GTAconsultants

# Precinct 15, Altona North Integrated Transport Study

**Client //** Victorian Planning Authority
**Office //** VIC
**Reference //** V106380
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# Precinct 15

# Altona North

# Integrated Transport Study

Issue: A 02.12.2016

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# Executive Summary

GTA Consultants has been involved with the development of Precinct 15 over a number of years, and most recently was commissioned by the Victorian Planning Authority (VPA) in August 2016 to prepare an Integrated Transport Study to help guide the development of Precinct 15 from a transport planning and access perspective.

The development of the Integrated Transport Study has broadly occurred through the following steps:

i A **policy review** of relevant transport documents affecting how the area is proposed to develop into the future and what the desired transport network looks like.
ii A review of the **existing transport conditions** in the area to provide a baseline of conditions to use when assessing the likely impact of the proposal.
iii Interrogation of the **strategic transport modelling** by GHD of the Hobsons Bay area to identify the expected level of change in user demands on the transport network between existing conditions and 2031 with full development of Precinct 15.
iv A **traffic assessment** of the future conditions of the existing and proposed intersections to identify the required road network arrangements.
v Development of an **integrated transport response** for the site to suitably support all modes of transport and reduce the reliance on private car use in accessing the site, and proximate key trip destinations and interchanges.
vi Identification of the **mitigating and/or supporting works** that will be required to suitably support the development of Precinct 15 and its integration with the surrounding transport network.

It is anticipated that the analysis and findings from this Integrated Transport Study will be used to inform the design and management of the required transport infrastructure to support the proposed development of Precinct 15, as well as be used to proportion the cost and responsibility of their implementation.

## Policy Review

Encouraging the use of public transport, walking and cycling as modes of transport, and reducing the reliance on private car use to access employment opportunities and services, is central to achieving the aims of the various policy documents affecting the area and directing how it develops into the future.

Given that Precinct 15 is located in the municipality of Hobsons Bay, which is in the inner southwest of metropolitan Melbourne, it has strong linkages to various employment and services areas, which provides a prime opportunity to achieve the above core policy directives.

However, this does require a shift in thinking away from providing unbounded capacity for private motor vehicle use, towards facilities that help encourage the use of alternative transport modes. This is in part due to the constrained nature of the broader area Precinct 15 is located in and the expected continued population and industry growth in the west, which won't be able to be purely serviced through building additional road capacity.

## Existing Transport Conditions

In terms of the existing transport conditions in the area, the following has been identified:

- The majority of the surrounding land use is standalone residential dwellings, but the majority of new housing recently been constructed is semi-detached housing.

- Current residential population in the eastern half of Hobsons Bay is approximately 45,000, with in the order of 600 residents being added each year.
- Car ownership levels are below average in Hobsons Bay, with in the order of 1.5 cars per dwelling. There has been slight increase in the average car ownership rates even though car travel for work has been decreasing.
- Hobsons Bay has an average car mode split the same as for the whole of metropolitan Melbourne. As such, there is considered to be opportunity to achieve a shift towards alternative transport modes given its proximity to major employment and services areas, as well as the mass transit services within Hobsons Bay and which connect to Hobsons Bay.
- The crash history in the area is considered to be typical for the road volumes and intersection types. No specific existing significant safety issue has been identified.
- The subject site currently has a high reliance on private car use to access it, with limited alternative transport services directly connecting with it, except for two local bus routes that operate along Blackshaws Road. However, there is considered to be a potential to connect with the proximate alternative transport facilities and services, such as the Spotswood Train Station to the east, the bus interchange at Altona Gate to the west and the Federation Bike Trail to the north.

### Strategic Transport Modelling

The Integrated Transport Study has utilised and builds on the strategic modelling analysis completed by GHD for the Hobsons Bay City Council (HBCC) area during the first half of 2016. The strategic modelling analysis was completed to determine the long term capacity of the main corridors and the associated transport network within the municipality to support the anticipated levels of future development in the area (referred to as the Cumulative Impact Assessment, or CIA).

The CIA modelling was completed using an extract of the Victorian Integrated Transport Model (VITM), which is a tool developed and maintained by the Department of Economic Development, Jobs, Transport and Resources (DEDJTR) to assist in the planning of road and public transport infrastructure in Victoria.

The extracted CIA Model extent from VITM was calibrated and validated to 2015 conditions. Against validation criteria specified in the VicRoads Transport Modelling Guidelines, the 2015 CIA Model outputs were found to be within acceptable tolerances, and so the model is considered to be fit-for-purpose.

The strategic level analysis undertaken through the CIA Model found that most of the increases in traffic volumes on the local road network would be on Blackshaws Road and other proximate roads to each development site.

It is noted that there is expected to only be relatively small increases in overall traffic volumes on Millars Road and Melbourne Road following full development of the subject site and other expected background growth.

The reason that only minor increases in traffic volumes are expected on the arterial roads is that as more people live in the study area the CIA Model expected that a higher proportion of people will use alternative transport modes during peak traffic periods. This is because the use of the alternative transport modes as the road network becomes more congested will become more attractive, especially from a travel time perspective, i.e. commuters will find it quicker to travel by alternative transport modes than driving a car during these peak times to the north of the West Gate Freeway and/or east of the Yarra River.

## Traffic Assessment & Mitigating Road Work

A traffic assessment has been undertaken to understand how the road network used to access Precinct 15 currently operates and is expected to operate in the future.

In order to consider the operation of the connecting road network today and in the future, the following key activities have been undertaken:

- Collected existing conditions traffic data of the key intersections
- Prepared existing conditions SIDRA Models for the key intersections
- Reviewed the CIA modelling analysis for the future traffic conditions for the area and identified the percentage increases on each link connected to the key intersections
- Applied the percentage changes on each link to determine the future turning movement volumes at each of the key intersections
- Assessed the future traffic conditions at the key intersections through the SIDRA Models
- Identified mitigating works to support the proposed development of Precinct 15.

On this basis, it is considered that the anticipated traffic generated by the proposed rezoning and development of Precinct 15 can be accommodated by the surrounding road network following full development of the site and other expected background development in the area until 2031, subject to the following mitigating road works to the existing road infrastructure:

- At the Millers Road / Blackshaws Road signalised intersection:
    - Extend the right-turn lane on the east approach of the intersection by 240m to 300m through modification to road markings and introduction of parking restrictions that at least restricts kerbside parking during the commuter peaks.
    - Convert the through lane on the east approach of the intersection to a through and right turn lane by modifying the directional arrow markings.
    - Modify the intersection phasing to have a split phasing for the east and west approaches.
- Increase the lengths of 'No Stopping' parking restrictions and install line marked right turn lanes on Blackshaws Road at the unsignalised intersections with Schutt Street, New Street and Hansen Street.

It will be necessary to install traffic signals at the two new site access intersections on Blackshaws Road associated with the connector streets. The approaches to these signalised intersections from within the site require two approaches lanes for 80m that are clear of intersections, property access points and kerbside parking.

Additionally, the internal road network layout should provide specific crossing facilities to support the separated bicycle facilities on one side of the connector streets.

## Integrated Transport Response & Supporting Facilities

While the CIA Model assumes a high reliance on private car use and the traffic analysis has considered the resulting traffic volumes, it is recommended that people should be encouraged to use alternative transport modes to access the site. As such, a higher proportion of alternative transport use is being aimed for, which is more similar to the proportion currently achieved in Maribyrnong.

On this basis, the following mode split targets are being aimed for as part of Precinct 15:

- Car / Truck Driver = 53%
- Car Passenger = 24%
- Public Transport = 18%

- Active Transport = 5%.

In order to achieve these aspirational mode split targets in 2031 for Precinct 15, the following supporting facilities are proposed:

- Pedestrian crossing facilities on most approaches to the two proposed signalised intersections along Blackshaws Road.
- A shared path connection to the Federation Trail along the southwest side of the freight line from Watson Street.
- Mixed traffic bicycle facilities along the length of Cyclamen Avenue, and supporting crossing treatments of Kyle Road and Millers Road.
- Mixed traffic bicycle facilities along the length of Aloha Street, and supporting crossing treatments of New Street and Stephenson Street.
- On-road bicycle lanes on The Broadway between Blackshaws Road and Hansen Street with mixed traffic bicycle facilities through the roundabout intersections.
- Advocate for a local bus route service through Precinct 15 that connects with Spotswood Station.
- Detectors in up or down stream bus stops of the proposed signalised intersections on Blackshaws Road and as part of the re-programming of the Millers Road / Blackshaws Road intersection.
- Advocate for in lane bus stops on local roads, which will also provide a local area traffic calming measure.

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# 1. Introduction



## 1.1 Background & Context

Amendment C33 to the Hobsons Bay Planning Scheme was prepared in 2007 and approved on 23 December 2008. It forms part of a review of the Industrial Land Management Strategy and Industrial Development Design Guidelines for a number of Strategic Redevelopment Areas where rezoning from industrial use is likely to occur within the municipality.

One of these areas is Precinct 15, which is an irregularly shaped piece of land located in Altona North and generally bound by Blackshaws Road to the south, New Street to the east, West Gate Freeway to the north and Kyle Road to the west.

Approval is now being sought for a Comprehensive Development Plan to guide the development and future use of Precinct 15. This is proposed to generally consist of its rezoning from an industrial use to a predominately residential use. The proposed development is likely to incorporate 3,000 dwellings and a mixed use area, including the potential for a neighbourhood activity centre of up to 5,550sqm of retail floor space.

GTA Consultants has been involved with the development of Precinct 15 over a number of years, and most recently was commissioned by the Victorian Planning Authority (VPA) in August 2016 to prepare an Integrated Transport Study to help guide the development of Precinct 15 from a transport planning and access perspective.

## 1.2 Purpose of this Report

This report sets out an integrated transport assessment of the anticipated transport implications of the proposed rezoning and development of Precinct 15, and its integration with the existing surrounding transport network, including consideration of the:

i existing transport network conditions surrounding the site
ii accessibility of the site by public and active transport modes
iii existing and future public transport facilities and provisions
iv existing and future bicycle and walking facilities and provisions
v proposed internal transport network and integration with the surrounding transport network
vi impact of the development proposal on the surrounding transport network
vii development of an integrated transport access approach for the site
viii identification of the transport infrastructure and services required to support the access demands of the site in context of its location.

The assessment also compares the development against the relevant sections of Clause 56 of the Hobsons Bay Planning Scheme.

## 1.3 Assessment Methodology

The development of the Integrated Transport Study has broadly occurred through the following steps, with a summary of the results presented in this report:

i A **policy review** of relevant transport documents affecting how the area is proposed to develop into the future and what the desired transport network looks like.

ii A review of the **existing transport conditions** in the area to provide a baseline of conditions to use when assessing the likely impact of the proposal.

iii Interrogation of the **strategic transport modelling** by GHD of the Hobsons Bay area to identify the expected level of change in user demands on the transport network between existing conditions and 2031 with full development of Precinct 15.

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v Development of an **integrated transport response** for the site to suitably support all modes of transport and reduce the reliance on private car use in accessing the site, and proximate key trip destinations and interchanges.

vi Identification of the **mitigating and/or supporting works** that will be required to suitably support the development of Precinct 15 and its integration with the surrounding transport network.

It is anticipated that the analysis and findings from this Integrated Transport Study will be used to inform the design and management of the required transport infrastructure to support the proposed development of Precinct 15, as well as be used to proportion the cost and responsibility of their implementation.

## 1.4 References

In preparing this report, a number of references have been made, including:

- Hobsons Bay Planning Scheme
- Plans for the proposed draft Comprehensive Development Plan prepared by VPA
- traffic surveys undertaken by GTA Consultants as referenced in the context of this report
- 'Without Prejudice comments on GTA Structure Plan assessment (Draft)' issued by Hobsons Bay City Council, dated 24/08/12
- 'Amendment C88, Precinct 15, Altona North, Request for Further Information', dated October 2015, issued by Hobsons Bay City Council
- reports prepared by GTA Consultants for the Precinct 15 / Caltex site
- Strategic modelling reports by GHD for the Hobsons Bay area
- various technical data as referenced in this report
- an inspection of the site and its surrounds
- other documents as nominated.

# 2. Transport Policy



## 2.1 Policy Review

There are a number of key State and Local Government policy documents applicable to the subject land which provide guidance on appropriate land use and development, as well as the transport facilities that are proposed to support the anticipated development and what the desired transport network will look like in the future.

In this regard, a review of the following State and Local Government documents has been undertaken to inform the Integrated Transport Study for Precinct 15:

- Transport Integration Act
- Plan Melbourne (Refresh)
- SmartRoads Policy
- State and Local Planning Policy Frameworks
- Western Transport Strategy
- Hobsons Bay Integrated Transport Strategy
- Hobsons Bay Strategic Bicycle Plan
- Cumulative Impact Assessment of Hobsons Bay.

These documents are discussed in the below sections, with consideration as to how they affect or should be applied to the development of Precinct 15.

### 2.1.1 Transport Integration Act

The Transport Integration Act is the primary transport statute for Victoria, and has caused significant change to the way transport and land use authorities make decisions and work together. The Act enshrines a triple bottom line approach to decision making about transport and land use matters.

The Act requires that all transport agencies work together to achieve an integrated and sustainable transport system, and that land use agencies such as the DEDJTR take account of transport issues in land use decisions. The Act has been effective to date in changing the focus of organisations that traditionally only considered a single transport mode.

The Act:

- *unifies all elements of the transport portfolio to ensure that transport agencies work together towards the common goal of an integrated transport system*
- *provides a framework for integrated and sustainable transport policy and operations*
- *recognises that the transport system should be conceived and planned as a single system performing multiple tasks rather than separate transport modes*
- *integrates land use and transport planning and decision-making by extending the framework to land use agencies whose decisions can significantly impact on transport ("interface bodies")*
- *re-constitutes transport agencies and aligns their charters to make them consistent with the framework.*

The Act forms an overarching legislative framework for transport related state planning policy decisions and has been integrated within the Victorian Planning Provisions (VPP).

### 2.1.2 Plan Melbourne (Refresh)

The Victorian Government released the Metropolitan Planning Strategy, Plan Melbourne (The Plan) on 20 May 2014. The Plan was intended to guide Melbourne's housing, commercial and industrial development through to 2050.

The current State Government is in the process of updating The Plan (Refresh). It has prepared a discussion paper, which it has been using to consult with relevant stakeholders and identify any key changes to The Plan. However, except for any of the specific changes identified in the Refresh, the current Metropolitan Planning Strategy is relevant and to be used to understand how development is expected to occur into the future.

The Plan includes the following key concepts to cater for the anticipated population growth:

i delivering a new 'integrated economic triangle', connecting key employment clusters, industrial precincts and economic gateways
ii protecting the suburbs by delivering density in defined locations
iii strengthening regional cities – distributing future growth to benefit all of Victoria (regional projects)
iv delivering a pipeline of large scale, city shaping infrastructure and urban renewal projects
v better use of existing assets, including increasing efficiency of road based transport and transport – land use integration
vi 20 minute neighbourhoods - places where people have access to local shops, schools, parks, jobs and a range of community services within 20 minutes of their home.

The Plan is underpinned by seven objectives and a range of supporting actions. The delivery of The Plan is a central focus of the VPA, which was created in October 2013 alongside the release of the draft Strategy.

The Plan identifies the following transport initiatives proximate to Precinct 15 that are considered relevant in its development:

- Altona North, Williamstown and Altona are identified as Activity Centres, which are located approximately 800m west, 4km southeast and 5km southwest respectively of the site. Therefore, the site is located within the vicinity of a range of employment opportunities and services.
- Investigation is to be undertaken of the potential of ferry berth locations at Altona and Williamstown.
- The Regional Rail Link has been constructed, which removed the regional rail services from the Williamstown and Werribee lines. This will allow additional metropolitan services to operate on these lines.

The Refresh identifies the following additional transport initiatives proximate to Precinct 15 that are considered relevant in its development:

- A total of 50 level crossings are to be removed, which includes the Ferguson Street crossing in Williamstown and the Kororoit Creek Road crossing in Williamstown North.
- The Western Distributor project is to provide a second river crossing and reduce heavy vehicle volumes in local residential areas to the west of the Port of Melbourne.

The main purpose of the above initiatives and many others in The Plan and the Refresh are to improve access to employment and services (20-minute city). This is generally proposed through better alternative transport facilities to reduce the reliance on private motor vehicles, and locating populations closer to their intended trip destinations through urban infill and increased densification in specific areas (i.e. close to transport nodes and/or activity centres), both of which can be expected to improve the efficiency and sustainability of the transport network to better integrate the ever increasing population to where they want to be and do things.

