			30	m	$400.00	$ 12,000.00
drainage pits @ intersection			8.2	m	$3,000.00	$ 24,600.00
AG drain			578	m	$40.00	$ 23,120.00
					subtotal	$ 1,202,581.00
					TMP and site est	$ 200,000.00
					Contingency 5%	$ 60,129.05
					Total Estimated Cost (excl. GST)	**$ 1,462,710.05**
					Council checking & supervision 3.25%	$ 47,538.08
					Consultant Fees 10%	$ 146,271.01
					Total Estimated Cost (excl. GST)	**$ 1,656,519.13**

CAD File: N:\Projects\2021\210473\Drawings\210473CLP1004.dgn

Date Plotted: 04-11-2022 14:58:37

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Scale
1:1500 @ A3
0 7.5 15 30

Drawing Title
ROSS WATT ROAD SUBDIVISION
SIGNALISED INTERSECTION DESIGN
CONCEPT LAYOUT PLAN

Designed	Approved	Melway Ref
TCW	VG	NA

Project Number	Drawing Number	Revision
210473	CLP1004	A

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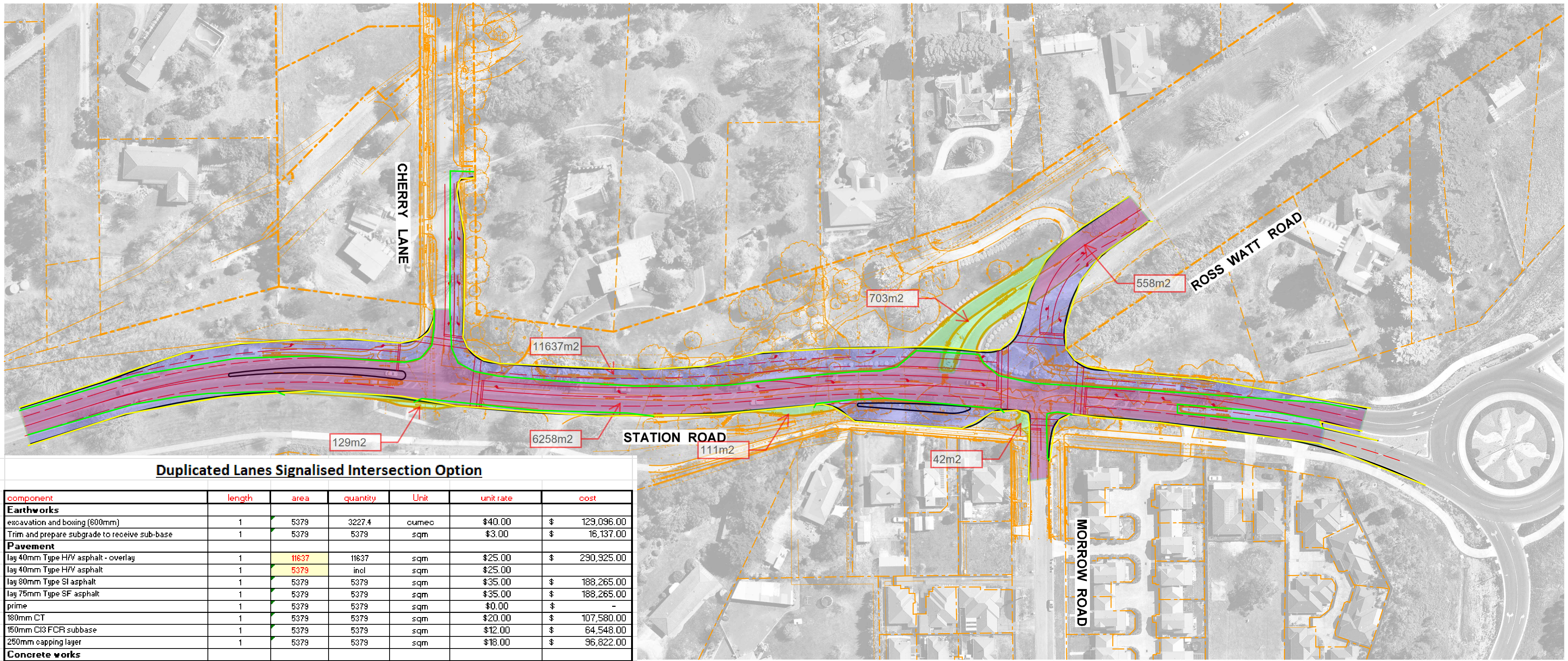
Aerial Photography
Aerial photography provided by Nearmap



Duplicated Lanes Signalised Intersection Option

component	length	area	quantity	Unit	unit rate	cost
Earthworks						
excavation and boxing (600mm)	1	5379	3227.4	cumec	$40.00	$ 129,096.00
Trim and prepare subgrade to receive sub-base	1	5379	5379	sqm	$3.00	$ 16,137.00
Pavement						
lay 40mm Type H/V asphalt - overlay	1	11637	11637	sqm	$25.00	$ 290,925.00
lay 40mm Type H/V asphalt	1	5379	incl	sqm	$25.00	
lay 80mm Type SI asphalt	1	5379	5379	sqm	$35.00	$ 188,265.00
lay 75mm Type SF asphalt	1	5379	5379	sqm	$35.00	$ 188,265.00
prime	1	5379	5379	sqm	$0.00	$ -
180mm CT	1	5379	5379	sqm	$20.00	$ 107,580.00
150mm CI3 FCR subbase	1	5379	5379	sqm	$12.00	$ 64,548.00
250mm capping layer	1	5379	5379	sqm	$18.00	$ 96,822.00
Concrete works						
kerb & channel (pavement)			1311	m	$85.00	$ 111,435.00
Traffic Islands			3	Item	$25,000.00	$ 75,000.00
Traffic Signals						
Signage & linemarking			1	Item	$30,000.00	$ 30,000.00
Signals			2	Item	$125,000.00	$ 250,000.00
Lighting / JUP			6	No.	$6,000.00	$ 36,000.00
Electrical / lighting			1	No.	$100,000.00	$ 100,000.00
Vicroads Fees			1	No.	$60,000.00	$ 60,000.00
Demolition Works						
Pavement and Kerb			856	m	$100.00	$ 85,600.00
125mm thick concrete foot path				m	$60.00	$ -
drainage pipe + Pit				Item	$2,860.00	$ -
Drainage						
drainage pipe + CR backfill (say 450mm dia)			524.4	m	$450.00	$ 235,980.00
drainage road x-ing + CR backfill (say 375mm dia)			45	m	$400.00	$ 18,000.00
drainage pits @ intersection			17.48	m	$3,000.00	$ 52,440.00
AG drain			1011	m	$40.00	$ 40,440.00
					subtotal	$ 2,176,533.00
					TMP and site est	$ 300,000.00
					Contingency 5%	$ 108,826.65
					Total Estimated Cost (excl. GST)	**$ 2,585,359.65**
					Council checking & supervision 3.25%	$ 84,024.19
					Consultant Fees 10%	$ 258,535.97
					Total Estimated Cost (excl. GST)	**$ 2,927,919.80**

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Drawing Title
ROSS WATT ROAD SUBDIVISION
DUPLICATED STATION RD - SIGNALS
CONCEPT LAYOUT PLAN

Designed	Approved	Melway Ref
TCW	VG	NA

Scale	Project Number	Drawing Number	Revision
1:1500 @ A3 (0 7.5 15 30)	210473	CLP1005	A

CAD File: N:\Projects\2021\210473\Drawings\210473CLP1005.dgn
Date Plotted: 04-11-2022 14:58:16

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Aerial Photography
Aerial photography provided by Nearmap

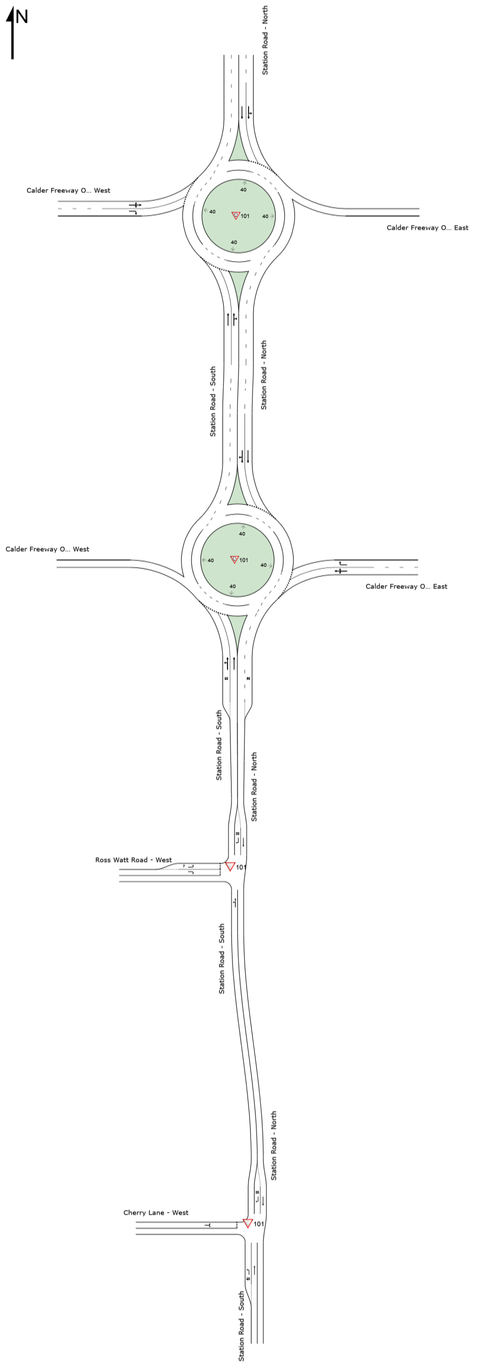
Appendix D SIDRA Results

NETWORK LAYOUT

Network: N101 [AM Peak (Network Folder: Existing)]

New Network
Network Category: (None)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
101	NA	StatCherAMExEx
101	NA	StatRossAMExEx
101	NA	StatCaldWestAMExEx
101	NA	StatCaldEastAMExEx

LANE SUMMARY

Site: 101 [StatCherAMExEx (Site Folder: Existing)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [AM Peak (Network Folder: Existing)]

Station Road / Cherry Lane
AM Peak, Existing Geometry, Existing Volumes
Site Category: (None)
Give-Way (Two-Way)

Lane Use and Performance

	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Station Road - South															
Lane 1	26	2.0	26	2.0	1831	0.014	100	5.6	LOS A	0.0	0.0	Short	50	0.0	NA
Lane 2	640	2.0	640	2.0	1925	0.332	100	0.1	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	666	2.0	666	2.0		0.332		0.3	LOS A	0.0	0.0				
North: Station Road - North															
Lane 1	797	2.0	797	2.0	1925	0.414	100	0.1	LOS A	0.0	0.0	Full	165	0.0	0.0
Lane 2	21	2.0	21	2.0	634	0.033	100	9.5	LOS A	0.1	0.8	Short	30	0.0	NA
Approach	818	2.0	818	2.0		0.414		0.3	LOS A	0.1	0.8				
West: Cherry Lane - West															
Lane 1	65	2.0	65	2.0	155	0.420	100	34.2	LOS A	1.4	10.1	Full	500	0.0	0.0
Approach	65	2.0	65	2.0		0.420		34.2	LOS A	1.4	10.1				
All Vehicles	1549	2.0	1549	2.0		0.420		1.7	LOS A	1.4	10.1				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Lane LOS values are based on degree of saturation per lane.
Minor Road Approach LOS values are based on worst degree of saturation for any lane.
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	L2 W	T1 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	26	-	26	2.0	1831	0.014	100	0.0	2
Lane 2	-	640	640	2.0	1925	0.332	100	NA	NA
Approach	26	640	666	2.0		0.332			

North: Station Road - North

Mov. From N To Exit:	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	797	-	797	2.0	1925	0.414	100	NA	NA
Lane 2	-	21	21	2.0	634	0.033	100	0.0	1
Approach	797	21	818	2.0		0.414			

West: Cherry Lane - West

Mov. From W To Exit:	L2 N	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	39	26	65	2.0	155	0.420	100	NA	NA
Approach	39	26	65	2.0		0.420			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	1549	2.0	0.420

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
West: Cherry Lane - West				
Lane 1	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101 [StatRossAMExEx (Site Folder: Existing)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [AM Peak (Network Folder: Existing)]

Station Road / Ross Watt Road
AM Peak, Existing Geometry, Existing Volumes
Site Category: (None)
Give-Way (Two-Way)

Lane Use and Performance

	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Station Road - South															
Lane 1	688	3.8	688	3.8	1894	0.363	100	0.5	LOS A	0.0	0.0	Full	165	0.0	0.0
Approach	688	3.8	688	3.8		0.363		0.5	LOS A	0.0	0.0				
North: Station Road - North															
Lane 1	818	4.0	818	4.0	1901	0.430	100	0.1	LOS A	0.0	0.0	Full	170	0.0	0.0
Lane 2	16	2.0	16	2.0	797	0.020	100	8.8	LOS A	0.1	0.5	Short	20	0.0	NA
Approach	834	4.0	834	4.0		0.430		0.2	LOS A	0.1	0.5				
West: Ross Watt Road - West															
Lane 1	28	2.0	28	2.0	809	0.035	100	8.5	LOS A	0.1	0.9	Short	7	0.0	NA
Lane 2	14	2.0	14	2.0	95	0.143	100	42.5	LOS A	0.4	2.8	Full	500	0.0	0.0
Approach	42	2.0	42	2.0		0.143		19.5	LOS A	0.4	2.8				
All Vehicles	1564	3.9	1564	3.9		0.430		0.9	LOS A	0.4	2.8				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Lane LOS values are based on degree of saturation per lane.
Minor Road Approach LOS values are based on worst degree of saturation for any lane.
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	L2 W	T1 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	59	629	688	3.8	1894	0.363	100	NA	NA
Approach	59	629	688	3.8		0.363			

North: Station Road - North

Mov. From N To Exit:	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	818	-	818	4.0	1901	0.430	100	NA	NA
Lane 2	-	16	16	2.0	797	0.020	100	0.0	1
Approach	818	16	834	4.0		0.430			

West: Ross Watt Road - West

Mov.	L2	R2	Total	%HV	Deg.	Lane	Prob.	Ov.

From W To Exit:	N	S			Cap. veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	28	-	28	2.0	809	0.035	100	0.0	2
Lane 2	-	14	14	2.0	95	0.143	100	NA	NA
Approach	28	14	42	2.0		0.143			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	1564	3.9	0.430

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.												

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
West: Ross Watt Road - West				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101 [StatCaldWestAMExEx (Site Folder: Existing)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [AM Peak (Network Folder: Existing)]

Station Road / Calder Freeway Westbound Lane
AM Peak, Existing Volumes, Existing Geometry
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Station Road - South															
Lane 1[d]	351	4.0	351	4.0	1378	0.254	100	3.8	LOS A	1.2	8.8	Short	50	0.0	NA
Lane 2	301	4.0	301	4.0	1184	0.254	100	3.9	LOS A	1.2	8.6	Full	170	0.0	0.0
Approach	652	4.0	652	4.0		0.254		3.8	LOS A	1.2	8.8				
East: Calder Freeway Off-ramp - East															
Lane 1[d]	160	4.0	160	4.0	1183	0.135	100	8.7	LOS A	0.6	4.0	Full	500	0.0	0.0
Lane 2	124	4.0	124	4.0	920	0.135	100	12.0	LOS A	0.5	3.8	Full	500	0.0	0.0
Approach	284	4.0	284	4.0		0.135		10.2	LOS A	0.6	4.0				
North: Station Road - North															
Lane 1	252	4.0	252	4.0	1463	0.172	56[6]	4.2	LOS A	0.0	0.0	Full	130	0.0	0.0
Lane 2[d]	562	4.0	562	4.0	1824	0.308	100	3.8	LOS A	0.0	0.0	Full	130	0.0	0.0
Approach	814	4.0	814	4.0		0.308		3.9	LOS A	0.0	0.0				
All Vehicles	1749	4.0	1749	4.0		0.308		4.9	LOS A	1.2	8.8				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

6 Lane under-utilisation due to downstream effects
d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	L2 W	T1 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	187	163	351	4.0	1378	0.254	100	0.0	2
Lane 2	-	301	301	4.0	1184	0.254	100	NA	NA
Approach	187	464	652	4.0		0.254			

East: Calder Freeway Off-ramp - East

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	83	1	76	160	4.0	1183	0.135	100	NA	NA

Lane 2	-	-	124	124	4.0	920	0.135	100	NA	NA
Approach	83	1	200	284	4.0		0.135			

North: Station Road - North										
Mov. From N To Exit:	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	252	-	252	4.0	1463	0.172	56[6]	NA	NA
Lane 2	488	74	562	4.0	1824	0.308	100	NA	NA
Approach	740	74	814	4.0		0.308			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	1749	4.0	0.308

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

6 Lane under-utilisation due to downstream effects

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Station Road - South Merge Type: **Priority**												
Exit Short Lane	1	60	0.0	488	498	3.06	2.04	335	1254	0.267	0.9	1.3
Merge Lane	2	-	100.0	Merge Lane is not Opposed				488	1800	0.271	0.0	0.0

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
East: Calder Freeway Off-ramp - East				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101 [StatCaldEastAMExEx (Site Folder: Existing)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [AM Peak (Network Folder: Existing)]

Station Road / Calder Freeway Eastbound Lane
AM Peak, Existing Volumes, Existing Geometry
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Station Road - South															
Lane 1 d	360	4.0	360	4.0	1826	0.197	100	2.9	LOS A	0.0	0.0	Full	130	0.0	0.0
Lane 2	304	4.0	304	4.0	1541	0.197	100	5.7	LOS A	0.0	0.0	Full	130	0.0	0.0
Approach	664	4.0	664	4.0		0.197		4.2	LOS A	0.0	0.0				
North: Station Road - North															
Lane 1 d	395	4.0	395	4.0	1285	0.307	100	4.3	LOS A	1.5	10.9	Full	500	0.0	0.0
Lane 2	328	4.0	328	4.0	1069	0.307	100	4.5	LOS A	1.5	10.5	Full	500	0.0	0.0
Approach	723	4.0	723	4.0		0.307		4.4	LOS A	1.5	10.9				
West: Calder Freeway Off-ramp - West															
Lane 1 d	209	4.0	209	4.0	1255	0.167	100	9.1	LOS A	0.6	4.6	Full	500	0.0	0.0
Lane 2	167	4.0	167	4.0	999	0.167	100	11.4	LOS A	0.6	4.5	Full	500	0.0	0.0
Approach	376	4.0	376	4.0		0.167		10.1	LOS A	0.6	4.6				
All Vehicles	1763	4.0	1763	4.0		0.307		5.5	LOS A	1.5	10.9				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	360	-	360	4.0	1826	0.197	100	NA	NA
Lane 2	172	132	304	4.0	1541	0.197	100	NA	NA
Approach	533	132	664	4.0		0.197			

North: Station Road - North

Mov. From N To Exit:	L2 E	T1 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	224	171	395	4.0	1285	0.307	100	NA	NA
Lane 2	-	328	328	4.0	1069	0.307	100	NA	NA

Approach	224	499	723	4.0		0.307				
West: Calder Freeway Off-ramp - West										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	60	1	148	209	4.0	1255	0.167	100	NA	NA
Lane 2	-	-	167	167	4.0	999	0.167	100	NA	NA
Approach	60	1	315	376	4.0		0.167			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	1763	4.0	0.307

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis

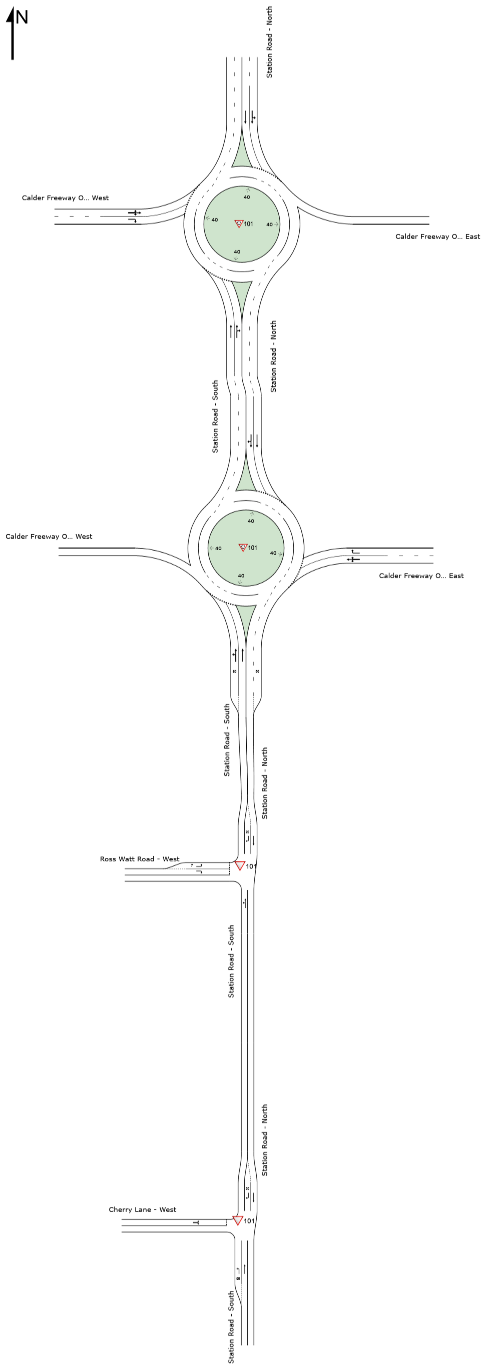
	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
West: Calder Freeway Off-ramp - West				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

NETWORK LAYOUT

Network: N101 [PM Peak (Network Folder: Existing)]

New Network
Network Category: (None)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
101	NA	StatCherPMExEx
101	NA	StatRossPMExEx
101	NA	StatCaldWestPMExEx
101	NA	StatCaldEastPMExEx

LANE SUMMARY

Site: 101 [StatCherPMExEx (Site Folder: Existing)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [PM Peak (Network Folder: Existing)]

Station Road / Cherry Lane
PM Peak, Existing Geometry, Existing Volumes
Site Category: (None)
Give-Way (Two-Way)

Lane Use and Performance

	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Station Road - South															
Lane 1	43	2.0	43	2.0	1831	0.024	100	5.6	LOS A	0.0	0.0	Short	50	0.0	NA
Lane 2	739	4.0	739	4.0	1901	0.389	100	0.1	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	782	3.9	782	3.9		0.389		0.4	LOS A	0.0	0.0				
North: Station Road - North															
Lane 1	733	4.0	733	4.0	1901	0.385	100	0.0	LOS A	0.0	0.0	Full	165	0.0	0.0
Lane 2	35	2.0	35	2.0	518	0.067	100	11.1	LOS A	0.2	1.6	Short	30	0.0	NA
Approach	767	3.9	767	3.9		0.385		0.5	LOS A	0.2	1.6				
West: Cherry Lane - West															
Lane 1	57	2.0	57	2.0	133	0.428	100	39.2	LOS A	1.4	9.9	Full	500	0.0	0.0
Approach	57	2.0	57	2.0		0.428		39.2	LOS A	1.4	9.9				
All Vehicles	1606	3.8	1606	3.8		0.428		1.9	LOS A	1.4	9.9				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Lane LOS values are based on degree of saturation per lane.
Minor Road Approach LOS values are based on worst degree of saturation for any lane.
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	L2 W	T1 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	43	-	43	2.0	1831	0.024	100	0.0	2
Lane 2	-	739	739	4.0	1901	0.389	100	NA	NA
Approach	43	739	782	3.9		0.389			

North: Station Road - North

Mov. From N To Exit:	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	733	-	733	4.0	1901	0.385	100	NA	NA
Lane 2	-	35	35	2.0	518	0.067	100	0.0	1
Approach	733	35	767	3.9		0.385			

West: Cherry Lane - West

Mov. From W To Exit:	L2 N	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	33	24	57	2.0	133	0.428	100	NA	NA
Approach	33	24	57	2.0		0.428			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	1606	3.8	0.428

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
West: Cherry Lane - West				
Lane 1	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101 [StatRossPMExEx (Site Folder: Existing)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [PM Peak (Network Folder: Existing)]

Station Road / Ross Watt Road
PM Peak, Existing Geometry, Existing Volumes
Site Category: (None)
Give-Way (Two-Way)

Lane Use and Performance

	Demand Flows [Total	HV]	Arrival Flows [Total	HV]	Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue [Veh	Dist]	Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: Station Road - South															
Lane 1	763	3.8	763	3.8	1893	0.403	100	0.6	LOS A	0.0	0.0	Full	165	0.0	0.0
Approach	763	3.8	763	3.8		0.403		0.6	LOS A	0.0	0.0				
North: Station Road - North															
Lane 1	799	4.0	799	4.0	1901	0.420	100	0.1	LOS A	0.0	0.0	Full	170	0.0	0.0
Lane 2	11	2.0	11	2.0	704	0.015	100	9.5	LOS A	0.1	0.4	Short	20	0.0	NA
Approach	809	4.0	809	4.0		0.420		0.2	LOS A	0.1	0.4				
West: Ross Watt Road - West															
Lane 1	7	2.0	7	2.0	741	0.010	100	8.8	LOS A	0.0	0.2	Short	7	0.0	NA
Lane 2	15	2.0	15	2.0	89	0.166	100	46.3	LOS A	0.5	3.3	Full	500	0.0	0.0
Approach	22	2.0	22	2.0		0.166		33.8	LOS A	0.5	3.3				
All Vehicles	1595	3.9	1595	3.9		0.420		0.8	LOS A	0.5	3.3				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Lane LOS values are based on degree of saturation per lane.
Minor Road Approach LOS values are based on worst degree of saturation for any lane.
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	L2 W	T1 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	76	687	763	3.8	1893	0.403	100	NA	NA
Approach	76	687	763	3.8		0.403			

North: Station Road - North

Mov. From N To Exit:	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	799	-	799	4.0	1901	0.420	100	NA	NA
Lane 2	-	11	11	2.0	704	0.015	100	0.0	1
Approach	799	11	809	4.0		0.420			

West: Ross Watt Road - West

Mov.	L2	R2	Total	%HV	Deg.	Lane	Prob.	Ov.

From W To Exit:	N	S			Cap. veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	7	-	7	2.0	741	0.010	100	0.0	2
Lane 2	-	15	15	2.0	89	0.166	100	NA	NA
Approach	7	15	22	2.0		0.166			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	1595	3.9	0.420

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
West: Ross Watt Road - West				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101 [StatCaldWestPMExEx (Site Folder: Existing)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [PM Peak (Network Folder: Existing)]

Station Road / Calder Freeway Westbound Lane
PM Peak, Existing Volumes, Existing Geometry
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows [Total	HV]	Arrival Flows [Total	HV]	Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue [Veh	Dist]	Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: Station Road - South															
Lane 1[d]	364	4.0	364	4.0	1404	0.259	100	3.9	LOS A	1.3	9.1	Short	50	0.0	NA
Lane 2	314	4.0	314	4.0	1209	0.259	100	3.8	LOS A	1.2	8.9	Full	170	0.0	0.0
Approach	678	4.0	678	4.0		0.259		3.8	LOS A	1.3	9.1				
East: Calder Freeway Off-ramp - East															
Lane 1[d]	179	4.0	179	4.0	1225	0.146	100	6.7	LOS A	0.6	4.3	Full	500	0.0	0.0
Lane 2	143	4.0	143	4.0	974	0.146	100	11.6	LOS A	0.6	4.1	Full	500	0.0	0.0
Approach	322	4.0	322	4.0		0.146		8.9	LOS A	0.6	4.3				
North: Station Road - North															
Lane 1	213	4.0	213	4.0	1463	0.146	56[6]	3.9	LOS A	0.0	0.0	Full	130	0.0	0.0
Lane 2[d]	475	4.0	475	4.0	1824	0.261	100	3.9	LOS A	0.0	0.0	Full	130	0.0	0.0
Approach	688	4.0	688	4.0		0.261		3.9	LOS A	0.0	0.0				
All Vehicles	1688	4.0	1688	4.0		0.261		4.8	LOS A	1.3	9.1				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

6 Lane under-utilisation due to downstream effects
d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	L2 W	T1 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	309	55	364	4.0	1404	0.259	100	0.0	2
Lane 2	-	314	314	4.0	1209	0.259	100	NA	NA
Approach	309	368	678	4.0		0.259			

East: Calder Freeway Off-ramp - East

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	151	1	28	179	4.0	1225	0.146	100	NA	NA

Lane 2	-	-	143	143	4.0	974	0.146	100	NA	NA
Approach	151	1	171	322	4.0		0.146			

North: Station Road - North									
Mov. From N To Exit:	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	213	-	213	4.0	1463	0.146	56 [6]	NA	NA
Lane 2	402	74	475	4.0	1824	0.261	100	NA	NA
Approach	615	74	688	4.0		0.261			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	1688	4.0	0.261

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

6 Lane under-utilisation due to downstream effects

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Station Road - South Merge Type: **Priority**												
Exit Short Lane	1	60	0.0	402	410	3.06	2.04	364	1346	0.270	0.7	1.0
Merge Lane	2	-	100.0	Merge Lane is not Opposed				402	1800	0.223	0.0	0.0

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
East: Calder Freeway Off-ramp - East				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101 [StatCaldEastPMExEx (Site Folder: Existing)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [PM Peak (Network Folder: Existing)]

Station Road / Calder Freeway Eastbound Lane
PM Peak, Existing Volumes, Existing Geometry
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Station Road - South															
Lane 1[d]	301	4.0	301	4.0	1826	0.165	100	2.9	LOS A	0.0	0.0	Full	130	0.0	0.0
Lane 2	254	4.0	254	4.0	1541	0.165	100	5.6	LOS A	0.0	0.0	Full	130	0.0	0.0
Approach	556	4.0	556	4.0		0.165		4.1	LOS A	0.0	0.0				
North: Station Road - North															
Lane 1[d]	287	4.0	287	4.0	1290	0.223	100	4.2	LOS A	1.0	7.3	Full	500	0.0	0.0
Lane 2	239	4.0	239	4.0	1075	0.223	100	4.3	LOS A	1.0	7.1	Full	500	0.0	0.0
Approach	526	4.0	526	4.0		0.223		4.2	LOS A	1.0	7.3				
West: Calder Freeway Off-ramp - West															
Lane 1[d]	231	4.0	231	4.0	1289	0.179	100	8.5	LOS A	0.7	5.0	Full	500	0.0	0.0
Lane 2	187	4.0	187	4.0	1047	0.179	100	11.2	LOS A	0.7	4.9	Full	500	0.0	0.0
Approach	418	4.0	418	4.0		0.179		9.7	LOS A	0.7	5.0				
All Vehicles	1500	4.0	1500	4.0		0.223		5.7	LOS A	1.0	7.3				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	301	-	301	4.0	1826	0.165	100	NA	NA
Lane 2	150	104	254	4.0	1541	0.165	100	NA	NA
Approach	452	104	556	4.0		0.165			

North: Station Road - North

Mov. From N To Exit:	L2 E	T1 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	165	122	287	4.0	1290	0.223	100	NA	NA
Lane 2	-	239	239	4.0	1075	0.223	100	NA	NA

Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Approach	165	361	526	4.0			0.223			
West: Calder Freeway Off-ramp - West										
Lane 1	82	1	147	231	4.0	1289	0.179	100	NA	NA
Lane 2	-	-	187	187	4.0	1047	0.179	100	NA	NA
Approach	82	1	335	418	4.0		0.179			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	1500	4.0	0.223

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis

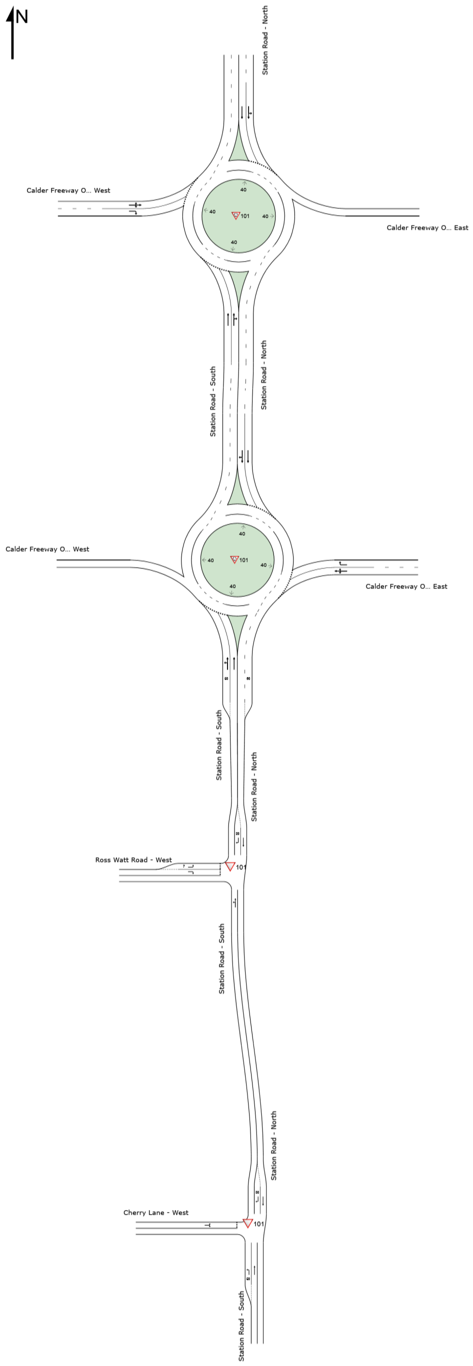
	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
West: Calder Freeway Off-ramp - West				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

NETWORK LAYOUT

Network: N101 [AM Peak (Network Folder: Growth Only)]

New Network
Network Category: (None)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
101	NA	StatCherAMExGr
101	NA	StatRossAMExGr
101	NA	StatCaldWestAMExGr
101	NA	StatCaldEastAMExGr

LANE SUMMARY

▽ Site: 101 [StatCherAMExGr (Site Folder: Growth Only - 15 years)]

Network: N101 [AM Peak (Network Folder: Growth Only)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Station Road / Cherry Lane
AM Peak, Existing Geometry, Growth Only
Site Category: (None)
Give-Way (Two-Way)

Lane Use and Performance

	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Station Road - South															
Lane 1	26	2.0	26	2.0	1831	0.014	100	5.6	LOS A	0.0	0.0	Short	50	0.0	NA
Lane 2	861	4.0	861	4.0	1901	0.453	100	0.2	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	887	3.9	887	3.9		0.453		0.3	LOS A	0.0	0.0				
North: Station Road - North															
Lane 1	1073	4.0	1073	4.0	1901	0.564	100	0.1	LOS A	0.0	0.0	Full	165	0.0	0.0
Lane 2	21	2.0	21	2.0	416	0.051	100	12.9	LOS A	0.2	1.2	Short	30	0.0	NA
Approach	1094	4.0	1094	4.0		0.564		0.3	LOS A	0.2	1.2				
West: Cherry Lane - West															
Lane 1	65	2.0	65	2.0	38	1.736	100	784.5	LOS F	20.0	142.7	Full	500	0.0	0.0
Approach	65	2.0	65	2.0		1.736		784.5	LOS F	20.0	142.7				
All Vehicles	2046	3.9	2046	3.9		1.736		25.3	LOS F	20.0	142.7				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Lane LOS values are based on degree of saturation per lane.
Minor Road Approach LOS values are based on worst degree of saturation for any lane.
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	L2 W	T1 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	26	-	26	2.0	1831	0.014	100	0.0	2
Lane 2	-	861	861	4.0	1901	0.453	100	NA	NA
Approach	26	861	887	3.9		0.453			

North: Station Road - North

Mov. From N To Exit:	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	1073	-	1073	4.0	1901	0.564	100	NA	NA
Lane 2	-	21	21	2.0	416	0.051	100	0.0	1
Approach	1073	21	1094	4.0		0.564			

West: Cherry Lane - West

Mov. From W To Exit:	L2 N	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	39	26	65	2.0	38	1.736	100	NA	NA
Approach	39	26	65	2.0		1.736			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2046	3.9	1.736

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
West: Cherry Lane - West				
Lane 1	0.0	13.8	1325.4	NA

LANE SUMMARY

Site: 101 [StatRossAMExGr (Site Folder: Growth Only - 15 years)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [AM Peak (Network Folder: Growth Only)]

Station Road / Ross Watt Road
AM Peak, Existing Geometry, Growth Only
Site Category: (None)
Give-Way (Two-Way)

Lane Use and Performance

	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Station Road - South															
Lane 1	926	3.8	910	3.9	1894	0.480	100	0.5	LOS A	0.0	0.0	Full	165	0.0	0.0
Approach	926	3.8	910	3.9		0.480		0.5	LOS A	0.0	0.0				
North: Station Road - North															
Lane 1	1101	4.0	1101	4.0	1901	0.579	100	0.1	LOS A	0.0	0.0	Full	170	0.0	0.0
Lane 2	21	2.0	21	2.0	532	0.040	100	11.5	LOS A	0.1	1.0	Short	20	0.0	NA
Approach	1122	4.0	1122	4.0		0.579		0.3	LOS A	0.1	1.0				
West: Ross Watt Road - West															
Lane 1	38	2.0	38	2.0	578	0.066	100	10.6	LOS A	0.2	1.6	Short	7	0.0	NA
Lane 2	18	2.0	18	2.0	23	0.783	100	258.2	LOS C	2.2	15.8	Full	500	0.0	0.0
Approach	56	2.0	56	2.0		0.783		90.0	LOS C	2.2	15.8				
All Vehicles	2104	3.9	2088	3.9		0.783		2.8	LOS C	2.2	15.8				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Lane LOS values are based on degree of saturation per lane.
Minor Road Approach LOS values are based on worst degree of saturation for any lane.
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	L2 W	T1 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	78	832	910	3.9	1894	0.480	100	NA	NA
Approach	78	832	910	3.9		0.480			

North: Station Road - North

Mov. From N To Exit:	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	1101	-	1101	4.0	1901	0.579	100	NA	NA
Lane 2	-	21	21	2.0	532	0.040	100	0.0	1
Approach	1101	21	1122	4.0		0.579			

West: Ross Watt Road - West

Mov.	L2	R2	Total	%HV	Deg.	Lane	Prob.	Ov.

From W To Exit:	N	S			Cap. veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	38	-	38	2.0	578	0.066	100	0.0	2
Lane 2	-	18	18	2.0	23	0.783	100	NA	NA
Approach	38	18	56	2.0		0.783			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2088	3.9	0.783

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
West: Ross Watt Road - West				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101 [StatCaldWestAMExGr (Site Folder: Growth Only - 15 years)]

Network: N101 [AM Peak (Network Folder: Growth Only)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Station Road / Calder Freeway Westbound Lane
AM Peak, Growth Volumes, Existing Geometry
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows [Total	HV]	Arrival Flows [Total	HV]	Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue [Veh	Dist]	Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: Station Road - South															
Lane 1[d]	476	4.0	468	4.0	1310	0.357	100	4.2	LOS A	1.9	13.6	Short	50	0.0	NA
Lane 2	402	4.0	395	4.0	1105	0.357	100	4.3	LOS A	1.8	13.1	Full	170	0.0	0.0
Approach	878	4.0	863	4.0		0.357		4.2	LOS A	1.9	13.6				
East: Calder Freeway Off-ramp - East															
Lane 1[d]	220	4.0	220	4.0	1091	0.201	100	10.4	LOS A	0.9	6.6	Full	500	0.0	0.0
Lane 2	163	4.0	163	4.0	808	0.201	100	13.3	LOS A	0.8	6.1	Full	500	0.0	0.0
Approach	382	4.0	382	4.0		0.201		11.6	LOS A	0.9	6.6				
North: Station Road - North															
Lane 1	339	4.0	339	4.0	1461	0.232	56[6]	5.5	LOS A	0.0	0.0	Full	130	0.0	0.0
Lane 2[d]	756	4.0	756	4.0	1824	0.415	100	3.7	LOS A	0.0	0.0	Full	130	0.0	0.0
Approach	1095	4.0	1095	4.0		0.415		4.3	LOS A	0.0	0.0				
All Vehicles	2355	4.0	2340	4.0		0.415		5.5	LOS A	1.9	13.6				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

6 Lane under-utilisation due to downstream effects
d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	L2 W	T1 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	248	220	468	4.0	1310	0.357	100	0.0	2
Lane 2	-	395	395	4.0	1105	0.357	100	NA	NA
Approach	248	615	863	4.0		0.357			

East: Calder Freeway Off-ramp - East

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	112	1	107	220	4.0	1091	0.201	100	NA	NA

Lane 2	-	-	163	163	4.0	808	0.201	100	NA	NA
Approach	112	1	269	382	4.0		0.201			

North: Station Road - North

Mov. From N To Exit:	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	339	-	339	4.0	1461	0.232	56 [6]	NA	NA
Lane 2	657	99	756	4.0	1824	0.415	100	NA	NA
Approach	996	99	1095	4.0		0.415			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2340	4.0	0.415

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

6 Lane under-utilisation due to downstream effects

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Station Road - South Merge Type: **Priority**												
Exit Short Lane	1	60	0.0	657	670	3.06	2.04	450	1072	0.420	1.3	2.6
Merge Lane	2	-	100.0	Merge Lane is not Opposed				657	1800	0.365	0.0	0.0

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
East: Calder Freeway Off-ramp - East				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101 [StatCaldEastAMExGr (Site Folder: Growth Only - 15 years)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [AM Peak (Network Folder: Growth Only)]

Station Road / Calder Freeway Eastbound Lane
AM Peak, Growth Volumes, Existing Geometry
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Station Road - South															
Lane 1[d]	485	4.0	479	4.0	1825	0.262	100	2.9	LOS A	0.0	0.0	Full	130	0.0	0.0
Lane 2	409	4.0	404	4.0	1541	0.262	100	5.7	LOS A	0.0	0.0	Full	130	0.0	0.0
Approach	894	4.0	883	4.0		0.262		4.2	LOS A	0.0	0.0				
North: Station Road - North															
Lane 1[d]	538	4.0	538	4.0	1198	0.449	100	5.0	LOS A	2.6	18.5	Full	500	0.0	0.0
Lane 2	435	4.0	435	4.0	968	0.449	100	5.5	LOS A	2.5	18.1	Full	500	0.0	0.0
Approach	974	4.0	974	4.0		0.449		5.2	LOS A	2.6	18.5				
West: Calder Freeway Off-ramp - West															
Lane 1[d]	287	4.0	287	4.0	1199	0.239	100	9.6	LOS A	1.0	7.1	Full	500	0.0	0.0
Lane 2	219	4.0	219	4.0	915	0.239	100	12.2	LOS A	0.9	6.7	Full	500	0.0	0.0
Approach	505	4.0	505	4.0		0.239		10.7	LOS A	1.0	7.1				
All Vehicles	2373	4.0	2362	4.0		0.449		6.0	LOS A	2.6	18.5				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	479	-	479	4.0	1825	0.262	100	NA	NA
Lane 2	229	175	404	4.0	1541	0.262	100	NA	NA
Approach	708	175	883	4.0		0.262			

North: Station Road - North

Mov. From N To Exit:	L2 E	T1 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	302	236	538	4.0	1198	0.449	100	NA	NA
Lane 2	-	435	435	4.0	968	0.449	100	NA	NA

Approach	302	672	974	4.0		0.449				
West: Calder Freeway Off-ramp - West										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	81	1	204	287	4.0	1199	0.239	100	NA	NA
Lane 2	-	-	219	219	4.0	915	0.239	100	NA	NA
Approach	81	1	423	505	4.0		0.239			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2362	4.0	0.449

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis

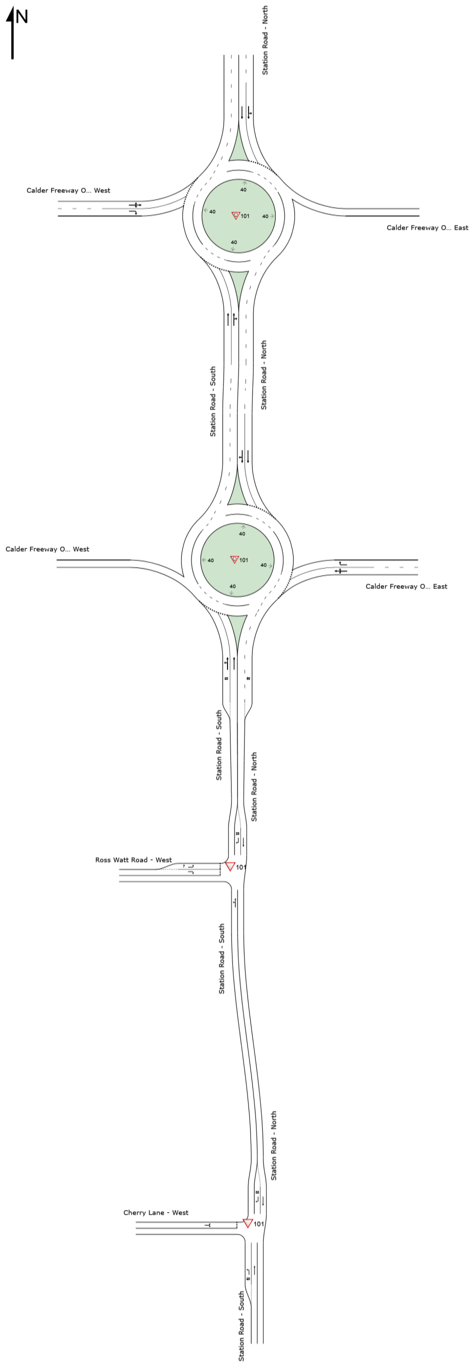
	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
West: Calder Freeway Off-ramp - West				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

NETWORK LAYOUT

Network: N101 [PM Peak (Network Folder: Growth Only)]

New Network
Network Category: (None)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
101	NA	StatCherPMExGr
101	NA	StatRossPMExGr
101	NA	StatCaldWestPMExGr
101	NA	StatCaldEastPMExGr

LANE SUMMARY

Site: 101 [StatCherPMExGr (Site Folder: Growth Only - 15 years)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [PM Peak (Network Folder: Growth Only)]

Station Road / Cherry Lane
PM Peak, Existing Geometry, Growth Only
Site Category: (None)
Give-Way (Two-Way)

Lane Use and Performance

	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Station Road - South															
Lane 1	43	2.0	43	2.0	1831	0.024	100	5.6	LOS A	0.0	0.0	Short	50	0.0	NA
Lane 2	995	4.0	995	4.0	1901	0.523	100	0.2	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	1038	3.9	1038	3.9		0.523		0.5	LOS A	0.0	0.0				
North: Station Road - North															
Lane 1	986	4.0	986	4.0	1901	0.519	100	0.1	LOS A	0.0	0.0	Full	165	0.0	0.0
Lane 2	35	2.0	35	2.0	301	0.115	100	16.7	LOS A	0.4	2.6	Short	30	0.0	NA
Approach	1021	3.9	1021	3.9		0.519		0.6	LOS A	0.4	2.6				
West: Cherry Lane - West															
Lane 1	57	2.0	57	2.0	34	1.673	100	745.3	LOS F	17.0	121.3	Full	500	0.0	0.0
Approach	57	2.0	57	2.0		1.673		745.3	LOS F	17.0	121.3				
All Vehicles	2116	3.9	2116	3.9		1.673		20.6	LOS F	17.0	121.3				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Lane LOS values are based on degree of saturation per lane.
Minor Road Approach LOS values are based on worst degree of saturation for any lane.
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	L2 W	T1 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	43	-	43	2.0	1831	0.024	100	0.0	2
Lane 2	-	995	995	4.0	1901	0.523	100	NA	NA
Approach	43	995	1038	3.9		0.523			

North: Station Road - North

Mov. From N To Exit:	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	986	-	986	4.0	1901	0.519	100	NA	NA
Lane 2	-	35	35	2.0	301	0.115	100	0.0	1
Approach	986	35	1021	3.9		0.519			

West: Cherry Lane - West

Mov. From W To Exit:	L2 N	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	33	24	57	2.0	34	1.673	100	NA	NA
Approach	33	24	57	2.0		1.673			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2116	3.9	1.673

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
West: Cherry Lane - West				
Lane 1	0.0	11.4	1212.3	NA

LANE SUMMARY

Site: 101 [StatRossPMExGr (Site Folder: Growth Only - 15 years)]

Network: N101 [PM Peak (Network Folder: Growth Only)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Station Road / Ross Watt Road
PM Peak, Existing Geometry, Growth Only
Site Category: (None)
Give-Way (Two-Way)

Lane Use and Performance

	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Station Road - South															
Lane 1	1027	3.8	1014	3.8	1893	0.536	100	0.6	LOS A	0.0	0.0	Full	165	0.0	0.0
Approach	1027	3.8	1014	3.8		0.536		0.6	LOS A	0.0	0.0				
North: Station Road - North															
Lane 1	1076	4.0	1076	4.0	1901	0.566	100	0.1	LOS A	0.0	0.0	Full	170	0.0	0.0
Lane 2	14	2.0	14	2.0	421	0.033	100	13.4	LOS A	0.1	0.8	Short	20	0.0	NA
Approach	1089	4.0	1089	4.0		0.566		0.3	LOS A	0.1	0.8				
West: Ross Watt Road - West															
Lane 1	9	2.0	9	2.0	493	0.019	100	11.5	LOS A	0.1	0.4	Short	7	0.0	NA
Lane 2	20	2.0	20	2.0	21	0.968	100	356.9	LOS E	3.3	23.3	Full	500	0.0	0.0
Approach	29	2.0	29	2.0		0.968		245.9	LOS E	3.3	23.3				
All Vehicles	2146	3.9	2133	3.9		0.968		3.8	LOS E	3.3	23.3				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Lane LOS values are based on degree of saturation per lane.
Minor Road Approach LOS values are based on worst degree of saturation for any lane.
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	L2 W	T1 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	101	913	1014	3.8	1893	0.536	100	NA	NA
Approach	101	913	1014	3.8		0.536			

North: Station Road - North

Mov. From N To Exit:	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	1076	-	1076	4.0	1901	0.566	100	NA	NA
Lane 2	-	14	14	2.0	421	0.033	100	0.0	1
Approach	1076	14	1089	4.0		0.566			

West: Ross Watt Road - West

Mov.	L2	R2	Total	%HV	Deg.	Lane	Prob.	Ov.

From W To Exit:	N	S			Cap. veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	9	-	9	2.0	493	0.019	100	0.0	2
Lane 2	-	20	20	2.0	21	0.968	100	NA	NA
Approach	9	20	29	2.0		0.968			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2133	3.9	0.968

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
West: Ross Watt Road - West				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101 [StatCaldWestPMExGr (Site Folder: Growth Only - 15 years)]

Network: N101 [PM Peak (Network Folder: Growth Only)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Station Road / Calder Freeway Westbound Lane
PM Peak, Growth Volumes, Existing Geometry
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows [Total	HV]	Arrival Flows [Total	HV]	Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue [Veh	Dist]	Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: Station Road - South															
Lane 1[d]	494	4.0	488	4.0	1347	0.362	100	4.2	LOS A	1.9	13.8	Short	50	0.0	NA
Lane 2	419	4.0	413	4.0	1142	0.362	100	4.2	LOS A	1.9	13.4	Full	170	0.0	0.0
Approach	913	4.0	901	4.0		0.362		4.2	LOS A	1.9	13.8				
East: Calder Freeway Off-ramp - East															
Lane 1[d]	246	4.0	246	4.0	1146	0.214	100	8.3	LOS A	0.9	6.8	Full	500	0.0	0.0
Lane 2	187	4.0	187	4.0	874	0.214	100	12.6	LOS A	0.9	6.4	Full	500	0.0	0.0
Approach	433	4.0	433	4.0		0.214		10.2	LOS A	0.9	6.8				
North: Station Road - North															
Lane 1	287	4.0	287	4.0	1463	0.196	56[6]	4.9	LOS A	0.0	0.0	Full	130	0.0	0.0
Lane 2[d]	640	4.0	640	4.0	1824	0.351	100	3.9	LOS A	0.0	0.0	Full	130	0.0	0.0
Approach	926	4.0	926	4.0		0.351		4.2	LOS A	0.0	0.0				
All Vehicles	2272	4.0	2260	4.0		0.362		5.3	LOS A	1.9	13.8				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

6 Lane under-utilisation due to downstream effects
d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	L2 W	T1 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	412	76	488	4.0	1347	0.362	100	0.0	2
Lane 2	-	413	413	4.0	1142	0.362	100	NA	NA
Approach	412	490	901	4.0		0.362			

East: Calder Freeway Off-ramp - East

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	202	1	42	246	4.0	1146	0.214	100	NA	NA

Lane 2	-	-	187	187	4.0	874	0.214	100	NA	NA
Approach	202	1	229	433	4.0		0.214			

North: Station Road - North

Mov. From N To Exit:	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	287	-	287	4.0	1463	0.196	56[6]	NA	NA
Lane 2	541	99	640	4.0	1824	0.351	100	NA	NA
Approach	827	99	926	4.0		0.351			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2260	4.0	0.362

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

6 Lane under-utilisation due to downstream effects

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Station Road - South Merge Type: **Priority**												
Exit Short Lane	1	60	0.0	541	551	3.06	2.04	489	1198	0.408	1.0	2.0
Merge Lane	2	-	100.0	Merge Lane is not Opposed				541	1800	0.300	0.0	0.0

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
East: Calder Freeway Off-ramp - East				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101 [StatCaldEastPMExGr (Site Folder: Growth Only - 15 years)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [PM Peak (Network Folder: Growth Only)]

Station Road / Calder Freeway Eastbound Lane
PM Peak, Growth Volumes, Existing Geometry
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows [Total	HV]	Arrival Flows [Total	HV]	Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue [Veh	Dist]	Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: Station Road - South															
Lane 1[d]	405	4.0	402	4.0	1825	0.220	100	2.9	LOS A	0.0	0.0	Full	130	0.0	0.0
Lane 2	342	4.0	339	4.0	1541	0.220	100	5.6	LOS A	0.0	0.0	Full	130	0.0	0.0
Approach	747	4.0	741	4.0		0.220		4.1	LOS A	0.0	0.0				
North: Station Road - North															
Lane 1[d]	392	4.0	392	4.0	1206	0.325	100	4.6	LOS A	1.6	11.7	Full	500	0.0	0.0
Lane 2	317	4.0	317	4.0	975	0.325	100	4.9	LOS A	1.5	11.1	Full	500	0.0	0.0
Approach	708	4.0	708	4.0		0.325		4.8	LOS A	1.6	11.7				
West: Calder Freeway Off-ramp - West															
Lane 1[d]	315	4.0	315	4.0	1234	0.255	100	9.0	LOS A	1.0	7.6	Full	500	0.0	0.0
Lane 2	247	4.0	247	4.0	967	0.255	100	11.8	LOS A	1.0	7.3	Full	500	0.0	0.0
Approach	562	4.0	562	4.0		0.255		10.2	LOS A	1.0	7.6				
All Vehicles	2018	4.0	2012	4.0		0.325		6.0	LOS A	1.6	11.7				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	402	-	402	4.0	1825	0.220	100	NA	NA
Lane 2	200	139	339	4.0	1541	0.220	100	NA	NA
Approach	602	139	741	4.0		0.220			

North: Station Road - North

Mov. From N To Exit:	L2 E	T1 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	222	170	392	4.0	1206	0.325	100	NA	NA
Lane 2	-	317	317	4.0	975	0.325	100	NA	NA

Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Approach	222	486	708	4.0			0.325			
West: Calder Freeway Off-ramp - West										
Lane 1	111	1	204	315	4.0	1234	0.255	100	NA	NA
Lane 2	-	-	247	247	4.0	967	0.255	100	NA	NA
Approach	111	1	451	562	4.0		0.255			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2012	4.0	0.325

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis

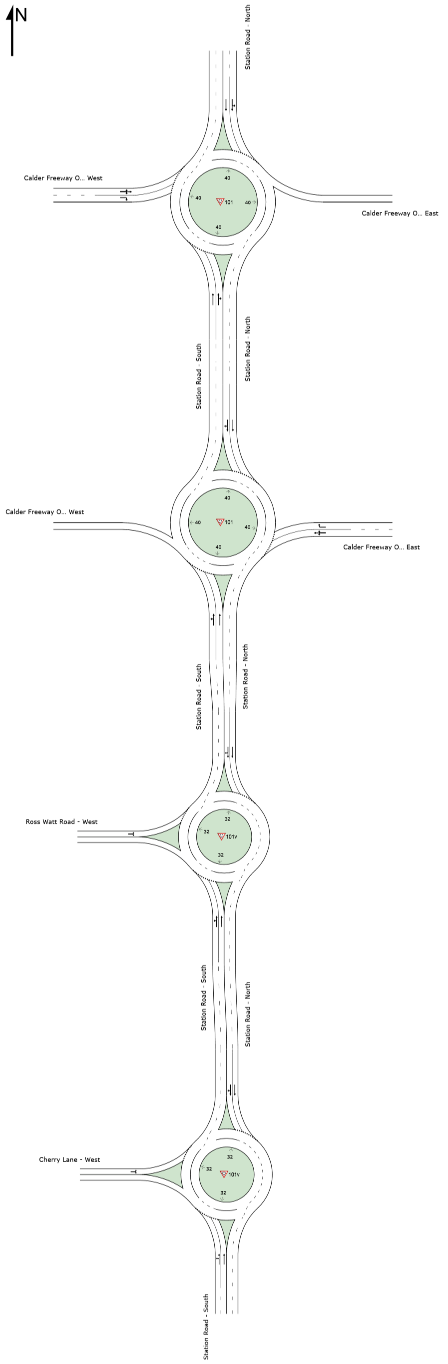
	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
West: Calder Freeway Off-ramp - West				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

NETWORK LAYOUT

Network: N101 [Roundabout - Both (Network Folder: Post Dev - 15yr Growth - AM Peak)]

New Network
Network Category: (None)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
101	NA	StatCaldEastAMFuEx
101	NA	StatCaldWestAMFuEx
101v	NA	StatRossAMExFu - Roundabout
101v	NA	StatCherAMExFu - Roundabout

LANE SUMMARY

Site: 101 [StatCaldEastAMFuEx (Site Folder: AM - Post Dev - 15yr Growth)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Roundabout - Both (Network Folder: Post Dev - 15yr Growth - AM Peak)]

Station Road / Calder Freeway Eastbound Lane
AM Peak, Future Volumes, Existing Geometry
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows [Total veh/h	Demand Flows HV] %	Arrival Flows [Total veh/h	Arrival Flows HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh	95% Back Of Queue Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Station Road - South															
Lane 1[d]	570	4.0	570	4.0	1826	0.312	100	2.9	LOS A	0.0	0.0	Full	130	0.0	0.0
Lane 2	481	4.0	481	4.0	1541	0.312	100	5.8	LOS A	0.0	0.0	Full	130	0.0	0.0
Approach	1052	4.0	1052	4.0		0.312		4.2	LOS A	0.0	0.0				
North: Station Road - North															
Lane 1[d]	570	4.0	570	4.0	1158	0.493	100	5.4	LOS A	2.7	19.7	Full	500	0.0	0.0
Lane 2	455	4.0	455	4.0	923	0.493	100	6.1	LOS A	2.6	18.7	Full	500	0.0	0.0
Approach	1025	4.0	1025	4.0		0.493		5.7	LOS A	2.7	19.7				
West: Calder Freeway Off-ramp - West															
Lane 1[d]	310	4.0	310	4.0	1161	0.267	100	10.1	LOS A	1.1	8.1	Full	500	0.0	0.0
Lane 2	229	4.0	229	4.0	859	0.267	100	12.7	LOS A	1.1	7.6	Full	500	0.0	0.0
Approach	539	4.0	539	4.0		0.267		11.2	LOS A	1.1	8.1				
All Vehicles	2616	4.0	2616	4.0		0.493		6.3	LOS A	2.7	19.7				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	570	-	570	4.0	1826	0.312	100	NA	NA
Lane 2	267	215	481	4.0	1541	0.312	100	NA	NA
Approach	837	215	1052	4.0		0.312			

North: Station Road - North

Mov. From N To Exit:	L2 E	T1 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	302	268	570	4.0	1158	0.493	100	NA	NA

Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 2	-	455	455	4.0		923	0.493	100	NA	NA
Approach	302	723	1025	4.0			0.493			
West: Calder Freeway Off-ramp - West										
Lane 1	81	1	228	310	4.0	1161	0.267	100	NA	NA
Lane 2	-	-	229	229	4.0	859	0.267	100	NA	NA
Approach	81	1	457	539	4.0		0.267			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2616	4.0	0.493

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
West: Calder Freeway Off-ramp - West				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101 [StatCaldWestAMFuEx (Site Folder: AM - Post Dev - 15yr Growth)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Roundabout - Both (Network Folder: Post Dev - 15yr Growth - AM Peak)]

Station Road / Calder Freeway Westbound Lane
AM Peak, Future Volumes, Existing Geometry
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Station Road - South															
Lane 1 [d]	605	4.0	605	4.0	1325	0.456	100	4.3	LOS A	2.6	18.9	Full	170	0.0	0.0
Lane 2	508	4.0	508	4.0	1113	0.456	100	4.5	LOS A	2.5	18.3	Full	170	0.0	0.0
Approach	1113	4.0	1113	4.0		0.456		4.4	LOS A	2.6	18.9				
East: Calder Freeway Off-ramp - East															
Lane 1 [d]	231	4.0	231	4.0	1127	0.205	100	8.4	LOS A	0.8	6.1	Full	500	0.0	0.0
Lane 2	168	4.0	168	4.0	818	0.205	100	13.0	LOS A	0.8	5.7	Full	500	0.0	0.0
Approach	399	4.0	399	4.0		0.205		10.3	LOS A	0.8	6.1				
North: Station Road - North															
Lane 1 [d]	639	4.0	639	4.0	1824	0.350	100	2.9	LOS A	0.0	0.0	Full	130	0.0	0.0
Lane 2	540	4.0	540	4.0	1540	0.350	100	4.1	LOS A	0.0	0.0	Full	130	0.0	0.0
Approach	1179	4.0	1179	4.0		0.350		3.4	LOS A	0.0	0.0				
All Vehicles	2691	4.0	2691	4.0		0.456		4.8	LOS A	2.6	18.9				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	L2 W	T1 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	331	274	605	4.0	1325	0.456	100	NA	NA
Lane 2	-	508	508	4.0	1113	0.456	100	NA	NA
Approach	331	782	1113	4.0		0.456			

East: Calder Freeway Off-ramp - East

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	128	1	102	231	4.0	1127	0.205	100	NA	NA

Lane 2	-	-	168	168	4.0	818	0.205	100	NA	NA
Approach	128	1	269	399	4.0		0.205			

North: Station Road - North

Mov. From N To Exit:	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	639	-	639	4.0	1824	0.350	100	NA	NA
Lane 2	441	99	540	4.0	1540	0.350	100	NA	NA
Approach	1080	99	1179	4.0		0.350			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2691	4.0	0.456

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
East: Calder Freeway Off-ramp - East				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101v [StatRossAMExFu - Roundabout (Site Folder: AM - Post Dev - 15yr Growth)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Roundabout - Both (Network Folder: Post Dev - 15yr Growth - AM Peak)]

Station Road / Ross Watt Road
AM Peak, Existing Geometry, Future Volumes
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Station Road - South															
Lane 1[d]	527	4.0	527	4.0	1444	0.365	100	4.0	LOS A	2.6	18.5	Full	165	0.0	0.0
Lane 2	469	4.0	469	4.0	1285	0.365	100	4.1	LOS A	2.5	18.2	Full	165	0.0	0.0
Approach	997	4.0	997	4.0		0.365		4.0	LOS A	2.6	18.5				
North: Station Road - North															
Lane 1[d]	650	4.0	650	4.0	1447	0.449	100	4.1	LOS A	3.8	27.5	Full	170	0.0	0.0
Lane 2	573	4.0	573	4.0	1276	0.449	100	5.3	LOS A	3.7	26.8	Full	170	0.0	0.0
Approach	1223	4.0	1223	4.0		0.449		4.6	LOS A	3.8	27.5				
West: Ross Watt Road - West															
Lane 1[d]	333	4.0	333	4.0	637	0.522	100	12.1	LOS A	3.2	23.1	Full	500	0.0	0.0
Approach	333	4.0	333	4.0		0.522		12.1	LOS A	3.2	23.1				
All Vehicles	2553	4.0	2553	4.0		0.522		5.4	LOS A	3.8	27.5				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	L2 W	T1 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	97	431	527	4.0	1444	0.365	100	NA	NA
Lane 2	-	469	469	4.0	1285	0.365	100	NA	NA
Approach	97	900	997	4.0		0.365			

North: Station Road - North

Mov. From N To Exit:	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	650	-	650	4.0	1447	0.449	100	NA	NA
Lane 2	464	109	573	4.0	1276	0.449	100	NA	NA

Mov. From W To Exit:	L2 N	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Approach	1114	109	1223	4.0		0.449			
West: Ross Watt Road - West									
Lane 1	220	113	333	4.0	637	0.522	100	NA	NA
Approach	220	113	333	4.0		0.522			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2553	4.0	0.522

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
West: Ross Watt Road - West				
Lane 1	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101v [StatCherAMExFu - Roundabout (Site Folder: AM - Post Dev - 15yr Growth)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Roundabout - Both (Network Folder: Post Dev - 15yr Growth - AM Peak)]

Station Road / Cherry Lane
AM Peak, Existing Geometry, Future Volumes
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows [Total	HV]	Arrival Flows [Total	HV]	Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue [Veh	Dist]	Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: Station Road - South															
Lane 1[d]	536	4.0	536	4.0	1626	0.329	100	3.6	LOS A	2.4	17.4	Full	500	0.0	0.0
Lane 2	469	4.0	469	4.0	1423	0.329	100	3.6	LOS A	2.4	17.1	Full	500	0.0	0.0
Approach	1004	4.0	1004	4.0		0.329		3.6	LOS A	2.4	17.4				
North: Station Road - North															
Lane 1[d]	639	4.0	639	4.0	1315	0.486	100	4.6	LOS A	4.0	29.1	Full	165	0.0	0.0
Lane 2	562	4.0	562	4.0	1157	0.486	100	5.2	LOS A	3.9	28.2	Full	165	0.0	0.0
Approach	1201	4.0	1201	4.0		0.486		4.9	LOS A	4.0	29.1				
West: Cherry Lane - West															
Lane 1[d]	295	4.0	295	4.0	711	0.414	100	12.5	LOS A	2.2	16.0	Full	500	0.0	0.0
Approach	295	4.0	295	4.0		0.414		12.5	LOS A	2.2	16.0				
All Vehicles	2500	4.0	2500	4.0		0.486		5.3	LOS A	4.0	29.1				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	L2 W	T1 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	125	410	536	4.0	1626	0.329	100	NA	NA
Lane 2	-	469	469	4.0	1423	0.329	100	NA	NA
Approach	125	879	1004	4.0		0.329			

North: Station Road - North

Mov. From N To Exit:	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	639	-	639	4.0	1315	0.486	100	NA	NA
Lane 2	528	34	562	4.0	1157	0.486	100	NA	NA

Mov. From W To Exit:	L2 N	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Approach	1167	34	1201	4.0		0.486			
West: Cherry Lane - West									
Lane 1	92	203	295	4.0	711	0.414	100	NA	NA
Approach	92	203	295	4.0		0.414			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2500	4.0	0.486

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis

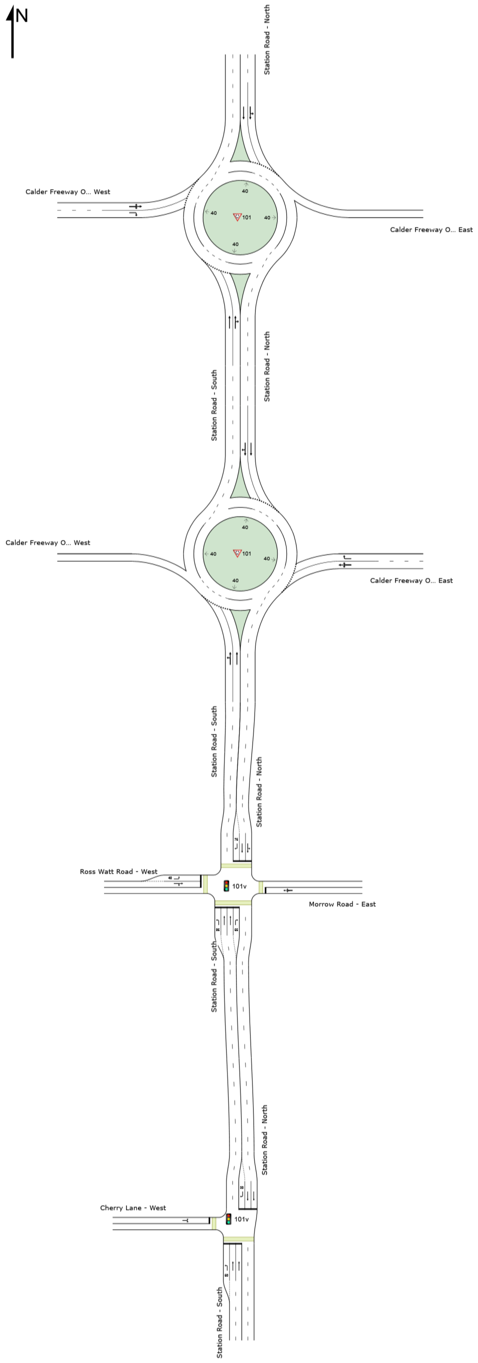
	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
West: Cherry Lane - West				
Lane 1	0.0	0.0	0.0	0.0

NETWORK LAYOUT

Network: N101 [Signals - Both (Network Folder: Post Dev - 15yr Growth - AM Peak)]

New Network
Network Category: (None)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
101	NA	StatCaldEastAMFuEx
101	NA	StatCaldWestAMFuEx
101v	NA	StatRossAMExFu - Signals
101v	NA	StatCherAMExFu - Signals

LANE SUMMARY

Site: 101 [StatCaldEastAMFuEx (Site Folder: AM - Post Dev - 15yr Growth)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Both (Network Folder: Post Dev - 15yr Growth - AM Peak)]

Station Road / Calder Freeway Eastbound Lane
AM Peak, Future Volumes, Existing Geometry
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Station Road - South															
Lane 1 [d]	570	4.0	570	4.0	1826	0.312	100	2.9	LOS A	0.0	0.0	Full	130	0.0	0.0
Lane 2	481	4.0	481	4.0	1541	0.312	100	5.8	LOS A	0.0	0.0	Full	130	0.0	0.0
Approach	1052	4.0	1052	4.0		0.312		4.2	LOS A	0.0	0.0				
North: Station Road - North															
Lane 1 [d]	570	4.0	570	4.0	1158	0.493	100	5.4	LOS A	2.7	19.7	Full	500	0.0	0.0
Lane 2	455	4.0	455	4.0	923	0.493	100	6.1	LOS A	2.6	18.7	Full	500	0.0	0.0
Approach	1025	4.0	1025	4.0		0.493		5.7	LOS A	2.7	19.7				
West: Calder Freeway Off-ramp - West															
Lane 1 [d]	310	4.0	310	4.0	1161	0.267	100	10.1	LOS A	1.1	8.1	Full	500	0.0	0.0
Lane 2	229	4.0	229	4.0	859	0.267	100	12.7	LOS A	1.1	7.6	Full	500	0.0	0.0
Approach	539	4.0	539	4.0		0.267		11.2	LOS A	1.1	8.1				
All Vehicles	2616	4.0	2616	4.0		0.493		6.3	LOS A	2.7	19.7				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	570	-	570	4.0	1826	0.312	100	NA	NA
Lane 2	267	215	481	4.0	1541	0.312	100	NA	NA
Approach	837	215	1052	4.0		0.312			

North: Station Road - North

Mov. From N To Exit:	L2 E	T1 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	302	268	570	4.0	1158	0.493	100	NA	NA

Lane 2	-	455	455	4.0	923	0.493	100	NA	NA
Approach	302	723	1025	4.0		0.493			

West: Calder Freeway Off-ramp - West										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	81	1	228	310	4.0	1161	0.267	100	NA	NA
Lane 2	-	-	229	229	4.0	859	0.267	100	NA	NA
Approach	81	1	457	539	4.0		0.267			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2616	4.0	0.493

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
West: Calder Freeway Off-ramp - West				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101 [StatCaldWestAMFuEx (Site Folder: AM - Post Dev - 15yr Growth)]

Network: N101 [Signals - Both (Network Folder: Post Dev - 15yr Growth - AM Peak)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Station Road / Calder Freeway Westbound Lane
AM Peak, Future Volumes, Existing Geometry
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows [Total	HV]	Arrival Flows [Total	HV]	Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue [Veh	Dist]	Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: Station Road - South															
Lane 1[d]	605	4.0	605	4.0	1325	0.456	100	4.3	LOS A	2.3	16.9	Full	170	0.0	0.0
Lane 2	508	4.0	508	4.0	1113	0.456	100	4.5	LOS A	2.2	16.1	Full	170	0.0	0.0
Approach	1113	4.0	1113	4.0		0.456		4.4	LOS A	2.3	16.9				
East: Calder Freeway Off-ramp - East															
Lane 1[d]	230	4.0	230	4.0	1119	0.206	100	8.4	LOS A	0.8	6.1	Full	500	-0.8[N3]	0.0
Lane 2	169	4.0	169	4.0	818	0.206	100	12.9	LOS A	0.8	5.7	Full	500	0.0	0.0
Approach	399	4.0	399	4.0		0.206		10.3	LOS A	0.8	6.1				
North: Station Road - North															
Lane 1[d]	636	4.0	636	4.0	1797	0.354	100	2.9	LOS A	0.0	0.0	Full	130	-1.4[N3]	0.0
Lane 2	543	4.0	543	4.0	1537	0.354	100	4.1	LOS A	0.0	0.0	Full	130	-0.3[N3]	0.0
Approach	1179	4.0	1179	4.0		0.354		3.4	LOS A	0.0	0.0				
All Vehicles	2691	4.0	2691	4.0		0.456		4.8	LOS A	2.3	16.9				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

d Dominant lane on roundabout approach
N3 Capacity Adjustment due to downstream lane blockage determined by the program.

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	L2 W	T1 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	331	274	605	4.0	1325	0.456	100	NA	NA
Lane 2	-	508	508	4.0	1113	0.456	100	NA	NA
Approach	331	782	1113	4.0		0.456			

East: Calder Freeway Off-ramp - East

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.

Lane 1	128	1	101	230	4.0	1119	0.206	100	NA	NA
Lane 2	-	-	169	169	4.0	818	0.206	100	NA	NA
Approach	128	1	269	399	4.0		0.206			

North: Station Road - North

Mov. From N To Exit:	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	636	-	636	4.0	1797	0.354	100	NA	NA
Lane 2	444	99	543	4.0	1537	0.354	100	NA	NA
Approach	1080	99	1179	4.0		0.354			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2691	4.0	0.456

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
East: Calder Freeway Off-ramp - East				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101v [StatRossAMExFu - Signals (Site Folder: AM - Post Dev - 15yr Growth)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Both (Network Folder: Post Dev - 15yr Growth - AM Peak)]

Station Road / Ross Watt Road
AM Peak, Existing Geometry, Future Volumes
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated   Cycle Time = 120 seconds (Network User-Given Cycle Time)

Lane Use and Performance

	Demand Flows [Total	HV]	Arrival Flows [Total	HV]	Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue [Veh	Dist]	Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: Station Road - South															
Lane 1	97	2.0	97	2.0	1144	0.085	100	10.4	LOS A	1.2	8.7	Short	95	0.0	NA
Lane 2	451	4.0	451	4.0	982	0.460	100	19.5	LOS A	16.5	119.5	Full	165	0.0	0.0
Lane 3	449	4.0	449	4.0	977 [1]	0.460	100	23.1	LOS A	16.4	118.8	Full	165	0.0	0.0
Lane 4	13	0.0	13	0.0	201	0.063	100	61.7	LOS A	0.7	4.7	Short	55	0.0	NA
Approach	1009	3.8	1009	3.8		0.460		20.8	LOS A	16.5	119.5				
East: Morrow Road - East															
Lane 1	64	0.0	64	0.0	148	0.433	100	44.3	LOS A	2.9	20.5	Full	500	-0.8 [N3]	0.0
Approach	64	0.0	64	0.0		0.433		44.3	LOS A	2.9	20.5				
North: Station Road - North															
Lane 1	568	3.9	568	3.9	965	0.588	100	20.9	LOS A	22.6	163.2	Full	170	-1.7 [N3]	1.3
Lane 2	558	4.0	558	4.0	949 [1]	0.588	100	25.1	LOS A	22.4	162.2	Full	170	0.0	0.7
Lane 3	109	2.0	109	2.0	198	0.552	100	66.0	LOS A	6.3	44.9	Short	75	0.0	NA
Approach	1236	3.8	1236	3.8		0.588		26.8	LOS A	22.6	163.2				
West: Ross Watt Road - West															
Lane 1	220	2.0	220	2.0	471 [1]	0.467	100	48.4	LOS A	10.8	77.1	Short	40	0.0	NA
Lane 2	118	1.9	118	1.9	199	0.593	100	65.4	LOS A	6.8	48.7	Full	500	0.0	0.0
Approach	338	2.0	338	2.0		0.593		54.3	LOS A	10.8	77.1				
All Vehicles	2647	3.4	2647	3.4		0.593		28.4	LOS A	22.6	163.2				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes.
Delay and stops experienced by drivers upstream of short lane entry have been accounted for.
N3 Capacity Adjustment due to downstream lane blockage determined by the program.