### 2.1.3 SmartRoads Policy

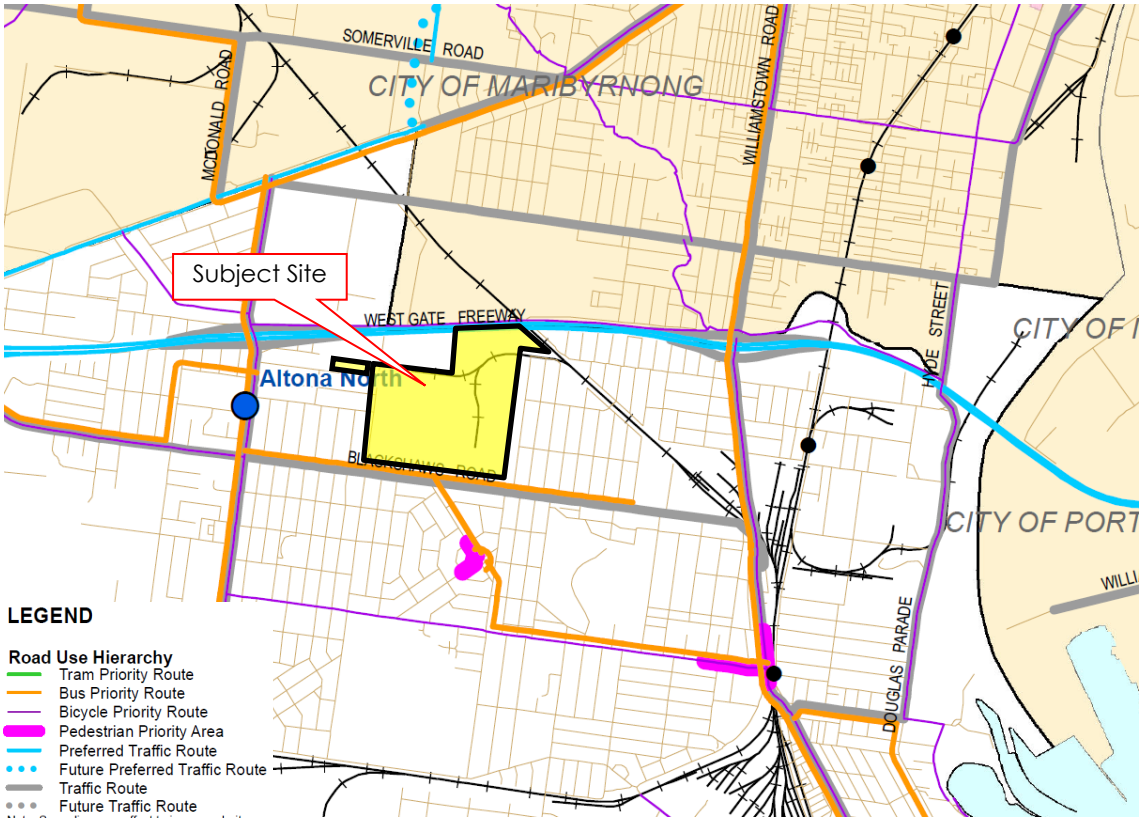
SmartRoads is a VicRoads policy which sets strategic 'modal' priorities on the road network and underpins many of the strategies significant to the operational directions that support broader strategies around land use and transport.

*"There is no single solution to managing congestion on our roads. Sustainable management of congestion will require an integrated approach involving better management of the existing network, building new infrastructure, visionary land use planning, encouraging sustainable transport modes, and changes in behaviour by individuals, businesses and government."*

All road users will continue to have access to all roads. However, certain routes will be managed to work better for cars while others for public transport, cyclists and pedestrians during the various peak and off-peak periods.

The VicRoads SmartRoads Network Operating Plan for the area surrounding the subject site has been reproduced in Figure 2.1.

**Figure 2.1: VicRoads SmartRoads Network Operating Plan – City of Hobsons Bay**




Source: VicRoads Website

Figure 2.1 illustrates the following arterial road network priorities in the area:

- West Gate Freeway is nominated as a Preferred Traffic Route
- Blackshaws Road, Millers Road and Melbourne Road (Williamstown Road) are nominated as Other Traffic/Bus Priority Routes
- The Broadway, Hansen Street and Mason Street make up a nominated Bus Priority Route between Blackshaws Road and Melbourne Road
- The Federation Trail on the north side of the West Gate Freeway, Mason Street, Millers Road and Melbourne Road are nominated as Bicycle Priority Routes.

### 2.1.4 State Planning Policy Framework

The State Planning Policy Framework contained within Clause 18 of the Hobsons Bay Planning Scheme sets out a range of objectives and implementation strategies to guide development within the entire State. Embedded within the Framework are a range of policies with the overall objective to increase the facilitation and integration of more sustainable transportation. For example:

**Clause 18.01-1:**

Objective:

*To create a safe and sustainable transport system by integrating land-use and transport.*

Strategy:

*Develop transport networks to support employment corridors that allow circumferential and radial movements.*

*Plan urban development to make jobs and community services more accessible by:*

- *Ensuring access is provided to developments in accordance with forecast demand, taking advantage of all available modes of transport and to minimise adverse impacts on existing transport networks and the amenity of surrounding areas.*
- *Coordinating improvements to public transport, walking and cycling networks with the ongoing development and redevelopment of the urban area.*
- *Concentrating key trip generators such as higher density residential development in and around Central Activities Districts, Principle, Major and Specialised Activity Centres on the Principle Public Transport Network.*
- *Requiring integrated transport plans to be prepared for all new major residential, commercial and industrial developments.*
- *Requiring the substantial increases in activity in employment corridors are connected to the Principle Public Transport Network.*
- *Providing routing, bus stop and interchange arrangements for public transport services in new development areas.*
- *Providing safe, convenient and direct pedestrian and cycling access to activity centres, public transport interchanges and other strategic redevelopment sites.*
- *Integrate public transport services and infrastructure into new development.*

**Clause 18.02-1:**

Objective:

*To promote the use of sustainable personal transport.*

Strategy:

- *Encourage the use of walking and cycling by creating environments that are safe and attractive.*
- *Develop high quality pedestrian environments that are accessible to footpath-bound vehicles such as wheelchairs, prams and scooters.*
- *Ensure development provides opportunities to create more sustainable transport options such as walking, cycling and public transport.*
- *Ensure cycling routes and infrastructure are constructed early in new developments.*

The proposed development of Precinct 15 represents a prime opportunity to promote the visions of State Planning Policy, by encouraging mixed use development and the use of more sustainable forms of transport through the provision of suitable facilities within and integrating the site with the surrounding transport network.

### 2.1.5 Local Planning Policy Framework

The Local Planning Policy Framework contained within Clause 21.09 of the Hobsons Bay Planning Scheme sets out a range of objectives and implementation strategies to guide development with a more local focus within Hobsons Bay.

The Clause sets out a number of Transport and Mobility objectives, as follows:

- *To provide access to, through and within the municipality by all modes of transport, including waling, cycling, public transport and private and commercial vehicles.*
- *To protect residential and other sensitive land uses from the adverse effects of vehicular traffic.*
- *To support increased use of public transport and an efficient network.*

Again, and as outlined above, Precinct 15 represents a prime opportunity to promote the visions of Local Planning Policy, by encouraging mixed use development and the use of more sustainable forms of transport through the provision of suitable facilities within the site, and integrating with the existing public and active transport facilities and services in the area.

### 2.1.6 Western Transport Strategy (2012)

The following Councils and other strategic transport partners in western Metropolitan Melbourne have formed LeadWest and the Western Transport Alliance:

- Brimbank City Council
- Hobsons Bay City Council
- Maribyrnong City Council
- Melbourne City Council
- Moonee Valley City Council
- Wyndham City Council
- Melton Shire Council
- Department Of Transport
- Office of Public Transport (Department of Infrastructure)
- VicRoads
- FCL Interstate Transport Services Pty Ltd
- Leadwest
- Martrans Company
- P & O Ports Ltd
- Patrick Logistics
- Port of Melbourne Corporation
- Queensland Rail
- RACV
- Toll Group
- Transport Workers Union
- Victorian Transport Association

The purpose of LeadWest and the Western Transport Alliance is to advocate for improved services and infrastructure to help support sustainable growth and regional development in Melbourne's west.

To help provide a basis for specific transport initiatives in the west, LeadWest and the Western Transport Alliance engaged AECOM in 2012 to prepare a transport strategy for the western region of Melbourne to manage the anticipated major population and industrial growth. The strategy identified a number of principal issues that will need to be addressed, which it proposed to be achieved through the implementation of the vision for the region, the six strategic objectives, and the suite of projects set out below.

**Vision:**

*"A liveable, productive and prosperous community, whose nationally significant economic and sustainable growth capabilities are strengthened and supported by its integrated transport system.*

**Strategic Objectives:**

- *Economic Development: Promote opportunities for transport to support sustainable economic prosperity for the region*
- *Competitive Positioning: Sustain and develop the region's competitive advantages through the design of the transport network*
- *Access to Employment: Increase accessibility to employment and opportunities in the region to facilitate better management of travel demand*
- *Impact Reduction: Reduce the adverse impacts from transport operations on the region*
- *Resilient Alternatives: Provide improved transport alternatives to address changing transport demands resulting from changes in land use and demographics*
- *Freight: Develop an integrated freight system for the region*

**Suite of Projects:**

- *East West Link (Western Section)*
- *SmartRoads Growth Area Plan*
- *Managed Motorways on the Region's freeway system*
- *Growth area arterial roads – corridor upgrades*
- *Activity centre arterial road / rail grade separations*
- *Seven Transit Network Development packages:*
    - Upgrading existing premium routes
    - Regional Rail Link package
    - Melbourne Metro / Melbourne Airport Rail Link package
    - West Gate Freeway Bus Rapid Transit package
    - Melton Rail Upgrade package
    - Avalon Airport Rail Link
    - Second CBD Rail Corridor Planning
- *Bay West Port Study*
- *Principle Freight Networks*
- *Western Freight Activity Centre*
- *Outer Metropolitan Ring Transport Corridor*
- *Cycling Network Development*

### 2.1.7 Hobsons Bay Integrated Transport Strategy

Hobsons Bay City Council is currently preparing an updated Integrated Transport Strategy (ITS) to the one that was prepared and adopted in 2006. Since 2006 a lot has happened, including the preparation of the Hobsons Bay Community Health and Wellbeing Plan and Council Plan in 2013.

It is understood that the updated ITS aims to create an integrated approach to transport and land use development across Hobsons Bay, as required under the Integrated Transport Act. This is expected to be achieved through a 'one network' approach that addresses the following key issues identified through consultation with the local community:

- Access to transport
- Modal issues
- Existing service issues associated with public transport
- Safety issues
- Management issues between authorities
- Land use intensification transport issues.

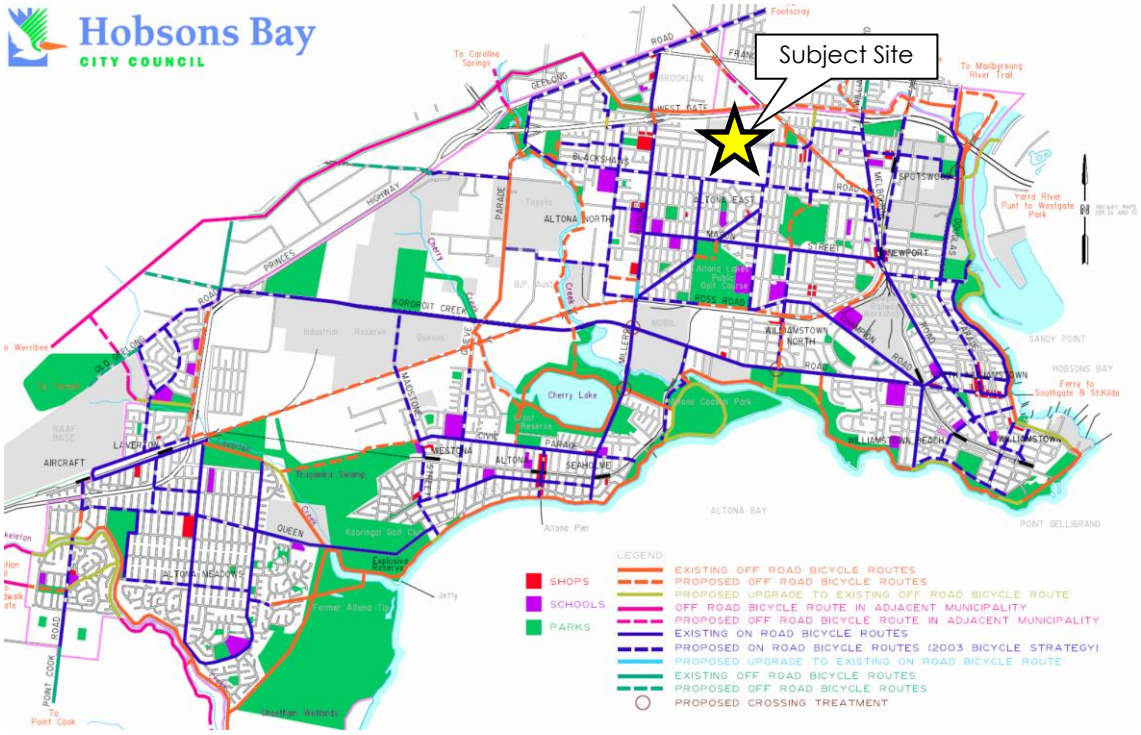
While no specific details around how the above issues are proposed to be resolved through the updated ITS, it is important to consider how they relate and being addressed through the development of Precinct 15.

### 2.1.8 Hobsons Bay Strategic Bicycle Plan (draft)

A draft Hobsons Bay Strategic Bicycle Plan was developed in 2012. While the draft has not been formally adopted by Council it does set out a proposed network to move towards.

The proposed bicycle network plan in the draft Strategic Bicycle Plan is presented in Figure 2.2.

**Figure 2.2: Draft Hobsons Bay Strategic Bicycle Plan – Proposed Bicycle Network**




Source: Hobsons Bay City Council Website

Based on Figure 2.2 there is limited and disjointed sections of bicycle facilities provided across the municipality of Hobsons Bay, with many missing links proposed to achieve a complete network. However, the key facilities of significant length that currently exist proximate to the site include the following:

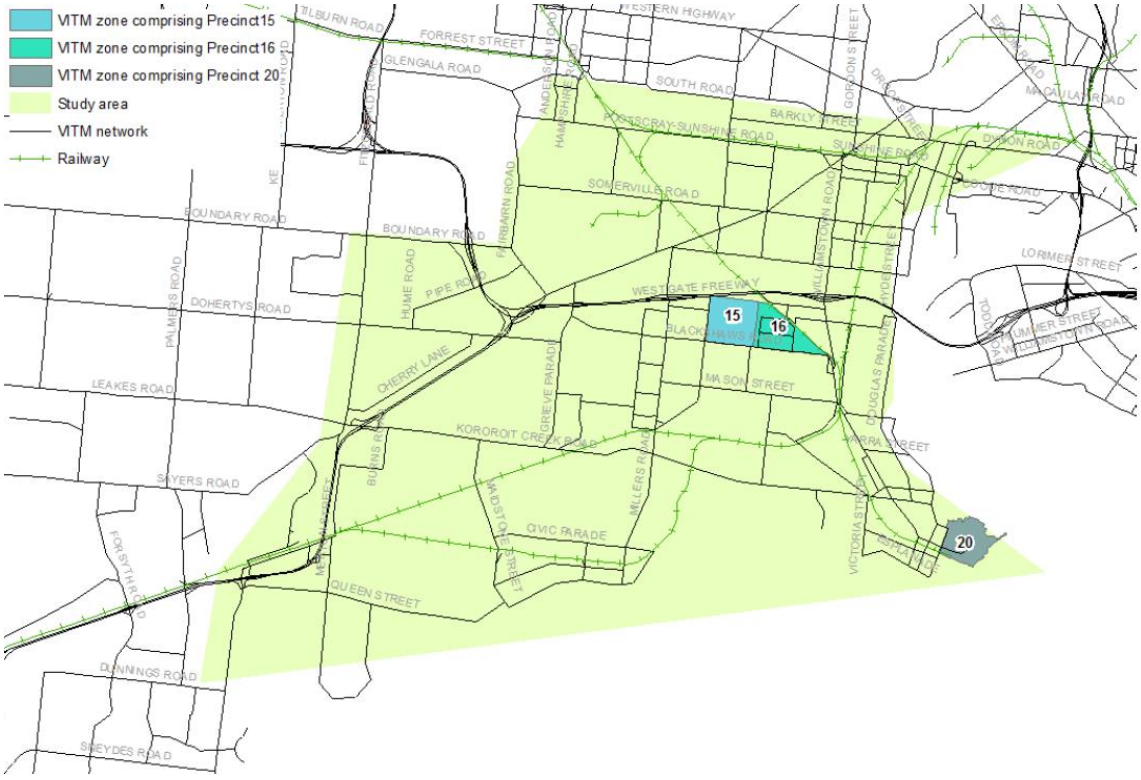
- Federation Trail on the north side of the West Gate Freeway west of the freight line
- Bay Trail West along the west side of the Yarra and along the south side of the coastline
- On-road bicycle shoulder lanes on Douglas Parade
- On-road bicycle lanes on Mason Street
- On-road bicycle lanes on Kororoit Creek Road.