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	97	-	-	97	2.0	1144	0.085	100	0.0	2

Mov.	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 2	-	451	-	451	4.0	982	0.460	100	NA	NA
Lane 3	-	449	-	449	4.0	977[1]	0.460	100	NA	NA
Lane 4	-	-	13	13	0.0	201	0.063	100	0.0	3
Approach	97	900	13	1009	3.8		0.460			
East: Morrow Road - East										
Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	29	5	29	64	0.0	148	0.433	100	NA	NA
Approach	29	5	29	64	0.0		0.433			
North: Station Road - North										
Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	13	555	-	568	3.9	965	0.588	100	NA	NA
Lane 2	-	558	-	558	4.0	949[1]	0.588	100	NA	NA
Lane 3	-	-	109	109	2.0	198	0.552	100	0.0	2
Approach	13	1114	109	1236	3.8		0.588			
West: Ross Watt Road - West										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	220	-	-	220	2.0	471[1]	0.467	100	65.8	2
Lane 2	-	5	113	118	1.9	199	0.593	100	NA	NA
Approach	220	5	113	338	2.0		0.593			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2647	3.4	0.593

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes.
Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
Lane 4	0.0	0.0	0.0	0.0
East: Morrow Road - East				
Lane 1	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0

Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
West: Ross Watt Road - West				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101v [StatCherAMExFu - Signals (Site Folder: AM - Post Dev - 15yr Growth)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Both (Network Folder: Post Dev - 15yr Growth - AM Peak)]

Station Road / Cherry Lane
AM Peak, Existing Geometry, Future Volumes
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated   Cycle Time = 120 seconds (Site User-Given Cycle Time)

Lane Use and Performance

	Demand Flows [Total	HV]	Arrival Flows [Total	HV]	Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue [Veh	Dist]	Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: Station Road - South															
Lane 1	125	2.0	125	2.0	1556	0.080	100	12.5	LOS A	1.1	8.1	Short	50	0.0	NA
Lane 2	419	4.0	419	4.0	838 [1]	0.500	100	27.8	LOS A	16.5	119.5	Full	500	0.0	0.0
Lane 3	460	4.0	460	4.0	919	0.500	100	22.5	LOS A	18.1	131.1	Full	500	0.0	0.0
Approach	1004	3.8	1004	3.8		0.500		23.4	LOS A	18.1	131.1				
North: Station Road - North															
Lane 1	618	4.0	618	4.0	1109	0.557	100	16.3	LOS A	22.0	159.1	Full	165	0.0	1.7
Lane 2	549	4.0	549	4.0	985 [1]	0.557	100	25.8	LOS A	19.5	141.3	Full	165	0.0	0.0
Lane 3	34	2.0	34	2.0	284	0.119	100	47.9	LOS A	1.2	8.9	Short	30	0.0	NA
Approach	1201	3.9	1201	3.9		0.557		21.6	LOS A	22.0	159.1				
West: Cherry Lane - West															
Lane 1	295	2.0	295	2.0	578	0.510	100	41.5	LOS A	14.1	100.1	Full	500	0.0	0.0
Approach	295	2.0	295	2.0		0.510		41.5	LOS A	14.1	100.1				
All Vehicles	2500	3.6	2500	3.6		0.557		24.7	LOS A	22.0	159.1				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes.
Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	L2 W	T1 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	125	-	125	2.0	1556	0.080	100	0.0	2
Lane 2	-	419	419	4.0	838 [1]	0.500	100	NA	NA
Lane 3	-	460	460	4.0	919	0.500	100	NA	NA
Approach	125	879	1004	3.8		0.500			

North: Station Road - North

Mov. From N To Exit:	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.

Lane 1	618	-	618	4.0	1109	0.557	100	NA	NA
Lane 2	549	-	549	4.0	985 [1]	0.557	100	NA	NA
Lane 3	-	34	34	2.0	284	0.119	100	0.0	2
Approach	1167	34	1201	3.9		0.557			
West: Cherry Lane - West									
Mov. From W To Exit:	L2 N	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	92	203	295	2.0	578	0.510	100	NA	NA
Approach	92	203	295	2.0		0.510			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2500	3.6	0.557

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes.
Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
West: Cherry Lane - West				
Lane 1	0.0	0.0	0.0	0.0

PHASING SUMMARY

Site: 101v [StatRossAMExFu - Signals (Site Folder: AM - Post Dev - 15yr Growth)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Both (Network Folder: Post Dev - 15yr Growth - AM Peak)]

Station Road / Ross Watt Road
AM Peak, Existing Geometry, Future Volumes
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated   Cycle Time = 120 seconds (Network User-Given Cycle Time)

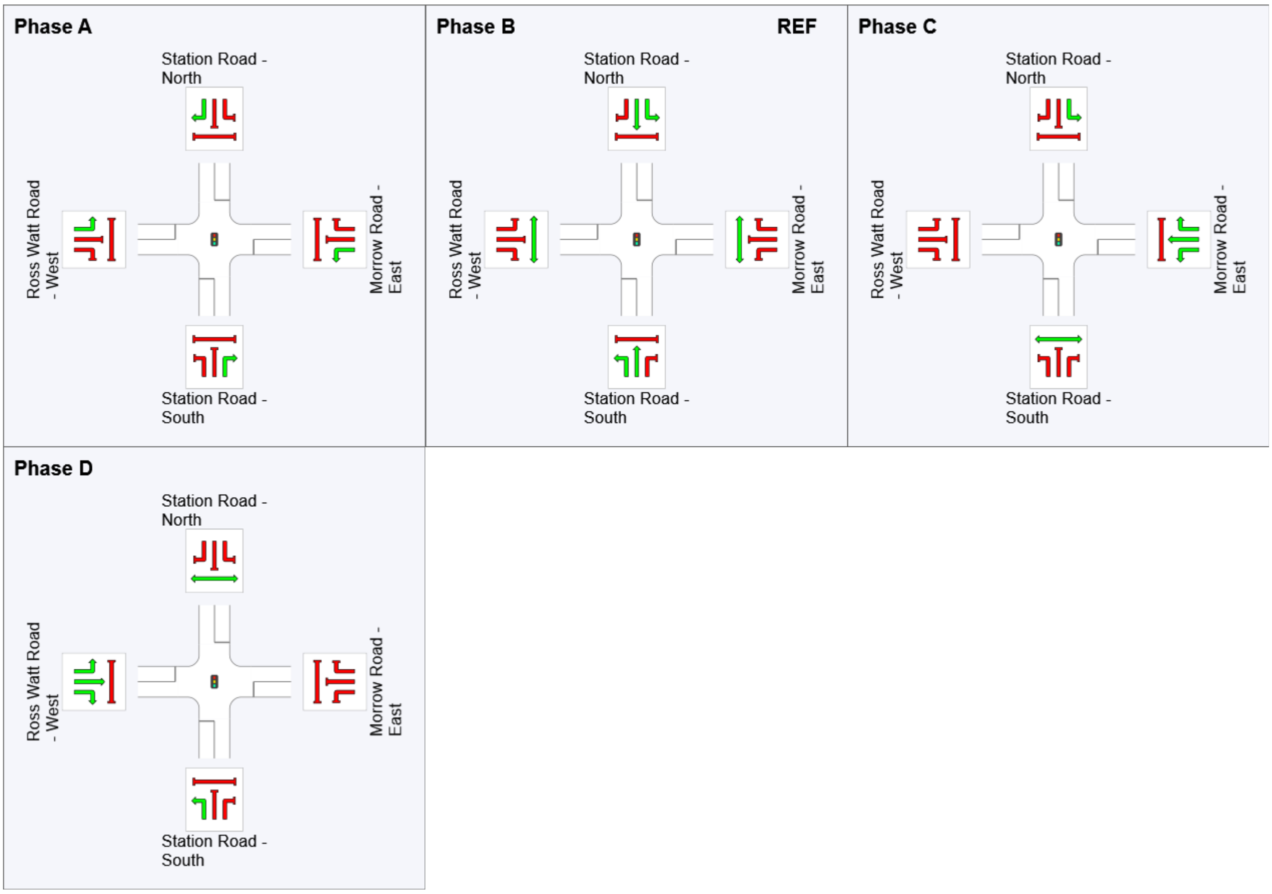
Timings based on settings in the Network Timing dialog
Phase Times determined by the program
Downstream lane blockage effects included in determining phase times
Phase Sequence: Convert Function Default
Input Phase Sequence: A, B, C, D
Output Phase Sequence: A, B, C, D
Reference Phase: Phase B
Offset: 0 seconds (User)

Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	101	0	68	82
Green Time (sec)	13	62	8	13
Phase Time (sec)	19	68	14	19
Phase Split	16%	57%	12%	16%
Phase Frequency (%)	100.0	100.0	100.0	100.0

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase

Normal Movement	Permitted/Opposed
Slip/Bypass-Lane Movement	Opposed Slip/Bypass-Lane
Stopped Movement	Turn On Red
Other Movement Class (MC) Running	Undetected Movement
Mixed Running & Stopped MCs	Continuous Movement
Other Movement Class (MC) Stopped	Phase Transition Applied

PHASING SUMMARY

Site: 101v [StatCherAMExFu - Signals (Site Folder: AM - Post Dev - 15yr Growth)]

Network: N101 [Signals - Both (Network Folder: Post Dev - 15yr Growth - AM Peak)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Station Road / Cherry Lane
AM Peak, Existing Geometry, Future Volumes
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated   Cycle Time = 120 seconds (Site User-Given Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Downstream lane blockage effects included in determining phase times
Phase Sequence: Convert Function Default
Input Phase Sequence: A, C, B
Output Phase Sequence: A, C, B
Reference Phase: Phase A
Offset: 0 seconds (User)

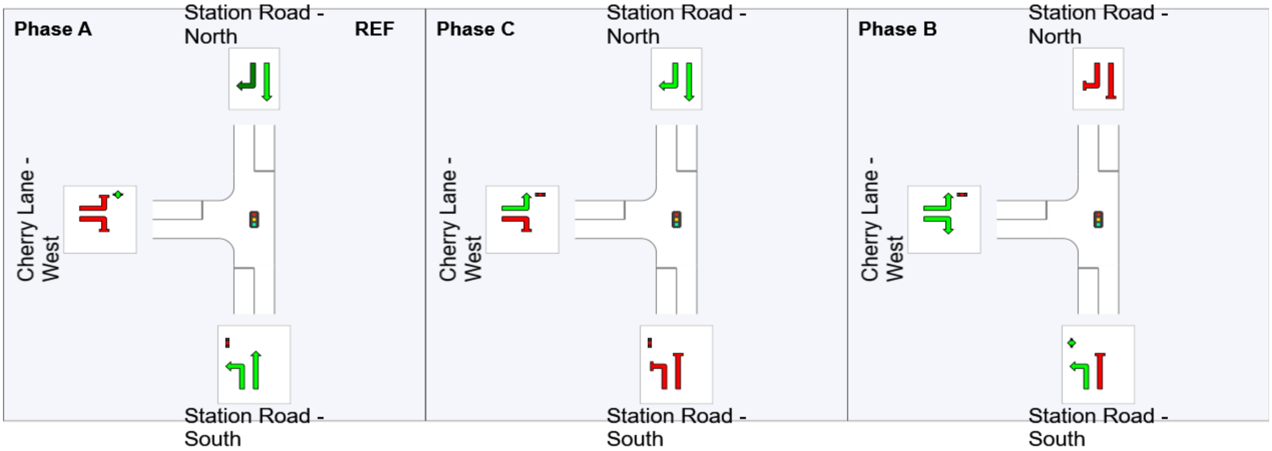
Phase Timing Summary

Phase	A	C	B
Phase Change Time (sec)	0	64	76
Green Time (sec)	58	6	38
Phase Time (sec)	64	12	44
Phase Split	53%	10%	37%
Phase Frequency (%)	100.0 [4]	100.0 [4]	100.0 [4]

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

4 Phase Frequency specified by the user (phase times not specified).

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase

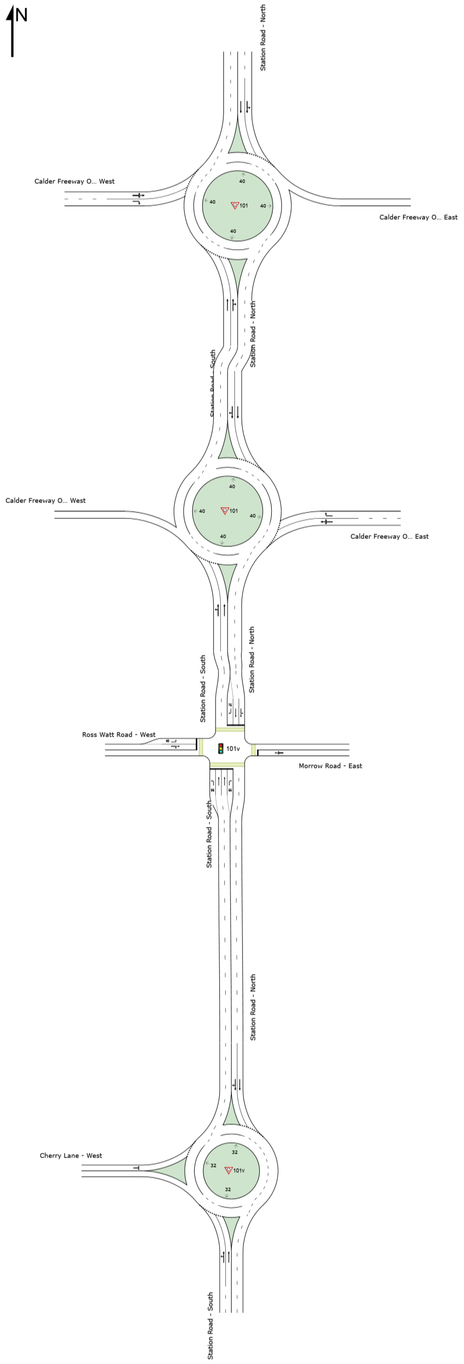
Normal Movement	Permitted/Opposed
Slip/Bypass-Lane Movement	Opposed Slip/Bypass-Lane
Stopped Movement	Turn On Red
Other Movement Class (MC) Running	Undetected Movement
Mixed Running & Stopped MCs	Continuous Movement
Other Movement Class (MC) Stopped	Phase Transition Applied

NETWORK LAYOUT

Network: N101 [Signals - Ross Watt (Network Folder: Post Dev - 15yr Growth - AM Peak)]

New Network
Network Category: (None)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
101	NA	StatCaldEastAMFuEx
101	NA	StatCaldWestAMFuEx
101v	NA	StatRossAMExFu - Signals
101v	NA	StatCherAMExFu - Roundabout

LANE SUMMARY

Site: 101 [StatCaldEastAMFuEx (Site Folder: AM - Post Dev - 15yr Growth)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Ross Watt (Network Folder: Post Dev - 15yr Growth - AM Peak)]

Station Road / Calder Freeway Eastbound Lane
AM Peak, Future Volumes, Existing Geometry
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows [Total	HV]	Arrival Flows [Total	HV]	Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue [Veh	Dist]	Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: Station Road - South															
Lane 1[d]	570	4.0	570	4.0	1826	0.312	100	2.9	LOS A	0.0	0.0	Full	130	0.0	0.0
Lane 2	481	4.0	481	4.0	1541	0.312	100	5.8	LOS A	0.0	0.0	Full	130	0.0	0.0
Approach	1052	4.0	1052	4.0		0.312		4.2	LOS A	0.0	0.0				
North: Station Road - North															
Lane 1[d]	570	4.0	570	4.0	1158	0.493	100	5.4	LOS A	2.7	19.7	Full	500	0.0	0.0
Lane 2	455	4.0	455	4.0	923	0.493	100	6.1	LOS A	2.6	18.7	Full	500	0.0	0.0
Approach	1025	4.0	1025	4.0		0.493		5.7	LOS A	2.7	19.7				
West: Calder Freeway Off-ramp - West															
Lane 1[d]	310	4.0	310	4.0	1161	0.267	100	10.1	LOS A	1.1	8.1	Full	500	0.0	0.0
Lane 2	229	4.0	229	4.0	859	0.267	100	12.7	LOS A	1.1	7.6	Full	500	0.0	0.0
Approach	539	4.0	539	4.0		0.267		11.2	LOS A	1.1	8.1				
All Vehicles	2616	4.0	2616	4.0		0.493		6.3	LOS A	2.7	19.7				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	570	-	570	4.0	1826	0.312	100	NA	NA
Lane 2	267	215	481	4.0	1541	0.312	100	NA	NA
Approach	837	215	1052	4.0		0.312			

North: Station Road - North

Mov. From N To Exit:	L2 E	T1 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.

Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	302	268	570	4.0		1158	0.493	100	NA	NA
Lane 2	-	455	455	4.0		923	0.493	100	NA	NA
Approach	302	723	1025	4.0			0.493			
West: Calder Freeway Off-ramp - West										
Lane 1	81	1	228	310	4.0	1161	0.267	100	NA	NA
Lane 2	-	-	229	229	4.0	859	0.267	100	NA	NA
Approach	81	1	457	539	4.0		0.267			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2616	4.0	0.493

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
West: Calder Freeway Off-ramp - West				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101 [StatCaldWestAMFuEx (Site Folder: AM - Post Dev - 15yr Growth)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Ross Watt (Network Folder: Post Dev - 15yr Growth - AM Peak)]

Station Road / Calder Freeway Westbound Lane
AM Peak, Future Volumes, Existing Geometry
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Station Road - South															
Lane 1 [d]	605	4.0	605	4.0	1325	0.456	100	4.3	LOS A	2.3	16.9	Full	170	0.0	0.0
Lane 2	508	4.0	508	4.0	1113	0.456	100	4.5	LOS A	2.2	16.1	Full	170	0.0	0.0
Approach	1113	4.0	1113	4.0		0.456		4.4	LOS A	2.3	16.9				
East: Calder Freeway Off-ramp - East															
Lane 1 [d]	231	4.0	231	4.0	1127	0.205	100	8.4	LOS A	0.8	6.1	Full	500	0.0	0.0
Lane 2	168	4.0	168	4.0	818	0.205	100	13.0	LOS A	0.8	5.7	Full	500	0.0	0.0
Approach	399	4.0	399	4.0		0.205		10.3	LOS A	0.8	6.1				
North: Station Road - North															
Lane 1 [d]	639	4.0	639	4.0	1824	0.350	100	2.9	LOS A	0.0	0.0	Full	130	0.0	0.0
Lane 2	540	4.0	540	4.0	1540	0.350	100	4.1	LOS A	0.0	0.0	Full	130	0.0	0.0
Approach	1179	4.0	1179	4.0		0.350		3.4	LOS A	0.0	0.0				
All Vehicles	2691	4.0	2691	4.0		0.456		4.8	LOS A	2.3	16.9				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	L2 W	T1 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	331	274	605	4.0	1325	0.456	100	NA	NA
Lane 2	-	508	508	4.0	1113	0.456	100	NA	NA
Approach	331	782	1113	4.0		0.456			

East: Calder Freeway Off-ramp - East

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.

Lane 1	128	1	102	231	4.0	1127	0.205	100	NA	NA
Lane 2	-	-	168	168	4.0	818	0.205	100	NA	NA
Approach	128	1	269	399	4.0		0.205			

North: Station Road - North

Mov. From N To Exit:	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	639	-	639	4.0	1824	0.350	100	NA	NA
Lane 2	441	99	540	4.0	1540	0.350	100	NA	NA
Approach	1080	99	1179	4.0		0.350			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2691	4.0	0.456

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
East: Calder Freeway Off-ramp - East				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101v [StatRossAMExFu - Signals (Site Folder: AM - Post Dev - 15yr Growth)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Ross Watt (Network Folder: Post Dev - 15yr Growth - AM Peak)]

Station Road / Ross Watt Road
AM Peak, Existing Geometry, Future Volumes
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated   Cycle Time = 120 seconds (Site User-Given Cycle Time)

Lane Use and Performance

	Demand Flows [Total	Demand Flows HV]	Arrival Flows [Total	Arrival Flows HV]	Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue [Veh	95% Back Of Queue Dist]	Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: Station Road - South															
Lane 1	97	2.0	97	2.0	1160	0.084	100	10.2	LOS A	1.2	8.7	Short	95	0.0	NA
Lane 2	451	4.0	451	4.0	998	0.452	100	18.8	LOS A	16.2	117.3	Full	165	0.0	0.0
Lane 3	449	4.0	449	4.0	993 [1]	0.452	100	22.1	LOS A	16.1	116.7	Full	165	0.0	0.0
Lane 4	13	0.0	13	0.0	201	0.063	100	61.3	LOS A	0.7	4.7	Short	55	0.0	NA
Approach	1009	3.8	1009	3.8		0.452		20.0	LOS A	16.2	117.3				
East: Morrow Road - East															
Lane 1	64	0.0	64	0.0	134	0.479	100	45.4	LOS A	3.0	20.9	Full	500	0.0	0.0
Approach	64	0.0	64	0.0		0.479		45.4	LOS A	3.0	20.9				
North: Station Road - North															
Lane 1	572	3.9	572	3.9	998	0.573	100	20.1	LOS A	22.2	160.5	Full	170	0.0	0.0
Lane 2	555	4.0	555	4.0	968 [1]	0.573	100	23.7	LOS A	21.8	157.5	Full	170	0.0	0.0
Lane 3	109	2.0	109	2.0	198	0.552	100	65.4	LOS A	6.3	44.9	Short	75	0.0	NA
Approach	1236	3.8	1236	3.8		0.573		25.7	LOS A	22.2	160.5				
West: Ross Watt Road - West															
Lane 1	220	2.0	220	2.0	471 [1]	0.467	100	48.4	LOS A	10.8	77.1	Short	40	0.0	NA
Lane 2	118	1.9	118	1.9	199	0.593	100	65.4	LOS A	6.8	48.7	Full	500	0.0	0.0
Approach	338	2.0	338	2.0		0.593		54.3	LOS A	10.8	77.1				
All Vehicles	2647	3.4	2647	3.4		0.593		27.7	LOS A	22.2	160.5				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes.
Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Approach Lane Flows (veh/h)

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
South: Station Road - South										
Lane 1	97	-	-	97	2.0	1160	0.084	100	0.0	2

Mov.	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 2	-	451	-	451	4.0	998	0.452	100	NA	NA
Lane 3	-	449	-	449	4.0	993 [1]	0.452	100	NA	NA
Lane 4	-	-	13	13	0.0	201	0.063	100	0.0	3
Approach	97	900	13	1009	3.8		0.452			

East: Morrow Road - East

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	29	5	29	64	0.0	134	0.479	100	NA	NA
Approach	29	5	29	64	0.0		0.479			

North: Station Road - North

Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	13	559	-	572	3.9	998	0.573	100	NA	NA
Lane 2	-	555	-	555	4.0	968 [1]	0.573	100	NA	NA
Lane 3	-	-	109	109	2.0	198	0.552	100	0.0	2
Approach	13	1114	109	1236	3.8		0.573			

West: Ross Watt Road - West

Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	220	-	-	220	2.0	471 [1]	0.467	100	65.8	2
Lane 2	-	5	113	118	1.9	199	0.593	100	NA	NA
Approach	220	5	113	338	2.0		0.593			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2647	3.4	0.593

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes.
Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
Lane 4	0.0	0.0	0.0	0.0
East: Morrow Road - East				
Lane 1	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0

Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
West: Ross Watt Road - West				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101v [StatCherAMExFu - Roundabout (Site Folder: AM - Post Dev - 15yr Growth)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Ross Watt (Network Folder: Post Dev - 15yr Growth - AM Peak)]

Station Road / Cherry Lane
AM Peak, Existing Geometry, Future Volumes
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Station Road - South															
Lane 1 d	535	4.0	535	4.0	1630	0.328	100	3.6	LOS A	2.5	18.4	Full	500	0.0	0.0
Lane 2	469	4.0	469	4.0	1428	0.328	100	3.6	LOS A	2.5	17.9	Full	500	0.0	0.0
Approach	1004	4.0	1004	4.0		0.328		3.6	LOS A	2.5	18.4				
North: Station Road - North															
Lane 1 d	639	4.0	639	4.0	1315	0.486	100	4.6	LOS A	3.6	26.0	Full	165	0.0	0.0
Lane 2	562	4.0	562	4.0	1157	0.486	100	5.2	LOS A	3.4	24.9	Full	165	0.0	0.0
Approach	1201	4.0	1201	4.0		0.486		4.9	LOS A	3.6	26.0				
West: Cherry Lane - West															
Lane 1 d	295	4.0	295	4.0	712	0.414	100	12.5	LOS A	2.2	15.9	Full	500	0.0	0.0
Approach	295	4.0	295	4.0		0.414		12.5	LOS A	2.2	15.9				
All Vehicles	2500	4.0	2500	4.0		0.486		5.3	LOS A	3.6	26.0				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	L2 W	T1 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	125	410	535	4.0	1630	0.328	100	NA	NA
Lane 2	-	469	469	4.0	1428	0.328	100	NA	NA
Approach	125	879	1004	4.0		0.328			

North: Station Road - North

Mov. From N To Exit:	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	639	-	639	4.0	1315	0.486	100	NA	NA

Lane 2	528	34	562	4.0	1157	0.486	100	NA	NA
Approach	1167	34	1201	4.0		0.486			
West: Cherry Lane - West									
Mov. From W To Exit:	L2 N	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	92	203	295	4.0	712	0.414	100	NA	NA
Approach	92	203	295	4.0		0.414			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2500	4.0	0.486

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
West: Cherry Lane - West				
Lane 1	0.0	0.0	0.0	0.0

PHASING SUMMARY

Site: 101v [StatRossAMExFu - Signals (Site Folder: AM - Post Dev - 15yr Growth)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Ross Watt (Network Folder: Post Dev - 15yr Growth - AM Peak)]

Station Road / Ross Watt Road
AM Peak, Existing Geometry, Future Volumes
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated   Cycle Time = 120 seconds (Site User-Given Cycle Time)

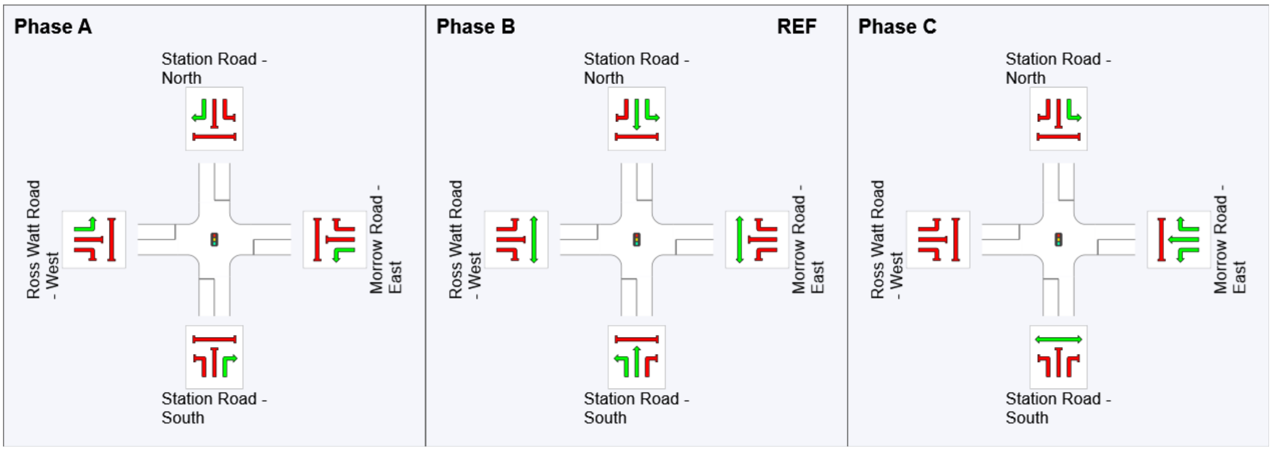
Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Downstream lane blockage effects included in determining phase times
Phase Sequence: Convert Function Default
Input Phase Sequence: A, B, C, D
Output Phase Sequence: A, B, C, D
Reference Phase: Phase B
Offset: NA

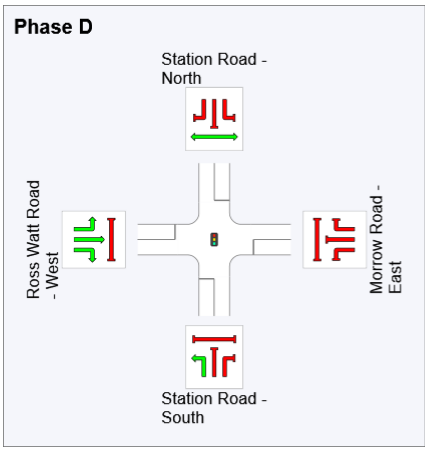
Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	101	0	69	82
Green Time (sec)	13	63	7	13
Phase Time (sec)	19	69	13	19
Phase Split	16%	58%	11%	16%
Phase Frequency (%)	100.0	100.0	100.0	100.0

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence





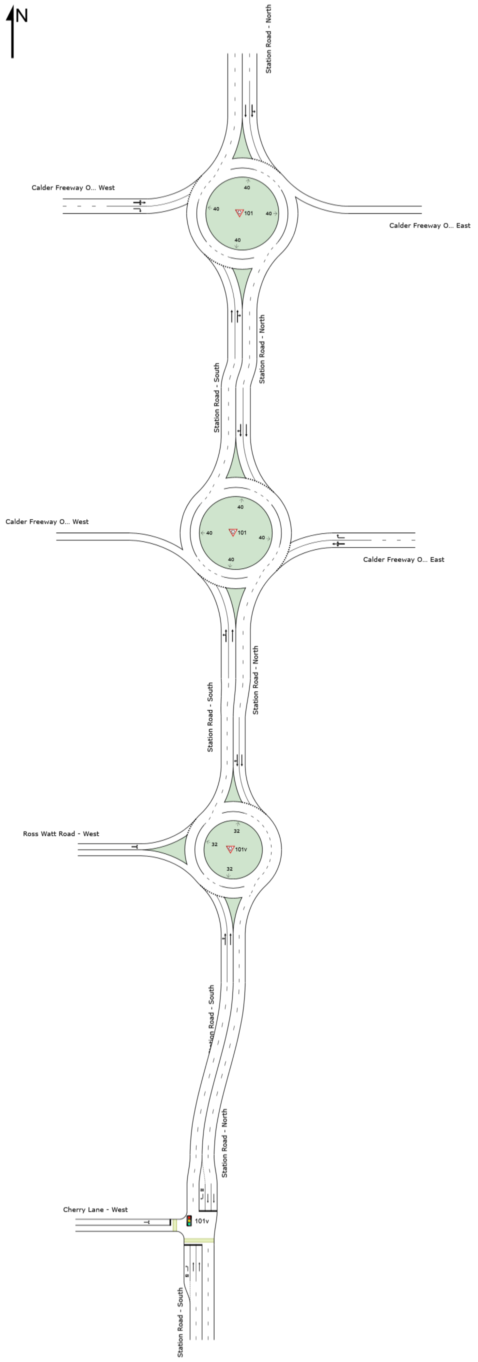
REF: Reference Phase
VAR: Variable Phase

NETWORK LAYOUT

Network: N101 [Signals - Cherry (Network Folder: Post Dev - 15yr Growth - AM Peak)]

New Network
Network Category: (None)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
101	NA	StatCaldEastAMFuEx
101	NA	StatCaldWestAMFuEx
101v	NA	StatRossAMExFu - Roundabout
101v	NA	StatCherAMExFu - Signals

Project: N:\Projects\2021\210473\Sidra\210473SID006A - VCAT.sip9

LANE SUMMARY

Site: 101 [StatCaldEastAMFuEx (Site Folder: AM - Post Dev - 15yr Growth)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Cherry (Network Folder: Post Dev - 15yr Growth - AM Peak)]

Station Road / Calder Freeway Eastbound Lane
AM Peak, Future Volumes, Existing Geometry
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Station Road - South															
Lane 1[d]	570	4.0	570	4.0	1826	0.312	100	2.9	LOS A	0.0	0.0	Full	130	0.0	0.0
Lane 2	481	4.0	481	4.0	1541	0.312	100	5.8	LOS A	0.0	0.0	Full	130	0.0	0.0
Approach	1052	4.0	1052	4.0		0.312		4.2	LOS A	0.0	0.0				
North: Station Road - North															
Lane 1[d]	570	4.0	570	4.0	1158	0.493	100	5.4	LOS A	2.7	19.7	Full	500	0.0	0.0
Lane 2	455	4.0	455	4.0	923	0.493	100	6.1	LOS A	2.6	18.7	Full	500	0.0	0.0
Approach	1025	4.0	1025	4.0		0.493		5.7	LOS A	2.7	19.7				
West: Calder Freeway Off-ramp - West															
Lane 1[d]	310	4.0	310	4.0	1161	0.267	100	10.1	LOS A	1.1	8.1	Full	500	0.0	0.0
Lane 2	229	4.0	229	4.0	859	0.267	100	12.7	LOS A	1.1	7.6	Full	500	0.0	0.0
Approach	539	4.0	539	4.0		0.267		11.2	LOS A	1.1	8.1				
All Vehicles	2616	4.0	2616	4.0		0.493		6.3	LOS A	2.7	19.7				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	570	-	570	4.0	1826	0.312	100	NA	NA
Lane 2	267	215	481	4.0	1541	0.312	100	NA	NA
Approach	837	215	1052	4.0		0.312			

North: Station Road - North

Mov. From N To Exit:	L2 E	T1 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	302	268	570	4.0	1158	0.493	100	NA	NA

Lane 2	-	455	455	4.0	923	0.493	100	NA	NA
Approach	302	723	1025	4.0		0.493			

West: Calder Freeway Off-ramp - West										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	81	1	228	310	4.0	1161	0.267	100	NA	NA
Lane 2	-	-	229	229	4.0	859	0.267	100	NA	NA
Approach	81	1	457	539	4.0		0.267			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2616	4.0	0.493

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.												

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
West: Calder Freeway Off-ramp - West				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101 [StatCaldWestAMFuEx (Site Folder: AM - Post Dev - 15yr Growth)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Cherry (Network Folder: Post Dev - 15yr Growth - AM Peak)]

Station Road / Calder Freeway Westbound Lane
AM Peak, Future Volumes, Existing Geometry
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Station Road - South															
Lane 1 [d]	605	4.0	605	4.0	1325	0.456	100	4.3	LOS A	2.6	18.9	Full	170	0.0	0.0
Lane 2	508	4.0	508	4.0	1113	0.456	100	4.5	LOS A	2.5	18.3	Full	170	0.0	0.0
Approach	1113	4.0	1113	4.0		0.456		4.4	LOS A	2.6	18.9				
East: Calder Freeway Off-ramp - East															
Lane 1 [d]	231	4.0	231	4.0	1127	0.205	100	8.4	LOS A	0.8	6.1	Full	500	0.0	0.0
Lane 2	168	4.0	168	4.0	818	0.205	100	13.0	LOS A	0.8	5.7	Full	500	0.0	0.0
Approach	399	4.0	399	4.0		0.205		10.3	LOS A	0.8	6.1				
North: Station Road - North															
Lane 1 [d]	639	4.0	639	4.0	1824	0.350	100	2.9	LOS A	0.0	0.0	Full	130	0.0	0.0
Lane 2	540	4.0	540	4.0	1540	0.350	100	4.1	LOS A	0.0	0.0	Full	130	0.0	0.0
Approach	1179	4.0	1179	4.0		0.350		3.4	LOS A	0.0	0.0				
All Vehicles	2691	4.0	2691	4.0		0.456		4.8	LOS A	2.6	18.9				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	L2 W	T1 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	331	274	605	4.0	1325	0.456	100	NA	NA
Lane 2	-	508	508	4.0	1113	0.456	100	NA	NA
Approach	331	782	1113	4.0		0.456			

East: Calder Freeway Off-ramp - East

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	128	1	102	231	4.0	1127	0.205	100	NA	NA

Mov. From N To Exit:	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 2	-	-	168	168	4.0	818	0.205	100	NA	NA
Approach	128	1	269	399	4.0		0.205			
North: Station Road - North									
Lane 1	639	-	639	4.0	1824	0.350	100	NA	NA
Lane 2	441	99	540	4.0	1540	0.350	100	NA	NA
Approach	1080	99	1179	4.0		0.350			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2691	4.0	0.456

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
East: Calder Freeway Off-ramp - East				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101v [StatRossAMExFu - Roundabout (Site Folder: AM - Post Dev - 15yr Growth)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Cherry (Network Folder: Post Dev - 15yr Growth - AM Peak)]

Station Road / Ross Watt Road
AM Peak, Existing Geometry, Future Volumes
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Station Road - South															
Lane 1[d]	527	4.0	527	4.0	1444	0.365	100	4.0	LOS A	2.2	16.3	Full	165	0.0	0.0
Lane 2	469	4.0	469	4.0	1285	0.365	100	4.1	LOS A	2.2	15.9	Full	165	0.0	0.0
Approach	997	4.0	997	4.0		0.365		4.0	LOS A	2.2	16.3				
North: Station Road - North															
Lane 1[d]	644	4.0	644	4.0	1422	0.453	100	4.1	LOS A	3.8	27.2	Full	170	-1.7[N3]	0.0
Lane 2	579	4.0	579	4.0	1280	0.453	100	5.3	LOS A	3.7	27.0	Full	170	0.0	0.0
Approach	1223	4.0	1223	4.0		0.453		4.6	LOS A	3.8	27.2				
West: Ross Watt Road - West															
Lane 1[d]	333	4.0	333	4.0	735	0.453	100	10.6	LOS A	3.0	21.5	Full	500	0.0	0.0
Approach	333	4.0	333	4.0		0.453		10.6	LOS A	3.0	21.5				
All Vehicles	2553	4.0	2553	4.0		0.453		5.2	LOS A	3.8	27.2				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

d Dominant lane on roundabout approach
N3 Capacity Adjustment due to downstream lane blockage determined by the program.

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	L2 W	T1 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	97	431	527	4.0	1444	0.365	100	NA	NA
Lane 2	-	469	469	4.0	1285	0.365	100	NA	NA
Approach	97	900	997	4.0		0.365			

North: Station Road - North

Mov. From N To Exit:	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	644	-	644	4.0	1422	0.453	100	NA	NA

Mov. From W To Exit:	L2 N	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 2	470	109	579	4.0	1280	0.453	100	NA	NA
Approach	1114	109	1223	4.0		0.453			
West: Ross Watt Road - West									
Lane 1	220	113	333	4.0	735	0.453	100	NA	NA
Approach	220	113	333	4.0		0.453			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2553	4.0	0.453

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
West: Ross Watt Road - West				
Lane 1	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101v [StatCherAMExFu - Signals (Site Folder: AM - Post Dev - 15yr Growth)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Cherry (Network Folder: Post Dev - 15yr Growth - AM Peak)]

Station Road / Cherry Lane
AM Peak, Existing Geometry, Future Volumes
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated   Cycle Time = 120 seconds (Site User-Given Cycle Time)

Lane Use and Performance

	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Station Road - South															
Lane 1	125	2.0	125	2.0	1556	0.080	100	12.5	LOS A	1.1	8.1	Short	50	0.0	NA
Lane 2	419	4.0	419	4.0	838 [1]	0.500	100	27.8	LOS A	16.5	119.5	Full	500	0.0	0.0
Lane 3	460	4.0	460	4.0	919	0.500	100	22.5	LOS A	18.1	131.1	Full	500	0.0	0.0
Approach	1004	3.8	1004	3.8		0.500		23.4	LOS A	18.1	131.1				
North: Station Road - North															
Lane 1	618	4.0	618	4.0	1109	0.557	100	16.3	LOS A	22.0	159.1	Full	165	0.0	1.7
Lane 2	549	4.0	549	4.0	985 [1]	0.557	100	25.8	LOS A	19.5	141.3	Full	165	0.0	0.0
Lane 3	34	2.0	34	2.0	284	0.119	100	47.9	LOS A	1.2	8.9	Short	30	0.0	NA
Approach	1201	3.9	1201	3.9		0.557		21.6	LOS A	22.0	159.1				
West: Cherry Lane - West															
Lane 1	295	2.0	295	2.0	578	0.510	100	41.5	LOS A	14.1	100.1	Full	500	0.0	0.0
Approach	295	2.0	295	2.0		0.510		41.5	LOS A	14.1	100.1				
All Vehicles	2500	3.6	2500	3.6		0.557		24.7	LOS A	22.0	159.1				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes.
Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	L2 W	T1 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	125	-	125	2.0	1556	0.080	100	0.0	2
Lane 2	-	419	419	4.0	838 [1]	0.500	100	NA	NA
Lane 3	-	460	460	4.0	919	0.500	100	NA	NA
Approach	125	879	1004	3.8		0.500			

North: Station Road - North

Mov. From N To Exit:	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.

Lane 1	618	-	618	4.0		1109	0.557	100	NA	NA
Lane 2	549	-	549	4.0		985 [1]	0.557	100	NA	NA
Lane 3	-	34	34	2.0		284	0.119	100	0.0	2
Approach	1167	34	1201	3.9			0.557			

West: Cherry Lane - West										
Mov. From W To Exit:	L2 N	R2 S	Total	%HV		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	92	203	295	2.0		578	0.510	100	NA	NA
Approach	92	203	295	2.0			0.510			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2500	3.6	0.557

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
West: Cherry Lane - West				
Lane 1	0.0	0.0	0.0	0.0

PHASING SUMMARY

Site: 101v [StatCherAMExFu - Signals (Site Folder: AM - Post Dev - 15yr Growth)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Cherry (Network Folder: Post Dev - 15yr Growth - AM Peak)]

Station Road / Cherry Lane
AM Peak, Existing Geometry, Future Volumes
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated   Cycle Time = 120 seconds (Site User-Given Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Downstream lane blockage effects included in determining phase times
Phase Sequence: Convert Function Default
Input Phase Sequence: A, C, B
Output Phase Sequence: A, C, B
Reference Phase: Phase A
Offset: NA

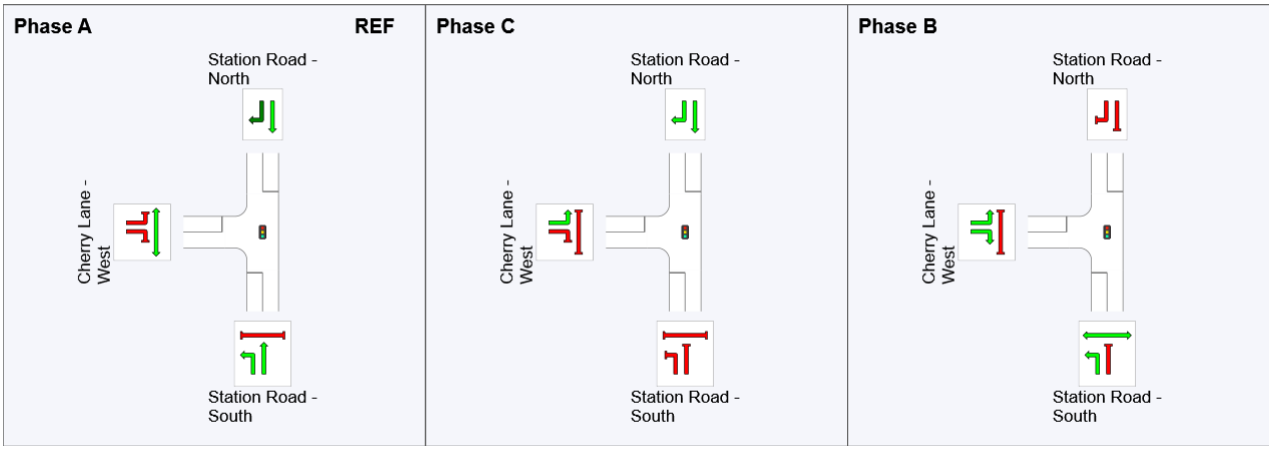
Phase Timing Summary

Phase	A	C	B
Phase Change Time (sec)	0	64	76
Green Time (sec)	58	6	38
Phase Time (sec)	64	12	44
Phase Split	53%	10%	37%
Phase Frequency (%)	100.0[4]	100.0[4]	100.0[4]

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

4 Phase Frequency specified by the user (phase times not specified).

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase

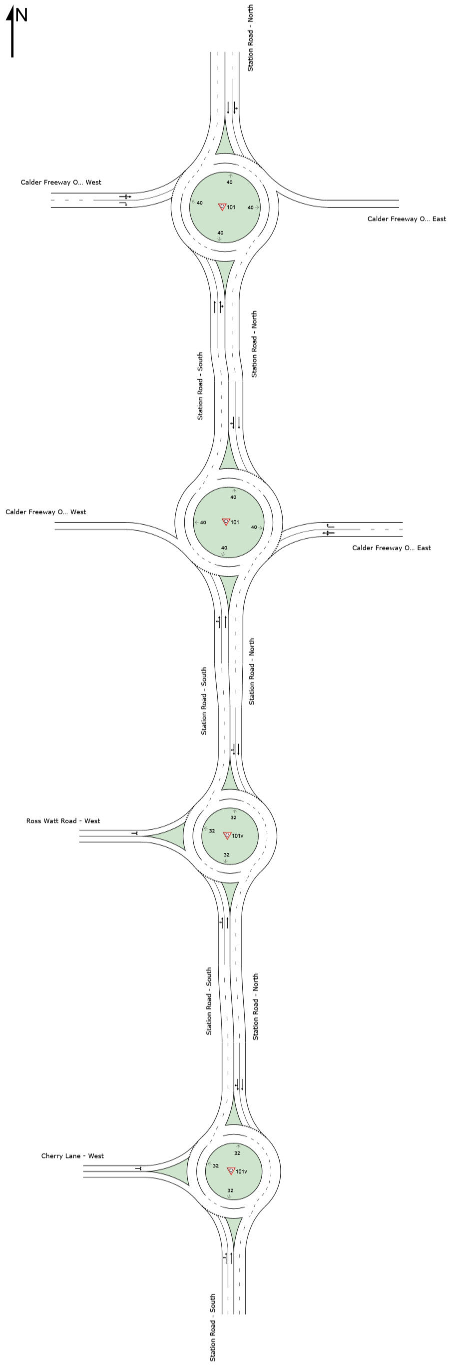
Normal Movement	Permitted/Opposed
Slip/Bypass-Lane Movement	Opposed Slip/Bypass-Lane
Stopped Movement	Turn On Red
Other Movement Class (MC) Running	Undetected Movement
Mixed Running & Stopped MCs	Continuous Movement
Other Movement Class (MC) Stopped	Phase Transition Applied

NETWORK LAYOUT

Network: N101 [Roundabout - Both (Network Folder: Post Dev - 15yr Growth - PM Peak)]

New Network
Network Category: (None)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
101	NA	StatCaldEastPMFuEx
101	NA	StatCaldWestPMFuEx
101v	NA	StatRossPMExFu - Roundabout
101v	NA	StatCherPMExFu - Roundabout

LANE SUMMARY

Site: 101 [StatCaldEastPMFuEx (Site Folder: PM - Post Dev - 15yr Growth)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Roundabout - Both (Network Folder: Post Dev - 15yr Growth - PM Peak)]

Station Road / Calder Freeway Eastbound Lane
PM Peak, Future Volumes, Existing Geometry
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows [Total	HV]	Arrival Flows [Total	HV]	Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue [Veh	Dist]	Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: Station Road - South															
Lane 1 [d]	454	4.0	454	4.0	1826	0.249	100	2.9	LOS A	0.0	0.0	Full	130	0.0	0.0
Lane 2	384	4.0	384	4.0	1541	0.249	100	5.7	LOS A	0.0	0.0	Full	130	0.0	0.0
Approach	838	4.0	838	4.0		0.249		4.2	LOS A	0.0	0.0				
North: Station Road - North															
Lane 1 [d]	451	4.0	451	4.0	1160	0.389	100	4.9	LOS A	1.8	13.0	Full	500	0.0	0.0
Lane 2	359	4.0	359	4.0	923	0.389	100	5.4	LOS A	1.7	12.3	Full	500	0.0	0.0
Approach	811	4.0	811	4.0		0.389		5.1	LOS A	1.8	13.0				
West: Calder Freeway Off-ramp - West															
Lane 1 [d]	355	4.0	355	4.0	1210	0.294	100	9.4	LOS A	1.2	8.9	Full	500	0.0	0.0
Lane 2	273	4.0	273	4.0	931	0.294	100	12.1	LOS A	1.2	8.6	Full	500	0.0	0.0
Approach	628	4.0	628	4.0		0.294		10.6	LOS A	1.2	8.9				
All Vehicles	2277	4.0	2277	4.0		0.389		6.3	LOS A	1.8	13.0				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	454	-	454	4.0	1826	0.249	100	NA	NA
Lane 2	221	162	384	4.0	1541	0.249	100	NA	NA
Approach	676	162	838	4.0		0.249			

North: Station Road - North

Mov. From N To Exit:	L2 E	T1 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	222	229	451	4.0	1160	0.389	100	NA	NA

Lane 2	-	359	359	4.0		923	0.389	100	NA	NA
Approach	222	588	811	4.0			0.389			
West: Calder Freeway Off-ramp - West										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	111	1	244	355	4.0	1210	0.294	100	NA	NA
Lane 2	-	-	273	273	4.0	931	0.294	100	NA	NA
Approach	111	1	517	628	4.0		0.294			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2277	4.0	0.389

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
West: Calder Freeway Off-ramp - West				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101 [StatCaldWestPMFuEx (Site Folder: PM - Post Dev - 15yr Growth)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Roundabout - Both (Network Folder: Post Dev - 15yr Growth - PM Peak)]

Station Road / Calder Freeway Westbound Lane
PM Peak, Future Volumes, Existing Geometry
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows [Total veh/h	Demand Flows HV] %	Arrival Flows [Total veh/h	Arrival Flows HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh	95% Back Of Queue Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Station Road - South															
Lane 1 [d]	567	4.0	567	4.0	1351	0.420	100	4.2	LOS A	2.4	17.1	Full	170	0.0	0.0
Lane 2	480	4.0	480	4.0	1143	0.420	100	4.3	LOS A	2.3	16.6	Full	170	0.0	0.0
Approach	1047	4.0	1047	4.0		0.420		4.3	LOS A	2.4	17.1				
East: Calder Freeway Off-ramp - East															
Lane 1 [d]	268	4.0	268	4.0	1146	0.234	100	6.3	LOS A	1.0	7.0	Full	500	0.0	0.0
Lane 2	197	4.0	197	4.0	843	0.234	100	12.8	LOS A	0.9	6.6	Full	500	0.0	0.0
Approach	465	4.0	465	4.0		0.234		9.0	LOS A	1.0	7.0				
North: Station Road - North															
Lane 1 [d]	593	4.0	593	4.0	1824	0.325	100	2.9	LOS A	0.0	0.0	Full	130	0.0	0.0
Lane 2	501	4.0	501	4.0	1540	0.325	100	4.2	LOS A	0.0	0.0	Full	130	0.0	0.0
Approach	1095	4.0	1095	4.0		0.325		3.5	LOS A	0.0	0.0				
All Vehicles	2607	4.0	2607	4.0		0.420		4.8	LOS A	2.4	17.1				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	L2 W	T1 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	461	106	567	4.0	1351	0.420	100	NA	NA
Lane 2	-	480	480	4.0	1143	0.420	100	NA	NA
Approach	461	586	1047	4.0		0.420			

East: Calder Freeway Off-ramp - East

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	235	1	32	268	4.0	1146	0.234	100	NA	NA

Mov. From N To Exit:	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 2	-	-	197	197	4.0	843	0.234	100	NA	NA
Approach	235	1	229	465	4.0		0.234			
North: Station Road - North										
Lane 1	593	-	593	4.0	1824	0.325	100	NA	NA
Lane 2	402	99	501	4.0	1540	0.325	100	NA	NA
Approach	996	99	1095	4.0		0.325			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2607	4.0	0.420

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
East: Calder Freeway Off-ramp - East				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101v [StatRossPMExFu - Roundabout (Site Folder: PM - Post Dev - 15yr Growth)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Roundabout - Both (Network Folder: Post Dev - 15yr Growth - PM Peak)]

Station Road / Ross Watt Road
PM Peak, Existing Geometry, Future Volumes
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Station Road - South															
Lane 1[d]	579	4.0	579	4.0	1335	0.434	100	4.5	LOS A	3.1	22.6	Full	165	0.0	0.0
Lane 2	514	4.0	514	4.0	1184	0.434	100	4.7	LOS A	3.1	22.1	Full	165	0.0	0.0
Approach	1093	4.0	1093	4.0		0.434		4.6	LOS A	3.1	22.6				
North: Station Road - North															
Lane 1[d]	687	4.0	687	4.0	1527	0.450	100	3.8	LOS A	3.9	28.1	Full	170	0.0	0.0
Lane 2	604	4.0	604	4.0	1342	0.450	100	5.8	LOS A	3.8	27.5	Full	170	0.0	0.0
Approach	1291	4.0	1291	4.0		0.450		4.7	LOS A	3.9	28.1				
West: Ross Watt Road - West															
Lane 1[d]	188	4.0	188	4.0	597	0.315	100	10.5	LOS A	1.5	11.1	Full	500	0.0	0.0
Approach	188	4.0	188	4.0		0.315		10.5	LOS A	1.5	11.1				
All Vehicles	2572	4.0	2572	4.0		0.450		5.1	LOS A	3.9	28.1				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	L2 W	T1 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	137	442	579	4.0	1335	0.434	100	NA	NA
Lane 2	-	514	514	4.0	1184	0.434	100	NA	NA
Approach	137	956	1093	4.0		0.434			

North: Station Road - North

Mov. From N To Exit:	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	687	-	687	4.0	1527	0.450	100	NA	NA
Lane 2	414	189	604	4.0	1342	0.450	100	NA	NA

Mov. From W To Exit:	L2 N	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Approach	1101	189	1291	4.0		0.450			
West: Ross Watt Road - West									
Lane 1	114	75	188	4.0	597	0.315	100	NA	NA
Approach	114	75	188	4.0		0.315			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2572	4.0	0.450

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
West: Ross Watt Road - West				
Lane 1	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101v [StatCherPMExFu - Roundabout (Site Folder: PM - Post Dev - 15yr Growth)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Roundabout - Both (Network Folder: Post Dev - 15yr Growth - PM Peak)]

Station Road / Cherry Lane
PM Peak, Existing Geometry, Future Volumes
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Station Road - South															
Lane 1[d]	676	4.0	676	4.0	1569	0.431	100	3.8	LOS A	3.4	24.3	Full	500	0.0	0.0
Lane 2	593	4.0	593	4.0	1377	0.431	100	3.8	LOS A	3.3	24.0	Full	500	0.0	0.0
Approach	1269	4.0	1269	4.0		0.431		3.8	LOS A	3.4	24.3				
North: Station Road - North															
Lane 1[d]	584	4.0	584	4.0	1422	0.411	100	4.1	LOS A	3.2	23.4	Full	165	0.0	0.0
Lane 2	517	4.0	517	4.0	1257	0.411	100	4.9	LOS A	3.2	22.8	Full	165	0.0	0.0
Approach	1101	4.0	1101	4.0		0.411		4.5	LOS A	3.2	23.4				
West: Cherry Lane - West															
Lane 1[d]	188	4.0	188	4.0	642	0.294	100	12.1	LOS A	1.4	10.0	Full	500	0.0	0.0
Approach	188	4.0	188	4.0		0.294		12.1	LOS A	1.4	10.0				
All Vehicles	2559	4.0	2559	4.0		0.431		4.7	LOS A	3.4	24.3				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	L2 W	T1 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	240	436	676	4.0	1569	0.431	100	NA	NA
Lane 2	-	593	593	4.0	1377	0.431	100	NA	NA
Approach	240	1029	1269	4.0		0.431			

North: Station Road - North

Mov. From N To Exit:	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	584	-	584	4.0	1422	0.411	100	NA	NA
Lane 2	457	60	517	4.0	1257	0.411	100	NA	NA

Approach	1041	60	1101	4.0		0.411			
West: Cherry Lane - West									
Mov. From W To Exit:	L2 N	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	63	125	188	4.0	642	0.294	100	NA	NA
Approach	63	125	188	4.0		0.294			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2559	4.0	0.431

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis

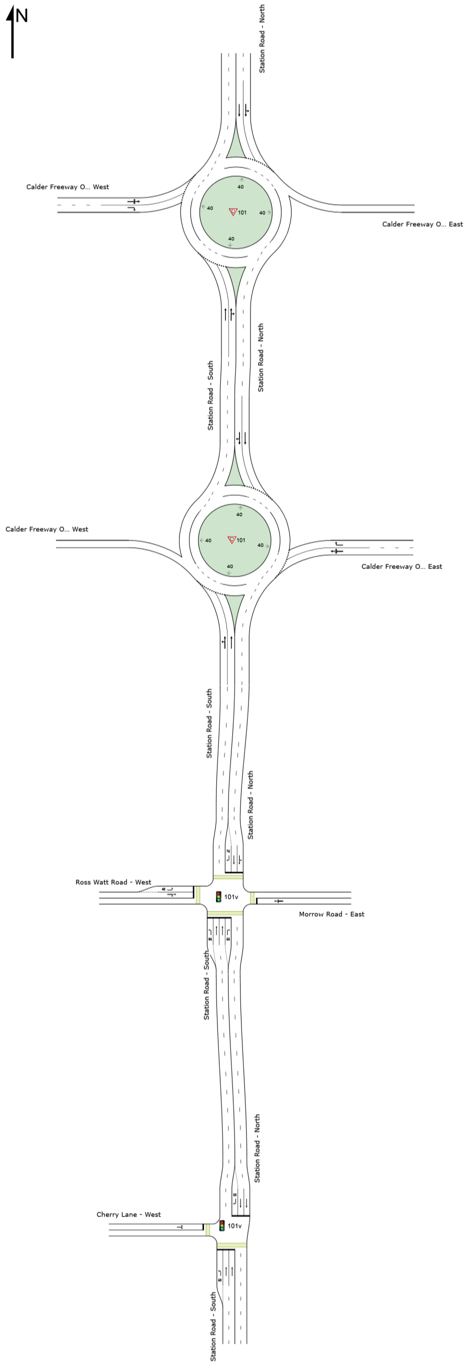
	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
West: Cherry Lane - West				
Lane 1	0.0	0.0	0.0	0.0

NETWORK LAYOUT

Network: N101 [Signals - Both (Network Folder: Post Dev - 15yr Growth - PM Peak)]

New Network
Network Category: (None)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
101	NA	StatCaldEastPMFuEx
101	NA	StatCaldWestPMFuEx
101v	NA	StatRossPMExFu - Signals
101v	NA	StatCherPMExFu - Signals

LANE SUMMARY

Site: 101 [StatCaldEastPMFuEx (Site Folder: PM - Post Dev - 15yr Growth)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Both (Network Folder: Post Dev - 15yr Growth - PM Peak)]

Station Road / Calder Freeway Eastbound Lane
PM Peak, Future Volumes, Existing Geometry
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows [Total	HV]	Arrival Flows [Total	HV]	Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue [Veh	Dist]	Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: Station Road - South															
Lane 1 [d]	454	4.0	454	4.0	1826	0.249	100	2.9	LOS A	0.0	0.0	Full	130	0.0	0.0
Lane 2	384	4.0	384	4.0	1541	0.249	100	5.7	LOS A	0.0	0.0	Full	130	0.0	0.0
Approach	838	4.0	838	4.0		0.249		4.2	LOS A	0.0	0.0				
North: Station Road - North															
Lane 1 [d]	451	4.0	451	4.0	1160	0.389	100	4.9	LOS A	1.8	13.0	Full	500	0.0	0.0
Lane 2	359	4.0	359	4.0	923	0.389	100	5.4	LOS A	1.7	12.3	Full	500	0.0	0.0
Approach	811	4.0	811	4.0		0.389		5.1	LOS A	1.8	13.0				
West: Calder Freeway Off-ramp - West															
Lane 1 [d]	355	4.0	355	4.0	1210	0.294	100	9.4	LOS A	1.2	8.9	Full	500	0.0	0.0
Lane 2	273	4.0	273	4.0	931	0.294	100	12.1	LOS A	1.2	8.6	Full	500	0.0	0.0
Approach	628	4.0	628	4.0		0.294		10.6	LOS A	1.2	8.9				
All Vehicles	2277	4.0	2277	4.0		0.389		6.3	LOS A	1.8	13.0				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	454	-	454	4.0	1826	0.249	100	NA	NA
Lane 2	221	162	384	4.0	1541	0.249	100	NA	NA
Approach	676	162	838	4.0		0.249			

North: Station Road - North

Mov. From N To Exit:	L2 E	T1 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	222	229	451	4.0	1160	0.389	100	NA	NA

Lane 2	-	359	359	4.0		923	0.389	100	NA	NA
Approach	222	588	811	4.0			0.389			
West: Calder Freeway Off-ramp - West										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	111	1	244	355	4.0	1210	0.294	100	NA	NA
Lane 2	-	-	273	273	4.0	931	0.294	100	NA	NA
Approach	111	1	517	628	4.0		0.294			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2277	4.0	0.389

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
West: Calder Freeway Off-ramp - West				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101 [StatCaldWestPMFuEx (Site Folder: PM - Post Dev - 15yr Growth)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Both (Network Folder: Post Dev - 15yr Growth - PM Peak)]

Station Road / Calder Freeway Westbound Lane
PM Peak, Future Volumes, Existing Geometry
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Station Road - South															
Lane 1 [d]	567	4.0	567	4.0	1350	0.420	100	4.2	LOS A	2.1	15.4	Full	170	0.0	0.0
Lane 2	480	4.0	480	4.0	1142	0.420	100	4.3	LOS A	2.1	14.9	Full	170	0.0	0.0
Approach	1047	4.0	1047	4.0		0.420		4.3	LOS A	2.1	15.4				
East: Calder Freeway Off-ramp - East															
Lane 1 [d]	261	4.0	261	4.0	1082	0.241	100	6.1	LOS A	0.9	6.8	Full	500	-5.9 [N3]	0.0
Lane 2	204	4.0	204	4.0	847	0.241	100	12.7	LOS A	0.9	6.8	Full	500	0.0	0.0
Approach	465	4.0	465	4.0		0.241		9.0	LOS A	0.9	6.8				
North: Station Road - North															
Lane 1 [d]	579	4.0	579	4.0	1705	0.340	100	2.9	LOS A	0.0	0.0	Full	130	-6.5 [N3]	0.0
Lane 2	516	4.0	516	4.0	1518	0.340	100	4.2	LOS A	0.0	0.0	Full	130	-1.7 [N3]	0.0
Approach	1095	4.0	1095	4.0		0.340		3.5	LOS A	0.0	0.0				
All Vehicles	2607	4.0	2607	4.0		0.420		4.8	LOS A	2.1	15.4				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

d Dominant lane on roundabout approach
N3 Capacity Adjustment due to downstream lane blockage determined by the program.

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	L2 W	T1 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	461	106	567	4.0	1350	0.420	100	NA	NA
Lane 2	-	480	480	4.0	1142	0.420	100	NA	NA
Approach	461	586	1047	4.0		0.420			

East: Calder Freeway Off-ramp - East

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.

Lane 1	235	1	25	261	4.0	1082	0.241	100	NA	NA
Lane 2	-	-	204	204	4.0	847	0.241	100	NA	NA
Approach	235	1	229	465	4.0		0.241			

North: Station Road - North

Mov. From N To Exit:	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	579	-	579	4.0	1705	0.340	100	NA	NA
Lane 2	417	99	516	4.0	1518	0.340	100	NA	NA
Approach	996	99	1095	4.0		0.340			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2607	4.0	0.420

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
East: Calder Freeway Off-ramp - East				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101v [StatRossPMExFu - Signals (Site Folder: PM - Post Dev - 15yr Growth)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Both (Network Folder: Post Dev - 15yr Growth - PM Peak)]

Station Road / Ross Watt Road
PM Peak, Existing Geometry, Future Volumes
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Network User-Given Cycle Time)

Lane Use and Performance

	Demand Flows [Total	HV]	Arrival Flows [Total	HV]	Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue [Veh	Dist]	Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: Station Road - South															
Lane 1	137	2.0	137	2.0	1053	0.130	100	9.4	LOS A	1.3	9.6	Short	95	0.0	NA
Lane 2	478	4.0	478	4.0	950	0.503	100	10.7	LOS A	12.0	86.9	Full	165	0.0	0.0
Lane 3	478	4.0	478	4.0	950	0.503	100	7.4	LOS A	9.2	66.6	Full	165	0.0	0.0
Lane 4	25	0.0	25	0.0	310	0.082	100	59.2	LOS A	1.5	10.2	Short	55	0.0	NA
Approach	1118	3.7	1118	3.7		0.503		10.2	LOS A	12.0	86.9				
East: Morrow Road - East															
Lane 1	39	0.0	39	0.0	132	0.295	100	46.7	LOS A	1.9	13.0	Full	500	0.0	0.0
Approach	39	0.0	39	0.0		0.295		46.7	LOS A	1.9	13.0				
North: Station Road - North															
Lane 1	580	3.8	580	3.8	951	0.610	100	22.6	LOS B	23.9	172.8	Full	170	0.0	6.5
Lane 2	546	4.0	546	4.0	896 [1]	0.610	100	27.0	LOS B	22.7	164.5	Full	170	0.0	2.1
Lane 3	189	2.0	189	2.0	305	0.621	100	60.8	LOS B	10.5	75.0	Short	75	0.0	NA
Approach	1316	3.6	1316	3.6		0.621		29.9	LOS B	23.9	172.8				
West: Ross Watt Road - West															
Lane 1	114	2.0	114	2.0	534	0.213	100	40.0	LOS A	5.0	35.6	Short	40	0.0	NA
Lane 2	80	1.9	80	1.9	138	0.580	100	66.4	LOS A	4.8	34.1	Full	500	0.0	0.0
Approach	194	1.9	194	1.9		0.580		50.9	LOS A	5.0	35.6				
All Vehicles	2666	3.5	2666	3.5		0.621		23.4	LOS B	23.9	172.8				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes.
Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	137	-	-	137	2.0	1053	0.130	100	0.0	2
Lane 2	-	478	-	478	4.0	950	0.503	100	NA	NA

Mov.	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 3	-	478	-	478	4.0	950	0.503	100	NA	NA
Lane 4	-	-	25	25	0.0	310	0.082	100	0.0	3
Approach	137	956	25	1118	3.7		0.503			
East: Morrow Road - East										
Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	17	5	17	39	0.0	132	0.295	100	NA	NA
Approach	17	5	17	39	0.0		0.295			
North: Station Road - North										
Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	25	555	-	580	3.8	951	0.610	100	NA	NA
Lane 2	-	546	-	546	4.0	896 [1]	0.610	100	NA	NA
Lane 3	-	-	189	189	2.0	305	0.621	100	5.0	2
Approach	25	1101	189	1316	3.6		0.621			
West: Ross Watt Road - West										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	114	-	-	114	2.0	534	0.213	100	0.0	2
Lane 2	-	5	75	80	1.9	138	0.580	100	NA	NA
Approach	114	5	75	194	1.9		0.580			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2666	3.5	0.621

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes.
Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
Lane 4	0.0	0.0	0.0	0.0
East: Morrow Road - East				
Lane 1	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

Lane 3	0.0	0.0	0.0	0.0
West: Ross Watt Road - West				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101v [StatCherPMExFu - Signals (Site Folder: PM - Post Dev - 15yr Growth)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Both (Network Folder: Post Dev - 15yr Growth - PM Peak)]

Station Road / Cherry Lane
PM Peak, Existing Geometry, Future Volumes
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated   Cycle Time = 120 seconds (Network User-Given Cycle Time)

Lane Use and Performance

	Demand Flows [Total veh/h	Demand Flows HV] %	Arrival Flows [Total veh/h	Arrival Flows HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh	95% Back Of Queue Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Station Road - South															
Lane 1	240	2.0	240	2.0	1068	0.225	100	21.3	LOS A	6.6	47.0	Short	50	0.0	NA
Lane 2	484	4.0	484	4.0	996 [1]	0.486	100	17.9	LOS A	15.9	115.3	Full	500	0.0	0.0
Lane 3	546	4.0	546	4.0	1125	0.486	100	14.8	LOS A	18.0	130.3	Full	500	0.0	0.0
Approach	1269	3.6	1269	3.6		0.486		17.2	LOS A	18.0	130.3				
North: Station Road - North															
Lane 1	521	4.0	521	4.0	1315	0.396	100	0.4	LOS A	1.0	7.1	Full	165	0.0	0.0
Lane 2	521	4.0	521	4.0	1315	0.396	100	2.7	LOS A	5.4	39.4	Full	165	0.0	0.0
Lane 3	60	2.0	60	2.0	276	0.218	100	15.0	LOS A	1.2	8.6	Short	30	0.0	NA
Approach	1101	3.9	1101	3.9		0.396		2.3	LOS A	5.4	39.4				
West: Cherry Lane - West															
Lane 1	188	2.0	188	2.0	397	0.475	100	50.2	LOS A	9.7	69.3	Full	500	0.0	0.0
Approach	188	2.0	188	2.0		0.475		50.2	LOS A	9.7	69.3				
All Vehicles	2559	3.6	2559	3.6		0.486		13.2	LOS A	18.0	130.3				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes.
Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	L2 W	T1 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	240	-	240	2.0	1068	0.225	100	0.0	2
Lane 2	-	484	484	4.0	996 [1]	0.486	100	NA	NA
Lane 3	-	546	546	4.0	1125	0.486	100	NA	NA
Approach	240	1029	1269	3.6		0.486			

North: Station Road - North

Mov. From N To Exit:	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.

Lane 1	521	-	521	4.0	1315	0.396	100	NA	NA
Lane 2	521	-	521	4.0	1315	0.396	100	NA	NA
Lane 3	-	60	60	2.0	276	0.218	100	0.0	2
Approach	1041	60	1101	3.9		0.396			

West: Cherry Lane - West

Mov. From W To Exit:	L2 N	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	63	125	188	2.0	397	0.475	100	NA	NA
Approach	63	125	188	2.0		0.475			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2559	3.6	0.486

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes.
Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
West: Cherry Lane - West				
Lane 1	0.0	0.0	0.0	0.0

PHASING SUMMARY

Site: 101v [StatRossPMExFu - Signals (Site Folder: PM - Post Dev - 15yr Growth)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Both (Network Folder: Post Dev - 15yr Growth - PM Peak)]

Station Road / Ross Watt Road
PM Peak, Existing Geometry, Future Volumes
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated   Cycle Time = 120 seconds (Network User-Given Cycle Time)

Timings based on settings in the Network Timing dialog
Phase Times determined by the program
Downstream lane blockage effects included in determining phase times
Phase Sequence: Convert Function Default
Input Phase Sequence: A, B, C, D
Output Phase Sequence: A, B, C, D
Reference Phase: Phase B
Offset: 0 seconds (User)

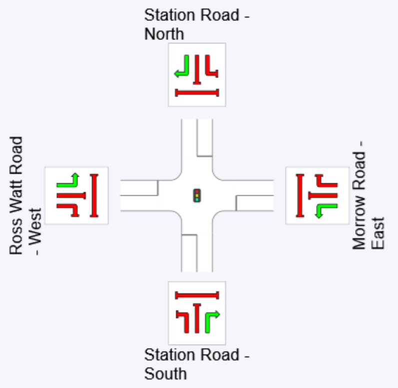
Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	94	0	66	79
Green Time (sec)	20	60	7	9
Phase Time (sec)	26	66	13	15
Phase Split	22%	55%	11%	13%
Phase Frequency (%)	100.0	100.0	100.0	100.0

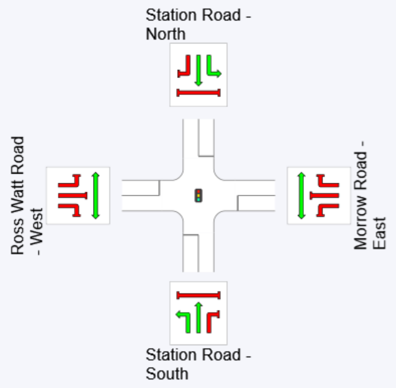
See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence

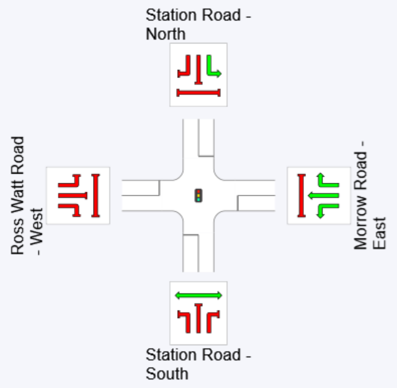
Phase A



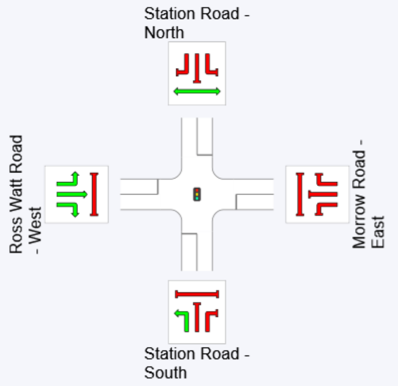
Phase B REF



Phase C



Phase D



REF: Reference Phase
VAR: Variable Phase

Normal Movement	Permitted/Opposed
Slip/Bypass-Lane Movement	Opposed Slip/Bypass-Lane
Stopped Movement	Turn On Red
Other Movement Class (MC) Running	Undetected Movement
Mixed Running & Stopped MCs	Continuous Movement
Other Movement Class (MC) Stopped	Phase Transition Applied

PHASING SUMMARY

Site: 101v [StatCherPMExFu - Signals (Site Folder: PM - Post Dev - 15yr Growth)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Both (Network Folder: Post Dev - 15yr Growth - PM Peak)]

Station Road / Cherry Lane
PM Peak, Existing Geometry, Future Volumes
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated   Cycle Time = 120 seconds (Network User-Given Cycle Time)

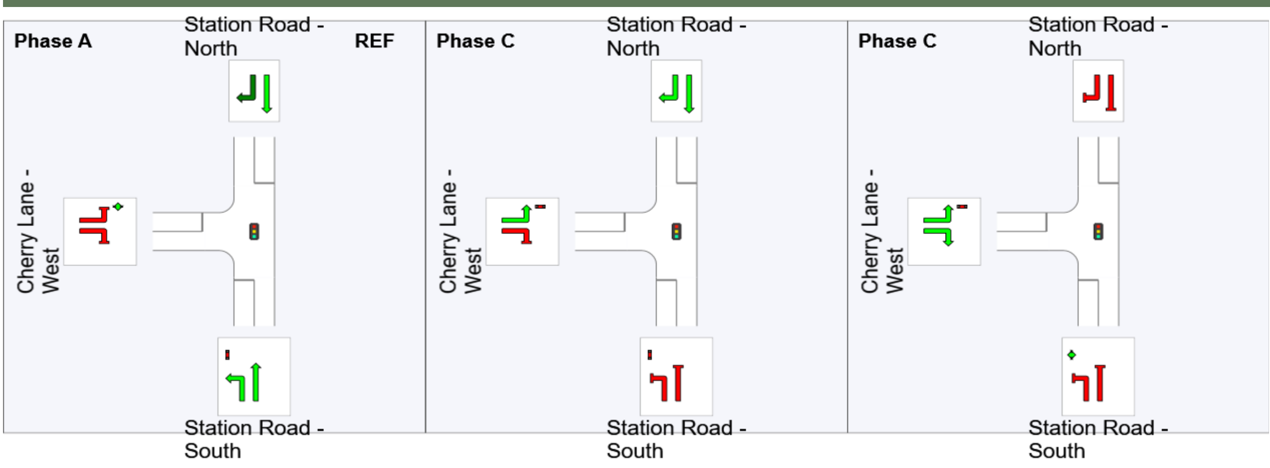
Timings based on settings in the Network Timing dialog
Phase Times determined by the program
Downstream lane blockage effects included in determining phase times
Phase Sequence: Convert Function Default
Input Phase Sequence: A, C, C
Output Phase Sequence: A, C, C
Reference Phase: Phase A
Offset: 0 seconds (User)

Phase Timing Summary

Phase	A	C	C
Phase Change Time (sec)	0	77	89
Green Time (sec)	71	6	25
Phase Time (sec)	77	12	31
Phase Split	64%	10%	26%
Phase Frequency (%)	100.0	100.0	100.0

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase

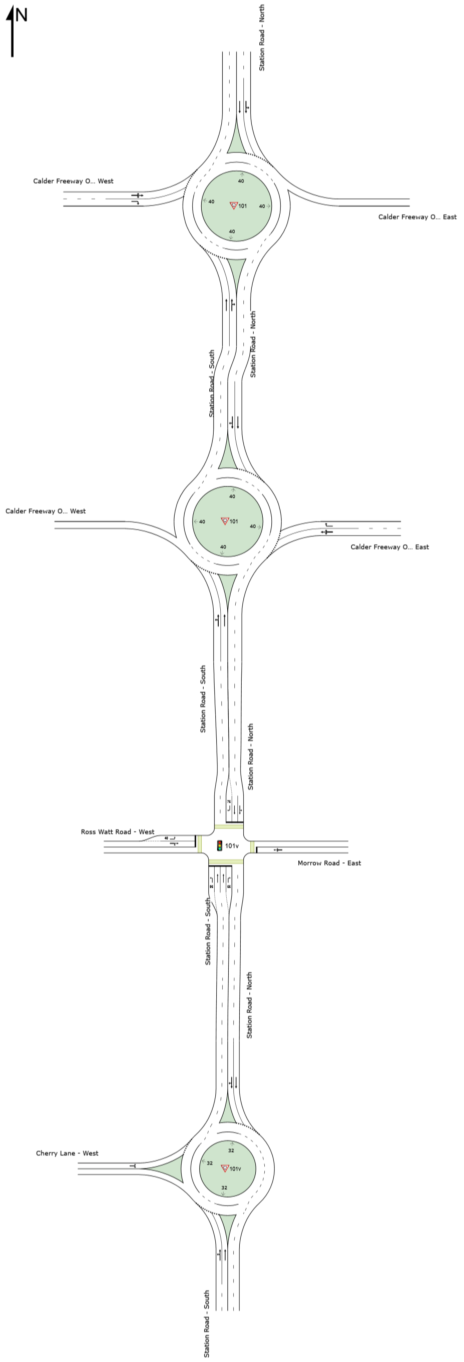
Normal Movement
Permitted/Opposed
Slip/Bypass-Lane Movement
Opposed Slip/Bypass-Lane
Stopped Movement
Turn On Red
Other Movement Class (MC) Running
Undetected Movement
Mixed Running & Stopped MCs
Continuous Movement
Other Movement Class (MC) Stopped
Phase Transition Applied

NETWORK LAYOUT

Network: N101 [Signals - Ross Watt (Network Folder: Post Dev - 15yr Growth - PM Peak)]

New Network
Network Category: (None)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
101	NA	StatCaldEastPMFuEx
101	NA	StatCaldWestPMFuEx
101v	NA	StatRossPMExFu - Signals
101v	NA	StatCherPMExFu - Roundabout

LANE SUMMARY

Site: 101 [StatCaldEastPMFuEx (Site Folder: PM - Post Dev - 15yr Growth)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Ross Watt (Network Folder: Post Dev - 15yr Growth - PM Peak)]

Station Road / Calder Freeway Eastbound Lane
PM Peak, Future Volumes, Existing Geometry
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows [Total	HV]	Arrival Flows [Total	HV]	Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue [Veh	Dist]	Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: Station Road - South															
Lane 1[d]	454	4.0	454	4.0	1826	0.249	100	2.9	LOS A	0.0	0.0	Full	130	0.0	0.0
Lane 2	384	4.0	384	4.0	1541	0.249	100	5.7	LOS A	0.0	0.0	Full	130	0.0	0.0
Approach	838	4.0	838	4.0		0.249		4.2	LOS A	0.0	0.0				
North: Station Road - North															
Lane 1[d]	451	4.0	451	4.0	1160	0.389	100	4.9	LOS A	1.8	13.0	Full	500	0.0	0.0
Lane 2	359	4.0	359	4.0	923	0.389	100	5.4	LOS A	1.7	12.3	Full	500	0.0	0.0
Approach	811	4.0	811	4.0		0.389		5.1	LOS A	1.8	13.0				
West: Calder Freeway Off-ramp - West															
Lane 1[d]	355	4.0	355	4.0	1210	0.294	100	9.4	LOS A	1.2	8.9	Full	500	0.0	0.0
Lane 2	273	4.0	273	4.0	931	0.294	100	12.1	LOS A	1.2	8.6	Full	500	0.0	0.0
Approach	628	4.0	628	4.0		0.294		10.6	LOS A	1.2	8.9				
All Vehicles	2277	4.0	2277	4.0		0.389		6.3	LOS A	1.8	13.0				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	454	-	454	4.0	1826	0.249	100	NA	NA
Lane 2	221	162	384	4.0	1541	0.249	100	NA	NA
Approach	676	162	838	4.0		0.249			

North: Station Road - North

Mov. From N To Exit:	L2 E	T1 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.