It is noted that on-road bicycle facilities are indicated on Millers Road and Melbourne Road. However, on-road facilities on these roads would not be consistent with Figure 2.2 of the Cycling Aspects of Austroads Guides (2014), so wouldn't be considered suitable for the vast majority of potential users. It is also noted that on-road bicycle facilities exist on Mills Street, but these are through wide parking lanes, which do not allocate suitable road space for cyclists and encourage them to be hard-up against parked vehicles.

### 2.1.9 Cumulative Impact Assessment

Hobsons Bay City Council and VicRoads engaged GHD in 2016 to undertake a strategic modelling analysis of the area indicated in Figure 2.3, which is the eastern half of Hobsons Bay (referred to as the Cumulative Impact Assessment, or CIA).

**Figure 2.3: CIA Model Extent**




Source: Figure 1 from the CIA Final Transport Modelling Report, July 2016

The CIA modelling was completed using an extract of the Victorian Integrated Transport Model (VITM), which is a tool developed and maintained by the Department of Economic Development, Jobs, Transport and Resources (DEDJTR) to assist in the planning of road and public transport infrastructure in Victoria.

The extracted CIA Model extent from VITM was calibrated and validated to 2015 conditions. Against validation criteria specified in the VicRoads Transport Modelling Guidelines, the 2015 CIA Model outputs were found to be within acceptable tolerances, and so the model is considered to be fit-for-purpose.

While this doesn't mean the CIA Model is perfectly accurate, it is suitable for the purpose of understanding the long term capacity of the main corridors and the associated transport network within the municipality to support the anticipated levels of future development in the area.

The following development precincts were assessed as part of the CIA Modelling in the context of the other growth and transport infrastructure improvements anticipated in the future VITM years affecting the study area:

- Altona North Precinct (Precinct 15 / Subject Site) (former Don Smallgoods site)
- The former Caltex Terminal, South Kingsville (Precinct 16)
- The remainder of the precinct around the former Caltex Terminal, South Kingsville (Precinct 16)
- Former Port Phillip Woollen Mills - 57 Nelson Place, Williamstown (Precinct 20).

The key findings of the CIA Modelling with the full development of the above development sites, and the other growth and transport infrastructure improvements anticipated in the future 2031VITM year model were the following:

- Most of the increase in traffic volumes due to the development would be on Blackshaws Road and other roads around the precinct.
- The development would have a minor impact on the traffic in the most of the road network in Hobsons Bay.
- The development would have some impact on congestion levels, namely at the following locations:
    - Melbourne Road south of West Gate Freeway
    - Melbourne Road south of Ferguson Street
    - Blackshaws Road near the junction with Melbourne Road
    - Blackshaws Road west of Mills Street.
- Millers Road south of West Gate Freeway would remain congested with or without the full development of the precincts.
- The following mitigation measures are expected to manage congestion resulting from the development of the precincts:
    - Capacity upgrades on Blackshaws Road near the junction with Melbourne Road
    - Capacity upgrades on Melbourne Road between Parker Street and Ferguson Street.
- There is considered to be a need to undertake Mesoscopic Modelling of the following:
    - West Gate Freeway interchanges between Williamstown Road and the Western Ring Road to fulling understand the metered arrangements
    - Local projects of interest that are proposed to support the development of the precincts.
- Calibration of the Freight Movement Model is also recommended, which is an input to the CIA Modelling.

## 2.2 Transport Policy Discussion

Encouraging the use of public transport, walking and cycling as modes of transport, and reducing the reliance on private car use to access employment opportunities and services, is central to achieving the aims of the various policy documents affecting the area and directing how it develops into the future.

Given that Precinct 15 is located in the municipality of Hobsons Bay, which is in the inner southwest of metropolitan Melbourne, it has strong linkages to the following employment and services areas, which provides a prime opportunity to achieve the above core policy directives:

- Melbourne CBD
- Supply chain and logistic activities associated with the Port of Melbourne
- Broader industrial activities in the west
- State significant activity centres of Altona, Williamstown and Altona North.

However, this does require a bit of a shift in thinking away from providing unbounded capacity for private motor vehicle use, towards facilities that help encourage the use of alternative transport modes. This is in part due to the constrained nature of the broader area Precinct 15 is located in and the expected continued population and industry growth in the west, which won't be able to be purely serviced through building additional road capacity.

This is best identified through consideration of the following distinctive boundaries or barriers to the broader area Precinct 15 is located in:

- Yarra River to the east
- Port Phillip Bay to the south
- Kororoit Creek to the west
- West Gate Freeway to the north.

Each of these boundaries or barriers limit the access opportunities to the area, and only significant infrastructure projects will help increase road capacity to the overall area.

This has been well considered by the Victorian Auditor General in a report released on Managing Traffic Congestion (April 2013). Most importantly, the report notes that in recent times:

*"Congestion management strategies remain heavily weighted towards the supply side with little attention to demand management. Continuing this approach poses a significant risk for achieving any congestion reduction benefits."*

The report goes on to note:

*"The state's increasingly constrained finances, coupled with significant population growth projected for Melbourne, indicates that an approach that ignores demand management is unsustainable. This warrants greater attention by transport agencies to address the demand-side factors contributing to congestion. Such strategies have been successful in alleviating congestion in other jurisdictions."*

As such, a focus for the area and development of Precinct 15 should be to encourage shorter trips to local employment opportunities and services through more space efficient transport modes like public and active transport, but at the same time suppress (or at least not actively encourage) the less efficient modes like private car use to access further afield locations during peak demand periods, such as the commuter peaks.

This approach is broadly consistent with the policy documents affecting the area and directing how it develops into the future, and is proposed to be generally applied as part of the Integrated Transport Study for Precinct 15.

# 3. Existing Conditions



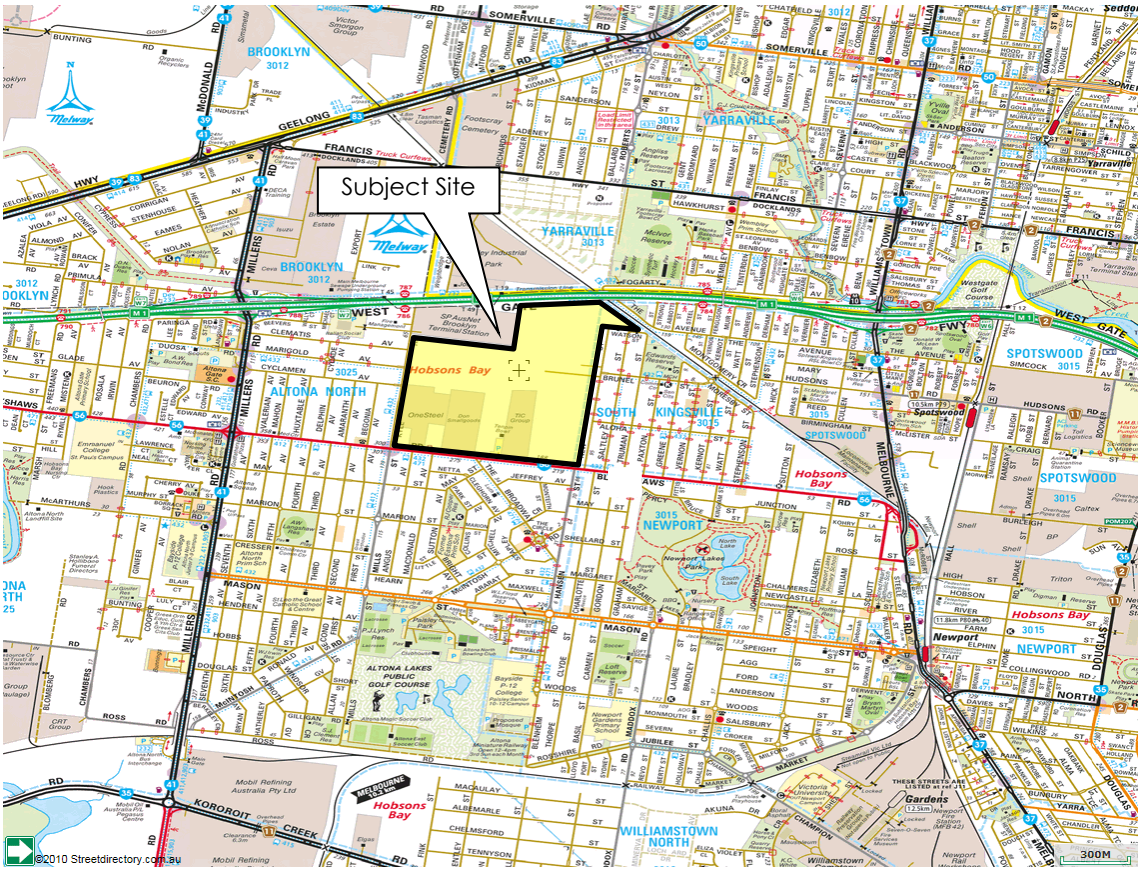
## 3.1 Subject Site & Land Use

The Altona North Precinct (Precinct 15) is located in Altona North and generally bound by Blackshaws Road to the south, New Street to the east, West Gate Freeway to the north and Kyle Road to the west. The site of approximately 67ha is irregular in shape and has frontages of 850m to Blackshaws Road, 640m to Kyle Road, 360m to West Gate Freeway, 190m to the freight rail line, 130m to Watson Street and 810m to New Street.

The site currently consists of a mix of large and small lots under a variety of ownerships, and is contained within Industrial 1 and 3 Zones (IN1Z & IN3Z). There is an SP Austnet Power substation located to the northwest of the site, with the surrounding land uses generally consisting of residential uses to the east, south and west, and industrial land uses to the north.

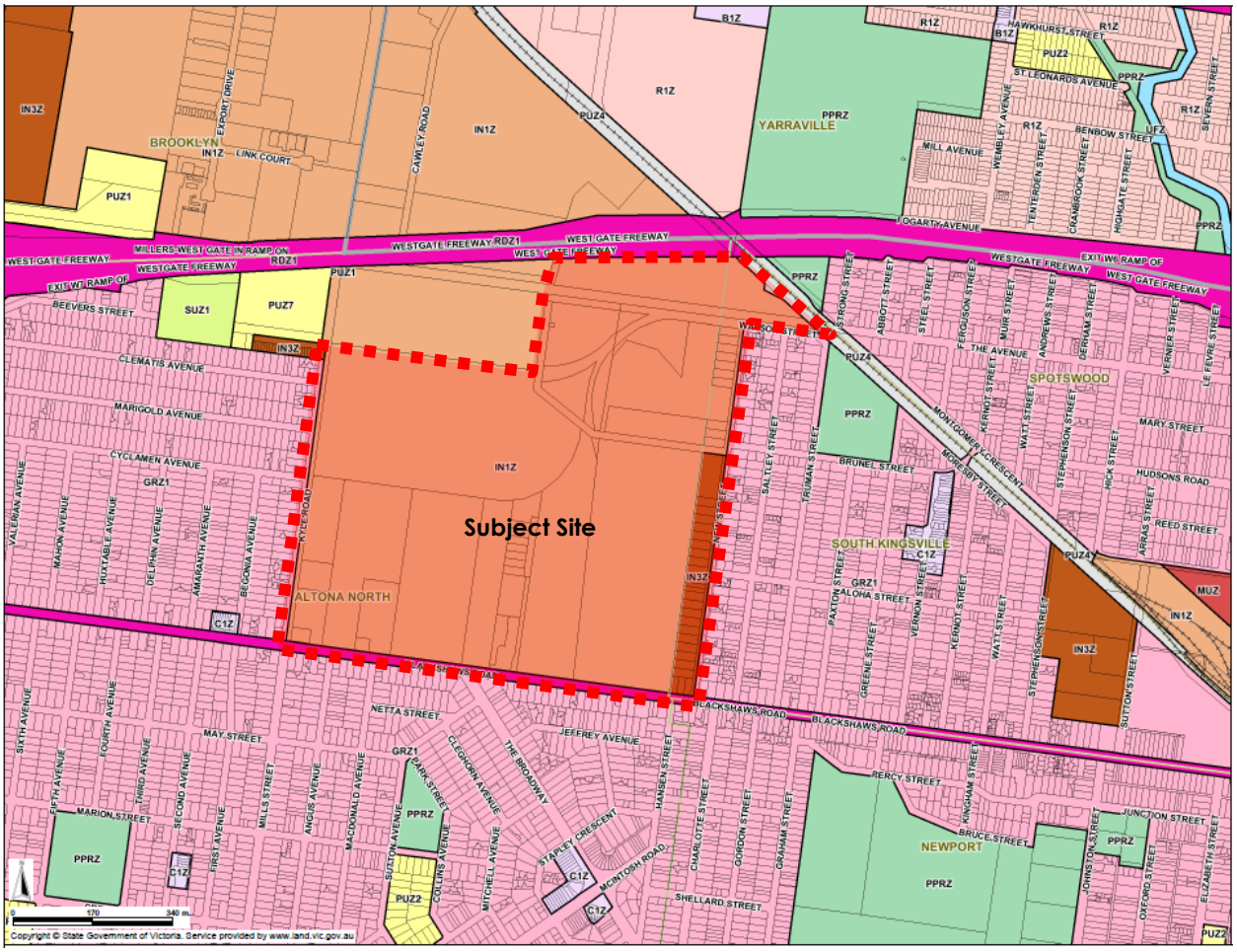
The location of the subject site and the surrounding environs is shown in Figure 3.1, and the land zoning is shown in Figure 3.2.

**Figure 3.1: Subject Site and its Environs**




(Reproduced with Permission from Melway Publishing Pty Ltd September 2014)

**Figure 3.2: Land Zoning Map**



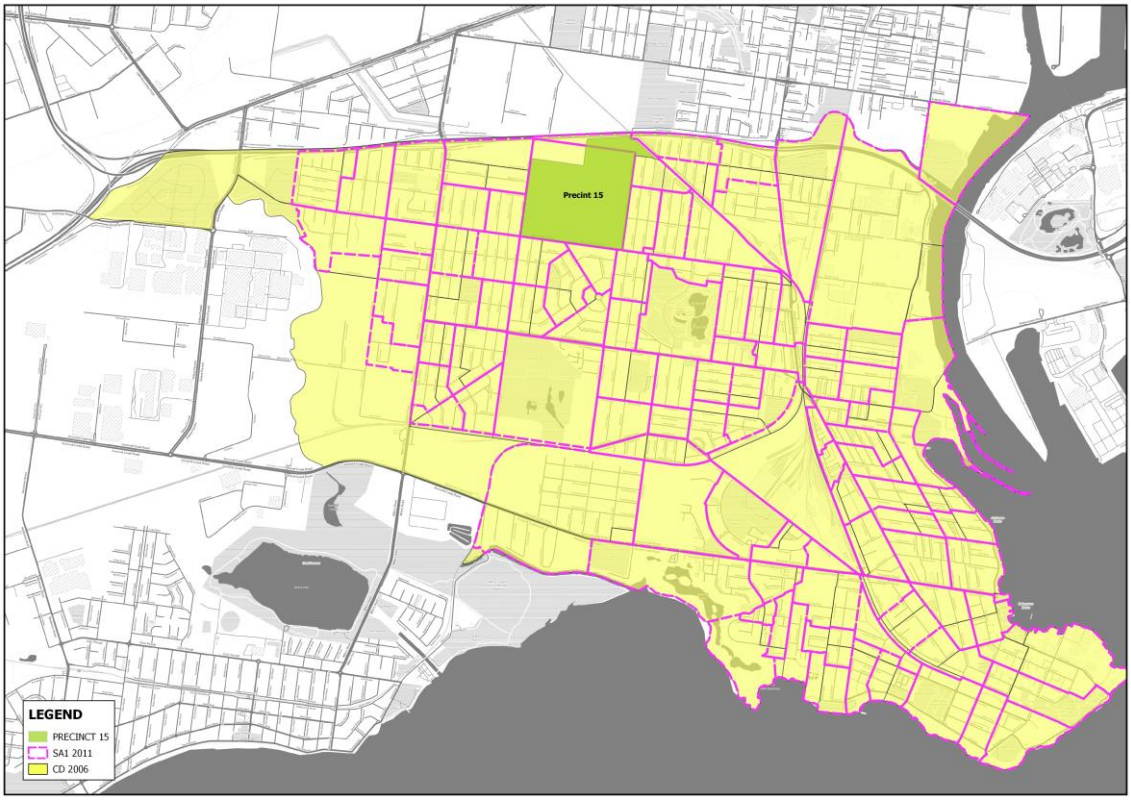

(Reproduced from Land Channel web site September 2014)

## 3.2 Population, Dwelling Mix & Car Ownership

The predominant land use in the area surrounding Precinct 15 is residential and the site is proposed to be predominantly developed with residential uses. Therefore, details of the current residential population, dwelling mix and car ownership rates have been obtained from ABS data from 2006 and 2011 for the area generally bound by the Yarra River to the east, Port Phillip Bay to the south, Kororoit Creek to the west and the West Gate Freeway to the north.