Lane 1	222	229	451	4.0	1160	0.389	100	NA	NA
Lane 2	-	359	359	4.0	923	0.389	100	NA	NA
Approach	222	588	811	4.0		0.389			

West: Calder Freeway Off-ramp - West										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	111	1	244	355	4.0	1210	0.294	100	NA	NA
Lane 2	-	-	273	273	4.0	931	0.294	100	NA	NA
Approach	111	1	517	628	4.0		0.294			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2277	4.0	0.389

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.												

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
West: Calder Freeway Off-ramp - West				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101 [StatCaldWestPMFuEx (Site Folder: PM - Post Dev - 15yr Growth)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Ross Watt (Network Folder: Post Dev - 15yr Growth - PM Peak)]

Station Road / Calder Freeway Westbound Lane
PM Peak, Future Volumes, Existing Geometry
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows [Total veh/h	Demand Flows HV] %	Arrival Flows [Total veh/h	Arrival Flows HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh	95% Back Of Queue Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Station Road - South															
Lane 1 d	567	4.0	567	4.0	1350	0.420	100	4.2	LOS A	2.1	15.2	Full	170	0.0	0.0
Lane 2	480	4.0	480	4.0	1142	0.420	100	4.3	LOS A	2.0	14.6	Full	170	0.0	0.0
Approach	1047	4.0	1047	4.0		0.420		4.3	LOS A	2.1	15.2				
East: Calder Freeway Off-ramp - East															
Lane 1 d	261	4.0	261	4.0	1082	0.241	100	6.1	LOS A	0.9	6.8	Full	500	-5.9 N3	0.0
Lane 2	204	4.0	204	4.0	847	0.241	100	12.7	LOS A	0.9	6.8	Full	500	0.0	0.0
Approach	465	4.0	465	4.0		0.241		9.0	LOS A	0.9	6.8				
North: Station Road - North															
Lane 1 d	579	4.0	579	4.0	1705	0.340	100	2.9	LOS A	0.0	0.0	Full	130	-6.5 N3	0.0
Lane 2	516	4.0	516	4.0	1518	0.340	100	4.2	LOS A	0.0	0.0	Full	130	-1.7 N3	0.0
Approach	1095	4.0	1095	4.0		0.340		3.5	LOS A	0.0	0.0				
All Vehicles	2607	4.0	2607	4.0		0.420		4.8	LOS A	2.1	15.2				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

d Dominant lane on roundabout approach
N3 Capacity Adjustment due to downstream lane blockage determined by the program.

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	L2 W	T1 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	461	106	567	4.0	1350	0.420	100	NA	NA
Lane 2	-	480	480	4.0	1142	0.420	100	NA	NA
Approach	461	586	1047	4.0		0.420			

East: Calder Freeway Off-ramp - East

Mov. From E	L2	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane

To Exit:	S	W	N			veh/h	v/c	%	%	No.
Lane 1	235	1	25	261	4.0	1082	0.241	100	NA	NA
Lane 2	-	-	204	204	4.0	847	0.241	100	NA	NA
Approach	235	1	229	465	4.0		0.241			

North: Station Road - North									
Mov. From N To Exit:	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	579	-	579	4.0	1705	0.340	100	NA	NA
Lane 2	417	99	516	4.0	1518	0.340	100	NA	NA
Approach	996	99	1095	4.0		0.340			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2607	4.0	0.420

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis										
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec

There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
East: Calder Freeway Off-ramp - East				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101v [StatRossPMExFu - Signals (Site Folder: PM - Post Dev - 15yr Growth)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Ross Watt (Network Folder: Post Dev - 15yr Growth - PM Peak)]

Station Road / Ross Watt Road
PM Peak, Existing Geometry, Future Volumes
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated   Cycle Time = 120 seconds (Site User-Given Cycle Time)

Lane Use and Performance

	Demand Flows [Total	HV]	Arrival Flows [Total	HV]	Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue [Veh	Dist]	Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: Station Road - South															
Lane 1	137	2.0	137	2.0	1053	0.130	100	12.3	LOS A	2.3	16.1	Short	95	0.0	NA
Lane 2	481	4.0	481	4.0	950	0.507	100	21.3	LOS A	18.6	134.8	Full	165	0.0	0.0
Lane 3	474	4.0	474	4.0	936[1]	0.507	100	26.9	LOS A	18.3	132.8	Full	165	0.0	0.0
Lane 4	25	0.0	25	0.0	310	0.082	100	56.8	LOS A	1.3	8.8	Short	55	0.0	NA
Approach	1118	3.7	1118	3.7		0.507		23.4	LOS A	18.6	134.8				
East: Morrow Road - East															
Lane 1	39	0.0	39	0.0	132	0.295	100	46.7	LOS A	1.9	13.0	Full	500	0.0	0.0
Approach	39	0.0	39	0.0		0.295		46.7	LOS A	1.9	13.0				
North: Station Road - North															
Lane 1	580	3.8	580	3.8	951	0.610	100	22.6	LOS B	23.9	172.8	Full	170	0.0	6.5
Lane 2	546	4.0	546	4.0	896[1]	0.610	100	27.0	LOS B	22.7	164.5	Full	170	0.0	2.1
Lane 3	189	2.0	189	2.0	305	0.621	100	60.8	LOS B	10.5	75.0	Short	75	0.0	NA
Approach	1316	3.6	1316	3.6		0.621		29.9	LOS B	23.9	172.8				
West: Ross Watt Road - West															
Lane 1	114	2.0	114	2.0	534	0.213	100	40.0	LOS A	5.0	35.6	Short	40	0.0	NA
Lane 2	80	1.9	80	1.9	138	0.580	100	66.4	LOS A	4.8	34.1	Full	500	0.0	0.0
Approach	194	1.9	194	1.9		0.580		50.9	LOS A	5.0	35.6				
All Vehicles	2666	3.5	2666	3.5		0.621		29.0	LOS B	23.9	172.8				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes.
Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	137	-	-	137	2.0	1053	0.130	100	0.0	2

Lane 2	-	481	-	481	4.0	950	0.507	100	NA	NA
Lane 3	-	474	-	474	4.0	936[1]	0.507	100	NA	NA
Lane 4	-	-	25	25	0.0	310	0.082	100	0.0	3
Approach	137	956	25	1118	3.7		0.507			

East: Morrow Road - East

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	17	5	17	39	0.0	132	0.295	100	NA	NA
Approach	17	5	17	39	0.0		0.295			

North: Station Road - North

Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	25	555	-	580	3.8	951	0.610	100	NA	NA
Lane 2	-	546	-	546	4.0	896[1]	0.610	100	NA	NA
Lane 3	-	-	189	189	2.0	305	0.621	100	5.0	2
Approach	25	1101	189	1316	3.6		0.621			

West: Ross Watt Road - West

Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	114	-	-	114	2.0	534	0.213	100	0.0	2
Lane 2	-	5	75	80	1.9	138	0.580	100	NA	NA
Approach	114	5	75	194	1.9		0.580			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2666	3.5	0.621

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes.
Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
Lane 4	0.0	0.0	0.0	0.0
East: Morrow Road - East				
Lane 1	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0

Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
West: Ross Watt Road - West				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101v [StatCherPMExFu - Roundabout (Site Folder: PM - Post Dev - 15yr Growth)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Ross Watt (Network Folder: Post Dev - 15yr Growth - PM Peak)]

Station Road / Cherry Lane
PM Peak, Existing Geometry, Future Volumes
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows [Total	HV]	Arrival Flows [Total	HV]	Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue [Veh	Dist]	Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: Station Road - South															
Lane 1[d]	676	4.0	676	4.0	1577	0.428	100	3.8	LOS A	3.7	26.7	Full	500	0.0	0.0
Lane 2	594	4.0	594	4.0	1386	0.428	100	3.8	LOS A	3.6	26.1	Full	500	0.0	0.0
Approach	1269	4.0	1269	4.0		0.428		3.8	LOS A	3.7	26.7				
North: Station Road - North															
Lane 1[d]	584	4.0	584	4.0	1422	0.411	100	4.1	LOS A	2.9	20.8	Full	165	0.0	0.0
Lane 2	517	4.0	517	4.0	1257	0.411	100	4.9	LOS A	2.8	20.1	Full	165	0.0	0.0
Approach	1101	4.0	1101	4.0		0.411		4.5	LOS A	2.9	20.8				
West: Cherry Lane - West															
Lane 1[d]	188	4.0	188	4.0	642	0.293	100	12.1	LOS A	1.4	10.0	Full	500	0.0	0.0
Approach	188	4.0	188	4.0		0.293		12.1	LOS A	1.4	10.0				
All Vehicles	2559	4.0	2559	4.0		0.428		4.7	LOS A	3.7	26.7				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	L2 W	T1 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	240	436	676	4.0	1577	0.428	100	NA	NA
Lane 2	-	594	594	4.0	1386	0.428	100	NA	NA
Approach	240	1029	1269	4.0		0.428			

North: Station Road - North

Mov. From N To Exit:	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	584	-	584	4.0	1422	0.411	100	NA	NA

Lane 2	457	60	517	4.0	1257	0.411	100	NA	NA
Approach	1041	60	1101	4.0		0.411			
West: Cherry Lane - West									
Mov. From W To Exit:	L2 N	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	63	125	188	4.0	642	0.293	100	NA	NA
Approach	63	125	188	4.0		0.293			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2559	4.0	0.428

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
West: Cherry Lane - West				
Lane 1	0.0	0.0	0.0	0.0

PHASING SUMMARY

Site: 101v [StatRossPMExFu - Signals (Site Folder: PM - Post Dev - 15yr Growth)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Ross Watt (Network Folder: Post Dev - 15yr Growth - PM Peak)]

Station Road / Ross Watt Road
PM Peak, Existing Geometry, Future Volumes
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated   Cycle Time = 120 seconds (Site User-Given Cycle Time)

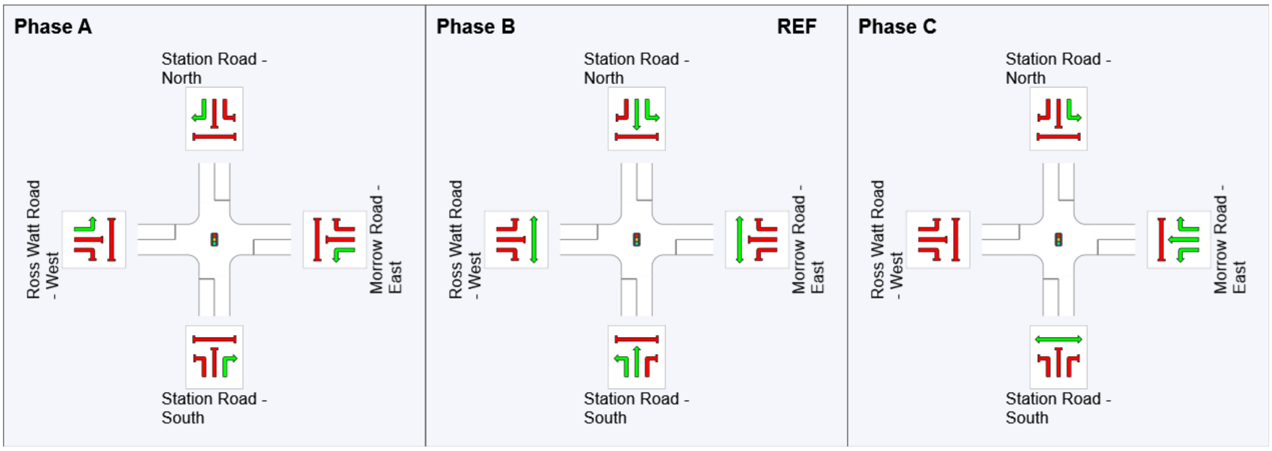
Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Downstream lane blockage effects included in determining phase times
Phase Sequence: Convert Function Default
Input Phase Sequence: A, B, C, D
Output Phase Sequence: A, B, C, D
Reference Phase: Phase B
Offset: NA

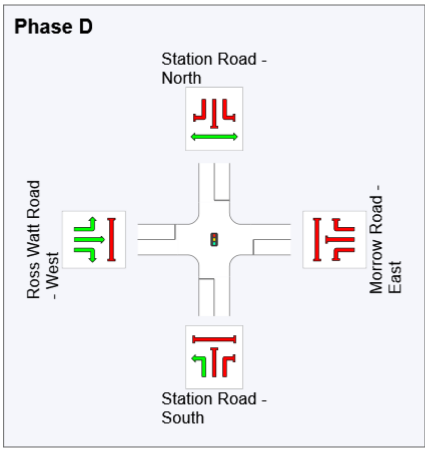
Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	94	0	66	79
Green Time (sec)	20	60	7	9
Phase Time (sec)	26	66	13	15
Phase Split	22%	55%	11%	13%
Phase Frequency (%)	100.0	100.0	100.0	100.0

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence





REF: Reference Phase
VAR: Variable Phase

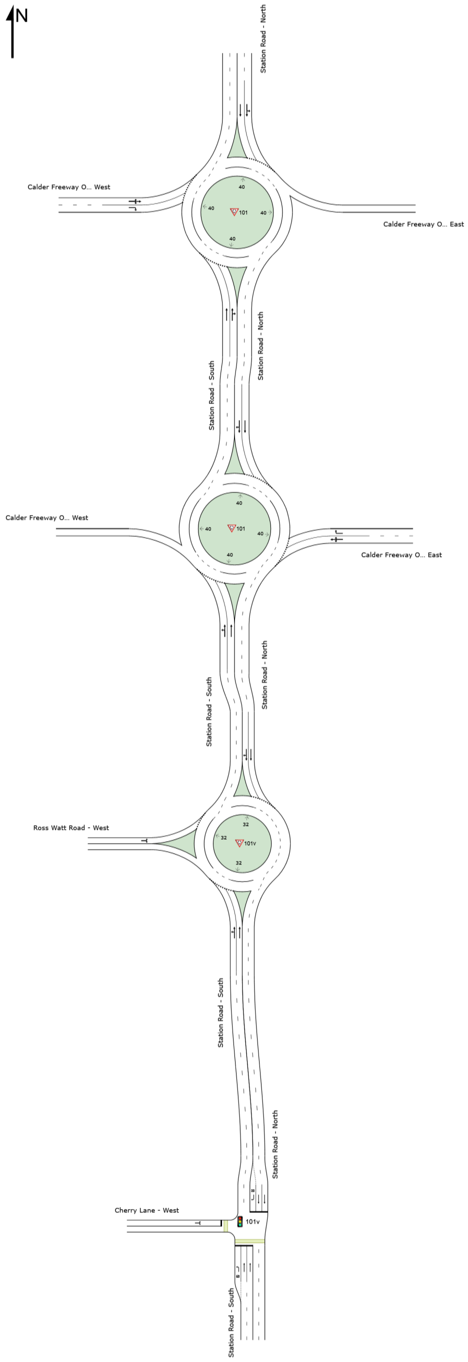
Normal Movement	Permitted/Opposed
Slip/Bypass-Lane Movement	Opposed Slip/Bypass-Lane
Stopped Movement	Turn On Red
Other Movement Class (MC) Running	Undetected Movement
Mixed Running & Stopped MCs	Continuous Movement
Other Movement Class (MC) Stopped	Phase Transition Applied

NETWORK LAYOUT

Network: N101 [Signals - Cherry (Network Folder: Post Dev - 15yr Growth - PM Peak)]

New Network
Network Category: (None)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
101	NA	StatCaldEastPMFuEx
101	NA	StatCaldWestPMFuEx
101v	NA	StatRossPMExFu - Roundabout
101v	NA	StatCherPMExFu - Signals

LANE SUMMARY

Site: 101 [StatCaldEastPMFuEx (Site Folder: PM - Post Dev - 15yr Growth)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Cherry (Network Folder: Post Dev - 15yr Growth - PM Peak)]

Station Road / Calder Freeway Eastbound Lane
PM Peak, Future Volumes, Existing Geometry
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Station Road - South															
Lane 1 [d]	454	4.0	454	4.0	1826	0.249	100	2.9	LOS A	0.0	0.0	Full	130	0.0	0.0
Lane 2	384	4.0	384	4.0	1541	0.249	100	5.7	LOS A	0.0	0.0	Full	130	0.0	0.0
Approach	838	4.0	838	4.0		0.249		4.2	LOS A	0.0	0.0				
North: Station Road - North															
Lane 1 [d]	451	4.0	451	4.0	1160	0.389	100	4.9	LOS A	1.8	13.0	Full	500	0.0	0.0
Lane 2	359	4.0	359	4.0	923	0.389	100	5.4	LOS A	1.7	12.3	Full	500	0.0	0.0
Approach	811	4.0	811	4.0		0.389		5.1	LOS A	1.8	13.0				
West: Calder Freeway Off-ramp - West															
Lane 1 [d]	355	4.0	355	4.0	1210	0.294	100	9.4	LOS A	1.2	8.9	Full	500	0.0	0.0
Lane 2	273	4.0	273	4.0	931	0.294	100	12.1	LOS A	1.2	8.6	Full	500	0.0	0.0
Approach	628	4.0	628	4.0		0.294		10.6	LOS A	1.2	8.9				
All Vehicles	2277	4.0	2277	4.0		0.389		6.3	LOS A	1.8	13.0				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	454	-	454	4.0	1826	0.249	100	NA	NA
Lane 2	221	162	384	4.0	1541	0.249	100	NA	NA
Approach	676	162	838	4.0		0.249			

North: Station Road - North

Mov. From N To Exit:	L2 E	T1 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	222	229	451	4.0	1160	0.389	100	NA	NA

Lane 2	-	359	359	4.0	923	0.389	100	NA	NA
Approach	222	588	811	4.0		0.389			

West: Calder Freeway Off-ramp - West										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	111	1	244	355	4.0	1210	0.294	100	NA	NA
Lane 2	-	-	273	273	4.0	931	0.294	100	NA	NA
Approach	111	1	517	628	4.0		0.294			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2277	4.0	0.389

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
West: Calder Freeway Off-ramp - West				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101 [StatCaldWestPMFuEx (Site Folder: PM - Post Dev - 15yr Growth)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Cherry (Network Folder: Post Dev - 15yr Growth - PM Peak)]

Station Road / Calder Freeway Westbound Lane
PM Peak, Future Volumes, Existing Geometry
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Station Road - South															
Lane 1 [d]	567	4.0	567	4.0	1351	0.420	100	4.2	LOS A	2.4	17.1	Full	170	0.0	0.0
Lane 2	480	4.0	480	4.0	1143	0.420	100	4.3	LOS A	2.3	16.6	Full	170	0.0	0.0
Approach	1047	4.0	1047	4.0		0.420		4.3	LOS A	2.4	17.1				
East: Calder Freeway Off-ramp - East															
Lane 1 [d]	268	4.0	268	4.0	1146	0.234	100	6.3	LOS A	1.0	7.0	Full	500	0.0	0.0
Lane 2	197	4.0	197	4.0	843	0.234	100	12.8	LOS A	0.9	6.6	Full	500	0.0	0.0
Approach	465	4.0	465	4.0		0.234		9.0	LOS A	1.0	7.0				
North: Station Road - North															
Lane 1 [d]	593	4.0	593	4.0	1824	0.325	100	2.9	LOS A	0.0	0.0	Full	130	0.0	0.0
Lane 2	501	4.0	501	4.0	1540	0.325	100	4.2	LOS A	0.0	0.0	Full	130	0.0	0.0
Approach	1095	4.0	1095	4.0		0.325		3.5	LOS A	0.0	0.0				
All Vehicles	2607	4.0	2607	4.0		0.420		4.8	LOS A	2.4	17.1				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	L2 W	T1 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	461	106	567	4.0	1351	0.420	100	NA	NA
Lane 2	-	480	480	4.0	1143	0.420	100	NA	NA
Approach	461	586	1047	4.0		0.420			

East: Calder Freeway Off-ramp - East

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	235	1	32	268	4.0	1146	0.234	100	NA	NA

Mov. From N To Exit:	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 2	-	-	197	197	4.0	843	0.234	100	NA	NA
Approach	235	1	229	465	4.0		0.234			
North: Station Road - North										
Lane 1	593	-	593	4.0	1824	0.325	100	NA	NA
Lane 2	402	99	501	4.0	1540	0.325	100	NA	NA
Approach	996	99	1095	4.0		0.325			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2607	4.0	0.420

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
East: Calder Freeway Off-ramp - East				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101v [StatRossPMExFu - Roundabout (Site Folder: PM - Post Dev - 15yr Growth)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Cherry (Network Folder: Post Dev - 15yr Growth - PM Peak)]

Station Road / Ross Watt Road
PM Peak, Existing Geometry, Future Volumes
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Station Road - South															
Lane 1 [d]	579	4.0	579	4.0	1334	0.434	100	4.5	LOS A	2.8	20.0	Full	165	0.0	0.0
Lane 2	514	4.0	514	4.0	1183	0.434	100	4.7	LOS A	2.7	19.4	Full	165	0.0	0.0
Approach	1093	4.0	1093	4.0		0.434		4.6	LOS A	2.8	20.0				
North: Station Road - North															
Lane 1 [d]	687	4.0	687	4.0	1526	0.450	100	3.8	LOS A	3.9	28.0	Full	170	0.0	0.0
Lane 2	604	4.0	604	4.0	1341	0.450	100	5.8	LOS A	3.8	27.4	Full	170	0.0	0.0
Approach	1291	4.0	1291	4.0		0.450		4.7	LOS A	3.9	28.0				
West: Ross Watt Road - West															
Lane 1 [d]	188	4.0	188	4.0	669	0.281	100	10.0	LOS A	1.5	10.8	Full	500	0.0	0.0
Approach	188	4.0	188	4.0		0.281		10.0	LOS A	1.5	10.8				
All Vehicles	2572	4.0	2572	4.0		0.450		5.1	LOS A	3.9	28.0				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	L2 W	T1 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	137	442	579	4.0	1334	0.434	100	NA	NA
Lane 2	-	514	514	4.0	1183	0.434	100	NA	NA
Approach	137	956	1093	4.0		0.434			

North: Station Road - North

Mov. From N To Exit:	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	687	-	687	4.0	1526	0.450	100	NA	NA
Lane 2	414	189	604	4.0	1341	0.450	100	NA	NA

Mov. From W To Exit:	L2 N	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Approach	1101	189	1291	4.0		0.450			
West: Ross Watt Road - West									
Lane 1	114	75	188	4.0	669	0.281	100	NA	NA
Approach	114	75	188	4.0		0.281			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2572	4.0	0.450

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
West: Ross Watt Road - West				
Lane 1	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101v [StatCherPMExFu - Signals (Site Folder: PM - Post Dev - 15yr Growth)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Cherry (Network Folder: Post Dev - 15yr Growth - PM Peak)]

Station Road / Cherry Lane
PM Peak, Existing Geometry, Future Volumes
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Lane Use and Performance

	Demand Flows [Total	HV]	Arrival Flows [Total	HV]	Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue [Veh	Dist]	Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: Station Road - South															
Lane 1	240	2.0	240	2.0	1068	0.225	100	21.3	LOS A	6.6	47.0	Short	50	0.0	NA
Lane 2	484	4.0	484	4.0	996 [1]	0.486	100	17.9	LOS A	15.9	115.3	Full	500	0.0	0.0
Lane 3	546	4.0	546	4.0	1125	0.486	100	14.8	LOS A	18.0	130.3	Full	500	0.0	0.0
Approach	1269	3.6	1269	3.6		0.486		17.2	LOS A	18.0	130.3				
North: Station Road - North															
Lane 1	573	4.0	573	4.0	1315	0.436	100	8.6	LOS A	14.5	105.1	Full	165	0.0	0.0
Lane 2	468	4.0	468	4.0	1072 [1]	0.436	100	11.5	LOS A	11.8	85.6	Full	165	0.0	0.0
Lane 3	60	2.0	60	2.0	276	0.218	100	28.5	LOS A	2.0	14.3	Short	30	0.0	NA
Approach	1101	3.9	1101	3.9		0.436		10.9	LOS A	14.5	105.1				
West: Cherry Lane - West															
Lane 1	188	2.0	188	2.0	397	0.475	100	50.2	LOS A	9.7	69.3	Full	500	0.0	0.0
Approach	188	2.0	188	2.0		0.475		50.2	LOS A	9.7	69.3				
All Vehicles	2559	3.6	2559	3.6		0.486		16.9	LOS A	18.0	130.3				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	L2 W	T1 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	240	-	240	2.0	1068	0.225	100	0.0	2
Lane 2	-	484	484	4.0	996 [1]	0.486	100	NA	NA
Lane 3	-	546	546	4.0	1125	0.486	100	NA	NA
Approach	240	1029	1269	3.6		0.486			

North: Station Road - North

Mov. From N To Exit:	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.

Lane 1	573	-	573	4.0	1315	0.436	100	NA	NA
Lane 2	468	-	468	4.0	1072[1]	0.436	100	NA	NA
Lane 3	-	60	60	2.0	276	0.218	100	0.0	2
Approach	1041	60	1101	3.9		0.436			
West: Cherry Lane - West									
Mov. From W To Exit:	L2 N	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	63	125	188	2.0	397	0.475	100	NA	NA
Approach	63	125	188	2.0		0.475			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2559	3.6	0.486

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes.
Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
West: Cherry Lane - West				
Lane 1	0.0	0.0	0.0	0.0

PHASING SUMMARY

Site: 101v [StatCherPMExFu - Signals (Site Folder: PM - Post Dev - 15yr Growth)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Cherry (Network Folder: Post Dev - 15yr Growth - PM Peak)]

Station Road / Cherry Lane
PM Peak, Existing Geometry, Future Volumes
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated   Cycle Time = 120 seconds (Site User-Given Cycle Time)

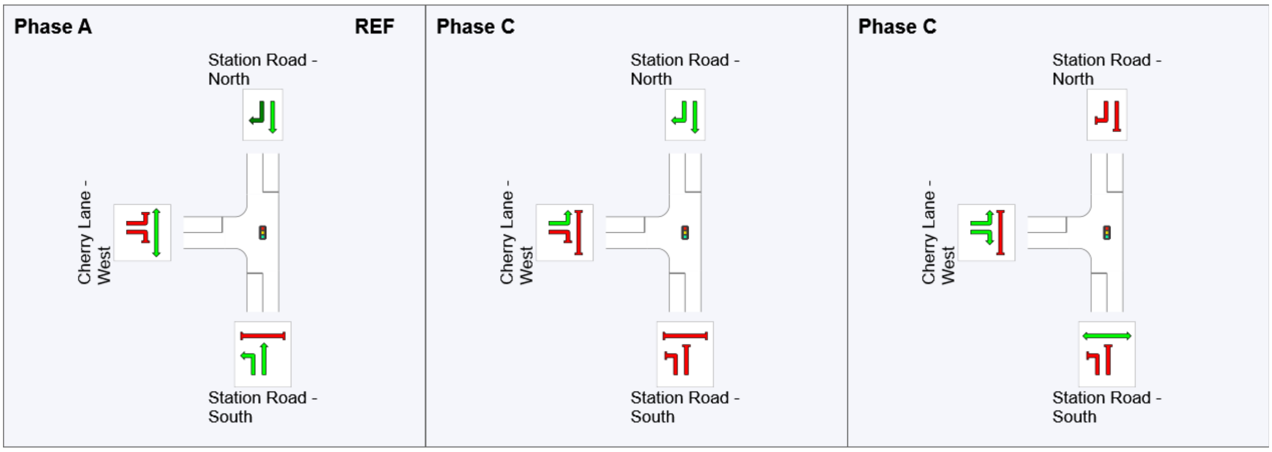
Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Downstream lane blockage effects included in determining phase times
Phase Sequence: Convert Function Default
Input Phase Sequence: A, C, C
Output Phase Sequence: A, C, C
Reference Phase: Phase A
Offset: NA

Phase Timing Summary

Phase	A	C	C
Phase Change Time (sec)	0	77	89
Green Time (sec)	71	6	25
Phase Time (sec)	77	12	31
Phase Split	64%	10%	26%
Phase Frequency (%)	100.0	100.0	100.0

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase

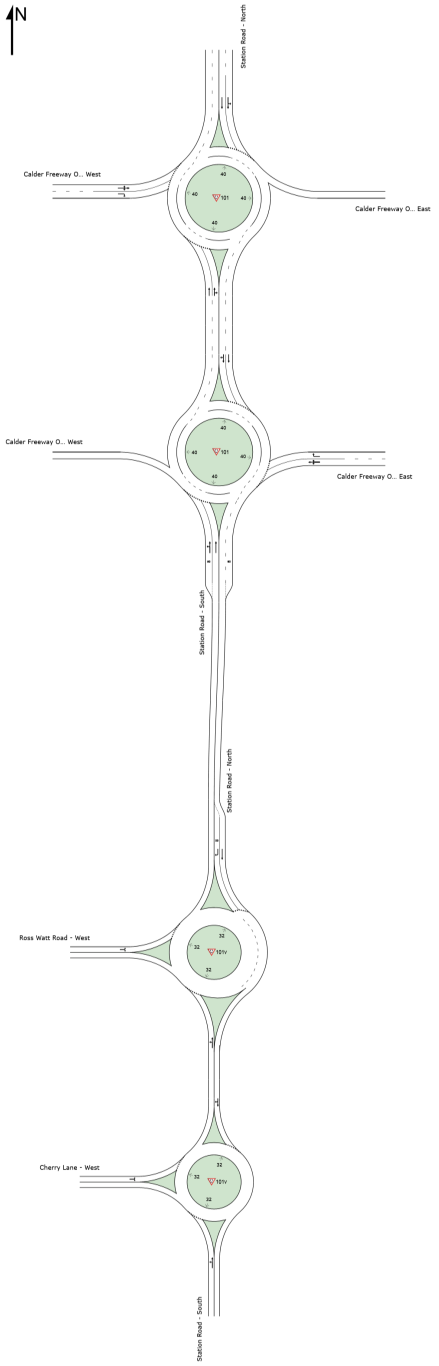
Normal Movement	Permitted/Opposed
Slip/Bypass-Lane Movement	Opposed Slip/Bypass-Lane
Stopped Movement	Turn On Red
Other Movement Class (MC) Running	Undetected Movement
Mixed Running & Stopped MCs	Continuous Movement
Other Movement Class (MC) Stopped	Phase Transition Applied

NETWORK LAYOUT

Network: N101 [AM Roundabouts - Both (Network Folder: Post Dev - 15yr Growth)]

New Network
Network Category: (None)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
101	NA	StatCaldEastAMFuEx
101	NA	StatCaldWestAMFuEx
101v	NA	StatRossAMExFu - Roundabout
101v	NA	StatCherAMExFu - Roundabout

LANE SUMMARY

Site: 101 [StatCaldEastAMFuEx (Site Folder: Roundabout - Post Dev - 15yr Growth)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [AM Roundabouts - Both (Network Folder: Post Dev - 15yr Growth)]

Station Road / Calder Freeway Eastbound Lane
AM Peak, Future Volumes, Existing Geometry
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows [Total	HV]	Arrival Flows [Total	HV]	Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue [Veh	Dist]	Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: Station Road - South															
Lane 1[d]	561	4.0	561	4.0	1826	0.307	100	2.9	LOS A	0.0	0.0	Full	130	0.0	0.0
Lane 2	474	4.0	474	4.0	1541	0.307	100	5.8	LOS A	0.0	0.0	Full	130	0.0	0.0
Approach	1035	4.0	1035	4.0		0.307		4.2	LOS A	0.0	0.0				
North: Station Road - North															
Lane 1[d]	570	4.0	570	4.0	1164	0.490	100	5.4	LOS A	2.7	19.5	Full	500	0.0	0.0
Lane 2	455	4.0	455	4.0	930	0.490	100	6.0	LOS A	2.5	18.5	Full	500	0.0	0.0
Approach	1025	4.0	1025	4.0		0.490		5.7	LOS A	2.7	19.5				
West: Calder Freeway Off-ramp - West															
Lane 1[d]	304	4.0	304	4.0	1164	0.261	100	10.1	LOS A	1.1	7.9	Full	500	0.0	0.0
Lane 2	226	4.0	226	4.0	865	0.261	100	12.6	LOS A	1.0	7.4	Full	500	0.0	0.0
Approach	529	4.0	529	4.0		0.261		11.2	LOS A	1.1	7.9				
All Vehicles	2589	4.0	2589	4.0		0.490		6.2	LOS A	2.7	19.5				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	561	-	561	4.0	1826	0.307	100	NA	NA
Lane 2	262	212	474	4.0	1541	0.307	100	NA	NA
Approach	823	212	1035	4.0		0.307			

North: Station Road - North

Mov. From N To Exit:	L2 E	T1 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.

Lane 1	302	268	570	4.0		1164	0.490	100	NA	NA
Lane 2	-	455	455	4.0		930	0.490	100	NA	NA
Approach	302	723	1025	4.0			0.490			

West: Calder Freeway Off-ramp - West

Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	79	1	224	304	4.0	1164	0.261	100	NA	NA
Lane 2	-	-	226	226	4.0	865	0.261	100	NA	NA
Approach	79	1	449	529	4.0		0.261			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2589	4.0	0.490

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
West: Calder Freeway Off-ramp - West				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101 [StatCaldWestAMFuEx (Site Folder: Roundabout - Post Dev - 15yr Growth)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [AM Roundabouts - Both (Network Folder: Post Dev - 15yr Growth)]

Station Road / Calder Freeway Westbound Lane
AM Peak, Future Volumes, Existing Geometry
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows [Total	HV]	Arrival Flows [Total	HV]	Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue [Veh	Dist]	Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: Station Road - South															
Lane 1[d]	595	4.0	595	4.0	1320	0.450	100	4.3	LOS A	2.6	18.7	Short	50	0.0	NA
Lane 2	500	4.0	500	4.0	1110	0.450	100	4.4	LOS A	2.5	18.1	Full	170	0.0	0.0
Approach	1095	4.0	1095	4.0		0.450		4.3	LOS A	2.6	18.7				
East: Calder Freeway Off-ramp - East															
Lane 1[d]	226	4.0	226	4.0	1069	0.211	100	10.8	LOS A	1.0	7.1	Full	500	0.0	0.0
Lane 2	166	4.0	166	4.0	783	0.211	100	13.6	LOS A	0.9	6.5	Full	500	0.0	0.0
Approach	392	4.0	392	4.0		0.211		12.0	LOS A	1.0	7.1				
North: Station Road - North															
Lane 1	358	4.0	358	4.0	1461	0.245	56[6]	6.0	LOS A	0.0	0.0	Full	130	0.0	0.0
Lane 2[d]	800	4.0	800	4.0	1824	0.439	100	3.7	LOS A	0.0	0.0	Full	130	0.0	0.0
Approach	1158	4.0	1158	4.0		0.439		4.4	LOS A	0.0	0.0				
All Vehicles	2644	4.0	2644	4.0		0.450		5.5	LOS A	2.6	18.7				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

6 Lane under-utilisation due to downstream effects
d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	L2 W	T1 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	325	269	595	4.0	1320	0.450	100	0.0	2
Lane 2	-	500	500	4.0	1110	0.450	100	NA	NA
Approach	325	769	1095	4.0		0.450			

East: Calder Freeway Off-ramp - East

Mov. From E	L2	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane

To Exit:	S	W	N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	126	1	99	226	4.0	1069	0.211	100	NA	NA
Lane 2	-	-	166	166	4.0	783	0.211	100	NA	NA
Approach	126	1	264	392	4.0		0.211			

North: Station Road - North

Mov. From N To Exit:	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	358	-	358	4.0	1461	0.245	56 [6]	NA	NA
Lane 2	703	97	800	4.0	1824	0.439	100	NA	NA
Approach	1061	97	1158	4.0		0.439			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2644	4.0	0.450

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

6 Lane under-utilisation due to downstream effects

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Station Road - South Merge Type: **Priority**												
Exit Short Lane	1	60	0.0	703	717	3.06	2.04	485	1023	0.474	1.5	3.1
Merge Lane	2	-	100.0	Merge Lane is not Opposed				703	1800	0.390	0.0	0.0

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
East: Calder Freeway Off-ramp - East				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101v [StatRossAMExFu - Roundabout (Site Folder: Roundabout - Post Dev - 15yr Growth)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [AM Roundabouts - Both (Network Folder: Post Dev - 15yr Growth)]

Station Road / Ross Watt Road
AM Peak, Existing Geometry, Future Volumes
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Station Road - South															
Lane 1[d]	979	4.0	979	4.0	1427	0.686	100	4.4	LOS B	8.5	61.9	Full	165	0.0	0.0
Approach	979	4.0	979	4.0		0.686		4.4	LOS B	8.5	61.9				
North: Station Road - North															
Lane 1[d]	1092	4.0	1092	4.0	1292	0.845	100	5.2	LOS C	14.8	106.9	Full	170	-19.5[N3]	0.0
Lane 2	109	4.0	109	4.0	1095	0.100	100	10.0	LOS A	0.7	4.8	Short	80	0.0	NA
Approach	1201	4.0	1201	4.0		0.845		5.6	LOS C	14.8	106.9				
West: Ross Watt Road - West															
Lane 1[d]	333	4.0	333	4.0	476	0.699	100	25.0	LOS B	7.7	55.6	Full	500	-7.6[N3]	0.0
Approach	333	4.0	333	4.0		0.699		25.0	LOS B	7.7	55.6				
All Vehicles	2513	4.0	2513	4.0		0.845		7.7	LOS C	14.8	106.9				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

d Dominant lane on roundabout approach
N3 Capacity Adjustment due to downstream lane blockage determined by the program.

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	L2 W	T1 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	96	883	979	4.0	1427	0.686	100	NA	NA
Approach	96	883	979	4.0		0.686			

North: Station Road - North

Mov. From N To Exit:	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	1092	-	1092	4.0	1292	0.845	100	NA	NA
Lane 2	-	109	109	4.0	1095	0.100	100	0.0	1

Mov. From W To Exit:	L2 N	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Approach	1092	109	1201	4.0		0.845			
West: Ross Watt Road - West									
Lane 1	220	113	333	4.0	476	0.699	100	NA	NA
Approach	220	113	333	4.0		0.699			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2513	4.0	0.845

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
West: Ross Watt Road - West				
Lane 1	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101v [StatCherAMExFu - Roundabout (Site Folder: Roundabout - Post Dev - 15yr Growth)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [AM Roundabouts - Both (Network Folder: Post Dev - 15yr Growth)]

Station Road / Cherry Lane
AM Peak, Existing Geometry, Future Volumes
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Station Road - South															
Lane 1 d	987	4.0	987	4.0	1604	0.616	100	3.6	LOS B	8.8	63.9	Full	500	0.0	0.0
Approach	987	4.0	987	4.0		0.616		3.6	LOS B	8.8	63.9				
North: Station Road - North															
Lane 1 d	1180	4.0	1180	4.0	1236	0.955	100	18.3	LOS E	34.9	252.7	Full	165	0.0	19.5
Approach	1180	4.0	1180	4.0		0.955		18.3	LOS E	34.9	252.7				
West: Cherry Lane - West															
Lane 1 d	295	4.0	295	4.0	617	0.478	100	17.7	LOS A	4.1	30.0	Full	500	0.0	0.0
Approach	295	4.0	295	4.0		0.478		17.7	LOS A	4.1	30.0				
All Vehicles	2462	4.0	2462	4.0		0.955		12.3	LOS E	34.9	252.7				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	L2 W	T1 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	125	862	987	4.0	1604	0.616	100	NA	NA
Approach	125	862	987	4.0		0.616			

North: Station Road - North

Mov. From N To Exit:	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	1146	34	1180	4.0	1236	0.955	100	NA	NA
Approach	1146	34	1180	4.0		0.955			

West: Cherry Lane - West

Mov. From W To Exit:	L2 N	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	92	203	295	4.0	617	0.478	100	NA	NA
Approach	92	203	295	4.0		0.478			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2462	4.0	0.955

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

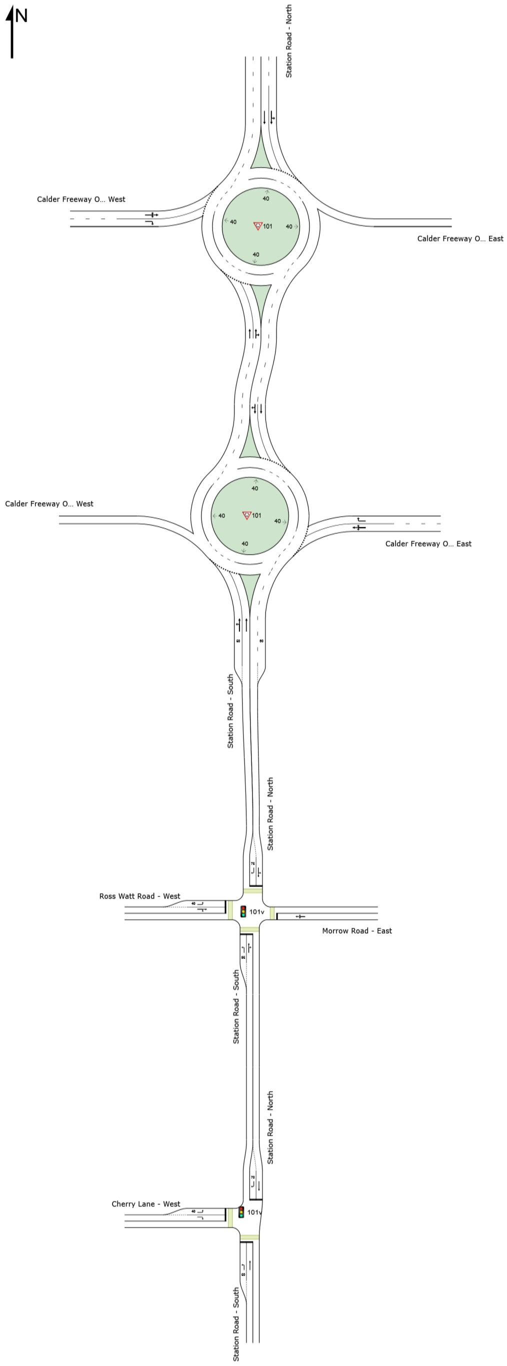
Variable Demand Analysis	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
West: Cherry Lane - West				
Lane 1	0.0	0.0	0.0	0.0

NETWORK LAYOUT

Network: N101 [Signals - Both (Network Folder: Sensitivity - AM Peak)]

New Network
Network Category: (None)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
101	NA	StatCaldEastAMFuEx
101	NA	StatCaldWestAMFuEx
101v	NA	StatRossAMExFu - Signals
101v	NA	StatCherAMExFu - Signals

Project: N:\Projects\2021\210473\Sidra\210473SID006A - VCAT.sip9

LANE SUMMARY

Site: 101 [StatCaldEastAMFuEx (Site Folder: Interim - Sensitivity Analysis)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Both (Network Folder: Sensitivity - AM Peak)]

Station Road / Calder Freeway Eastbound Lane
AM Peak, Future Volumes, Existing Geometry
Site Category: (None)
Roundabout
Design Life Analysis (Capacity): Results for 9 years

Lane Use and Performance

	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Station Road - South															
Lane 1 d	502	3.4	490	3.3	1831	0.267	100	2.9	LOS A	0.0	0.0	Full	130	0.0	0.0
Lane 2	424	3.3	414	3.2	1547	0.267	100	5.5	LOS A	0.0	0.0	Full	130	0.0	0.0
Approach	926	3.3	904	3.3		0.267		4.1	LOS A	0.0	0.0				
North: Station Road - North															
Lane 1 d	427	3.8	427	3.8	1227	0.348	100	4.5	LOS A	1.5	11.0	Full	500	0.0	0.0
Lane 2	348	3.6	348	3.6	1001	0.348	100	4.8	LOS A	1.4	10.4	Full	500	0.0	0.0
Approach	775	3.7	775	3.7		0.348		4.7	LOS A	1.5	11.0				
West: Calder Freeway Off-ramp - West															
Lane 1 d	325	1.6	325	1.6	1217	0.267	100	7.2	LOS A	1.1	7.9	Full	500	0.0	0.0
Lane 2	242	4.0	242	4.0	908	0.267	100	12.3	LOS A	1.1	7.6	Full	500	0.0	0.0
Approach	567	2.6	567	2.6		0.267		9.3	LOS A	1.1	7.9				
All Vehicles	2268	3.3	2246	3.3		0.348		5.6	LOS A	1.5	11.0				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	490	-	490	3.3	1831	0.267	100	NA	NA
Lane 2	248	166	414	3.2	1547	0.267	100	NA	NA
Approach	738	166	904	3.3		0.267			

North: Station Road - North

Mov. From N To Exit:	L2 E	T1 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.

	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	224	202	427	3.8		1227	0.348	100	NA	NA
Lane 2	-	348	348	3.6		1001	0.348	100	NA	NA
Approach	224	551	775	3.7			0.348			
West: Calder Freeway Off-ramp - West										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	180	39	106	325	1.6		1217	0.267	100	NA	NA
Lane 2	-	-	242	242	4.0	908	0.267	100	NA	NA
Approach	180	39	348	567	2.6		0.267			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2246	3.3	0.348

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.												

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
West: Calder Freeway Off-ramp - West				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101 [StatCaldWestAMFuEx (Site Folder: Interim - Sensitivity Analysis)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Both (Network Folder: Sensitivity - AM Peak)]

Station Road / Calder Freeway Westbound Lane
AM Peak, Future Volumes, Existing Geometry
Site Category: (None)
Roundabout
Design Life Analysis (Capacity): Results for 9 years

Lane Use and Performance

	Demand Flows [Total	HV]	Arrival Flows [Total	HV]	Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue [Veh	Dist]	Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: Station Road - South															
Lane 1[d]	549	3.0	521	3.0	1353	0.385	100	4.1	LOS A	1.8	13.0	Short	50	0.0	NA
Lane 2	465	3.1	441	3.1	1145	0.385	100	4.2	LOS A	1.7	12.5	Full	170	0.0	0.0
Approach	1013	3.1	961	3.0		0.385		4.1	LOS A	1.8	13.0				
East: Calder Freeway Off-ramp - East															
Lane 1[d]	205	3.7	205	3.7	1153	0.178	100	9.2	LOS A	3.6[N5]	26.1[N5]	Full	500	0.0	0.0
Lane 2	152	4.0	152	4.0	853	0.178	100	12.5	LOS A	0.7	4.8	Full	500	0.0	0.0
Approach	356	3.8	356	3.8		0.178		10.6	LOS A	3.6	26.1				
North: Station Road - North															
Lane 1	491	3.7	491	3.7	1536	0.320	56[6]	4.9	LOS A	10.0[N5]	72.3[N5]	Full	130	0.0	0.0
Lane 2[d]	565	3.7	565	3.7	988	0.572	100	3.9	LOS A	9.7[N5]	70.3[N5]	Full	130	-45.8[N3]	0.0
Approach	1057	3.7	1057	3.7		0.572		4.4	LOS A	10.0	72.3				
All Vehicles	2427	3.4	2374	3.5		0.572		5.2	LOS A	10.0	72.3				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

6 Lane under-utilisation due to downstream effects
d Dominant lane on roundabout approach
N3 Capacity Adjustment due to downstream lane blockage determined by the program.
N5 Results for this lane are determined by Back of Queue values of downstream lanes (proportional to lane movement flows).

Approach Lane Flows (veh/h)

Mov. From S To Exit:	L2 W	T1 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
South: Station Road - South									
Lane 1	287	234	521	3.0	1353	0.385	100	0.0	2
Lane 2	-	441	441	3.1	1145	0.385	100	NA	NA
Approach	287	675	961	3.0		0.385			
East: Calder Freeway Off-ramp - East									

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	116	1	87	205	3.7	1153	0.178	100	NA	NA
Lane 2	-	-	152	152	4.0	853	0.178	100	NA	NA
Approach	116	1	239	356	3.8		0.178			
North: Station Road - North										
Mov. From N To Exit:	T1 S	R2 W	Total	%HV		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	491	-	491	3.7		1536	0.320	56[6]	NA	NA
Lane 2	477	88	565	3.7		988	0.572	100	NA	NA
Approach	969	88	1057	3.7			0.572			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2374	3.5	0.572

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

6 Lane under-utilisation due to downstream effects

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Station Road - South Merge Type: **Priority**												
Exit Short Lane	1	60	0.0	477	486	3.05	2.04	607	1270	0.478	0.8	2.0
Merge Lane	2	-	100.0	Merge Lane is not Opposed				477	1800	0.265	0.0	0.0

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
East: Calder Freeway Off-ramp - East				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101v [StatRossAMExFu - Signals (Site Folder: Interim - Sensitivity Analysis)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Both (Network Folder: Sensitivity - AM Peak)]

Station Road / Ross Watt Road
AM Peak, Existing Geometry, Future Volumes
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Network User-Given Cycle Time)
Design Life Analysis (Capacity): Results for 9 years

Lane Use and Performance

	Demand Flows [Total	HV]	Arrival Flows [Total	HV]	Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue [Veh	Dist]	Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: Station Road - South															
Lane 1	88	1.6	83	1.6	1270	0.066	100	10.1	LOS A	0.9	6.2	Short	95	0.0	NA
Lane 2	814	3.7	767	3.7	972[1]	0.790	100	21.1	LOS C	31.3	225.9	Full	165	0.0	33.6
Approach	903	3.5	851	3.5		0.790		20.0	LOS C	31.3	225.9				
East: Morrow Road - East															
Lane 1	46	0.0	46	0.0	134	0.345	100	47.4	LOS A	2.2	15.5	Full	500	0.0	0.0
Approach	46	0.0	46	0.0		0.345		47.4	LOS A	2.2	15.5				
North: Station Road - North															
Lane 1	1000	3.9	1000	3.9	1100[1]	0.909	100	45.6	LOS D	38.3[N4]	277.4[N4]	Full	170	0.0	50.0
Lane 2	107	0.4	107	0.4	267	0.402	100	50.8	LOS A	3.2	22.6	Short	75	0.0	NA
Approach	1107	3.6	1107	3.6		0.909		46.1	LOS D	38.3	277.4				
West: Ross Watt Road - West															
Lane 1	216	0.3	216	0.3	302[1]	0.715	100	65.2	LOS C	12.4	87.1	Short	40	0.0	NA
Lane 2	113	0.3	113	0.3	139	0.814	100	78.7	LOS C	7.2	50.7	Full	500	0.0	0.0
Approach	329	0.3	329	0.3		0.814		69.8	LOS C	12.4	87.1				
All Vehicles	2385	3.0	2333	3.1		0.909		40.0	LOS D	38.3	277.4				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes.
Delay and stops experienced by drivers upstream of short lane entry have been accounted for.
N4 Average back of queue has been restricted to the available queue storage space.

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	83	-	-	83	1.6	1270	0.066	100	0.0	2
Lane 2	-	758	9	767	3.7	972[1]	0.790	100	NA	NA
Approach	83	758	9	851	3.5		0.790			

Mov. From / To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
East: Morrow Road - East										
Mov. From E To Exit:	S	W	N							
Lane 1	22	2	22	46	0.0	134	0.345	100	NA	NA
Approach	22	2	22	46	0.0		0.345			
North: Station Road - North										
Mov. From N To Exit:	E	S	W							
Lane 1	9	990	-	1000	3.9	1100[1]	0.909	100	NA	NA
Lane 2	-	-	107	107	0.4	267	0.402	100	0.0	1
Approach	9	990	107	1107	3.6		0.909			
West: Ross Watt Road - West										
Mov. From W To Exit:	N	E	S							
Lane 1	216	-	-	216	0.3	302[1]	0.715	100	77.6	2
Lane 2	-	2	111	113	0.3	139	0.814	100	NA	NA
Approach	216	2	111	329	0.3		0.814			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2333	3.1	0.909

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes.
Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
East: Morrow Road - East				
Lane 1	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
West: Ross Watt Road - West				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101v [StatCherAMExFu - Signals (Site Folder: Interim - Sensitivity Analysis)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Both (Network Folder: Sensitivity - AM Peak)]

Station Road / Cherry Lane
AM Peak, Existing Geometry, Future Volumes
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated   Cycle Time = 120 seconds (Network User-Given Cycle Time)
Design Life Analysis (Capacity): Results for 9 years

Lane Use and Performance

	Demand Flows [Total	HV]	Arrival Flows [Total	HV]	Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue [Veh	Dist]	Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: Station Road - South															
Lane 1	77	1.5	77	1.5	1638	0.047	100	18.2	LOS A	0.3	1.9	Short	50	0.0	NA
Lane 2	805	3.7	805	3.7	874 [1]	0.921	100	42.3	LOS D	50.6	365.7	Full	500	-32.2 [N3]	0.0
Approach	882	3.5	882	3.5		0.921		40.2	LOS D	50.6	365.7				
North: Station Road - North															
Lane 1	990	3.9	990	3.9	1347	0.735	100	1.5	LOS C	11.1	80.3	Full	165	0.0	0.0
Lane 2	104	0.3	104	0.3	126	0.827	100	74.2	LOS C	6.9	48.2	Short	70	0.0	NA
Approach	1094	3.6	1094	3.6		0.827		8.4	LOS C	11.1	80.3				
West: Cherry Lane - West															
Lane 1	211	0.3	211	0.3	227 [1]	0.926	100	80.5	LOS D	15.4	107.9	Short	40	-32.2 [N3]	NA
Lane 2	108	0.3	108	0.3	340	0.319	100	51.8	LOS A	5.6	39.1	Full	500	0.0	0.0
Approach	319	0.3	319	0.3		0.926		70.7	LOS D	15.4	107.9				
All Vehicles	2295	3.1	2295	3.1		0.926		29.3	LOS D	50.6	365.7				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes.
Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

N3 Capacity Adjustment due to downstream lane blockage determined by the program.

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	L2 W	T1 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	77	-	77	1.5	1638	0.047	100	0.0	2
Lane 2	-	805	805	3.7	874 [1]	0.921	100	NA	NA
Approach	77	805	882	3.5		0.921			

North: Station Road - North

Mov. From N To Exit:	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.

Lane 1	990	-	990	3.9	1347	0.735	100	NA	NA
Lane 2	-	104	104	0.3	126	0.827	100	0.0	1
Approach	990	104	1094	3.6		0.827			
West: Cherry Lane - West									
Mov. From W To Exit:	L2 N	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	211	-	211	0.3	227[1]	0.926	100	98.8	2
Lane 2	-	108	108	0.3	340	0.319	100	NA	NA
Approach	211	108	319	0.3		0.926			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2295	3.1	0.926

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes.
Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.												

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
West: Cherry Lane - West				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

PHASING SUMMARY

Site: 101v [StatRossAMExFu - Signals (Site Folder: Interim - Sensitivity Analysis)]

Network: N101 [Signals - Both (Network Folder: Sensitivity - AM Peak)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Station Road / Ross Watt Road
AM Peak, Existing Geometry, Future Volumes
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated   Cycle Time = 120 seconds (Network User-Given Cycle Time)
Design Life Analysis (Capacity): Results for 9 years

Timings based on settings in the Network Timing dialog
Phase Times determined by the program
Downstream lane blockage effects included in determining phase times
Phase Sequence: Split Phase
Input Phase Sequence: A, B, C, D
Output Phase Sequence: A, B, C, D
Reference Phase: Phase B
Offset: 0 seconds (User)

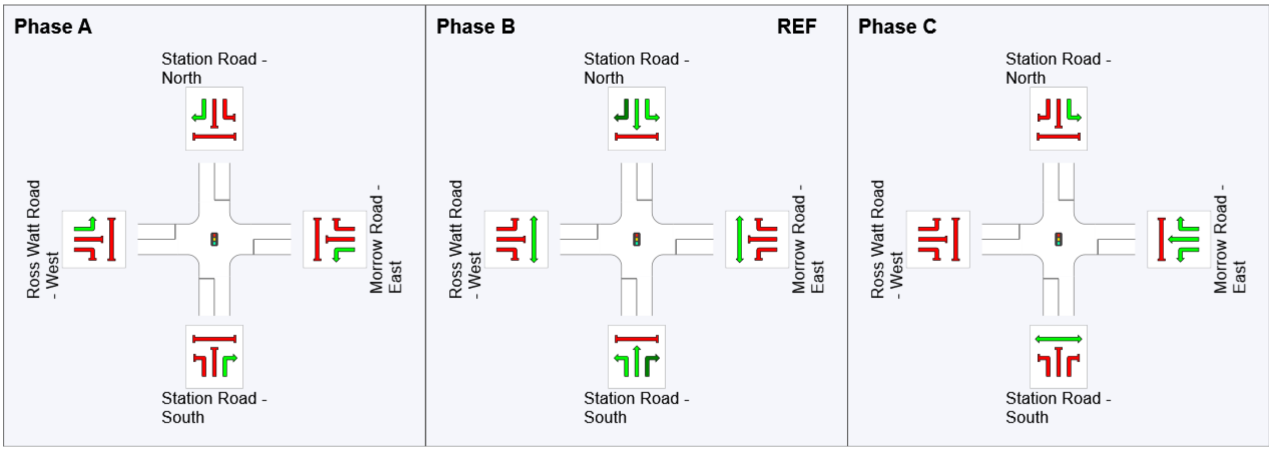
Phase Timing Summary

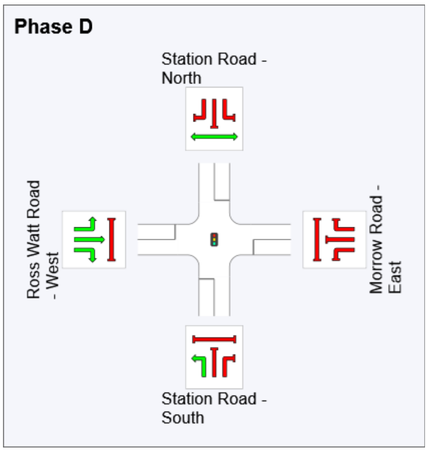
Phase	A	B	C	D
Phase Change Time (sec)	108	0	80	93
Green Time (sec)	6	74	7	9
Phase Time (sec)	12	80	13	15
Phase Split	10%	67%	11%	13%
Phase Frequency (%)	100.0 [4]	100.0	100.0	100.0 [4]

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

4 Phase Frequency specified by the user (phase times not specified).

Output Phase Sequence





REF: Reference Phase
VAR: Variable Phase

Normal Movement	Permitted/Opposed
Slip/Bypass-Lane Movement	Opposed Slip/Bypass-Lane
Stopped Movement	Turn On Red
Other Movement Class (MC) Running	Undetected Movement
Mixed Running & Stopped MCs	Continuous Movement
Other Movement Class (MC) Stopped	Phase Transition Applied

PHASING SUMMARY

Site: 101v [StatCherAMExFu - Signals (Site Folder: Interim - Sensitivity Analysis)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Both (Network Folder: Sensitivity - AM Peak)]

Station Road / Cherry Lane
AM Peak, Existing Geometry, Future Volumes
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated   Cycle Time = 120 seconds (Network User-Given Cycle Time)
Design Life Analysis (Capacity): Results for 9 years

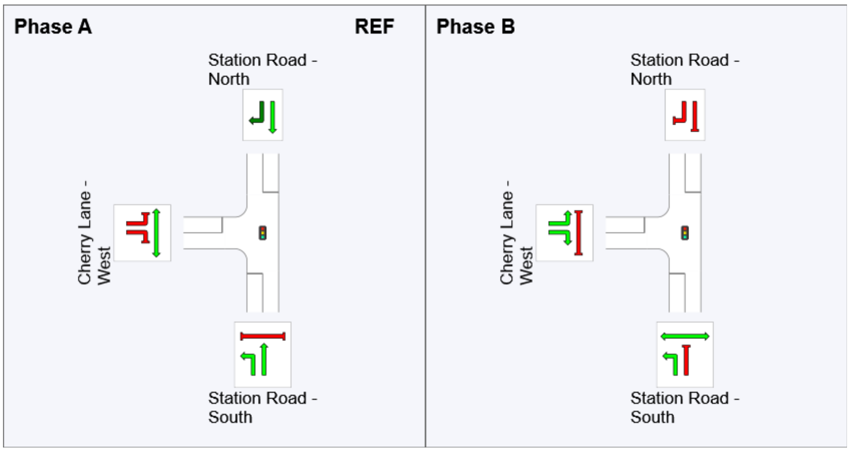
Timings based on settings in the Network Timing dialog
Phase Times determined by the program
Downstream lane blockage effects included in determining phase times
Phase Sequence: Convert Function Default
Input Phase Sequence: A, B
Output Phase Sequence: A, B
Reference Phase: Phase A
Offset: 0 seconds (User)

Phase Timing Summary

Phase	A	B
Phase Change Time (sec)	0	91
Green Time (sec)	85	23
Phase Time (sec)	91	29
Phase Split	76%	24%
Phase Frequency (%)	100.0	100.0

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase

Normal Movement	Permitted/Opposed
Slip/Bypass-Lane Movement	Opposed Slip/Bypass-Lane
Stopped Movement	Turn On Red
Other Movement Class (MC) Running	Undetected Movement
Mixed Running & Stopped MCs	Continuous Movement
Other Movement Class (MC) Stopped	Phase Transition Applied

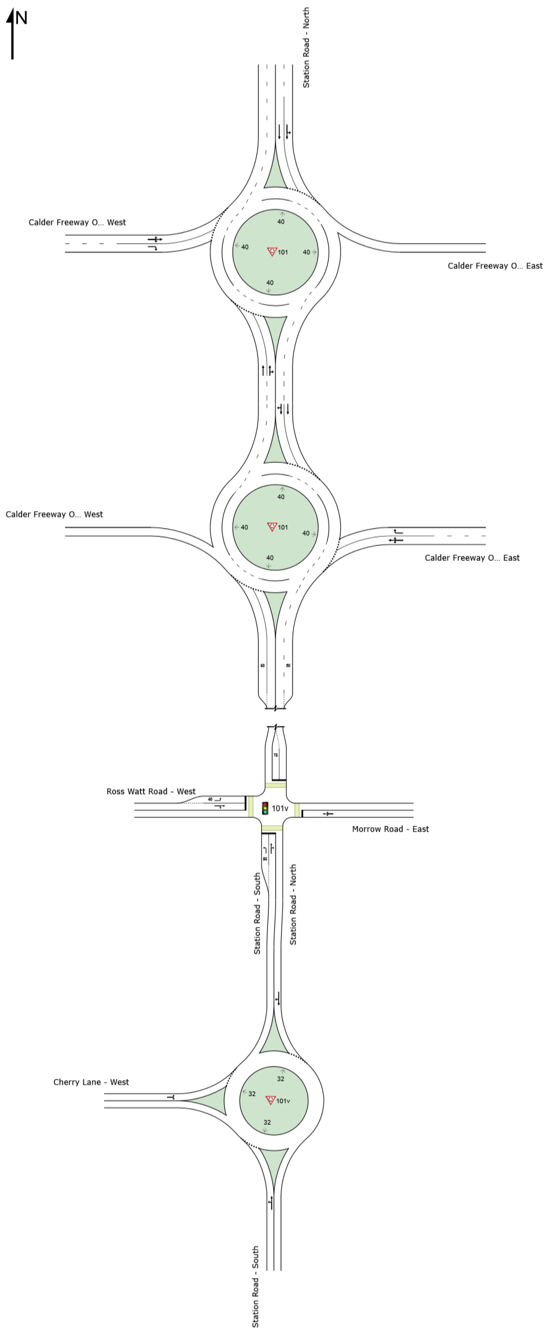
NETWORK LAYOUT

Network: N101 [Signals - Ross Watt Road (Network Folder: Sensitivity - AM Peak)]

New Network
Network Category: (None)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.

In the Network Configuration dialog, Site positions are too close for drawing a Network Connection in Layout drawing.



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
101	NA	StatCaldEastAMFuEx
101	NA	StatCaldWestAMFuEx
101v	NA	StatRossAMExFu - Signals
101v	NA	StatCherAMExFu - Roundabout

LANE SUMMARY

Site: 101 [StatCaldEastAMFuEx (Site Folder: Interim - Sensitivity Analysis)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Ross Watt Road (Network Folder: Sensitivity - AM Peak)]

Station Road / Calder Freeway Eastbound Lane
AM Peak, Future Volumes, Existing Geometry
Site Category: (None)
Roundabout
Design Life Analysis (Capacity): Results for 12 years

Lane Use and Performance

	Demand Flows [Total	HV]	Arrival Flows [Total	HV]	Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue [Veh	Dist]	Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: Station Road - South															
Lane 1 [d]	523	3.4	523	3.4	1831	0.286	100	2.9	LOS A	0.0	0.0	Full	130	0.0	0.0
Lane 2	442	3.3	442	3.3	1547	0.286	100	5.4	LOS A	0.0	0.0	Full	130	0.0	0.0
Approach	965	3.3	965	3.3		0.286		4.0	LOS A	0.0	0.0				
North: Station Road - North															
Lane 1 [d]	427	3.8	427	3.8	1223	0.349	100	4.5	LOS A	1.5	11.1	Full	500	0.0	0.0
Lane 2	348	3.6	348	3.6	998	0.349	100	4.9	LOS A	1.4	10.5	Full	500	0.0	0.0
Approach	775	3.7	775	3.7		0.349		4.7	LOS A	1.5	11.1				
West: Calder Freeway Off-ramp - West															
Lane 1 [d]	326	1.7	326	1.7	1203	0.271	100	7.3	LOS A	1.1	8.1	Full	500	0.0	0.0
Lane 2	241	4.0	241	4.0	887	0.271	100	12.5	LOS A	1.1	7.8	Full	500	0.0	0.0
Approach	567	2.6	567	2.6		0.271		9.5	LOS A	1.1	8.1				
All Vehicles	2307	3.3	2307	3.3		0.349		5.6	LOS A	1.5	11.1				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	523	-	523	3.4	1831	0.286	100	NA	NA
Lane 2	272	169	442	3.3	1547	0.286	100	NA	NA
Approach	796	169	965	3.3		0.286			

North: Station Road - North

Mov. From N To Exit:	L2 E	T1 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.

	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	224	202	427	3.8		1223	0.349	100	NA	NA
Lane 2	-	348	348	3.6		998	0.349	100	NA	NA
Approach	224	551	775	3.7			0.349			

West: Calder Freeway Off-ramp - West

Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	180	39	108	326	1.7	1203	0.271	100	NA	NA
Lane 2	-	-	241	241	4.0	887	0.271	100	NA	NA
Approach	180	39	348	567	2.6		0.271			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2307	3.3	0.349

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
West: Calder Freeway Off-ramp - West				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101 [StatCaldWestAMFuEx (Site Folder: Interim - Sensitivity Analysis)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Ross Watt Road (Network Folder: Sensitivity - AM Peak)]

Station Road / Calder Freeway Westbound Lane
AM Peak, Future Volumes, Existing Geometry
Site Category: (None)
Roundabout
Design Life Analysis (Capacity): Results for 12 years

Lane Use and Performance

	Demand Flows [Total	HV]	Arrival Flows [Total	HV]	Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue [Veh	Dist]	Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: Station Road - South															
Lane 1[d]	576	3.1	576	3.1	1340	0.430	100	4.2	LOS A	2.1	15.3	Short	50	0.0	NA
Lane 2	485	3.2	485	3.2	1129	0.430	100	4.3	LOS A	2.0	14.6	Full	170	0.0	0.0
Approach	1061	3.1	1061	3.1		0.430		4.3	LOS A	2.1	15.3				
East: Calder Freeway Off-ramp - East															
Lane 1[d]	218	3.7	218	3.7	1139	0.191	100	9.5	LOS A	4.2[N5]	30.4[N5]	Full	500	0.0	0.0
Lane 2	159	4.0	159	4.0	834	0.191	100	12.7	LOS A	0.7	5.2	Full	500	0.0	0.0
Approach	377	3.8	377	3.8		0.191		10.8	LOS A	4.2	30.4				
North: Station Road - North															
Lane 1	519	3.7	519	3.7	1535	0.338	56[6]	5.2	LOS A	11.7[N5]	84.7[N5]	Full	130	0.0	0.0
Lane 2[d]	597	3.7	597	3.7	988	0.605	100	3.9	LOS B	11.4[N5]	82.3[N5]	Full	130	-45.8[N3]	0.0
Approach	1116	3.7	1116	3.7		0.605		4.5	LOS B	11.7	84.7				
All Vehicles	2555	3.5	2555	3.5		0.605		5.3	LOS B	11.7	84.7				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

6 Lane under-utilisation due to downstream effects
d Dominant lane on roundabout approach
N3 Capacity Adjustment due to downstream lane blockage determined by the program.
N5 Results for this lane are determined by Back of Queue values of downstream lanes (proportional to lane movement flows).

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	L2 W	T1 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	316	260	576	3.1	1340	0.430	100	0.0	2
Lane 2	-	485	485	3.2	1129	0.430	100	NA	NA
Approach	316	746	1061	3.1		0.430			

East: Calder Freeway Off-ramp - East

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	122	1	94	218	3.7	1139	0.191	100	NA	NA
Lane 2	-	-	159	159	4.0	834	0.191	100	NA	NA
Approach	122	1	254	377	3.8		0.191			

North: Station Road - North

Mov. From N To Exit:	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	519	-	519	3.7	1535	0.338	56[6]	NA	NA
Lane 2	504	93	597	3.7	988	0.605	100	NA	NA
Approach	1023	93	1116	3.7		0.605			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2555	3.5	0.605

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

6 Lane under-utilisation due to downstream effects

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Station Road - South Merge Type: **Priority**												
Exit Short Lane	1	60	0.0	504	513	3.05	2.04	641	1241	0.517	0.9	2.3
Merge Lane	2	-	100.0	Merge Lane is not Opposed				504	1800	0.280	0.0	0.0

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
East: Calder Freeway Off-ramp - East				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101v [StatRossAMExFu - Signals (Site Folder: Interim - Sensitivity Analysis)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Ross Watt Road (Network Folder: Sensitivity - AM Peak)]

Station Road / Ross Watt Road
AM Peak, Existing Geometry, Future Volumes
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated   Cycle Time = 120 seconds (Site User-Given Cycle Time)
Design Life Analysis (Capacity): Results for 12 years

Lane Use and Performance

	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Station Road - South															
Lane 1	93	1.6	93	1.6	1392	0.067	100	13.6	LOS A	1.3	9.5	Short	95	0.0	NA
Lane 2	860	3.7	860	3.7	1170 [1]	0.735	100	19.1	LOS C	33.2	239.8	Full	165	0.0	39.2
Approach	953	3.5	953	3.5		0.735		18.6	LOS C	33.2	239.8				
East: Morrow Road - East															
Lane 1	46	0.0	46	0.0	62	0.752	100	75.4	LOS C	3.0	21.3	Full	500	-3.2 [N3]	0.0
Approach	46	0.0	46	0.0		0.752		75.4	LOS C	3.0	21.3				
North: Station Road - North															
Lane 1	1059	3.9	1059	3.9	1119 [1]	0.947	100	41.1	LOS D	38.3 [N4]	277.4 [N4]	Full	170	-6.4 [N3]	50.0
Lane 2	108	0.4	108	0.4	192	0.565	100	46.1	LOS A	5.4	38.1	Short	75	0.0	NA
Approach	1168	3.6	1168	3.6		0.947		41.6	LOS D	38.3	277.4				
West: Ross Watt Road - West															
Lane 1	218	0.3	218	0.3	233 [1]	0.936	100	91.1	LOS D	15.6	109.3	Short	40	0.0	NA
Lane 2	114	0.3	114	0.3	227	0.504	100	68.2	LOS A	6.4	44.8	Full	500	-6.4 [N3]	0.0
Approach	332	0.3	332	0.3		0.936		83.3	LOS D	15.6	109.3				
All Vehicles	2500	3.1	2500	3.1		0.947		39.0	LOS D	38.3	277.4				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes.
Delay and stops experienced by drivers upstream of short lane entry have been accounted for.
N3 Capacity Adjustment due to downstream lane blockage determined by the program.
N4 Average back of queue has been restricted to the available queue storage space.

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	93	-	-	93	1.6	1392	0.067	100	0.0	2
Lane 2	-	851	9	860	3.7	1170 [1]	0.735	100	NA	NA

Mov. From To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Approach	93	851	9	953	3.5		0.735			
East: Morrow Road - East										
Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	22	2	22	46	0.0	62	0.752	100	NA	NA
Approach	22	2	22	46	0.0		0.752			
North: Station Road - North										
Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	9	1050	-	1059	3.9	1119[1]	0.947	100	NA	NA
Lane 2	-	-	108	108	0.4	192	0.565	100	0.0	1
Approach	9	1050	108	1168	3.6		0.947			
West: Ross Watt Road - West										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	218	-	-	218	0.3	233[1]	0.936	100	100.0	2
Lane 2	-	2	112	114	0.3	227	0.504	100	NA	NA
Approach	218	2	112	332	0.3		0.936			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2500	3.1	0.947

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
East: Morrow Road - East				
Lane 1	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
West: Ross Watt Road - West				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101v [StatCherAMExFu - Roundabout (Site Folder: Interim - Sensitivity Analysis)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Ross Watt Road (Network Folder: Sensitivity - AM Peak)]

Station Road / Cherry Lane
AM Peak, Existing Geometry, Future Volumes
Site Category: (None)
Roundabout
Design Life Analysis (Capacity): Results for 12 years

Lane Use and Performance

	Demand Flows [Total	HV]	Arrival Flows [Total	HV]	Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue [Veh	Dist]	Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: Station Road - South															
Lane 1[d]	955	3.5	955	3.5	1069	0.893	100	4.2	LOS C	24.2	174.5	Full	500	-33.7[N3]	0.0
Approach	955	3.5	955	3.5		0.893		4.2	LOS C	24.2	174.5				
North: Station Road - North															
Lane 1[d]	1139	3.6	1139	3.6	1235	0.923	100	11.3	LOS D	24.0	173.6	Full	165	0.0	6.5
Approach	1139	3.6	1139	3.6		0.923		11.3	LOS D	24.0	173.6				
West: Cherry Lane - West															
Lane 1[d]	295	0.9	295	0.9	445	0.662	100	22.0	LOS B	6.4	45.3	Full	500	-15.4[N3]	0.0
Approach	295	0.9	295	0.9		0.662		22.0	LOS B	6.4	45.3				
All Vehicles	2389	3.2	2389	3.2		0.923		9.8	LOS D	24.2	174.5				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

d Dominant lane on roundabout approach
N3 Capacity Adjustment due to downstream lane blockage determined by the program.

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	L2 W	T1 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	125	830	955	3.5	1069	0.893	100	NA	NA
Approach	125	830	955	3.5		0.893			

North: Station Road - North

Mov. From N To Exit:	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	1105	34	1139	3.6	1235	0.923	100	NA	NA
Approach	1105	34	1139	3.6		0.923			

West: Cherry Lane - West									
Mov. From W To Exit:	L2 N	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	92	203	295	0.9	445	0.662	100	NA	NA
Approach	92	203	295	0.9		0.662			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2389	3.2	0.923

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis											
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
West: Cherry Lane - West				
Lane 1	0.0	0.0	0.0	0.0

PHASING SUMMARY

Site: 101v [StatRossAMExFu - Signals (Site Folder: Interim - Sensitivity Analysis)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Ross Watt Road (Network Folder: Sensitivity - AM Peak)]

Station Road / Ross Watt Road
AM Peak, Existing Geometry, Future Volumes
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated   Cycle Time = 120 seconds (Site User-Given Cycle Time)
Design Life Analysis (Capacity): Results for 12 years

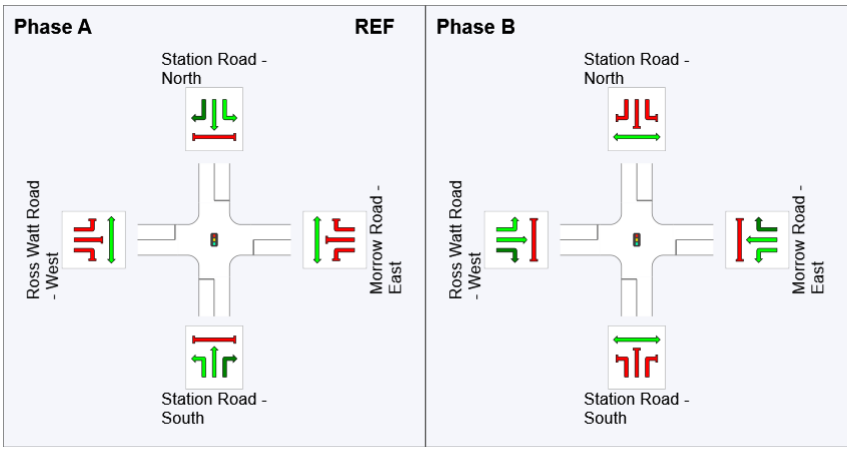
Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Downstream lane blockage effects included in determining phase times
Phase Sequence: Two Phase
Input Phase Sequence: A, B
Output Phase Sequence: A, B
Reference Phase: Phase A
Offset: NA

Phase Timing Summary

Phase	A	B
Phase Change Time (sec)	0	97
Green Time (sec)	91	17
Phase Time (sec)	97	23
Phase Split	81%	19%
Phase Frequency (%)	100.0	100.0

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase

Normal Movement	Permitted/Opposed
Slip/Bypass-Lane Movement	Opposed Slip/Bypass-Lane
Stopped Movement	Turn On Red
Other Movement Class (MC) Running	Undetected Movement
Mixed Running & Stopped MCs	Continuous Movement
Other Movement Class (MC) Stopped	Phase Transition Applied

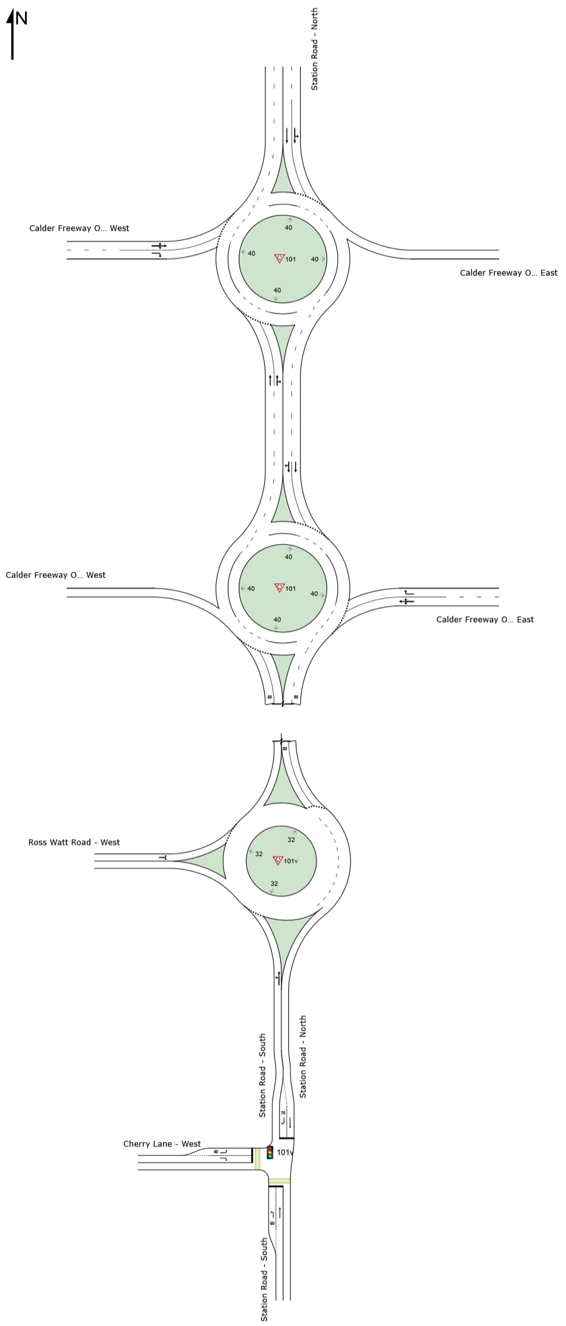
NETWORK LAYOUT

Network: N101 [Signals - Cherry (Network Folder: Sensitivity - AM Peak)]

New Network
Network Category: (None)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.