The associated area the ABS data has been collected for is shown in Figure 3.3, with the population and dwelling type information provided in Table 3.1, and car ownership rates in Table 3.2.

**Figure 3.3: ABS Data Collection Extent**




## 3.2.1 Population and Dwelling Mix

**Table 3.1: 2006 to 2011 Population and Dwelling Type Data**

| Data Type | 2006 | 2011 | Difference |
|---|---|---|---|
| Population | 40,254 | 42,297 | +2,043 (5.1%) |
| Separate House | 12,141 | 12,171 | +30 (0.2%) |
| Semi-Detached Dwelling | 2,729 | 3,437 | +708 (25.9%) |
| Flat, Unit or Apartment in a Block | 2,096 | 2,176 | +80 (3.8%) |
| Other [1] | 258 | 209 | -49 (-19.0%) |
| **Total Dwellings** | **17,224** | **17,993** | **+769 (4.5%)** |

Source: ABS Census Data 2006 and 2011.

[1] Includes 'Flat, unit or apartment attached to a house', 'caravan, cabin, houseboat' and 'house or flat attached to a shop, office, etc.'

Based on the 2011 ABS data there were in the order of 42,300 residents in the eastern half of Hobsons Bay (as shown in Figure 3.3). From 2006 there was an increase in the order of 5%, which if continued through to 2016 would mean there are currently in the order of 45,000 residents in the same area.

With regard to the dwelling mix, the majority of the housing stock is separate houses, with 67.6% of dwellings in 2011. Between 2006 and 2011 there was an increase of 4.5% in the number of houses, which is marginally less than the rate of population increases. Therefore, more people are living in each dwelling. The majority of the increase in dwelling numbers has come through the increase of semi-detached dwellings, with 92.1% of the overall increase. This indicates an increase in dwelling densification in the area away from separate hoses, which is consistent with many inner metropolitan locations and is expected to continue in the future.

### 3.2.2 Car Ownership Rates

The rate of car ownership for various dwelling types is presented in Table 3.2 for the eastern half of Hobsons Bay (as shown in Figure 3.3), and compared against Metropolitan Melbourne, Hobsons Bay LGA, Maribyrnong LGA and Wyndham LGA.

**Table 3.2: Car Ownership Rates by Dwelling Type – 2006 to 2011 (veh/dwelling)**

| Year | Location | Dwelling Type | | | | Total | Increase /Decrease from 2006 |
|---|---|---|---|---|---|---|---|
| | | Separate House | Semi-Detached Dwelling | Flat, Unit or Apartment in a Block | Other [1] | | |
| 2006 | Eastern Half of Hobsons Bay | 1.61 | 1.40 | 0.93 | 1.22 | **1.49** | - |
| | Metropolitan Melbourne | 1.82 | 1.31 | 0.96 | 1.14 | **1.62** | - |
| | Hobsons Bay LGA | 1.68 | 1.33 | 0.96 | 1.10 | **1.56** | - |
| | Maribyrnong LGA | 1.42 | 1.23 | 0.87 | 1.07 | **1.29** | - |
| | Wyndham LGA | 1.88 | 1.45 | 1.02 | 1.32 | **1.81** | - |
| 2011 | Eastern Half of Hobsons Bay | 1.64 | 1.51 | 0.93 | 1.08 | **1.53** | **+0.04** |
| | Metropolitan Melbourne | 1.88 | 1.37 | 0.98 | 1.12 | **1.67** | **+0.05** |
| | Hobsons Bay LGA | 1.70 | 1.46 | 1.01 | 1.22 | **1.59** | **+0.03** |
| | Maribyrnong LGA | 1.48 | 1.37 | 0.96 | 1.12 | **1.35** | **+0.06** |
| | Wyndham LGA | 1.86 | 1.51 | 1.11 | 1.01 | **1.81** | **0** |

Source: ABS Census Data 2006 and 2011.

[1] Includes 'Flat, unit or apartment attached to a house', 'Caravan, cabin, houseboat' and 'House or flat attached to a shop, office, etc.'

Table 3.2 shows that in the eastern half of Hobsons there is a lower average car ownership rate than Metropolitan Melbourne, Hobsons Bay LGA and Wyndham LGA, but higher car ownership rate than Maribyrnong LGA.

Between 2006 to 2011, overall car ownership within the study area marginally increased (by 0.04 vehicles/dwelling), noting this trend has occurred across most of the regions analysed.

However, car ownership can be more a factor of socio-economics and/or the number of people living in each dwelling. Also, many people are owning cars but using alternative transport modes for commuting, i.e. leaving their car at home during the week.

## 3.3 Existing Travel Behaviour

Guidance on the existing travel characteristics of Hobsons Bay residents has been sought from the 2006 and 2011 ABS Method of Travel to Work data. It should be noted that the associated mode splits are work or commuter related trips only, so does not include other types, such as education, retail, recreation, etc. related trips. However, work or commuter related trips make up the majority of the peak period trips on a weekday, which is the focus of the majority of the analysis in the Integrated Transport Study.

On this basis, Table 3.3 has been prepared to summarise the 2006 and 2011 mode splits for those that reside and work within the municipality of Hobsons Bay.

**Table 3.3: 2006 & 2011 ABS Method of Travel to Work Data for Hobsons Bay**

| Mode | 2006 | | 2011 | |
|---|---|---|---|---|
| | Reside | Employed | Reside | Employed |
| Car / Truck Driver | 23,160 (78%) | 22,209 (88%) | 24,167 (76%) | 23,866 (88%) |
| Car Passenger | 1,828 (6%) | 1,364 (5%) | 1,812 (6%) | 1,374 (5%) |
| Public Transport | 3,224 (11%) | 584 (2%) | 4,225 (13%) | 687 (2%) |
| Bicycle | 402 (1%) | 256 (1%) | 516 (2%) | 263 (1%) |
| Walk | 664 (2%) | 548 (2%) | 705 (2%) | 598 (2%) |
| Other | 343 (1%) | 231 (1%) | 376 (1%) | 210 (1%) |

Table 3.3 indicates that between 2006 and 2011 there was an increase in the number of trips and a shift away from private car use when travelling to work by those that reside in Hobsons Bay. The shift away from private car use relates to an increase in public transport use, which for those that reside in Hobsons Bay is predominantly by train.

It is noted that while there was an increase in the number of trips, there was no material change in mode split proportions between 2006 and 2011 by those that are employed in Hobsons Bay. Moreover, the mode split is much higher towards private car use for those that are employed in Hobsons Bay than those that live there. This gives some indication to the proportion of people that live in Hobsons Bay, work in the Melbourne CBD and use train to get there. Also, this shows that the activity centres and industrial areas in Hobsons Bay, where the majority of the employment is located, are still easily accessible by car and/or have limited accessibility by alternative transport modes.

By way of comparison, Table 3.4 provides a summary of the 2011 ABS Method of Travel to Work data for residents living in Hobsons Bay and a sample of other municipalities in Melbourne.

**Table 3.4: Average Household Mode Splits by LGA**

| Mode | Hobsons Bay LGA | Maribyrnong LGA | Wyndham LGA | All Victoria |
|---|---|---|---|---|
| Car / Truck Driver | 24,167 (76%) | 17,966 (67%) | 51,278 (82%) | 78% |
| Car Passenger | 1,812 (6%) | 1,606 (6%) | 4,757 (8%) | 6% |
| Public Transport | 4,225 (13%) | 5,108 (18%) | 4,699 (8%) | 9% |
| Bicycle | 516 (2%) | 972 (4%) | 248 (1%) | 2% |
| Walk | 705 (2%) | 941 (3%) | 861 (1%) | 4% |
| Other | 376 (1%) | 399 (1%) | 614 (1%) | 2% |

Table 3.4 indicates that the Hobsons Bay LGA has mode splits that are reflective of the whole of Victoria. As such, there is considered to be the ability to achieve a shift away from private car use and at least be more consistent with Maribyrnong, which is the next municipality to the north.

## 3.4 Road Network

### 3.4.1 Surrounding Roads

#### West Gate Freeway

The West Gate Freeway is a key link in Melbourne's road network both commercially and for private use. It is the major connection between the western suburbs and the Melbourne CBD, with connections to other major roads such as the Monash Freeway to the east, Princes Freeway to the West and CityLink to the north.

In the vicinity of the subject site, the West Gate Freeway functions as a freeway and is located within a Road Zone 1 in the Hobsons Bay Planning Scheme. It is a two-way road aligned in an

east-west direction and configured with divided four-lane, 20 metre wide carriageways in each direction, set within a 63 metre wide road reserve (approx.).

The Williamstown Road / Melbourne Road and Millers Road interchanges are closest to the subject site, located 1.3km to the northeast and 900m northwest respectively. Sound walls have been constructed along the length of the Freeway although they are not continuous along the Precinct frontage.

### Blackshaws Road

Blackshaws Road is a secondary arterial road (Road Zone 1) aligned in an east-west direction along the subject site's southern boundary, connecting Millers Road to the west with Melbourne Road to the east. Adjacent to the subject site, it is a two-way road with a 60km/h speed limit configured with a two-lane, 12.3m wide carriageway set within a 20.8m wide road reserve (approx.). Kerbside parking is permitted subject to time restrictions. Blackshaws Road carries approximately 14,500 vehicles per day[1] past the site.

### New Street

New Street is a local road aligned in a north-south direction along the subject site's eastern boundary. Adjacent to the subject site, it is a two-way road with a 50km/h speed limit configured with a two-lane, 7.4m wide carriageway set within a 15.9m wide road reserve (approx.). Unrestricted car parking is permitted on both sides of the carriageway. New Street carries approximately 3,000[2] vehicles per day past the site.

### Kyle Road

Kyle Road is a local road aligned in a north-south direction. Adjacent to the subject site, it is a two-way road with a 50km/h speed limit configured with a two-lane, 12.7m wide carriageway set within a 20.5m wide road reserve (approx.). Unrestricted car parking is permitted on both sides of the carriageway. Kyle Road carries approximately 2,500 vehicles per day[2] past the site.

### Other Roads

Other roads of note within the vicinity of the site include the following:

- Melbourne Road - Primary arterial road to the east of the site connecting Blackshaws Road and the West Gate Freeway
- Millers Road – Primary arterial road to the west of the site connecting Blackshaws Road and the West Gate Freeway
- The Broadway – Local road extending southeast from Blackshaws Road along its southern frontage
- Hanson Street - Connector road extending south from Blackshaws Road to the west of New Street
- Mills Street – Connector road extending south of Kyle Road from Blackshaws Road.

Blackshaws Road, New Street and Kyle Road are shown in Figure 3.4 to Figure 3.7.

[1] Based on the peak hour traffic counts undertaken by GTA in August 2016 and assuming a peak-to-daily ratio of 8%.
[2] Based on the peak hour traffic counts undertaken by GTA in June 2012 and assuming a peak-to-daily ratio of 10%.

Figure 3.4: Blackshaws Road (Adjacent to Site, looking east)

Figure 3.5: Blackshaws Road (Adjacent to Site, looking west)

Figure 3.6: New Street (Adjacent to Site)

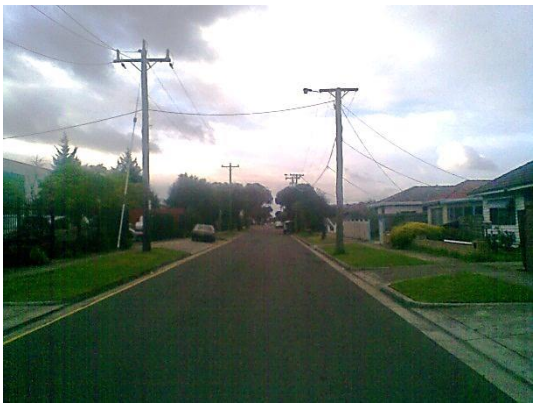


Figure 3.7: Kyle Road (Adjacent to Site)

### 3.4.2 Surrounding Intersections

The following intersections exist along the frontage of the site:

- New Street / Watson Street (unsignalised T-intersection)
- New Street / Brunel Street (unsignalised T-intersection)
- New Street / Aloha Street (unsignalised T-intersection)
- Blackshaws Road / New Street (unsignalised T-intersection)
- Blackshaws Road / Hansen Street (unsignalised T-intersection)
- Blackshaws Road / The Broadway (unsignalised T-intersection)
- Blackshaws Road / Macdonald Avenue (unsignalised T-intersection)
- Blackshaws Road / Angus Avenue (unsignalised T-intersection)
- Blackshaws Road / Mills Street / Kyle Road (signalised X-intersection)
- Kyle Road / Cyclamen Avenue (unsignalised T-intersection)
- Kyle Road / Marigold Avenue (unsignalised T-intersection)
- Kyle Road / Clematis Avenue (unsignalised T-intersection).

The following other intersections of note generally connect the site to the surrounding arterial road network:

- Melbourne Road / The Avenue (signalised X-intersection)
- Melbourne Road / Hudsons Road (signalised X-intersection)
- Melbourne Road / Blackshaws Road (unsignalised T-intersection)
- Melbourne Road / Ross Street (unsignalised T-intersection)
- Blackshaws Road / Schutt Street (unsignalised T-intersection)

- Millers Road / Marigold Avenue / Dousa Road (signalised X-intersection)
- Millers Road / Blackshaws Road (signalised X-intersection)
- Millers Road / Marigold Avenue / Duosa Road (signalised X-intersection).

### 3.4.3 Accident Statistics

A review of the reported casualty accident history for the roads and intersections adjoining and connecting the subject site to the surrounding arterial road network has been sourced from the VicRoads CrashStats accident database. This database records all accidents causing injury that have occurred in Victoria since 1987 (as recorded by Victorian Police).

A summary of the reported accidents causing injury for the last available five-year period (1 January 2011 to 31 December 2015) is presented in Table 3.5 and Figure 3.8.

**Table 3.5: Casualty Accident History (1 January 2011 – 31 December 2015)**

| Location | No. of Accidents | | |
|---|---|---|---|
| | Fatality | Serious Injury | Other Injury |
| **INTERSECTIONS** | | | |
| At Int of ALOHA STREET and PAXTON STREET | | | 1 |
| At Int of BLACKSHAWS ROAD and BEGONIA AVENUE | | | 1 |
| At Int of BLACKSHAWS ROAD and CHARLOTTE STREET | | | 2 |
| At Int of BLACKSHAWS ROAD and GREENE STREET | | 1 | |
| At Int of BLACKSHAWS ROAD and HANSEN STREET | | | 1 |
| At Int of BLACKSHAWS ROAD and MILLERS ROAD | | 3 | 2 |
| At Int of BLACKSHAWS ROAD and MILLS STREET | | 2 | 8 |
| At Int of BLACKSHAWS ROAD and NEW STREET | | | 2 |
| At Int of BLACKSHAWS ROAD and SECOND AVENUE | | | 1 |
| At Int of BLACKSHAWS ROAD and SEVENTH AVENUE | | | 1 |
| At Int of BLACKSHAWS ROAD and THIRD AVENUE | | 1 | 2 |
| At Int of BLACKSHAWS ROAD and VALERIAN AVENUE | | | 1 |
| At Int of BLACKSHAWS ROAD and VERNON STREET | | | 1 |
| At Int of CULLEN STREET and HUDSONS ROAD | | | 1 |
| At Int of KERNOT STREET and MONTGOMERY CRESCENT | | | 1 |
| At Int of KYLE ROAD and MARIGOLD AVENUE | | 1 | |
| At Int of MELBOURNE ROAD and THE AVENUE | | | 5 |
| At Int of MELBOURNE ROAD and HUDSONS ROAD | | | 5 |
| At Int of MELBOURNE ROAD and MARY STREET | | | 2 |
| At Int of MELBOURNE ROAD and REED STREET | | 1 | |
| At Int of MILLERS ROAD and BEURON ROAD | | | 2 |
| At Int of MILLERS ROAD and CYCLAMEN AVENUE | | | 3 |
| At Int of MILLERS ROAD and DUOSA ROAD | | | 3 |
| At Int of MILLERS ROAD and EDWARD AVENUE | | 1 | |
| At Int of MILLERS ROAD and MILLERS-WEST GATE OUT RAMP ON | | 2 | 1 |
| At Int of WEST GATE OUT-MELBOURNE RAMP OF and MELBOURNE ROAD | | 1 | 4 |
| **Intersections Sub-Total** | **-** | **13** | **50** |
| **MID-BLOCKS** | | | |
| On BLACKSHAWS ROAD between SECOND AVENUE and FIRST AVENUE | | 1 | |
| On BLACKSHAWS ROAD between MCDONALD AVENUE and THE BROADWAY | | | 3 |
| On BLACKSHAWS ROAD between THE BROADWAY and HANSEN STREET | | 1 | |

| | | | |
|---|---|---|---|
| On BLACKSHAWS ROAD between HANSEN STREET and CHARLOTTE STREET | | | 1 |
| On BLACKSHAWS ROAD between STEPHENSON STREET and JOHNSTON STREET | | 1 | 2 |
| On BLACKSHAWS ROAD between ELIZABETH STREET and SCHUTT STREET | | | 1 |
| On KERNOT STREET between MONTGOMERY CRESCENT and THE AVENUE | | | 1 |
| On KYLE ROAD between BLACKSHAWS ROAD and CYCLAMEN AVENUE | | | 1 |
| On MARIGOLD AVENUE between MILLERS ROAD and CYCADE AVENUE | | | 1 |
| On MELBOURNE ROAD between WEST GATE OUT-MELBOURNE RAMP OF and THE AVENUE | | | 2 |
| On MELBOURNE ROAD between MARY STREET and HUDSONS ROAD | | | 1 |
| On MELBOURNE ROAD between REED STREET and BIRMINGHAM STREET | | 1 | |
| On MELBOURNE ROAD between BIRMINGHAM STREET and BLACKSHAWS ROAD | | 2 | |
| On MILLERS ROAD between CYCLAMEN AVENUE and BEURON ROAD | | 1 | 2 |
| On MILLERS ROAD between BEURON ROAD and EDWARD AVENUE | | | 1 |
| On MILLERS ROAD between EDWARD AVENUE and BLACKSHAWS ROAD | | | 1 |
| On MILLERS ROAD between BLACKSHAWS ROAD and WALKER CLOSE | | 1 | 2 |
| On NEW STREET between BLACKSHAWS ROAD and ALOHA STREET | | | 1 |
| On THE AVENUE between FOGARTY AVENUE and STRONG STREET | | 1 | |
| On THE AVENUE between ANDREWS STREET and STEPHENSON STREET | | | 1 |
| **Road Sections Sub-Total** | | **9** | **21** |
| **TOTAL ACCIDENTS** | | **22** | **71** |

Source: VicRoads

[1] Fatality: At least one person was killed in the accident or died within 30 days as a result of the accident.

[2] Serious injury: At least one person was sent to hospital as a result of the accident.

[3] Other injury: At least one person required medical treatment as a result of the accident.

**Figure 3.8: Casualty Accident History**

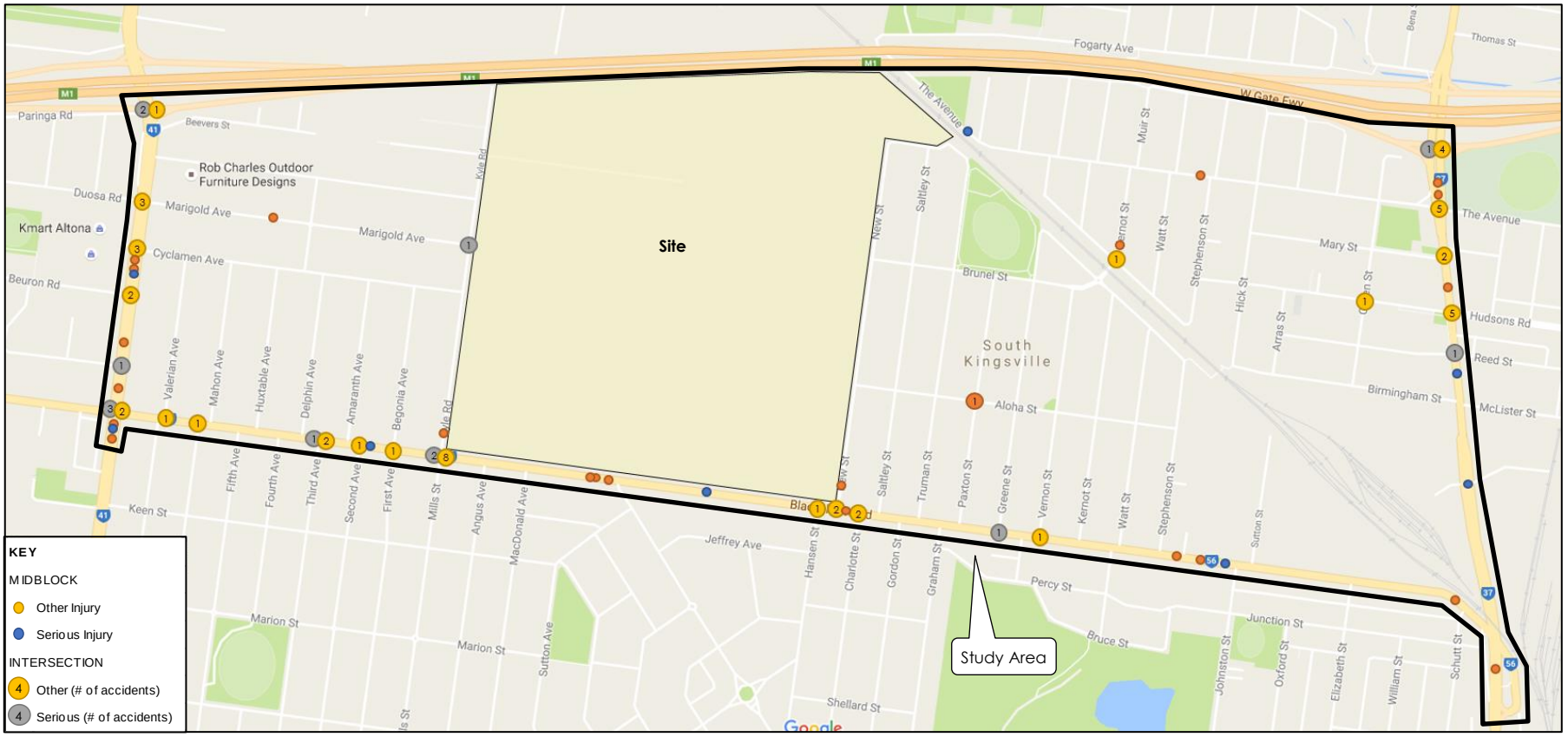


Table 3.5 and Figure 3.8 indicate that there is a moderate history of reported accidents causing injury in the vicinity of the subject site. A total of 92 accidents occurred within the last five-year period, with a total of 24 serious injuries and 87 other injuries. No fatalities were recorded.

The five most common accident types for the above data are shown in Table 3.6, along with the relevant Crash Stats diagram.

**Table 3.6: Accidents by DCA**

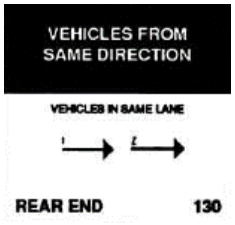
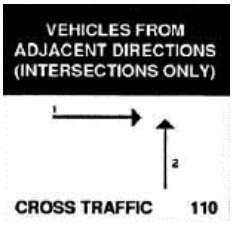
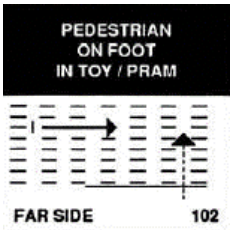
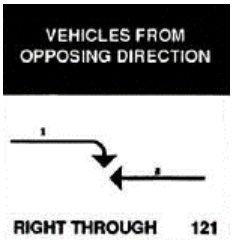
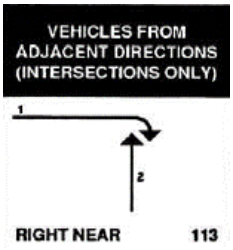
| DCA Code | | # of Accidents | Serious Injuries | Other Injuries | Years | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 2011 | 2012 | 2013 | 2014 | 2015 |
| 130<br>Rear End |  | 24 | 5 | 25 | 3 | 2 | 8 | 6 | 5 |
| 110<br>Cross Traffic |  | 9 | - | 11 | - | 3 | 3 | 2 | 1 |
| 102<br>Far Side |  | 8 | 3 | 5 | 1 | 3 | 3 | 1 | - |
| 121<br>Right Through |  | 8 | 2 | 9 | - | 2 | 2 | 2 | 2 |
| 113<br>Right Near |  | 6 | 1 | 6 | - | 1 | 1 | 3 | 1 |

Table 3.6 shows that the most common accident type is a Rear End. This type of incident occurred 24 times in the five-year period, with four of these occurring at one intersection, the West Gate Ramp / Melbourne Road, which not considered excessive given the volume of traffic that uses that road.

The five locations with the most number of accidents were all intersections. A brief summary of the accidents that occurred at these intersections is provided in Table 3.7.

**Table 3.7: Accidents by Location**

| Intersection | Serious Injury | Other Injury | Years | | | | | DCAs |
|---|---|---|---|---|---|---|---|---|
| | | | 2011 | 2012 | 2013 | 2014 | 2015 | |
| Blackshaws Road and Mills Street and Kyle Road | 2 | 8 | - | 1 | 5 | 2 | 1 | 110 (4), 121 (2), 123, 130, 173 |
| Blackshaws Road and Millers Road | 3 | 2 | - | 1 | 2 | 1 | 1 | 102, 121, 130, 131, 173 |
| West Gate Ramp and Melbourne Road | 1 | 4 | - | 1 | - | 2 | 2 | 113, 130(4) |
| Melbourne Road and Hudsons Road | - | 5 | - | 1 | 2 | 5 | - | 110 (2), 130 (2), 137 |
| Melbourne Road and The Avenue | - | 5 | - | 1 | 2 | 2 | - | 110 (2), 121, 130 (2) |

Table 3.7 shows that the Blackshaws Road / Mills Street / Kyle Road intersection had a total of ten accidents over the five-year period (1 January 2011 to 31 December 2015).

The most common accident type at this intersection was DCA 110 – Cross Traffic. This type of accident occurred four times at this location, three of which involved a vehicle travelling southbound colliding with a vehicle travelling eastbound.

The West Gate Ramp and Melbourne Road intersection also had four of the same accident type, DCA 130 – Rear End, as discussed in the previous section.

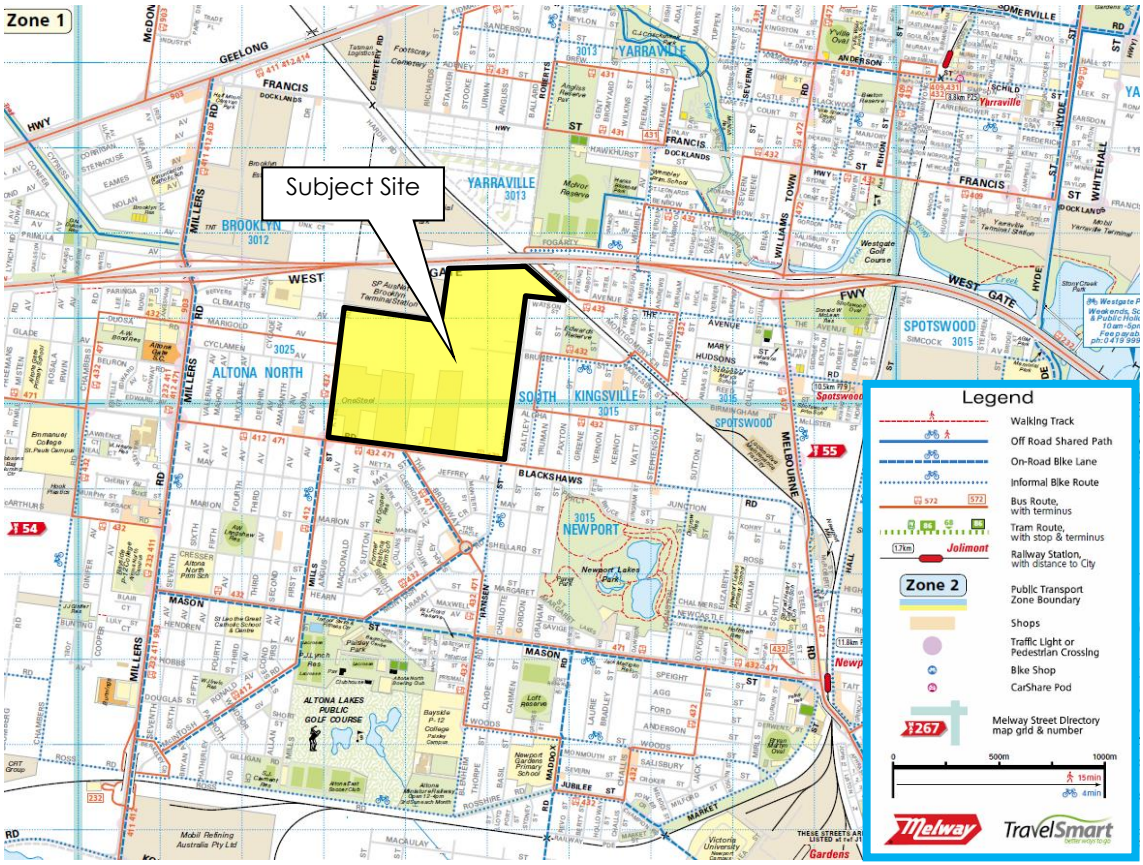
In both cases these numbers are not considered excessive or believed to represent a significant safety issue.

## 3.5 Active Transport

The subject site has reasonable access to a range of alternative transport infrastructure. These are most clearly set out within the Hobsons Bay municipality 'TravelSmart' map, a portion of which is presented in Figure 3.9.

The sustainable transport infrastructure options surrounding the subject site are described in further detail within the following sections of this report.

**Figure 3.9: Nearby Sustainable Transport Options**




(Downloaded June 2012)

## Pedestrian Infrastructure

Pedestrian paths are generally provided on both sides of all roads in the vicinity of the subject site. Signalised pedestrian crossings are provided at the Blackshaws Road / Mills Street / Kyle Road intersection, while a pedestrian zebra crossing, with flashing lights, is provided on Blackshaws Road between Begonia Avenue and Kyle Road.

## Cycle Infrastructure

Bicycle lanes are provided on both sides of Millers Road.

The Federation Bike Trail runs from Werribee to Brooklyn and currently terminates north of the Site. The trail will ultimately be developed along the north side of the West Gate Freeway to provide a link from the existing start / end of the trail at Millers Road to the existing shared pedestrian / cycle trail on Hyde Street in Yarraville. This will provide direct access for pedestrians and cyclists to the Melbourne CBD.

The Principal Bicycle Network (PBN) is a network of arterial cycling routes in metropolitan Melbourne. Figure 3.10 shows the PBN in the vicinity of the subject site.

**Figure 3.10: PBN Routes (Purple Lines)**

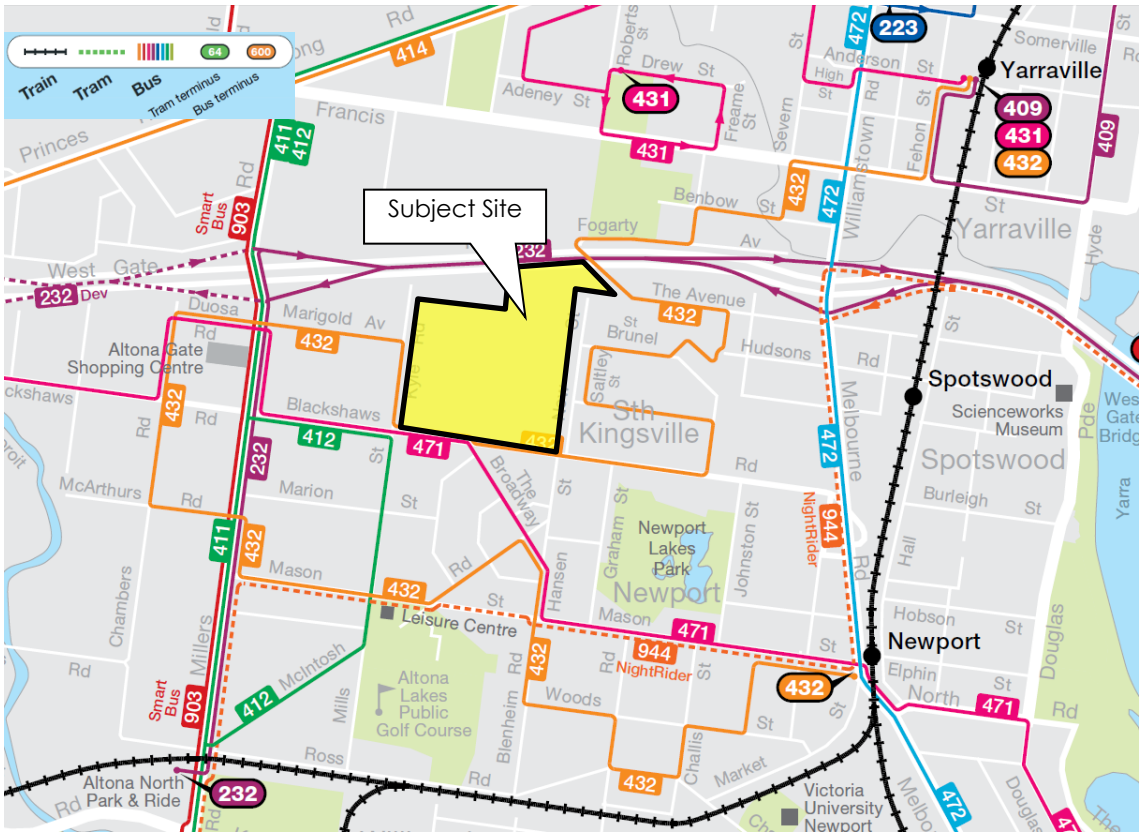

(Source: Transmaps Website)

Figure 3.10 indicates that in the vicinity of the subject site the Federation Bike Trail on the northern side of the West Gate Freeway, Melbourne Road, The Avenue, Hansen Street, Mills Road and Millers Road all form part of the PBN. This is generally consistent with Hobsons Bay Strategic Bicycle Plan (refer to Figure 2.2), except for Blackshaws Road and New Street.