In the Network Configuration dialog, Site positions are too close for drawing a Network Connection in Layout drawing.



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
101	NA	StatCaldEastAMFuEx
101	NA	StatCaldWestAMFuEx
101v	NA	StatCherAMExFu - Signals
101v	NA	StatRossAMExFu - Roundabout

Project: N:\Projects\2021\210473\Sidra\210473SID006A - VCAT.sip9

LANE SUMMARY

Site: 101 [StatCaldEastAMFuEx (Site Folder: Interim - Sensitivity Analysis)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Cherry (Network Folder: Sensitivity - AM Peak)]

Station Road / Calder Freeway Eastbound Lane
AM Peak, Future Volumes, Existing Geometry
Site Category: (None)
Roundabout
Design Life Analysis (Capacity): Results for 10 years

Lane Use and Performance

	Demand Flows [Total	HV]	Arrival Flows [Total	HV]	Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue [Veh	Dist]	Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: Station Road - South															
Lane 1[d]	509	3.4	509	3.4	1831	0.278	100	2.9	LOS A	0.0	0.0	Full	130	0.0	0.0
Lane 2	430	3.3	430	3.3	1547	0.278	100	5.5	LOS A	0.0	0.0	Full	130	0.0	0.0
Approach	939	3.3	939	3.3		0.278		4.1	LOS A	0.0	0.0				
North: Station Road - North															
Lane 1[d]	427	3.8	427	3.8	1224	0.349	100	4.5	LOS A	1.5	11.0	Full	500	0.0	0.0
Lane 2	348	3.6	348	3.6	998	0.349	100	4.8	LOS A	1.4	10.4	Full	500	0.0	0.0
Approach	775	3.7	775	3.7		0.349		4.7	LOS A	1.5	11.0				
West: Calder Freeway Off-ramp - West															
Lane 1[d]	326	1.6	326	1.6	1209	0.270	100	7.2	LOS A	1.1	8.0	Full	500	0.0	0.0
Lane 2	242	4.0	242	4.0	896	0.270	100	12.4	LOS A	1.1	7.7	Full	500	0.0	0.0
Approach	567	2.6	567	2.6		0.270		9.4	LOS A	1.1	8.0				
All Vehicles	2281	3.3	2281	3.3		0.349		5.6	LOS A	1.5	11.0				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	509	-	509	3.4	1831	0.278	100	NA	NA
Lane 2	260	169	430	3.3	1547	0.278	100	NA	NA
Approach	769	169	939	3.3		0.278			

North: Station Road - North

Mov. From N To Exit:	L2 E	T1 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.

Mov.	L2	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
Lane 1	224	202	427	3.8		1224	0.349	100	NA	NA
Lane 2	-	348	348	3.6		998	0.349	100	NA	NA
Approach	224	551	775	3.7			0.349			

West: Calder Freeway Off-ramp - West										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	180	39	107	326	1.6	1209	0.270	100	NA	NA
Lane 2	-	-	242	242	4.0	896	0.270	100	NA	NA
Approach	180	39	348	567	2.6		0.270			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2281	3.3	0.349

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
West: Calder Freeway Off-ramp - West				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101 [StatCaldWestAMFuEx (Site Folder: Interim - Sensitivity Analysis)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Cherry (Network Folder: Sensitivity - AM Peak)]

Station Road / Calder Freeway Westbound Lane
AM Peak, Future Volumes, Existing Geometry
Site Category: (None)
Roundabout
Design Life Analysis (Capacity): Results for 10 years

Lane Use and Performance

	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Station Road - South															
Lane 1[d]	558	3.1	558	3.1	1350	0.413	100	4.1	LOS A	2.3	16.3	Short	50	0.0	NA
Lane 2	471	3.1	471	3.1	1140	0.413	100	4.3	LOS A	2.2	15.9	Full	170	0.0	0.0
Approach	1029	3.1	1029	3.1		0.413		4.2	LOS A	2.3	16.3				
East: Calder Freeway Off-ramp - East															
Lane 1[d]	209	3.7	209	3.7	1148	0.182	100	9.3	LOS A	0.7	5.2	Full	500	0.0	0.0
Lane 2	154	4.0	154	4.0	846	0.182	100	12.6	LOS A	0.7	4.9	Full	500	0.0	0.0
Approach	363	3.8	363	3.8		0.182		10.7	LOS A	0.7	5.2				
North: Station Road - North															
Lane 1	500	3.7	500	3.7	1535	0.326	56[6]	5.0	LOS A	0.0	0.0	Full	130	0.0	0.0
Lane 2[d]	576	3.7	576	3.7	989	0.583	100	3.9	LOS A	0.0	0.0	Full	130	-45.7[N7]	0.0
Approach	1076	3.7	1076	3.7		0.583		4.4	LOS A	0.0	0.0				
All Vehicles	2468	3.5	2468	3.5		0.583		5.2	LOS A	2.3	16.3				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

6 Lane under-utilisation due to downstream effects
d Dominant lane on roundabout approach
N7 The capacity reduction has been determined from the queue blockage probability based on the Back of Queue value of a Site further downstream.

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	L2 W	T1 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	306	252	558	3.1	1350	0.413	100	0.0	2
Lane 2	-	471	471	3.1	1140	0.413	100	NA	NA
Approach	306	723	1029	3.1		0.413			

East: Calder Freeway Off-ramp - East

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	118	1	90	209	3.7	1148	0.182	100	NA	NA
Lane 2	-	-	154	154	4.0	846	0.182	100	NA	NA
Approach	118	1	244	363	3.8		0.182			

North: Station Road - North

Mov. From N To Exit:	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	500	-	500	3.7	1535	0.326	56[6]	NA	NA
Lane 2	486	90	576	3.7	989	0.583	100	NA	NA
Approach	986	90	1076	3.7		0.583			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2468	3.5	0.583

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

6 Lane under-utilisation due to downstream effects

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Station Road - South Merge Type: **Priority**												
Exit Short Lane	1	60	0.0	486	495	3.05	2.04	618	1260	0.491	0.9	2.1
Merge Lane	2	-	100.0	Merge Lane is not Opposed				486	1800	0.270	0.0	0.0

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
East: Calder Freeway Off-ramp - East				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101v [StatCherAMExFu - Signals (Site Folder: Interim - Sensitivity Analysis)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Cherry (Network Folder: Sensitivity - AM Peak)]

Station Road / Cherry Lane
AM Peak, Existing Geometry, Future Volumes
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)
Design Life Analysis (Capacity): Results for 10 years

Lane Use and Performance

	Demand Flows [Total	HV]	Arrival Flows [Total	HV]	Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue [Veh	Dist]	Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: Station Road - South															
Lane 1	77	1.5	77	1.5	1638	0.047	100	12.4	LOS A	0.3	1.9	Short	50	0.0	NA
Lane 2	820	3.7	820	3.7	1351 [1]	0.607	100	10.9	LOS B	22.1	159.5	Full	500	0.0	0.0
Approach	897	3.6	897	3.6		0.607		11.0	LOS B	22.1	159.5				
North: Station Road - North															
Lane 1	1010	3.9	918	3.9	1192 [1]	0.770	100	13.3	LOS C	31.7	229.4	Full	165	0.0	35.1
Lane 2	104	0.3	102	0.3	282	0.361	100	26.9	LOS A	3.6	24.9	Short	70	0.0	NA
Approach	1114	3.6	1020	3.6		0.770		14.6	LOS C	31.7	229.4				
West: Cherry Lane - West															
Lane 1	211	0.3	211	0.3	272 [1]	0.773	100	68.9	LOS C	12.6	88.5	Short	40	0.0	NA
Lane 2	108	0.3	108	0.3	278	0.390	100	63.1	LOS A	5.9	41.0	Full	500	0.0	0.0
Approach	319	0.3	319	0.3		0.773		67.0	LOS C	12.6	88.5				
All Vehicles	2330	3.1	2235	3.3		0.773		20.6	LOS C	31.7	229.4				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes.
Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	L2 W	T1 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	77	-	77	1.5	1638	0.047	100	0.0	2
Lane 2	-	820	820	3.7	1351 [1]	0.607	100	NA	NA
Approach	77	820	897	3.6		0.607			

North: Station Road - North

Mov. From N To Exit:	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	918	-	918	3.9	1192 [1]	0.770	100	NA	NA

Mov. From W To Exit:	L2 N	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 2	-	102	102	0.3	282	0.361	100	0.0	1
Approach	918	102	1020	3.6		0.770			
West: Cherry Lane - West									
Lane 1	211	-	211	0.3	272[1]	0.773	100	79.2	2
Lane 2	-	108	108	0.3	278	0.390	100	NA	NA
Approach	211	108	319	0.3		0.773			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2235	3.3	0.773

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
West: Cherry Lane - West				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101v [StatRossAMExFu - Roundabout (Site Folder: Interim - Sensitivity Analysis)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Cherry (Network Folder: Sensitivity - AM Peak)]

Station Road / Ross Watt Road
AM Peak, Existing Geometry, Future Volumes
Site Category: (None)
Roundabout
Design Life Analysis (Capacity): Results for 10 years

Lane Use and Performance

	Demand Flows [Total	HV]	Arrival Flows [Total	HV]	Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue [Veh	Dist]	Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: Station Road - South															
Lane 1[d]	910	3.7	910	3.7	1432	0.635	100	4.2	LOS B	6.8	49.4	Full	165	0.0	0.0
Approach	910	3.7	910	3.7		0.635		4.2	LOS B	6.8	49.4				
North: Station Road - North															
Lane 1[d]	1010	3.9	1010	3.9	1035	0.976	100	13.7	LOS E[11]	34.7	251.0	Full	170	-35.7[N3]	18.0
Lane 2	108	0.7	108	0.7	1119	0.096	100	10.0	LOS A	0.6	4.5	Short	80	0.0	NA
Approach	1117	3.6	1117	3.6		0.976		13.4	LOS E[11]	34.7	251.0				
West: Ross Watt Road - West															
Lane 1[d]	328	0.6	328	0.6	548	0.599	100	20.5	LOS A	6.9	48.9	Full	500	-15.8[N3]	0.0
Approach	328	0.6	328	0.6		0.599		20.5	LOS A	6.9	48.9				
All Vehicles	2355	3.2	2355	3.2		0.976		10.8	LOS E[11]	34.7	251.0				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

11 Level of Service is worse than the Level of Service Target specified in the Parameter Settings dialog.
d Dominant lane on roundabout approach
N3 Capacity Adjustment due to downstream lane blockage determined by the program.

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	L2 W	T1 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	90	820	910	3.7	1432	0.635	100	NA	NA
Approach	90	820	910	3.7		0.635			

North: Station Road - North

Mov. From N To Exit:	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	1010	-	1010	3.9	1035	0.976	100	NA	NA

Mov. From W To Exit:	L2 N	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 2	-	108	108	0.7	1119	0.096	100	0.0	1
Approach	1010	108	1117	3.6		0.976			
West: Ross Watt Road - West									
Lane 1	217	111	328	0.6	548	0.599	100	NA	NA
Approach	217	111	328	0.6		0.599			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2355	3.2	0.976

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
West: Ross Watt Road - West				
Lane 1	0.0	0.0	0.0	0.0

PHASING SUMMARY

Site: 101v [StatCherAMExFu - Signals (Site Folder: Interim - Sensitivity Analysis)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Cherry (Network Folder: Sensitivity - AM Peak)]

Station Road / Cherry Lane
AM Peak, Existing Geometry, Future Volumes
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated   Cycle Time = 120 seconds (Site User-Given Cycle Time)
Design Life Analysis (Capacity): Results for 10 years

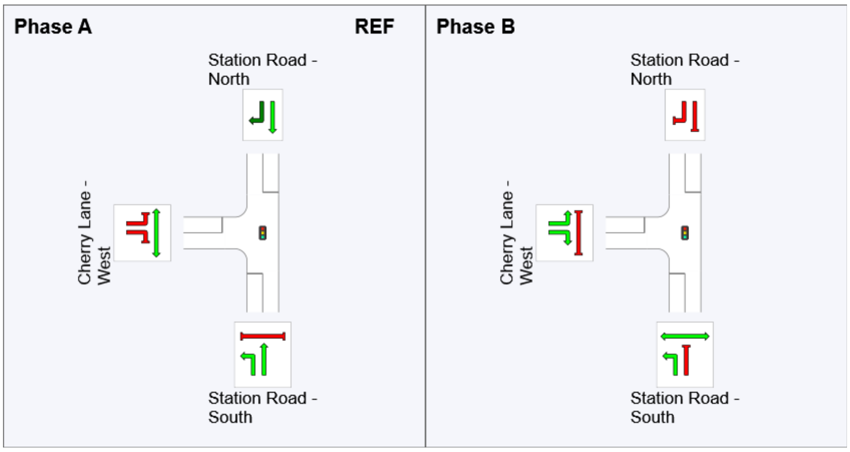
Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Downstream lane blockage effects included in determining phase times
Phase Sequence: Convert Function Default
Input Phase Sequence: A, B
Output Phase Sequence: A, B
Reference Phase: Phase A
Offset: NA

Phase Timing Summary

Phase	A	B
Phase Change Time (sec)	0	95
Green Time (sec)	89	19
Phase Time (sec)	95	25
Phase Split	79%	21%
Phase Frequency (%)	100.0	100.0

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase

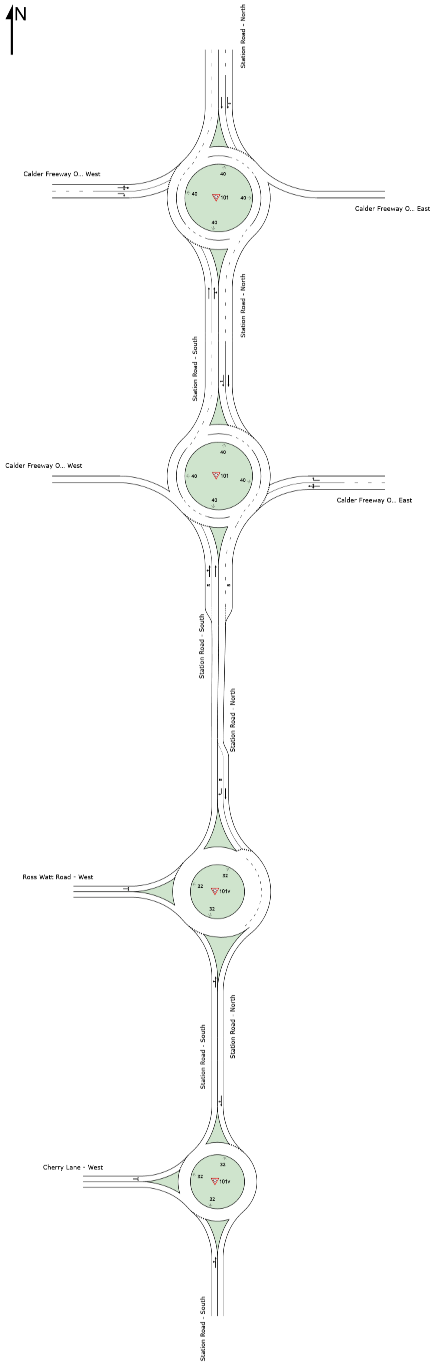
Normal Movement	Permitted/Opposed
Slip/Bypass-Lane Movement	Opposed Slip/Bypass-Lane
Stopped Movement	Turn On Red
Other Movement Class (MC) Running	Undetected Movement
Mixed Running & Stopped MCs	Continuous Movement
Other Movement Class (MC) Stopped	Phase Transition Applied

NETWORK LAYOUT

Network: N101 [PM Roundabouts - Both (Network Folder: Post Dev - 15yr Growth)]

New Network
Network Category: (None)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
101	NA	StatCaldEastPMFuEx
101	NA	StatCaldWestPMFuEx
101v	NA	StatRossPMExFu - Roundabout
101v	NA	StatCherPMExFu - Roundabout

LANE SUMMARY

Site: 101 [StatCaldEastPMFuEx (Site Folder: Roundabout - Post Dev - 15yr Growth)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [PM Roundabouts - Both (Network Folder: Post Dev - 15yr Growth)]

Station Road / Calder Freeway Eastbound Lane
PM Peak, Future Volumes, Existing Geometry
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows [Total	HV]	Arrival Flows [Total	HV]	Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue [Veh	Dist]	Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: Station Road - South															
Lane 1[d]	454	4.0	454	4.0	1826	0.249	100	2.9	LOS A	0.0	0.0	Full	130	0.0	0.0
Lane 2	384	4.0	384	4.0	1541	0.249	100	5.7	LOS A	0.0	0.0	Full	130	0.0	0.0
Approach	838	4.0	838	4.0		0.249		4.2	LOS A	0.0	0.0				
North: Station Road - North															
Lane 1[d]	451	4.0	451	4.0	1160	0.389	100	4.9	LOS A	1.8	13.0	Full	500	0.0	0.0
Lane 2	359	4.0	359	4.0	923	0.389	100	5.4	LOS A	1.7	12.3	Full	500	0.0	0.0
Approach	811	4.0	811	4.0		0.389		5.1	LOS A	1.8	13.0				
West: Calder Freeway Off-ramp - West															
Lane 1[d]	355	4.0	355	4.0	1210	0.294	100	9.4	LOS A	1.2	8.9	Full	500	0.0	0.0
Lane 2	273	4.0	273	4.0	931	0.294	100	12.1	LOS A	1.2	8.6	Full	500	0.0	0.0
Approach	628	4.0	628	4.0		0.294		10.6	LOS A	1.2	8.9				
All Vehicles	2277	4.0	2277	4.0		0.389		6.3	LOS A	1.8	13.0				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	454	-	454	4.0	1826	0.249	100	NA	NA
Lane 2	221	162	384	4.0	1541	0.249	100	NA	NA
Approach	676	162	838	4.0		0.249			

North: Station Road - North

Mov. From N To Exit:	L2 E	T1 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.

Lane 1	222	229	451	4.0		1160	0.389	100	NA	NA
Lane 2	-	359	359	4.0		923	0.389	100	NA	NA
Approach	222	588	811	4.0			0.389			

West: Calder Freeway Off-ramp - West										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	111	1	244	355	4.0	1210	0.294	100	NA	NA
Lane 2	-	-	273	273	4.0	931	0.294	100	NA	NA
Approach	111	1	517	628	4.0		0.294			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2277	4.0	0.389

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.												

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
West: Calder Freeway Off-ramp - West				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101 [StatCaldWestPMFuEx (Site Folder: Roundabout - Post Dev - 15yr Growth)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [PM Roundabouts - Both (Network Folder: Post Dev - 15yr Growth)]

Station Road / Calder Freeway Westbound Lane
PM Peak, Future Volumes, Existing Geometry
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Station Road - South															
Lane 1[d]	567	4.0	567	4.0	1348	0.421	100	4.2	LOS A	2.4	17.3	Short	50	0.0	NA
Lane 2	480	4.0	480	4.0	1141	0.421	100	4.3	LOS A	2.3	16.8	Full	170	0.0	0.0
Approach	1047	4.0	1047	4.0		0.421		4.3	LOS A	2.4	17.3				
East: Calder Freeway Off-ramp - East															
Lane 1[d]	267	4.0	267	4.0	1092	0.245	100	9.7	LOS A	1.1	8.2	Full	500	0.0	0.0
Lane 2	198	4.0	198	4.0	808	0.245	100	13.4	LOS A	1.0	7.6	Full	500	0.0	0.0
Approach	465	4.0	465	4.0		0.245		11.3	LOS A	1.1	8.2				
North: Station Road - North															
Lane 1	339	4.0	339	4.0	1463	0.232	56[6]	6.1	LOS A	0.0	0.0	Full	130	0.0	0.0
Lane 2[d]	756	4.0	756	4.0	1824	0.414	100	3.7	LOS A	0.0	0.0	Full	130	0.0	0.0
Approach	1095	4.0	1095	4.0		0.414		4.5	LOS A	0.0	0.0				
All Vehicles	2607	4.0	2607	4.0		0.421		5.6	LOS A	2.4	17.3				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

6 Lane under-utilisation due to downstream effects
d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	L2 W	T1 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	461	106	567	4.0	1348	0.421	100	0.0	2
Lane 2	-	480	480	4.0	1141	0.421	100	NA	NA
Approach	461	586	1047	4.0		0.421			

East: Calder Freeway Off-ramp - East

Mov. From E	L2	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane

To Exit:	S	W	N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	235	1	32	267	4.0	1092	0.245	100	NA	NA
Lane 2	-	-	198	198	4.0	808	0.245	100	NA	NA
Approach	235	1	229	465	4.0		0.245			

North: Station Road - North

Mov. From N To Exit:	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	339	-	339	4.0	1463	0.232	56 [6]	NA	NA
Lane 2	657	99	756	4.0	1824	0.414	100	NA	NA
Approach	996	99	1095	4.0		0.414			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2607	4.0	0.421

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

6 Lane under-utilisation due to downstream effects

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Station Road - South Merge Type: **Priority**												
Exit Short Lane	1	60	0.0	657	670	3.06	2.04	574	1073	0.535	1.3	3.2
Merge Lane	2	-	100.0	Merge Lane is not Opposed				657	1800	0.365	0.0	0.0

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
East: Calder Freeway Off-ramp - East				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101v [StatRossPMExFu - Roundabout (Site Folder: Roundabout - Post Dev - 15yr Growth)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [PM Roundabouts - Both (Network Folder: Post Dev - 15yr Growth)]

Station Road / Ross Watt Road
PM Peak, Existing Geometry, Future Volumes
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows [Total	HV]	Arrival Flows [Total	HV]	Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue [Veh	Dist]	Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: Station Road - South															
Lane 1[d]	1093	4.0	1093	4.0	1298	0.842	100	8.1	LOS C	15.9	114.9	Full	165	0.0	0.0
Approach	1093	4.0	1093	4.0		0.842		8.1	LOS C	15.9	114.9				
North: Station Road - North															
Lane 1[d]	1101	4.0	1101	4.0	1679	0.656	100	4.3	LOS B	9.4	68.0	Full	170	0.0	0.0
Lane 2	189	4.0	189	4.0	1166	0.162	100	9.8	LOS A	1.2	8.5	Short	80	0.0	NA
Approach	1291	4.0	1291	4.0		0.656		5.1	LOS B	9.4	68.0				
West: Ross Watt Road - West															
Lane 1[d]	188	4.0	188	4.0	391	0.482	100	18.8	LOS A	4.3	31.0	Full	500	0.0	0.0
Approach	188	4.0	188	4.0		0.482		18.8	LOS A	4.3	31.0				
All Vehicles	2572	4.0	2572	4.0		0.842		7.4	LOS C	15.9	114.9				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	L2 W	T1 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	137	956	1093	4.0	1298	0.842	100	NA	NA
Approach	137	956	1093	4.0		0.842			

North: Station Road - North

Mov. From N To Exit:	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	1101	-	1101	4.0	1679	0.656	100	NA	NA
Lane 2	-	189	189	4.0	1166	0.162	100	0.0	1

Approach	1101	189	1291	4.0		0.656			
West: Ross Watt Road - West									
Mov. From W To Exit:	L2 N	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	114	75	188	4.0	391	0.482	100	NA	NA
Approach	114	75	188	4.0		0.482			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2572	4.0	0.842

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
West: Ross Watt Road - West				
Lane 1	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101v [StatCherPMExFu - Roundabout (Site Folder: Roundabout - Post Dev - 15yr Growth)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [PM Roundabouts - Both (Network Folder: Post Dev - 15yr Growth)]

Station Road / Cherry Lane
PM Peak, Existing Geometry, Future Volumes
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Station Road - South															
Lane 1[d]	1269	4.0	1269	4.0	1535	0.827	100	4.3	LOS C	19.0	137.6	Full	500	0.0	0.0
Approach	1269	4.0	1269	4.0		0.827		4.3	LOS C	19.0	137.6				
North: Station Road - North															
Lane 1[d]	1101	4.0	1101	4.0	1365	0.807	100	5.4	LOS C	13.9	100.5	Full	165	0.0	0.0
Approach	1101	4.0	1101	4.0		0.807		5.4	LOS C	13.9	100.5				
West: Cherry Lane - West															
Lane 1[d]	188	4.0	188	4.0	417	0.452	100	20.9	LOS A	4.0	28.6	Full	500	0.0	0.0
Approach	188	4.0	188	4.0		0.452		20.9	LOS A	4.0	28.6				
All Vehicles	2559	4.0	2559	4.0		0.827		6.0	LOS C	19.0	137.6				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	L2 W	T1 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	240	1029	1269	4.0	1535	0.827	100	NA	NA
Approach	240	1029	1269	4.0		0.827			

North: Station Road - North

Mov. From N To Exit:	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	1041	60	1101	4.0	1365	0.807	100	NA	NA
Approach	1041	60	1101	4.0		0.807			

West: Cherry Lane - West

Mov. From W To Exit:	L2 N	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	63	125	188	4.0	417	0.452	100	NA	NA
Approach	63	125	188	4.0		0.452			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2559	4.0	0.827

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis

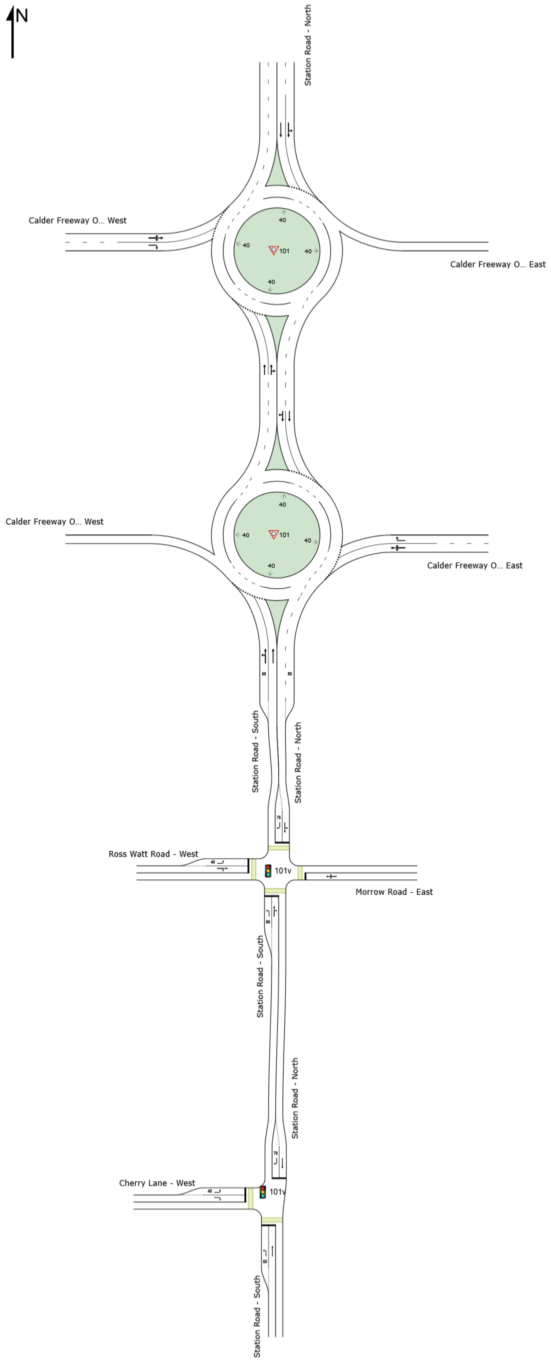
	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
West: Cherry Lane - West				
Lane 1	0.0	0.0	0.0	0.0

NETWORK LAYOUT

Network: N101 [Signals - Both (Network Folder: Sensitivity - PM Peak)]

New Network
Network Category: (None)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
101	NA	StatCaldEastPMFuEx
101	NA	StatCaldWestPMFuEx
101v	NA	StatRossPMExFu - Signals
101v	NA	StatCherPMExFu - Signals

LANE SUMMARY

Site: 101 [StatCaldEastPMFuEx (Site Folder: Interim - Sensitivity Analysis)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Both (Network Folder: Sensitivity - PM Peak)]

Station Road / Calder Freeway Eastbound Lane
PM Peak, Future Volumes, Existing Geometry
Site Category: (None)
Roundabout
Design Life Analysis (Capacity): Results for 9 years

Lane Use and Performance

	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Station Road - South															
Lane 1[d]	398	3.5	398	3.5	1830	0.218	100	2.9	LOS A	0.0	0.0	Full	130	0.0	0.0
Lane 2	336	3.5	336	3.5	1545	0.218	100	5.4	LOS A	0.0	0.0	Full	130	0.0	0.0
Approach	734	3.5	734	3.5		0.218		4.0	LOS A	0.0	0.0				
North: Station Road - North															
Lane 1[d]	345	3.5	345	3.5	1240	0.278	100	4.4	LOS A	1.2	8.3	Full	500	0.0	0.0
Lane 2	284	3.1	284	3.1	1019	0.278	100	4.7	LOS A	1.1	7.9	Full	500	0.0	0.0
Approach	628	3.4	628	3.4		0.278		4.5	LOS A	1.2	8.3				
West: Calder Freeway Off-ramp - West															
Lane 1[d]	272	3.0	272	3.0	1245	0.219	100	9.2	LOS A	0.9	6.3	Full	500	0.0	0.0
Lane 2	212	4.0	212	4.0	970	0.219	100	11.7	LOS A	0.8	6.1	Full	500	0.0	0.0
Approach	484	3.5	484	3.5		0.219		10.3	LOS A	0.9	6.3				
All Vehicles	1847	3.4	1847	3.4		0.278		5.8	LOS A	1.2	8.3				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	398	-	398	3.5	1830	0.218	100	NA	NA
Lane 2	210	126	336	3.5	1545	0.218	100	NA	NA
Approach	608	126	734	3.5		0.218			

North: Station Road - North

Mov. From N To Exit:	L2 E	T1 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.

Mov.	L2	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
Lane 1	165	180	345	3.5		1240	0.278	100	NA	NA
Lane 2	-	284	284	3.1		1019	0.278	100	NA	NA
Approach	165	463	628	3.4			0.278			
West: Calder Freeway Off-ramp - West										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	82	1	189	272	3.0	1245	0.219	100	NA	NA
Lane 2	-	-	212	212	4.0	970	0.219	100	NA	NA
Approach	82	1	401	484	3.5		0.219			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	1847	3.4	0.278

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.												

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
West: Calder Freeway Off-ramp - West				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101 [StatCaldWestPMFuEx (Site Folder: Interim - Sensitivity Analysis)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Both (Network Folder: Sensitivity - PM Peak)]

Station Road / Calder Freeway Westbound Lane
PM Peak, Future Volumes, Existing Geometry
Site Category: (None)
Roundabout
Design Life Analysis (Capacity): Results for 9 years

Lane Use and Performance

	Demand Flows [Total	HV]	Arrival Flows [Total	HV]	Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue [Veh	Dist]	Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: Station Road - South															
Lane 1[d]	510	3.5	510	3.5	1378	0.370	100	4.1	LOS A	1.8	13.0	Short	50	0.0	NA
Lane 2	435	3.3	435	3.3	1175	0.370	100	4.1	LOS A	1.8	12.7	Full	170	0.0	0.0
Approach	945	3.4	945	3.4		0.370		4.1	LOS A	1.8	13.0				
East: Calder Freeway Off-ramp - East															
Lane 1[d]	239	3.5	239	3.5	1164	0.205	100	7.7	LOS A	2.1[N5]	15.2[N5]	Full	500	0.0	0.0
Lane 2	179	4.0	179	4.0	871	0.205	100	12.4	LOS A	0.8	5.6	Full	500	0.0	0.0
Approach	418	3.7	418	3.7		0.205		9.7	LOS A	2.1	15.2				
North: Station Road - North															
Lane 1	459	3.3	459	3.3	1529	0.300	56[6]	4.9	LOS A	3.0[N5]	21.4[N5]	Full	130	0.0	0.0
Lane 2[d]	533	3.4	533	3.4	992	0.537	100	4.0	LOS A	2.9[N5]	20.8[N5]	Full	130	-45.5[N3]	0.0
Approach	991	3.3	991	3.3		0.537		4.4	LOS A	3.0	21.4				
All Vehicles	2354	3.4	2354	3.4		0.537		5.2	LOS A	3.0	21.4				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

6 Lane under-utilisation due to downstream effects
d Dominant lane on roundabout approach
N3 Capacity Adjustment due to downstream lane blockage determined by the program.
N5 Results for this lane are determined by Back of Queue values of downstream lanes (proportional to lane movement flows).

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	L2 W	T1 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	414	96	510	3.5	1378	0.370	100	0.0	2
Lane 2	-	435	435	3.3	1175	0.370	100	NA	NA
Approach	414	531	945	3.4		0.370			

East: Calder Freeway Off-ramp - East

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	213	1	25	239	3.5	1164	0.205	100	NA	NA
Lane 2	-	-	179	179	4.0	871	0.205	100	NA	NA
Approach	213	1	204	418	3.7		0.205			
North: Station Road - North										
Mov. From N To Exit:	T1 S	R2 W	Total	%HV		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	459	-	459	3.3		1529	0.300	56 [6]	NA	NA
Lane 2	444	88	533	3.4		992	0.537	100	NA	NA
Approach	903	88	991	3.3			0.537			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2354	3.4	0.537

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

6 Lane under-utilisation due to downstream effects

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Station Road - South Merge Type: **Priority**												
Exit Short Lane	1	60	0.0	444	452	3.05	2.03	671	1308	0.513	0.8	2.0
Merge Lane	2	-	100.0	Merge Lane is not Opposed				444	1800	0.247	0.0	0.0

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
East: Calder Freeway Off-ramp - East				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101v [StatRossPMExFu - Signals (Site Folder: Interim - Sensitivity Analysis)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Both (Network Folder: Sensitivity - PM Peak)]

Station Road / Ross Watt Road
PM Peak, Existing Geometry, Future Volumes
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Network User-Given Cycle Time)
Design Life Analysis (Capacity): Results for 9 years

Lane Use and Performance

	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Station Road - South															
Lane 1	125	1.4	125	1.4	1517	0.083	100	8.0	LOS A	1.6	11.1	Short	95	0.0	NA
Lane 2	871	3.8	871	3.8	1284	0.678	100	4.3	LOS B	17.4	125.8	Full	165	0.0	0.0
Approach	996	3.5	996	3.5		0.678		4.8	LOS B	17.4	125.8				
East: Morrow Road - East															
Lane 1	27	0.0	27	0.0	64	0.429	100	71.5	LOS A	1.7	12.0	Full	500	0.0	0.0
Approach	27	0.0	27	0.0		0.429		71.5	LOS A	1.7	12.0				
North: Station Road - North															
Lane 1	999	3.8	999	3.8	1133 [1]	0.882	100	15.4	LOS C	38.4 [N4]	277.4 [N4]	Full	170	0.0	50.0
Lane 2	188	0.1	188	0.1	274	0.687	100	29.0	LOS B	8.5	59.5	Short	75	0.0	NA
Approach	1187	3.2	1187	3.2		0.882		17.5	LOS C	38.4	277.4				
West: Ross Watt Road - West															
Lane 1	113	0.2	113	0.2	139	0.812	100	71.7	LOS C	7.2	50.5	Short	40	0.0	NA
Lane 2	74	0.5	74	0.5	131	0.568	100	66.6	LOS A	4.5	31.4	Full	500	0.0	0.0
Approach	187	0.3	187	0.3		0.812		69.7	LOS C	7.2	50.5				
All Vehicles	2398	3.1	2398	3.1		0.882		16.9	LOS C	38.4	277.4				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes.
Delay and stops experienced by drivers upstream of short lane entry have been accounted for.
N4 Average back of queue has been restricted to the available queue storage space.

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	125	-	-	125	1.4	1517	0.083	100	0.0	2
Lane 2	-	852	19	871	3.8	1284	0.678	100	NA	NA
Approach	125	852	19	996	3.5		0.678			

East: Morrow Road - East										
Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	13	2	13	27	0.0	64	0.429	100	NA	NA
Approach	13	2	13	27	0.0		0.429			

North: Station Road - North										
Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	19	980	-	999	3.8	1133[1]	0.882	100	NA	NA
Lane 2	-	-	188	188	0.1	274	0.687	100	0.0	1
Approach	19	980	188	1187	3.2		0.882			

West: Ross Watt Road - West										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	113	-	-	113	0.2	139	0.812	100	26.2	2
Lane 2	-	2	72	74	0.5	131	0.568	100	NA	NA
Approach	113	2	72	187	0.3		0.812			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2398	3.1	0.882

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes.
Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
East: Morrow Road - East				
Lane 1	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
West: Ross Watt Road - West				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101v [StatCherPMExFu - Signals (Site Folder: Interim - Sensitivity Analysis)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Both (Network Folder: Sensitivity - PM Peak)]

Station Road / Cherry Lane
PM Peak, Existing Geometry, Future Volumes
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Network User-Given Cycle Time)
Design Life Analysis (Capacity): Results for 9 years

Lane Use and Performance

	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Station Road - South															
Lane 1	240	0.4	240	0.4	1652	0.145	100	11.0	LOS A	0.9	6.4	Short	50	0.0	NA
Lane 2	918	3.8	918	3.8	1325[1]	0.693	100	8.6	LOS B	24.2	175.3	Full	500	0.0	0.0
Approach	1158	3.1	1158	3.1		0.693		9.1	LOS B	24.2	175.3				
North: Station Road - North															
Lane 1	930	3.8	930	3.8	1501[1]	0.620	100	3.5	LOS B	16.8	121.7	Full	165	0.0	0.0
Lane 2	60	1.2	60	1.2	203	0.295	100	25.6	LOS A	2.3	16.3	Short	70	0.0	NA
Approach	990	3.6	990	3.6		0.620		4.8	LOS B	16.8	121.7				
West: Cherry Lane - West															
Lane 1	63	1.0	63	1.0	200	0.316	100	60.4	LOS A	3.5	24.9	Short	40	0.0	NA
Lane 2	125	0.4	125	0.4	185	0.676	100	64.9	LOS B	7.5	52.5	Full	500	0.0	0.0
Approach	188	0.6	188	0.6		0.676		63.4	LOS B	7.5	52.5				
All Vehicles	2337	3.1	2337	3.1		0.693		11.7	LOS B	24.2	175.3				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes.
Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	L2 W	T1 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	240	-	240	0.4	1652	0.145	100	0.0	2
Lane 2	-	918	918	3.8	1325[1]	0.693	100	NA	NA
Approach	240	918	1158	3.1		0.693			

North: Station Road - North

Mov. From N To Exit:	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	930	-	930	3.8	1501[1]	0.620	100	NA	NA

Mov. From W To Exit:	L2 N	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 2	-	60	60	1.2	203	0.295	100	0.0	1
Approach	930	60	990	3.6		0.620			
West: Cherry Lane - West									
Lane 1	63	-	63	1.0	200	0.316	100	0.0	2
Lane 2	-	125	125	0.4	185	0.676	100	NA	NA
Approach	63	125	188	0.6		0.676			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2337	3.1	0.693

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes.
Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
West: Cherry Lane - West				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

PHASING SUMMARY

Site: 101v [StatRossPMExFu - Signals (Site Folder: Interim - Sensitivity Analysis)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Both (Network Folder: Sensitivity - PM Peak)]

Station Road / Ross Watt Road
PM Peak, Existing Geometry, Future Volumes
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated   Cycle Time = 120 seconds (Network User-Given Cycle Time)
Design Life Analysis (Capacity): Results for 9 years

Timings based on settings in the Network Timing dialog
Phase Times determined by the program
Downstream lane blockage effects included in determining phase times
Phase Sequence: Two Phase
Input Phase Sequence: A, B
Output Phase Sequence: A, B
Reference Phase: Phase A
Offset: 0 seconds (User)

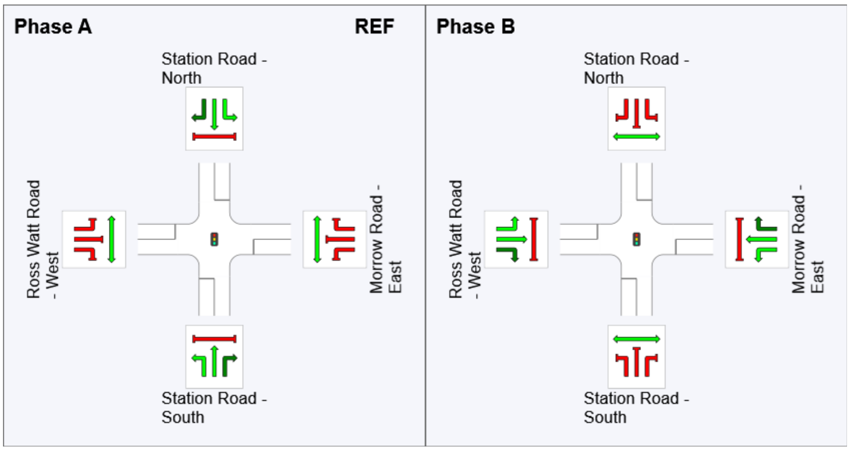
Phase Timing Summary

Phase	A	B
Phase Change Time (sec)	0	105
Green Time (sec)	99	9
Phase Time (sec)	105	15
Phase Split	88%	13%
Phase Frequency (%)	100.0[4]	100.0[4]

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

4 Phase Frequency specified by the user (phase times not specified).

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase

Normal Movement	Permitted/Opposed
Slip/Bypass-Lane Movement	Opposed Slip/Bypass-Lane
Stopped Movement	Turn On Red
Other Movement Class (MC) Running	Undetected Movement
Mixed Running & Stopped MCs	Continuous Movement
Other Movement Class (MC) Stopped	Phase Transition Applied

PHASING SUMMARY

Site: 101v [StatCherPMExFu - Signals (Site Folder: Interim - Sensitivity Analysis)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Both (Network Folder: Sensitivity - PM Peak)]

Station Road / Cherry Lane
PM Peak, Existing Geometry, Future Volumes
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Network User-Given Cycle Time)
Design Life Analysis (Capacity): Results for 9 years

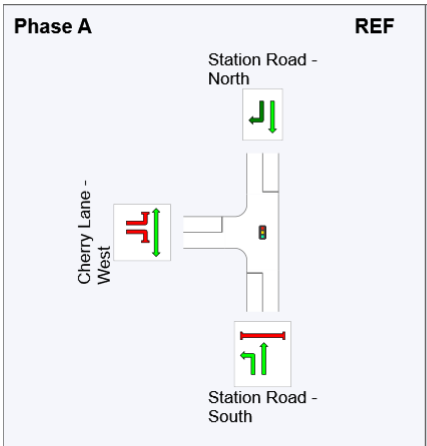
Timings based on settings in the Network Timing dialog
Phase Times determined by the program
Downstream lane blockage effects included in determining phase times
Phase Sequence: Convert Function Default
Input Phase Sequence: A, B
Output Phase Sequence: A, B
Reference Phase: Phase A
Offset: 0 seconds (User)

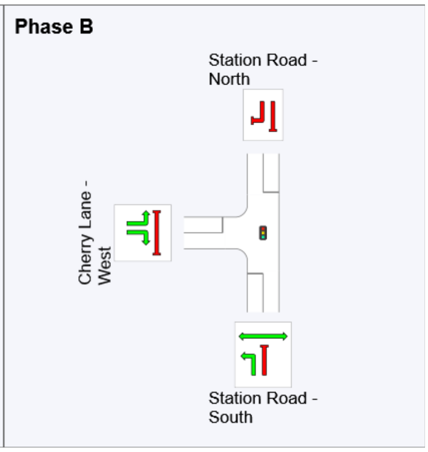
Phase Timing Summary

Phase	A	B
Phase Change Time (sec)	0	101
Green Time (sec)	95	13
Phase Time (sec)	101	19
Phase Split	84%	16%
Phase Frequency (%)	100.0	100.0

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence





REF: Reference Phase
VAR: Variable Phase

Normal Movement	Permitted/Opposed
Slip/Bypass-Lane Movement	Opposed Slip/Bypass-Lane
Stopped Movement	Turn On Red
Other Movement Class (MC) Running	Undetected Movement
Mixed Running & Stopped MCs	Continuous Movement
Other Movement Class (MC) Stopped	Phase Transition Applied

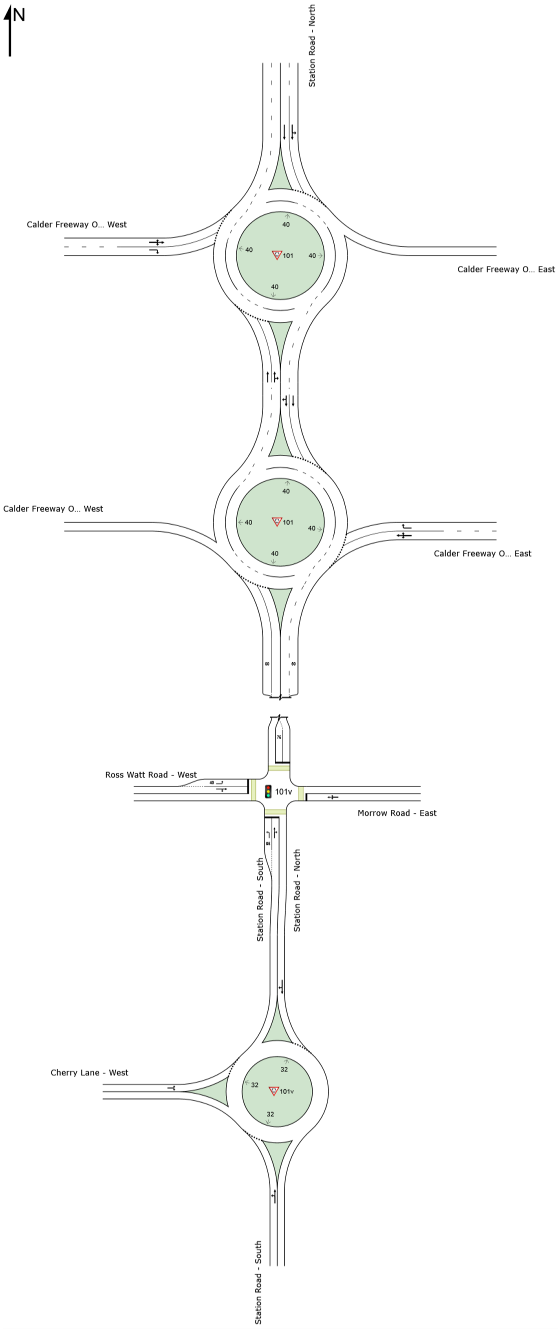
NETWORK LAYOUT

Network: N101 [Signals - Ross Watt Road (Network Folder: Sensitivity - PM Peak)]

New Network
Network Category: (None)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.

In the Network Configuration dialog, Site positions are too close for drawing a Network Connection in Layout drawing.



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
101	NA	StatCaldEastPMFuEx
101	NA	StatCaldWestPMFuEx
101v	NA	StatRossPMExFu - Signals
101v	NA	StatCherPMExFu - Roundabout

LANE SUMMARY

Site: 101 [StatCaldEastPMFuEx (Site Folder: Interim - Sensitivity Analysis)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Ross Watt Road (Network Folder: Sensitivity - PM Peak)]

Station Road / Calder Freeway Eastbound Lane
PM Peak, Future Volumes, Existing Geometry
Site Category: (None)
Roundabout
Design Life Analysis (Capacity): Results for 10 years

Lane Use and Performance

	Demand Flows [Total	HV]	Arrival Flows [Total	HV]	Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue [Veh	Dist]	Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: Station Road - South															
Lane 1[d]	404	3.6	404	3.6	1830	0.221	100	2.9	LOS A	0.0	0.0	Full	130	0.0	0.0
Lane 2	341	3.5	341	3.5	1545	0.221	100	5.3	LOS A	0.0	0.0	Full	130	0.0	0.0
Approach	745	3.5	745	3.5		0.221		4.0	LOS A	0.0	0.0				
North: Station Road - North															
Lane 1[d]	345	3.5	345	3.5	1240	0.278	100	4.4	LOS A	1.2	8.3	Full	500	0.0	0.0
Lane 2	284	3.1	284	3.1	1019	0.278	100	4.7	LOS A	1.1	7.9	Full	500	0.0	0.0
Approach	628	3.4	628	3.4		0.278		4.5	LOS A	1.2	8.3				
West: Calder Freeway Off-ramp - West															
Lane 1[d]	272	3.0	272	3.0	1243	0.219	100	9.2	LOS A	0.9	6.3	Full	500	0.0	0.0
Lane 2	212	4.0	212	4.0	966	0.219	100	11.7	LOS A	0.8	6.1	Full	500	0.0	0.0
Approach	484	3.5	484	3.5		0.219		10.3	LOS A	0.9	6.3				
All Vehicles	1858	3.4	1858	3.4		0.278		5.8	LOS A	1.2	8.3				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	404	-	404	3.6	1830	0.221	100	NA	NA
Lane 2	215	126	341	3.5	1545	0.221	100	NA	NA
Approach	619	126	745	3.5		0.221			

North: Station Road - North

Mov. From N To Exit:	L2 E	T1 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.

Lane 1	165	180	345	3.5		1240	0.278	100	NA	NA
Lane 2	-	284	284	3.1		1019	0.278	100	NA	NA
Approach	165	463	628	3.4			0.278			
West: Calder Freeway Off-ramp - West										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	82	1	189	272	3.0	1243	0.219	100	NA	NA
Lane 2	-	-	212	212	4.0	966	0.219	100	NA	NA
Approach	82	1	401	484	3.5		0.219			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	1858	3.4	0.278

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
West: Calder Freeway Off-ramp - West				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101 [StatCaldWestPMFuEx (Site Folder: Interim - Sensitivity Analysis)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Ross Watt Road (Network Folder: Sensitivity - PM Peak)]

Station Road / Calder Freeway Westbound Lane
PM Peak, Future Volumes, Existing Geometry
Site Category: (None)
Roundabout
Design Life Analysis (Capacity): Results for 10 years

Lane Use and Performance

	Demand Flows [Total	HV]	Arrival Flows [Total	HV]	Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue [Veh	Dist]	Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: Station Road - South															
Lane 1[d]	519	3.5	519	3.5	1374	0.378	100	4.1	LOS A	1.8	13.0	Short	50	0.0	NA
Lane 2	442	3.3	442	3.3	1171	0.378	100	4.1	LOS A	1.7	12.5	Full	170	0.0	0.0
Approach	961	3.4	961	3.4		0.378		4.1	LOS A	1.8	13.0				
East: Calder Freeway Off-ramp - East															
Lane 1[d]	244	3.5	244	3.5	1155	0.211	100	8.0	LOS A	0.9	6.2	Full	500	0.0	0.0
Lane 2	182	4.0	182	4.0	862	0.211	100	12.5	LOS A	0.8	5.9	Full	500	0.0	0.0
Approach	425	3.7	425	3.7		0.211		9.9	LOS A	0.9	6.2				
North: Station Road - North															
Lane 1	441	3.3	441	3.3	1521	0.290	56[6]	5.1	LOS A	0.0	0.0	Full	130	0.0	0.0
Lane 2[d]	567	3.4	567	3.4	1094	0.518	100	3.9	LOS A	0.0	0.0	Full	130	-40.0[N3]	0.0
Approach	1008	3.3	1008	3.3		0.518		4.4	LOS A	0.0	0.0				
All Vehicles	2394	3.4	2394	3.4		0.518		5.3	LOS A	1.8	13.0				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

6 Lane under-utilisation due to downstream effects
d Dominant lane on roundabout approach
N3 Capacity Adjustment due to downstream lane blockage determined by the program.

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	L2 W	T1 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	421	98	519	3.5	1374	0.378	100	0.0	2
Lane 2	-	442	442	3.3	1171	0.378	100	NA	NA
Approach	421	540	961	3.4		0.378			

East: Calder Freeway Off-ramp - East

Mov.	L2	T1	R2	Total	%HV	Deg.	Lane	Prob.	Ov.

From E To Exit:	S	W	N			Cap. veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	216	1	26	244	3.5	1155	0.211	100	NA	NA
Lane 2	-	-	182	182	4.0	862	0.211	100	NA	NA
Approach	216	1	208	425	3.7		0.211			

North: Station Road - North

Mov. From N To Exit:	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	441	-	441	3.3	1521	0.290	56[6]	NA	NA
Lane 2	477	90	567	3.4	1094	0.518	100	NA	NA
Approach	918	90	1008	3.3		0.518			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2394	3.4	0.518

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

6 Lane under-utilisation due to downstream effects

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Station Road - South Merge Type: **Priority**												
Exit Short Lane	1	60	0.0	477	485	3.05	2.03	657	1273	0.516	0.8	2.2
Merge Lane	2	-	100.0	Merge Lane is not Opposed				477	1800	0.265	0.0	0.0

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
East: Calder Freeway Off-ramp - East				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101v [StatRossPMExFu - Signals (Site Folder: Interim - Sensitivity Analysis)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Ross Watt Road (Network Folder: Sensitivity - PM Peak)]

Station Road / Ross Watt Road
PM Peak, Existing Geometry, Future Volumes
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated   Cycle Time = 120 seconds (Site User-Given Cycle Time)
Design Life Analysis (Capacity): Results for 10 years

Lane Use and Performance

	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Station Road - South															
Lane 1	127	1.5	127	1.5	1532	0.083	100	8.5	LOS A	1.3	9.2	Short	95	0.0	NA
Lane 2	887	3.8	887	3.8	1270[1]	0.699	100	9.7	LOS B	26.6	192.4	Full	165	0.0	18.9
Approach	1014	3.5	1014	3.5		0.699		9.6	LOS B	26.6	192.4				
East: Morrow Road - East															
Lane 1	27	0.0	27	0.0	75	0.367	100	70.4	LOS A	1.7	11.8	Full	500	0.0	0.0
Approach	27	0.0	27	0.0		0.367		70.4	LOS A	1.7	11.8				
North: Station Road - North															
Lane 1	1018	3.8	1018	3.8	1183[1]	0.860	100	10.0	LOS C	36.1	260.8	Full	170	0.0	44.2
Lane 2	189	0.1	189	0.1	216	0.875	100	68.3	LOS C	14.0	97.9	Short	75	0.0	NA
Approach	1207	3.2	1207	3.2		0.875		19.1	LOS C	36.1	260.8				
West: Ross Watt Road - West															
Lane 1	113	0.2	113	0.2	124	0.915	100	80.4	LOS D	7.8	54.4	Short	40	0.0	NA
Lane 2	75	0.5	75	0.5	118	0.633	100	68.5	LOS B	4.6	32.2	Full	500	0.0	0.0
Approach	188	0.3	188	0.3		0.915		75.7	LOS D	7.8	54.4				
All Vehicles	2437	3.1	2437	3.1		0.915		20.1	LOS D	36.1	260.8				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes.
Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Approach Lane Flows (veh/h)

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
South: Station Road - South										
Lane 1	127	-	-	127	1.5	1532	0.083	100	0.0	2
Lane 2	-	868	19	887	3.8	1270[1]	0.699	100	NA	NA
Approach	127	868	19	1014	3.5		0.699			
East: Morrow Road - East										

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	13	2	13	27	0.0	75	0.367	100	NA	NA
Approach	13	2	13	27	0.0		0.367			
North: Station Road - North										
Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	19	999	-	1018	3.8	1183[1]	0.860	100	NA	NA
Lane 2	-	-	189	189	0.1	216	0.875	100	29.2	1
Approach	19	999	189	1207	3.2		0.875			
West: Ross Watt Road - West										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	113	-	-	113	0.2	124	0.915	100	33.1	2
Lane 2	-	2	73	75	0.5	118	0.633	100	NA	NA
Approach	113	2	73	188	0.3		0.915			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2437	3.1	0.915

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
East: Morrow Road - East				
Lane 1	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
West: Ross Watt Road - West				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101v [StatCherPMExFu - Roundabout (Site Folder: Interim - Sensitivity Analysis)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Ross Watt Road (Network Folder: Sensitivity - PM Peak)]

Station Road / Cherry Lane
PM Peak, Existing Geometry, Future Volumes
Site Category: (None)
Roundabout
Design Life Analysis (Capacity): Results for 10 years

Lane Use and Performance

	Demand Flows [Total	HV]	Arrival Flows [Total	HV]	Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue [Veh	Dist]	Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: Station Road - South															
Lane 1[d]	1176	3.1	1176	3.1	1309	0.898	100	4.8	LOS C	24.9	178.8	Full	500	-15.7[N3]	0.0
Approach	1176	3.1	1176	3.1		0.898		4.8	LOS C	24.9	178.8				
North: Station Road - North															
Lane 1[d]	1008	3.6	1008	3.6	1366	0.738	100	5.1	LOS C	10.7	77.1	Full	165	0.0	0.0
Approach	1008	3.6	1008	3.6		0.738		5.1	LOS C	10.7	77.1				
West: Cherry Lane - West															
Lane 1[d]	188	0.6	188	0.6	396	0.476	100	19.2	LOS A	4.1	28.7	Full	500	-7.3[N3]	0.0
Approach	188	0.6	188	0.6		0.476		19.2	LOS A	4.1	28.7				
All Vehicles	2372	3.1	2372	3.1		0.898		6.1	LOS C	24.9	178.8				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

d Dominant lane on roundabout approach
N3 Capacity Adjustment due to downstream lane blockage determined by the program.

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	L2 W	T1 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	240	936	1176	3.1	1309	0.898	100	NA	NA
Approach	240	936	1176	3.1		0.898			

North: Station Road - North

Mov. From N To Exit:	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	948	60	1008	3.6	1366	0.738	100	NA	NA
Approach	948	60	1008	3.6		0.738			

West: Cherry Lane - West									
Mov. From W To Exit:	L2 N	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	63	125	188	0.6	396	0.476	100	NA	NA
Approach	63	125	188	0.6		0.476			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2372	3.1	0.898

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
West: Cherry Lane - West				
Lane 1	0.0	0.0	0.0	0.0

PHASING SUMMARY

Site: 101v [StatRossPMExFu - Signals (Site Folder: Interim - Sensitivity Analysis)]

Network: N101 [Signals - Ross Watt Road (Network Folder: Sensitivity - PM Peak)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Station Road / Ross Watt Road
PM Peak, Existing Geometry, Future Volumes
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated   Cycle Time = 120 seconds (Site User-Given Cycle Time)
Design Life Analysis (Capacity): Results for 10 years

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Downstream lane blockage effects included in determining phase times
Phase Sequence: Two Phase
Input Phase Sequence: A, B
Output Phase Sequence: A, B
Reference Phase: Phase A
Offset: NA

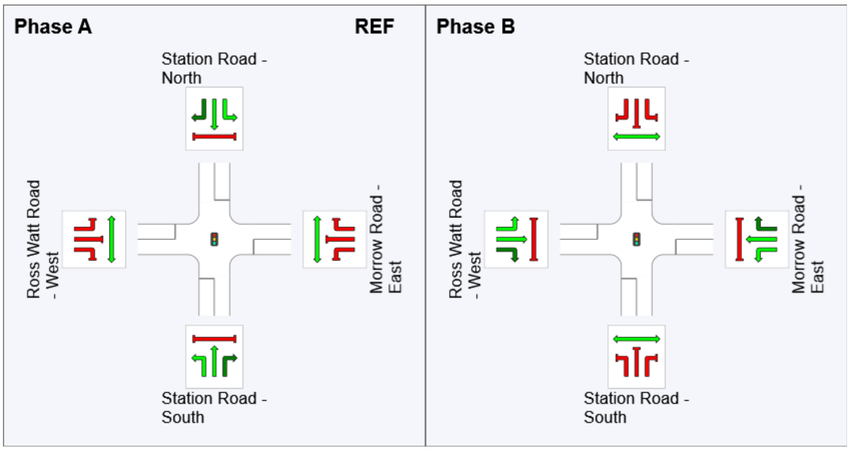
Phase Timing Summary

Phase	A	B
Phase Change Time (sec)	0	106
Green Time (sec)	100	8
Phase Time (sec)	106	14
Phase Split	88%	12%
Phase Frequency (%)	100.0[4]	100.0[4]

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

4 Phase Frequency specified by the user (phase times not specified).

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase

Normal Movement	Permitted/Opposed
Slip/Bypass-Lane Movement	Opposed Slip/Bypass-Lane
Stopped Movement	Turn On Red
Other Movement Class (MC) Running	Undetected Movement
Mixed Running & Stopped MCs	Continuous Movement
Other Movement Class (MC) Stopped	Phase Transition Applied

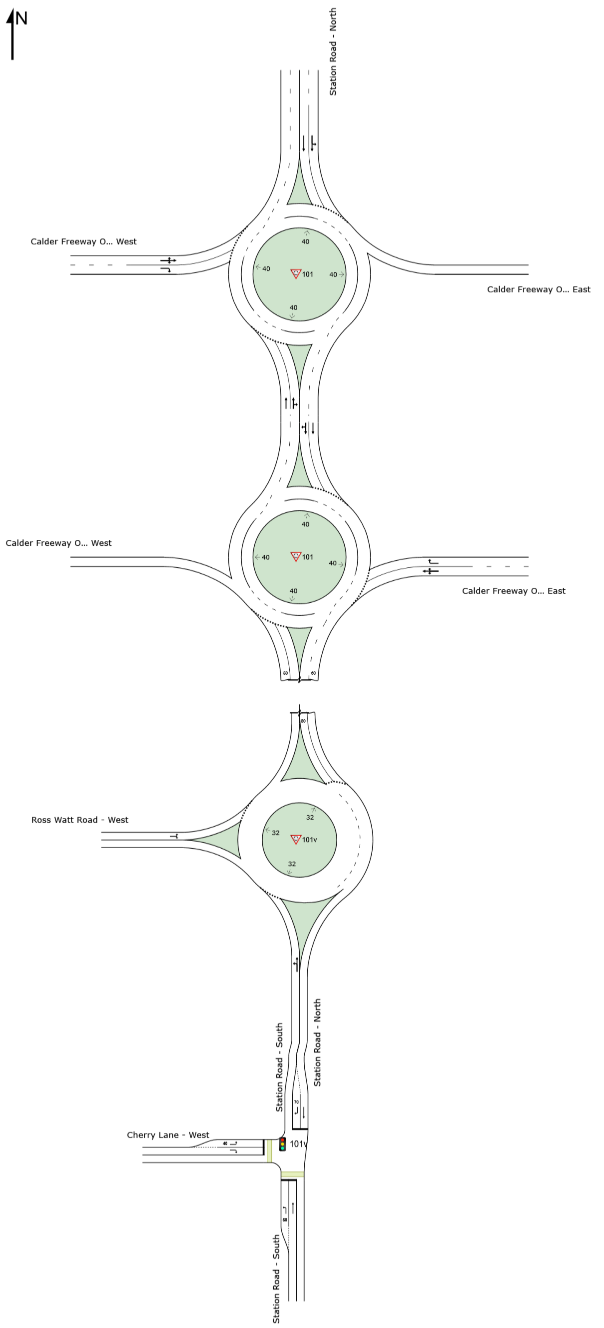
NETWORK LAYOUT

Network: N101 [Signals - Cherry (Network Folder: Sensitivity - PM Peak)]

New Network
Network Category: (None)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.

In the Network Configuration dialog, Site positions are too close for drawing a Network Connection in Layout drawing.



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
101	NA	StatCaldEastPMFuEx
101	NA	StatCaldWestPMFuEx
101v	NA	StatCherPMExFu - Signals
101v	NA	StatRossPMExFu - Roundabout

LANE SUMMARY

Site: 101 [StatCaldEastPMFuEx (Site Folder: Interim - Sensitivity Analysis)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Cherry (Network Folder: Sensitivity - PM Peak)]

Station Road / Calder Freeway Eastbound Lane
PM Peak, Future Volumes, Existing Geometry
Site Category: (None)
Roundabout
Design Life Analysis (Capacity): Results for 10 years

Lane Use and Performance

	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Station Road - South															
Lane 1 [d]	404	3.6	404	3.6	1830	0.221	100	2.9	LOS A	0.0	0.0	Full	130	0.0	0.0
Lane 2	341	3.5	341	3.5	1545	0.221	100	5.3	LOS A	0.0	0.0	Full	130	0.0	0.0
Approach	745	3.5	745	3.5		0.221		4.0	LOS A	0.0	0.0				
North: Station Road - North															
Lane 1 [d]	345	3.5	345	3.5	1240	0.278	100	4.4	LOS A	1.2	8.3	Full	500	0.0	0.0
Lane 2	284	3.1	284	3.1	1019	0.278	100	4.7	LOS A	1.1	7.9	Full	500	0.0	0.0
Approach	628	3.4	628	3.4		0.278		4.5	LOS A	1.2	8.3				
West: Calder Freeway Off-ramp - West															
Lane 1 [d]	272	3.0	272	3.0	1243	0.219	100	9.2	LOS A	0.9	6.3	Full	500	0.0	0.0
Lane 2	212	4.0	212	4.0	966	0.219	100	11.7	LOS A	0.8	6.1	Full	500	0.0	0.0
Approach	484	3.5	484	3.5		0.219		10.3	LOS A	0.9	6.3				
All Vehicles	1858	3.4	1858	3.4		0.278		5.8	LOS A	1.2	8.3				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	404	-	404	3.6	1830	0.221	100	NA	NA
Lane 2	215	126	341	3.5	1545	0.221	100	NA	NA
Approach	619	126	745	3.5		0.221			

North: Station Road - North

Mov. From N To Exit:	L2 E	T1 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.

Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	165	180	345	3.5		1240	0.278	100	NA	NA
Lane 2	-	284	284	3.1		1019	0.278	100	NA	NA
Approach	165	463	628	3.4			0.278			
West: Calder Freeway Off-ramp - West										
Lane 1	82	1	189	272	3.0	1243	0.219	100	NA	NA
Lane 2	-	-	212	212	4.0	966	0.219	100	NA	NA
Approach	82	1	401	484	3.5		0.219			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	1858	3.4	0.278

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.												

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
West: Calder Freeway Off-ramp - West				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101 [StatCaldWestPMFuEx (Site Folder: Interim - Sensitivity Analysis)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Cherry (Network Folder: Sensitivity - PM Peak)]

Station Road / Calder Freeway Westbound Lane
PM Peak, Future Volumes, Existing Geometry
Site Category: (None)
Roundabout
Design Life Analysis (Capacity): Results for 10 years

Lane Use and Performance

	Demand Flows [Total	HV]	Arrival Flows [Total	HV]	Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue [Veh	Dist]	Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: Station Road - South															
Lane 1[d]	519	3.5	519	3.5	1373	0.378	100	4.1	LOS A	2.1	14.9	Short	50	0.0	NA
Lane 2	442	3.3	442	3.3	1170	0.378	100	4.1	LOS A	2.0	14.5	Full	170	0.0	0.0
Approach	961	3.4	961	3.4		0.378		4.1	LOS A	2.1	14.9				
East: Calder Freeway Off-ramp - East															
Lane 1[d]	243	3.5	243	3.5	1126	0.216	100	8.7	LOS A	1.0	7.0	Full	500	0.0	0.0
Lane 2	182	4.0	182	4.0	843	0.216	100	12.9	LOS A	0.9	6.5	Full	500	0.0	0.0
Approach	425	3.7	425	3.7		0.216		10.5	LOS A	1.0	7.0				
North: Station Road - North															
Lane 1	312	3.3	312	3.3	1468	0.213	56[6]	5.4	LOS A	0.0	0.0	Full	130	0.0	0.0
Lane 2[d]	696	3.4	696	3.4	1829	0.380	100	3.7	LOS A	0.0	0.0	Full	130	0.0	0.0
Approach	1008	3.3	1008	3.3		0.380		4.3	LOS A	0.0	0.0				
All Vehicles	2394	3.4	2394	3.4		0.380		5.3	LOS A	2.1	14.9				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

6 Lane under-utilisation due to downstream effects
d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	L2 W	T1 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	421	98	519	3.5	1373	0.378	100	0.0	2
Lane 2	-	442	442	3.3	1170	0.378	100	NA	NA
Approach	421	540	961	3.4		0.378			

East: Calder Freeway Off-ramp - East

Mov. From E	L2	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane

To Exit:	S	W	N			veh/h	v/c	%	%	No.
Lane 1	216	1	26	243	3.5	1126	0.216	100	NA	NA
Lane 2	-	-	182	182	4.0	843	0.216	100	NA	NA
Approach	216	1	208	425	3.7		0.216			
North: Station Road - North										
Mov. From N To Exit:	T1 S	R2 W	Total	%HV		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	312	-	312	3.3		1468	0.213	56[6]	NA	NA
Lane 2	606	90	696	3.4		1829	0.380	100	NA	NA
Approach	918	90	1008	3.3			0.380			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2394	3.4	0.380

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

6 Lane under-utilisation due to downstream effects

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Station Road - South Merge Type: **Priority**												
Exit Short Lane	1	60	0.0	606	616	3.05	2.03	528	1136	0.465	1.2	2.5
Merge Lane	2	-	100.0	Merge Lane is not Opposed				606	1800	0.337	0.0	0.0

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
East: Calder Freeway Off-ramp - East				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101v [StatCherPMExFu - Signals (Site Folder: Interim - Sensitivity Analysis)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Cherry (Network Folder: Sensitivity - PM Peak)]

Station Road / Cherry Lane
PM Peak, Existing Geometry, Future Volumes
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated   Cycle Time = 120 seconds (Site User-Given Cycle Time)
Design Life Analysis (Capacity): Results for 10 years

Lane Use and Performance

	Demand Flows [Total	HV]	Arrival Flows [Total	HV]	Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue [Veh	Dist]	Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: Station Road - South															
Lane 1	240	0.4	240	0.4	1652	0.145	100	11.4	LOS A	0.9	6.4	Short	50	0.0	NA
Lane 2	936	3.9	936	3.9	1321[1]	0.708	100	9.0	LOS C	25.4	183.6	Full	500	0.0	0.0
Approach	1176	3.1	1176	3.1		0.708		9.4	LOS C	25.4	183.6				
North: Station Road - North															
Lane 1	948	3.8	948	3.8	1358[1]	0.698	100	7.6	LOS B	25.3	182.6	Full	165	0.0	14.2
Lane 2	60	1.2	60	1.2	194	0.309	100	24.7	LOS A	2.1	14.6	Short	70	0.0	NA
Approach	1008	3.6	1008	3.6		0.698		8.7	LOS B	25.3	182.6				
West: Cherry Lane - West															
Lane 1	63	1.0	63	1.0	200	0.316	100	60.4	LOS A	3.5	24.9	Short	40	0.0	NA
Lane 2	125	0.4	125	0.4	185	0.676	100	64.9	LOS B	7.5	52.5	Full	500	0.0	0.0
Approach	188	0.6	188	0.6		0.676		63.4	LOS B	7.5	52.5				
All Vehicles	2372	3.1	2372	3.1		0.708		13.4	LOS C	25.4	183.6				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes.
Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	L2 W	T1 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	240	-	240	0.4	1652	0.145	100	0.0	2
Lane 2	-	936	936	3.9	1321[1]	0.708	100	NA	NA
Approach	240	936	1176	3.1		0.708			

North: Station Road - North

Mov. From N To Exit:	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	948	-	948	3.8	1358[1]	0.698	100	NA	NA

Mov. From W To Exit:	L2 N	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 2	-	60	60	1.2	194	0.309	100	0.0	1
Approach	948	60	1008	3.6		0.698			
West: Cherry Lane - West									
Lane 1	63	-	63	1.0	200	0.316	100	0.0	2
Lane 2	-	125	125	0.4	185	0.676	100	NA	NA
Approach	63	125	188	0.6		0.676			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2372	3.1	0.708

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes.
Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
West: Cherry Lane - West				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101v [StatRossPMExFu - Roundabout (Site Folder: Interim - Sensitivity Analysis)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Cherry (Network Folder: Sensitivity - PM Peak)]

Station Road / Ross Watt Road
PM Peak, Existing Geometry, Future Volumes
Site Category: (None)
Roundabout
Design Life Analysis (Capacity): Results for 10 years

Lane Use and Performance

	Demand Flows [Total	HV]	Arrival Flows [Total	HV]	Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue [Veh	Dist]	Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: Station Road - South															
Lane 1 [d]	996	3.6	996	3.6	1304	0.764	100	5.9	LOS C	10.0	72.4	Full	165	0.0	0.0
Approach	996	3.6	996	3.6		0.764		5.9	LOS C	10.0	72.4				
North: Station Road - North															
Lane 1 [d]	999	3.9	999	3.9	1446	0.691	100	4.3	LOS B	9.6	69.3	Full	170	-14.2 [N3]	0.0
Lane 2	189	0.1	189	0.1	1196	0.158	100	9.7	LOS A	1.1	8.0	Short	80	0.0	NA
Approach	1188	3.3	1188	3.3		0.691		5.2	LOS B	9.6	69.3				
West: Ross Watt Road - West															
Lane 1 [d]	186	0.3	186	0.3	514	0.361	100	14.1	LOS A	3.0	20.9	Full	500	-6.1 [N3]	0.0
Approach	186	0.3	186	0.3		0.361		14.1	LOS A	3.0	20.9				
All Vehicles	2369	3.2	2369	3.2		0.764		6.2	LOS C	10.0	72.4				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

d Dominant lane on roundabout approach
N3 Capacity Adjustment due to downstream lane blockage determined by the program.

Approach Lane Flows (veh/h)

South: Station Road - South

Mov. From S To Exit:	L2 W	T1 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	127	868	996	3.6	1304	0.764	100	NA	NA
Approach	127	868	996	3.6		0.764			

North: Station Road - North

Mov. From N To Exit:	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	999	-	999	3.9	1446	0.691	100	NA	NA
Lane 2	-	189	189	0.1	1196	0.158	100	0.0	1

Approach	999	189	1188	3.3		0.691			
West: Ross Watt Road - West									
Mov. From W To Exit:	L2 N	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	113	73	186	0.3	514	0.361	100	NA	NA
Approach	113	73	186	0.3		0.361			

	Total	%HV	Deg.Satn (v/c)
All Vehicles	2369	3.2	0.764

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Station Road - South				
Lane 1	0.0	0.0	0.0	0.0
North: Station Road - North				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
West: Ross Watt Road - West				
Lane 1	0.0	0.0	0.0	0.0

PHASING SUMMARY

Site: 101v [StatCherPMExFu - Signals (Site Folder: Interim - Sensitivity Analysis)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Signals - Cherry (Network Folder: Sensitivity - PM Peak)]

Station Road / Cherry Lane
PM Peak, Existing Geometry, Future Volumes
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)
Design Life Analysis (Capacity): Results for 10 years

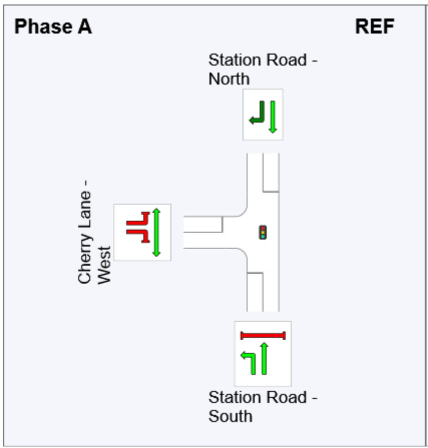
Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Downstream lane blockage effects included in determining phase times
Phase Sequence: Convert Function Default
Input Phase Sequence: A, B
Output Phase Sequence: A, B
Reference Phase: Phase A
Offset: NA

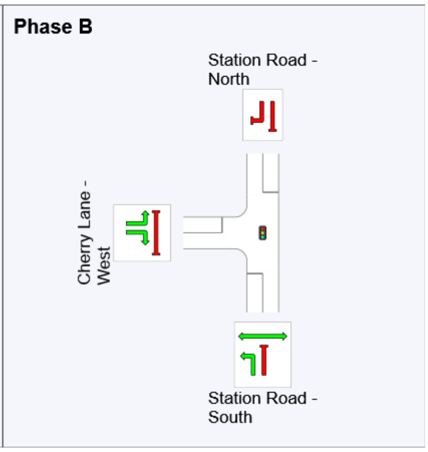
Phase Timing Summary

Phase	A	B
Phase Change Time (sec)	0	101
Green Time (sec)	95	13
Phase Time (sec)	101	19
Phase Split	84%	16%
Phase Frequency (%)	100.0	100.0

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence





REF: Reference Phase
VAR: Variable Phase

Normal Movement	Permitted/Opposed
Slip/Bypass-Lane Movement	Opposed Slip/Bypass-Lane
Stopped Movement	Turn On Red
Other Movement Class (MC) Running	Undetected Movement
Mixed Running & Stopped MCs	Continuous Movement
Other Movement Class (MC) Stopped	Phase Transition Applied