## 3.6 Public Transport

Figure 3.11 shows the subject site in relation to existing public transport services within its vicinity whilst Table 3.8 summarises the road based routes and major destinations that can be reached using these services.

**Figure 3.11: Existing Public Transport Services and Stops**




Source: PTV Website

**Table 3.8: Road Based Public Transport Provision**

| Route Nos | Route Description | Distance to Nearest Stop | Significant Destinations On Route |
|---|---|---|---|
| 232 | Altona North – Queen Victoria Market | 1,150m | Altona North Bus Interchange, Altona Gate S.C., West Gate Fwy, Todd Rd, Williamstown Rd, Montague St, Charles Grimes Bridge, Flinders St, Queen Victoria Market |
| 412 | Laverton – Footscray | 50m | Laverton Railway Station, Victoria St, Queen St, Millers Rd, Berkeley Cr, Mills St, Blackshaws Rd, Millers Rd, Altona Gate S.C., Geelong Rd, Paisley Street |
| 432 | Newport – Yarraville | 50m | Newport Railway Station, The Broadway, The Circle, Millers Rd, Marigold Av, Kyle Rd, Blackshaws Rd, Stephenson St, Aloha St, Brunel St, The Avenue, Fogarty Avenue, Wembley Av, Anderson Street, Yarraville Railway Station |
| 471 | Williamstown - Sunshine | 1,000m | The Esplanade, Melbourne Rd to Newport Railway Station, The Broadway, The Circle, Blackshaws Rd, Altona Gate Shopping Centre, Duosa Rd, Princes Hwy, Sunshine Railway Station |

It is noted that the Altona Gate Shopping Centre accommodates a major bus interchange servicing a number of bus routes as follows:

- Bus route 232 travels from Altona Gate Shopping Centre to Queen Victoria Market via the West Gate Freeway, Port Melbourne, and the Melbourne Convention Centre and along Queen Street to the markets.
- Bus routes 411 and 412 travel from Laverton to Footscray via Altona, Altona Gate Shopping Centre and West Footscray.
- Bus route 432 travels from Newport to Yarraville via Altona North, South Kingsville, Spotswood and Yarraville.

- Bus route 471 travels from Williamstown to Sunshine via Williamstown, Newport, Altona North and Sunshine West.
- Bus route 903 is a Smart Bus route and travels from Altona to Mordialloc via Sunshine, Essendon, Preston, Heidelberg, Doncaster, Burwood, Chadstone, Oakleigh and Mentone.

In addition to road based public transport, Spotswood Railway Station on the Werribee and Williamstown lines is located approximately 2.5 kilometres to the east of the centre of the subject site. However, no connecting bus services currently access Spotswood Station, and therefore users from the subject site would need to walk (approx. 30mins) or cycle (approx. 10mins) there.

Further, the Yarraville and Newport Railway Stations are located 3.1km and 2.8km from the centre of subject site, which can be accessed by the 432 and 471 bus services respectively that go past the subject site.

# 4. Development Proposal

## 4.1 Land Use

The Comprehensive Development Plan anticipates that the rezoning of the site will be to a predominantly residential use with a mixed-use town centre and some public open space. The anticipated development schedule is presented in Table 4.1 and the conceptual land use plan is shown in Figure 4.1.

**Table 4.1: Indicative Development Schedule**

| Use | Size |
|---|---|
| Residential | Approx. 3,000 dwellings in a mixture of densities |
| Mixed Use Zone | Potential for up to 5,550m$^2$ retail floor space (4,200m$^2$ supermarket + 1,350m$^2$ specialty retail) and 7,000m$^2$ of leasable office floor space |

**Figure 4.1: Land Use Plan**


Source: VPA

## 4.2 Vehicle Access Approach

### 4.2.1 General Approach

The general vehicle access approach for the development is to try and encourage site generated traffic to primarily access the precinct via Blackshaws Road. This is to be achieved by providing the higher capacity site accesses to Blackshaws Road, and designing the internal road network to maximise traffic movement efficiency in the north-south direction, rather than the east-west direction. Furthermore, improvements to the level of service for motorists travelling along Blackshaws Road, especially through the intersections, have been investigated to make it more attractive to access the precinct from the surrounding arterial road network via Blackshaws Road instead of any local streets in the area.

This approach is considered to be consistent with best practice vehicle access planning and consistent with relevant Austroads Guidelines. Also, it is acknowledged that there is only limited remaining capacity within the surrounding local road network to accommodate additional traffic volumes, and that there would be significant amenity impacts on local residents in the local streets should they be relied upon in accessing the precinct.

### 4.2.2 Site Access Points

The precinct is bounded on three sides by existing roads and it is anticipated that access will be obtained via a number of intersections with these roads to allow the new development to seamlessly mesh in with the existing residential street network which surrounds it.

Specifically, the Development / Structure Plan envisages access to the precinct from:

i Two new signalised intersections on Blackshaws Road at the following locations:
   - Intersection with The Broadway and a new connector street into the site
   - 220m east of The Broadway with a new connector street into the site

ii New roundabout with Kyle Road and a new connector street into the site between Marigold Avenue and Cyclamen Avenue

iii New roundabout with New Street, Brunel Street and a new connector street into the site

iv Additional unsignalised intersections with Blackshaws Road, Kyle Road and New Street.

Further details of these works and others required to support the development are provided in Section 6 of this report.

### 4.2.3 Internal Road Network

The proposed layout of the internal road network broadly proposes a road hierarchy consisting of connector streets and access streets within the subject site to connect with the abutting road network and access the proposed internal land uses. Of particular note, there is an east-west connector street proposed through the site between Kyle Road and New Street, and two north-south connector streets proposed between the signalised intersections on Blackshaws Road and the internal east-west connector street.

These connector streets will provide efficient access to the abutting road network, and internal lower order road network and land uses, while minimising the attractiveness for local vehicles to drive east-west through the site for the following reasons:

- There are more north-south connector streets than east-west
- There is more capacity available along Blackshaws Road than within the local road network to access the surrounding arterial roads
- The east-west connector street does not form a single continuous straight route through the site. Rather, there is a significant internal dog-leg associated with the more eastern north-south connector street
- The proposed roundabout intersection on Kyle Road with the east-west connector street is at a mid-block location between Marigold Avenue and Cyclamen Avenue.

Further details of the internal road network and how it will mesh with the existing surrounding road network are provided in Section 6 of this report.

## 4.3 Active Transport Facilities

The Comprehensive Development Plan anticipates a number of pedestrian and bicycle links through the site, through the provision of footpaths along almost all streets, dedicated bicycle paths along the connector streets, and shared paths through the open space areas.

This network of internal paths will provide particularly strong connections to the likely mixed use zone and the 'Quarry Park' central significant open space area.

The paths are also proposed to be connected to the surrounding local residential network through the following facilities:

- Pedestrian crossing facilities on most approaches to the two proposed signalised intersections along Blackshaws Road
- A connection to the Federation Trail along the southwest side of the freight line from Watson Street
- Mixed traffic bicycle facilities along the length of Cyclamen Avenue, and supporting crossing treatments of Kyle Road and Millers Road
- Mixed traffic bicycle facilities along the length of Aloha Street, and supporting crossing treatments of New Street and Stephenson Street
  (provides a connection to Birmingham Street, which in the Hobsons Bay Strategic Bicycle Plan to accommodate an off-road facility that will connect with the Spotswood Train Station).
- On-road bicycle lanes on The Broadway between Blackshaws Road and Hansen Street with mixed traffic bicycle facilities through the roundabout intersections.

Further details on the suitability of the active transport facilities and how they will be used by those accessing Precinct 15 are provided in Section 7 of this report.

## 4.4 Public Transport Services

The planning, operation and management of the public transport services in the area is outside of the control of any one development. However, through discussions with PTV and other key stakeholders there is an understanding that there is the potential in the future for a local bus route to travel east-west through the site. Its specific route through the site and overall is not known at this time, but it is expected that it would connect with either the Yarraville or Spotswood Stations.

It is also expected that a high frequency bus service would also operate along Blackshaws Road, connecting with at least the Altona Gate bus interchange to the west and the Newport Station to the southeast.

With this understanding, the proposed internal connector streets will be designed to accommodate potential future bus services. A bus service through the site along the east-west central connector street would allow all dwellings to be within 400m of a bus route, in accordance with DEDJTR guidelines.

Further details on the suitability of the public transport facilities and how they will be used by those accessing Precinct 15 are provided in Section 7 of this report.

# 5. Strategic Modelling



## 5.1 Overview

The Integrated Transport Study has utilised and builds on the strategic modelling analysis completed by GHD for the Hobsons Bay City Council (HBCC) area. The strategic modelling analysis was completed to determine the long term capacity of the main corridors and the associated transport network within the municipality to support the anticipated levels of future development in the area (referred to as the Cumulative Impact Assessment, or CIA).

The CIA modelling was completed using the Victorian Integrated Transport Model (VITM), which is a tool developed and maintained by the Department of Economic Development, Jobs, Transport and Resources (DEDJTR) to assist in the planning of road and public transport infrastructure in Victoria.

VITM is a multimodal strategic model that uses future population, employment, and land use data projections to forecast travel behaviour and the impacts of changes to the road and public transport networks. As such, VITM already includes future population projections within Hobsons Bay, including Precinct 15. VITM utilises this demographic data to identify the transport demand that needs to be accommodated by the transport network.

VITM contains all existing and anticipated major freeways, main arterials, and connector roads within the Melbourne Statistical Division. As such, the Western Distributor and widening of the West Gate Freeway are included in the future model years. It also includes the existing and anticipated metropolitan public transport network, so the Melbourne Metro and other service and network improvements planned through the Metropolitan Rail and Bus Network Development Plans are included in the future year models. However, the influence and impact of active transport is not as well integrated within VITM, as a mode split estimate is applied to the daily anticipated volumes of a given area and the associated number of trips are removed and not applied to the transport network.

As such, VITM provides a coarse but strategic understanding of how user demands will change into the future, including potential mode shifts, and the likely potential performance of the resulting transport network, as well as comparisons of potential infrastructure options.

## 5.2 CIA Model Development

The CIA modelling undertaken by GHD was focused on the HBCC area. It did this by extracting a suitable sub-region from VITM that covered the study area and calibrated the resulting model based on available traffic and public transport data, such as SCATS data from signalised intersections, sample travel time surveys, available Council traffic data, and train station boarding and alighting numbers.

It is noted in the Calibration and Validation Report for the CIA Model by GHD that it is considered fit for purpose and provides results that are within the standard validation criteria ranges. However, as with most models, it doesn't exactly reflect the existing volumes being experienced by the transport network. Broadly speaking the CIA model is underestimating traffic volumes within the local road network of the HBCC area and overestimating the traffic volumes on the West Gate Freeway.

However, the level of difference in the model to what is actually observed is considered acceptable. Moreover, given that the traffic assessment set out in this report focuses on the local

road network and uses the CIA Model to understand the level of change on the local road network, the CIA Model will be assuming that there is more capacity on the local road network than actually exists. As such, it will apply a less constrained traffic network to how people will choose to travel in the future, against the increasing demands. So, it is expected that the model will likely overestimate the level of traffic that will be generated in the future, which is considered conservative from an analysis perspective.

## 5.3 Scenarios Run

With the purpose of the CIA modelling being to determine the long term capacity of the transport network within the municipality to support the anticipated levels of future development in the area, the calibrated existing CIA Model was used to asses a number of development scenarios for the following development precincts in the context of the other growth and transport infrastructure improvements anticipated in the future VITM years affecting the study area:

- The former Don Smallgoods site, Altona North (Precinct 15 / Subject Site)
- The former Caltex Terminal, South Kingsville (Precinct 16)
- The remainder of the precinct around the former Caltex Terminal, South Kingsville (Precinct 16)
- Former Port Phillip Woollen Mills - 57 Nelson Place, Williamstown (Precinct 20).

While GTA has been provided with the CIA modelling inputs, we have not reviewed them in detail. As such, our analysis of the impacts of the various development scenarios is generally based on the available outputs of the modelled links from the VITM informed CIA scenario runs completed by GHD.

The scenarios that GHD developed and provided outputs for are outlined in Table 5.1.

**Table 5.1: Modelled Scenarios by GHD**

| Year | Scenario | Description |
|---|---|---|
| 2021 | Base | Do nothing (no development) |
| 2021 | Scenario 1 | All developments with half development of Precincts 15 and 20 only |
| 2021 | Scenario 2 | All developments with half development Precinct 16 only |
| 2021 | Scenario 3 | All developments with half development Precincts 15, 16 and 20 |
| 2031 | Base | Do Nothing (no development) |
| 2031 | Scenario 1 | All developments with half development of Precincts 15 and 20 only |
| 2031 | Scenario 2 | All developments with half development Precinct 16 only |
| 2031 | Scenario 3 | All developments with half development Precincts 15, 16 and 20 |
| 2031 | Scenario 4 | All developments with full development of Precincts 15 and 20 only |
| 2031 | Scenario 5 | All developments with full development of Precinct 16 only |
| 2031 | Scenario 6a | All developments with full development of Precincts 15, 16 and 20 |
| 2031 | Scenario 6b | All developments with full development of Precincts 15, 16 and 20 including the New Street Extension |

For the purpose of the Integrated Transport Study, GTA has focused on the modelling outputs from Option 6a (i.e. following full development of the development sites in 2031 without the new North-South link).

It is noted that Scenario 6a not only includes the development of Precinct 15 (subject site), but Precinct 16, Precinct 20 and other background development expected up to 2031 in the area, such as the old Bradmill Denim Factory on the northern side of the West Gate Freeway.

## 5.4 Model Findings

The strategic level analysis undertaken through the CIA Model found that most of the increases in traffic volumes on the local road network would be on Blackshaws Road and other proximate roads to each development site. The level of increased traffic on Blackshaws Road that would occur following full development of above development sites is anticipated to be in the order of the following:

- 800 vehicles (125% increase) in the AM peak hour between Millers Road and Kyle Road
- 325 vehicles (32% increase) in the PM peak hour between Millers Road and Kyle Road.

The expected increases in traffic volumes anticipated on the major arterial roads of Millers Road and Melbourne Road by 2031 are as follows:

- Millers Road = +285 vehicles (12% increase) in the AM Peak Hour and +675 vehicles (28% increase) in the PM Peak Hour
- Melbourne Road = -175 vehicles (8.5% decrease) in the AM Peak Hour and -200 vehicles (7% decrease) in the PM Peak Hour.

It should be noted that the above relatively small increases in overall traffic volumes anticipated on Millers Road and Melbourne Road (except for the PM peak hour on Millers Road) are following full development of the above significant development sites and other expected background growth.

The reason that only minor increases in traffic volumes are expected is that as more people live in the study area the CIA Model expected that a higher proportion of people will use alternative transport modes during peak traffic periods. This is because the use of the alternative transport modes as the road network becomes more congested will become more attractive, especially from a travel time perspective, i.e. commuters will find it quicker to travel by alternative transport modes than driving a car during these peak times to the north of the West Gate Freeway and/or east of the Yarra River.

The major mass transport alternative available to these commuters is the train services on the Werribee and Williamstown rail lines. The associated train services are not impacted by increased congestion on Millers Road and Melbourne Road, and the only location where some potential impact could occur is at the level crossings, which are being removed. Also, with the removal of the regional rail services from these lines, and the Melbourne Metro project, they will be able to accommodate larger volumes of users, which has been taken into consideration in the CIA Model and contributes to a lower increase in traffic volumes on Millers Road and Melbourne Road than might otherwise be expected.

Moreover, it is understood that a stage 2 of the Melbourne Metro Project is being considered at an early feasibility stage, which would include access by train to Fishermans Bend and potentially across the Yarra River to Newport Station.

## 5.5 Precinct 15 – Scenario 6a (2031)

The key demographic outputs for Precinct 15 resulting from Scenario 6a of the CIA Model are identified in Table 5.2.

**Table 5.2: Precinct 15 Demographic Outputs - Scenario 6a (2031)**

| Demographic | Daily Numbers |
|---|---|
| Residential Dwellings | 3,171 dwellings |
| Residential Population | 7,963 people |
| Residential Visitors | 1,511 people |
| Commercial Employees | 2,836 people |
| Commercial Customers | 7,169 people |
| **Total Daily Population Accessing the Site** | **19,479 people** |

It is noted that the demographic outputs taken from the CIA Model indicate that more than 3,000 dwellings were modelled for Precinct 15. Also, given that on average office space accommodates one employee every 20sqm based on City of Melbourne 2016 CLUE Data, then the number of commercial employees would require some 56,720sqm of floor space. On this basis, the analysis is considered to be conservative on the high side from an impact perspective.

Also through interrogating Scenario 6a of the CIA Model, the expected commuter peak hour modal volumes for Precinct 15 were identified, as shown in Table 5.3.

**Table 5.3: Precinct 15 Peak Hour Commuter Modal Outputs - Scenario 6a (2031)**

| Mode | AM | | PM | |
|---|---|---|---|---|
| | Out | In | Out | In |
| Car / Truck Driver | 1,324 | 886 | 1,068 | 1,328 |
| Car Passenger | 663 | 333 | 491 | 596 |
| Public Transport | 202 | 20 | 40 | 273 |
| Park 'n' Ride | 168 | 22 | 34 | 188 |
| Active Transport [1] | 88 | 49 | 63 | 92 |
| **Total** | **2,446 people** | **1,310 people** | **1,696 people** | **2,477 people** |

[1] Based on a daily active transport mode split of 3.6% applied in the CIA Model

Based on the modal numbers presented in Table 5.3, the following broad mode split proportions are anticipated through the CIA Model for Precinct 15:

- Car / Truck Driver = 58%
- Car Passenger = 26%
- Public Transport = 12%
- Active Transport = 4%.

Compared with the ABS Method of Travel to Work Data presented in Table 3.3, the car passenger proportions are a lot higher. This is because the above relates to all trips, rather than the 1.1 to 1.3 occupants per vehicle typically experienced in commuter peak-hours (average car occupancy for school trips is over two people in each vehicle).

If we reduce the car passenger proportion to what was indicated in Table 5.3, the car driver mode share is 73%, which is only marginally lower than the ABS Method of Travel to Work mode splits for those that reside in Hobsons Bay in 2011. This is a little surprising, as it is expected that an increased mode shift towards alternative transport modes could be expected for the site and the municipality by 2031. A mode split similar to Maribyrnong 2011 is what would reasonably be

expected, but this could well be a function of the current limited access of the subject site by alternative transport modes, which has not been significantly changed in the 2031 CIA Model.

However, by adopting the traffic volumes anticipated by the CIA Model and targeting alternative transport volumes that are based on the 2011 mode splits in Maribyrnong for Precinct 15, a resilient assessment and desirable future transport network should be planned for.

# 6. Traffic Impact Assessment



## 6.1 Approach / Methodology

A traffic assessment has been undertaken to understand how the road network used to access Precinct 15 currently operates and is expected to operate in the future. The road network that has been considered broadly includes the following extents:

- Millers Road from the interchange with the West Gate Freeway to Blackshaws Road
- Melbourne Road from the interchange with the West Gate Freeway to Blackshaws Road and Ross Street
- Blackshaws Road between Millers Road and Melbourne Road
- Key intersections along the main 'rat running' route between Blackshaws Road and Melbourne Road consisting of New Street, Brunel Street, Kernot Street and The Avenue

In order to consider the operation of above road network today and in the future, the following key activities have been undertaken:

- Collected existing conditions traffic data of the key intersections
- Prepared existing conditions SIDRA Models for the key intersections
- Reviewed the CIA modelling analysis for the future traffic conditions for the area and identified the percentage increases on each link connected to the key intersections
- Applied the percentage changes on each link to determine the future turning movement volumes at each of the key intersections
- Assessed the future traffic conditions at the key intersections through the SIDRA Models
- Identified mitigating works to support the proposed development of Precinct 15.

A summary of the results on the above activities is set out in this section of the report.

## 6.2 Existing Conditions

### 6.2.1 Survey Activities

The following survey activities were undertaken to identify the existing traffic conditions of the road network used to access Precinct 15 on Tuesday 30 August 2016:

i VicRoads SCATS IDM and off-set data was obtained for the following signalised intersections:
   - West Gate Freeway Interchange / Millers Road
   - Millers Road / Marigold Avenue / Duosa Road
   - Millers Road / Cyclamen Avenue / Altona Gate Access
   - Millers Road / Blackshaws Road
   - Blackshaws Road / Kyle Road / Mills Street
   - Melbourne Road / Hudsons Road
   - Melbourne Road / The Avenue
   - West Gate Freeway Interchange / Melbourne Road.

ii Sample surveys were undertaken during the peak AM and PM periods to identify the following at the above signalised intersections:
   - Turning proportions on undetected and shared turning lanes
   - Queue lengths of each signal controlled turning movement.

iii Video surveys were undertaken of the following unsignalised intersections:

- Blackshaws Road / The Broadway
- Kernot Street / The Avenue
- Brunel Street / Railway Crossing
- Millers Road / Clematis Avenue
- Blackshaws Road / Sutton Street.

In addition, historic intersection counts from the March 2015 TIA Report by GTA Consultants were reviewed for the following unsignalised intersections:

- Blackshaws Road / Hansen Street
- Blackshaws Road / New Street
- Blackshaws Road / Schutt Street
- Melbourne Road / Blackshaws Road
- Melbourne Road / Ross Street.

### 6.2.2 Representative Peak Hour Traffic Volumes

It is common practice to design for the 85th percentile traffic event. As such, the traffic volumes recorded during the peak hours at the West Gate Freeway interchanges have been compared against SCATS data across August and part of September 2016. Graphs illustrating the traffic volumes recorded on 30 August 2016 against the other data are presented in Figure 6.1 to Figure 6.4.

**Figure 6.1: West Gate Freeway / Millers Road Interchange – AM Peak Hour Volumes**

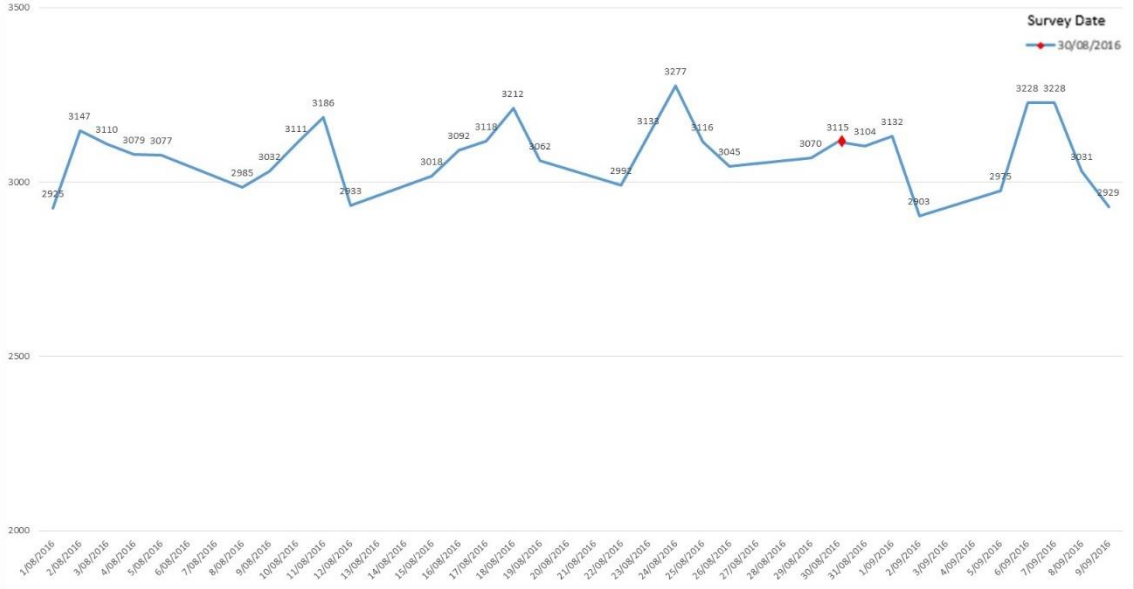


**Figure 6.2: West Gate Freeway / Millers Road Interchange – PM Peak Hour Volumes**

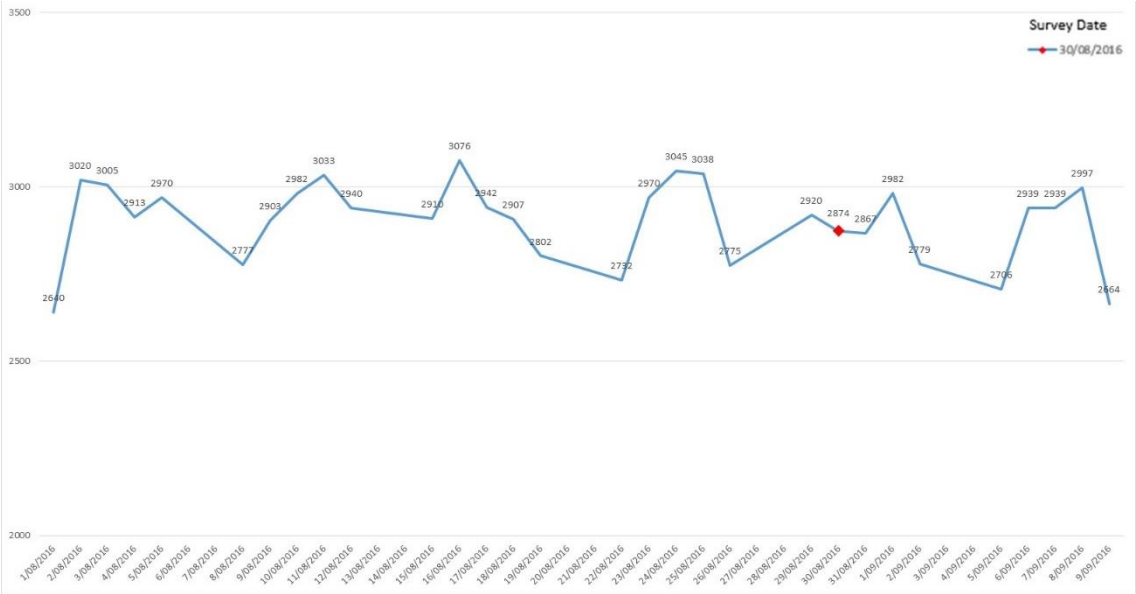



**Figure 6.3: West Gate Freeway / Melbourne Road Interchange – AM Peak Hour Volumes**

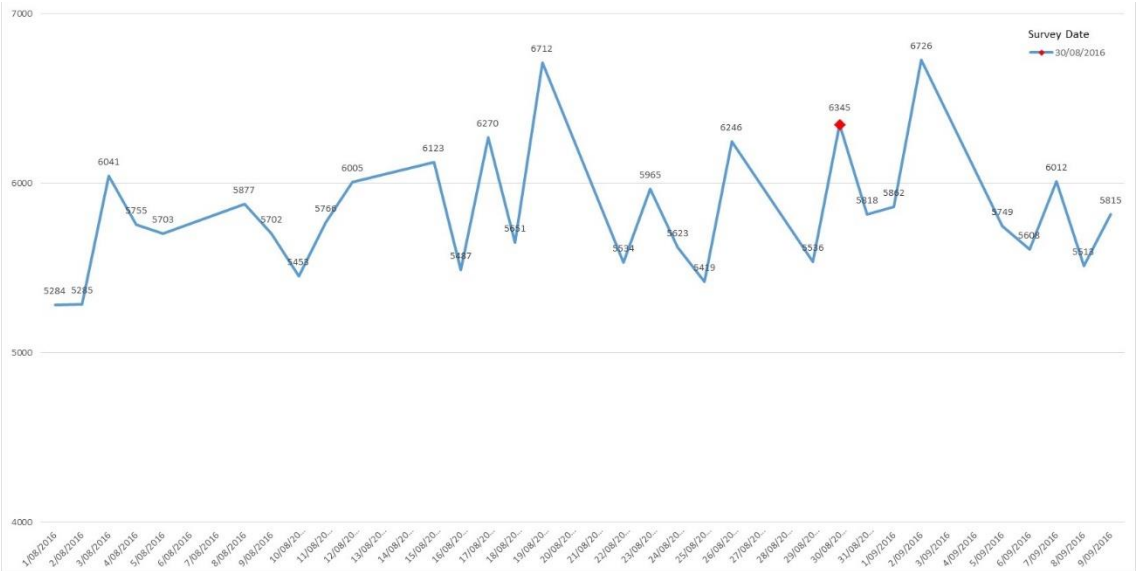
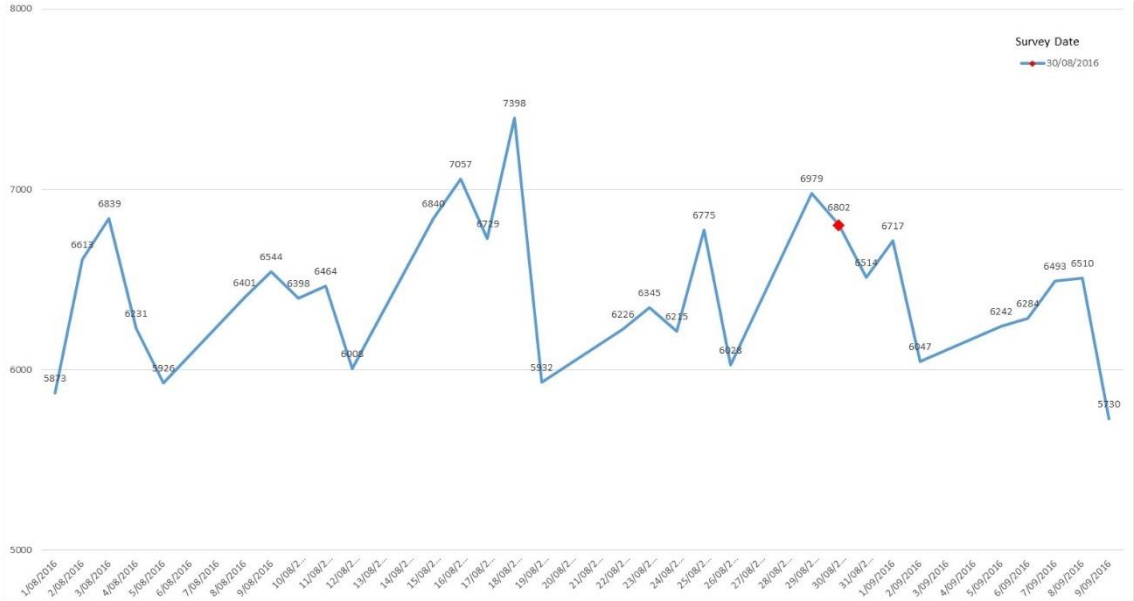


**Figure 6.4: West Gate Freeway / Melbourne Road Interchange – PM Peak Hour Volumes**




Based on these figures, the survey day is considered to be generally representative of what is considered to be a typical design day, except for the PM peak hour for the West Gate Freeway / Millers Road interchange. As such, the traffic volumes recorded at the interchange and along Millers Road has been increased by 5% for the purposes of this analysis.

It should also be noted that upon review of the traffic data collected, the road network AM and PM peak hours were found to generally be between 8am and 9am, and between 5pm and 6pm respectively. However, the following is advised about the peak hours adopted for analysis purposes:

- For the coordinated signalised intersections on Millers Road and Melbourne Road, the overall network AM and PM peak hour periods were adopted and not each signalised intersections peak hour volumes, i.e. not all of the signalised intersections along these roads peaked at the same time.
- For the standalone intersections (i.e. not on Millers Road and Melbourne Road) their specific peak hour intersection volumes were adopted for analysis purposes.

### 6.2.3 Peak Hour Traffic Volumes

Based on the above survey activities and adjustment in the PM peak hour to have representative peak hour traffic volumes, the resulting existing AM and PM peak hour traffic volumes are presented in Figure 6.5 and Figure 6.6.

## Figure 6.5: Existing Traffic Volumes – AM Peak Hour

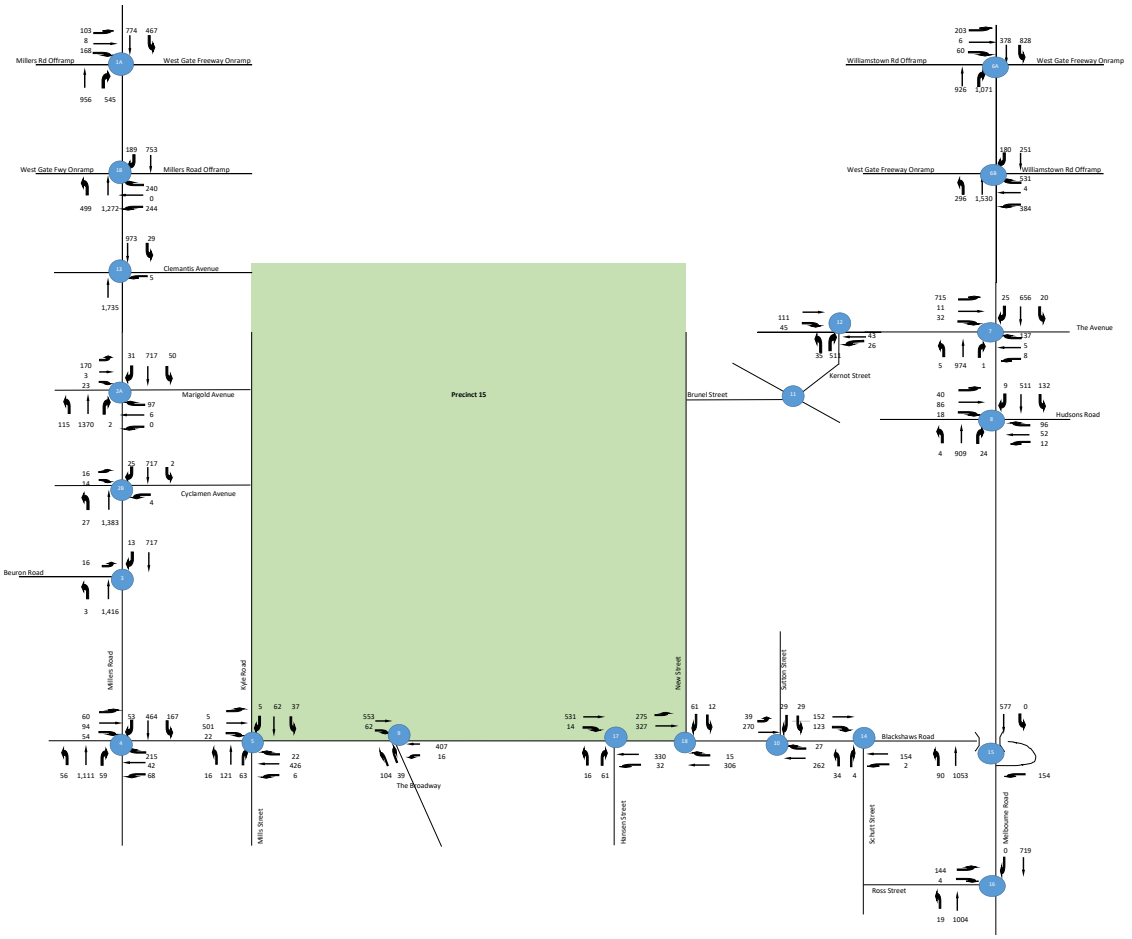
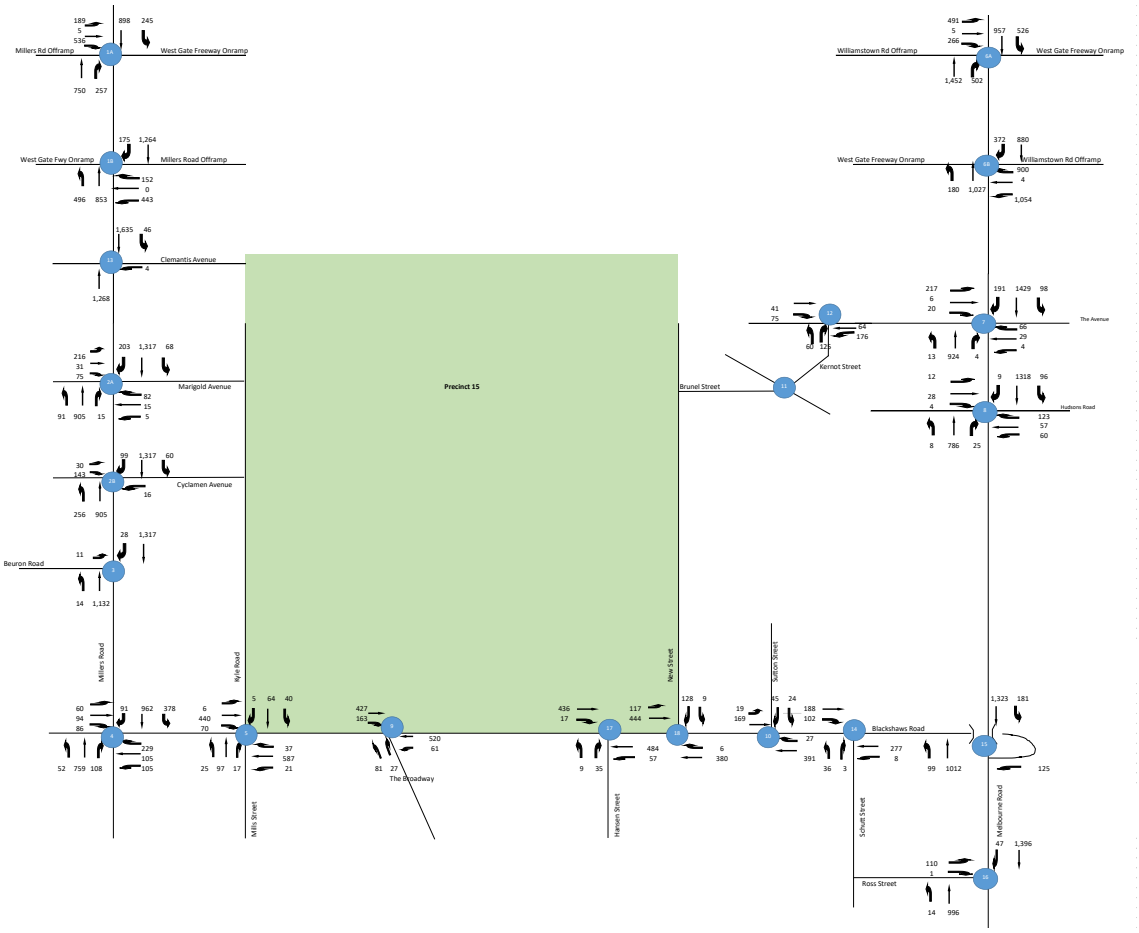


**Figure 6.6: Existing Traffic Volumes – PM Peak Hour**




Heavy vehicle volumes have also been included in the above traffic volumes. The volume of heavy vehicles has been identified through the surveys and/or the CIA model, which generally shows existing proportions are in the 0% to 6% range, but are expected to increase more to the 5% to 10% range and even higher on Millers Road, Melbourne Road and Blackshaws Road.

### 6.2.4 Intersection Operation

The operation of the key intersections has been assessed using *SIDRA INTERSECTION 7*, a computer based modelling package which calculates intersection performance.

The commonly used measure of intersection performance is referred to as the *Degree of Saturation (DOS)*. The DOS represents the flow-to-capacity ratio for the most critical movement on each leg of the intersection.

For signalised intersections, a DOS of around 0.95 has been typically considered the 'ideal' limit, beyond which queues and delays increase disproportionately, whilst for an unsignalised intersection a DOS of 0.90 is considered the 'ideal' limit[3].

[3] SIDRA INTERSECTION adopts the following criteria for Level of Service assessment:

| Level of Service | | Intersection Degree of Saturation (DOS) | | |
|---|---|---|---|---|
| | | Unsignalised Intersection | Signalised Intersection | Roundabout |
| A | Excellent | <=0.60 | <=0.60 | <=0.60 |
| B | Very Good | 0.60-0.70 | 0.60-0.70 | 0.60-0.70 |
| C | Good | 0.70-0.80 | 0.70-0.90 | 0.70-0.85 |

As part of the traffic assessment, the networking function available through SIDRA INTERSECTION 7 was used for the following coordinated intersections:

- Millers Road from the interchange with the West Gate Freeway to Blackshaws Road
- Melbourne Road from the interchange with the West Gate Freeway to Hudson Street.

The networking function allows for consideration of the impacts that up and down stream intersections have on each intersection in the aim of better reflecting actual traffic conditions, as well as helping with the understanding of which intersections drive the operation of others along a corridor.

The modelled existing DOS of each intersection in the AM and PM peak hours is provided in Table 6.1 and Table 6.2 respectively, with full results presented in Appendix A of this report.

**Table 6.1: Existing Conditions DOS – AM Peak Hour**

| Intersection | | DOS |
|---|---|---|
| West Gate Freeway North / Millers Road | Intersections Networked | 0.88 |
| West Gate Freeway South / Millers Road | | 1.05 |
| Millers Road / Clematis Avenue | | 0.97 |
| Millers Road / Marigold Avenue | | 0.76 |
| Millers Road / Cyclamen Avenue | | 0.51 |
| Millers Road / Beuron Road | | 0.37 |
| Millers Road / Blackshaws Road | | 0.78 |
| West Gate Freeway North / Melbourne Road | Intersections Networked | 0.62 |
| West Gate Freeway South / Melbourne Road | | 1.09 |
| Melbourne Road / The Avenue | | 0.93 |
| Melbourne Road / Hudsons Road | | 0.90 |
| Blackshaws Road / Kyle Road / Mills Street | | 0.39 |
| Blackshaws Road / The Broadway | | 0.36 |
| Blackshaws Road / Hansen Street | | 0.30 |
| Blackshaws Road / New Street | | 0.34 |
| Blackshaws Road / Sutton Street | | 0.17 |
| Blackshaws Road / Schutt Street | | 0.11 |
| Melbourne Road / Blackshaws Road | | 0.30 |
| Melbourne Road / Ross Street | | 0.32 |
| The Avenue / Kernot Street | | 0.61 |

**Table 6.2: Existing Conditions DOS – PM Peak Hour**

| Intersection | | DOS |
|---|---|---|
| West Gate Freeway North / Millers Road | Intersections Networked | 0.92 |
| West Gate Freeway South / Millers Road | | 0.94 |
| Millers Road / Clematis Avenue | | 0.41 |
| Millers Road / Marigold Avenue | | 0.71 |
| Millers Road / Cyclamen Avenue | | 0.65 |
| Millers Road / Beuron Road | | 0.39 |
| Millers Road / Blackshaws Road | | 0.86 |

| | | | | |
|---|---|---|---|---|
| D | Acceptable | 0.80-0.90 | 0.90-0.95 | 0.85-0.95 |
| E | Poor | 0.90-1.00 | 0.95-1.00 | 0.95-1.00 |
| F | Very Poor | >=1.0 | >=1.0 | >=1.0 |

| Intersection | | DOS |
|---|---|---|
| West Gate Freeway North / Melbourne Road | Intersections Networked | 0.90 |
| West Gate Freeway South / Melbourne Road | | 0.66 |
| Melbourne Road / The Avenue | | 0.66 |
| Melbourne Road / Hudsons Road | | 0.92 |
| Blackshaws Road / Kyle Road / Mills Street | | 0.47 |
| Blackshaws Road / The Broadway | | 0.41 |
| Blackshaws Road / Hansen Street | | 0.30 |
| Blackshaws Road / New Street | | 0.31 |
| Blackshaws Road / Sutton Street | | 0.24 |
| Blackshaws Road / Schutt Street | | 0.16 |
| Melbourne Road / Blackshaws Road | | 0.65 |
| Melbourne Road / Ross Street | | 0.38 |
| The Avenue / Kernot Street | | 0.20 |

Table 6.1 and Table 6.2 indicate that the intersections all currently operate within acceptable levels of operation except for the following:

- West Gate Freeway South / Millers Road in the AM Peak Hour (DOS of 1.05)
- Millers Road / Clematis Avenue in the AM Peak Hour (DOS of 0.97)
- West Gate Freeway South / Melbourne Road in the AM Peak Hour (DOS of 1.09).

These intersections currently operate above the 'ideal' limit with a DOS of above 0.95. However, this criterion relates to the level of service experienced rather than the point at which operational failure of the intersection occurs. Moreover, given the strategic importance of the West Gate Freeway and the use of ramp metering during peak periods, it is not realistic to expect the proximate intersections, such as the above, to operate with a DOS of 0.95 or less.

It is also noted that the use of intersection modelling software, such as SIDRA INTERSECTION, is limited in its ability to accurately reflect the operation of intersections like those associated with the interchanges with the West Gate Freeway, as the associated computer program is not designed to simulate complex vehicle interactions caused through closely spaced intersections and flow management measures, such as the on-ramp metering impacting the capacity of departure lanes to the signalised intersections associated with the interchanges. However, for the purposes of analysing the development proposal for the subject site, it is considered to provide a suitable baseline upon which to understand what the impacts on the road network will likely be and how it might be managed into the future.

## 6.3 Future Conditions (2031)

### 6.3.1 CIA Model Link Changes

The percentage changes in traffic volumes on each link connected to the key intersections have been extracted from the CIA Model to understand what the likely future traffic volume change will be.

In this regard, Figure 6.7 to Figure 6.10 indicate the percentage changes between 2015 and 2031 (under Scenario 6a) on each approach and departure link connecting to the key intersections being analysed.

Figure 6.7: Strategic Model Output – AM Peak Approach Link Changes

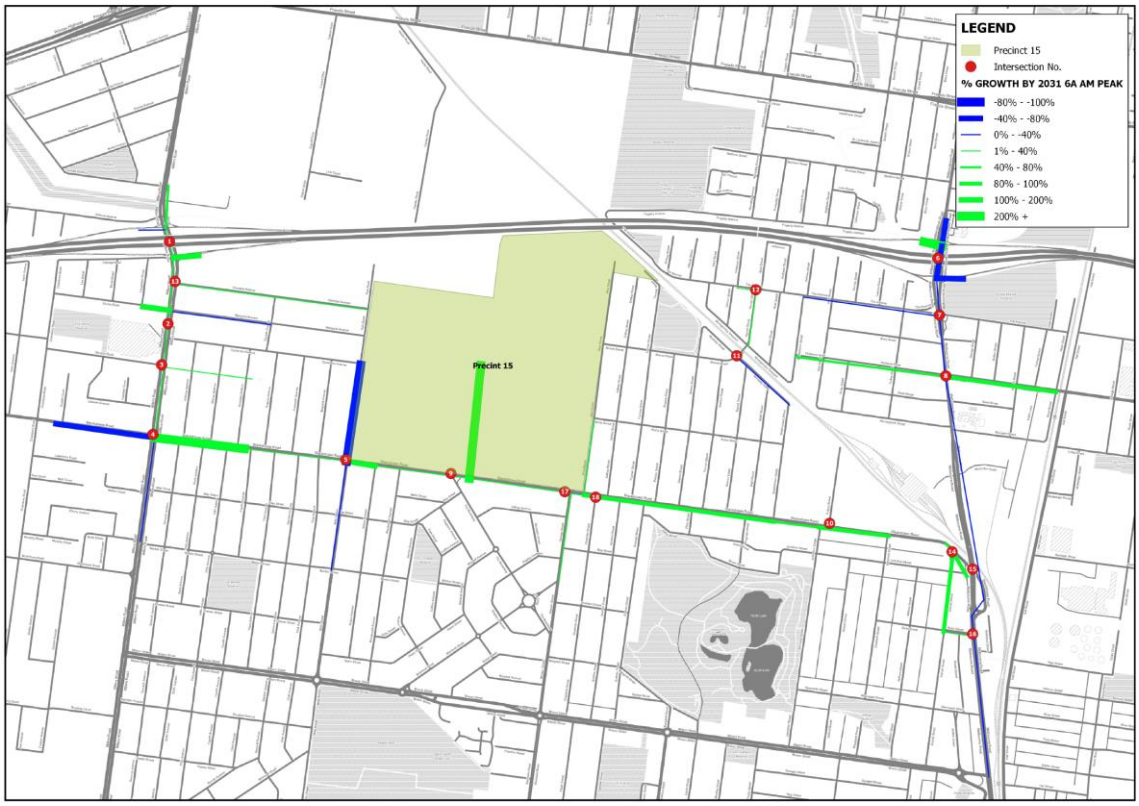



Figure 6.8: Strategic Model Output – AM Peak Departure Link Changes

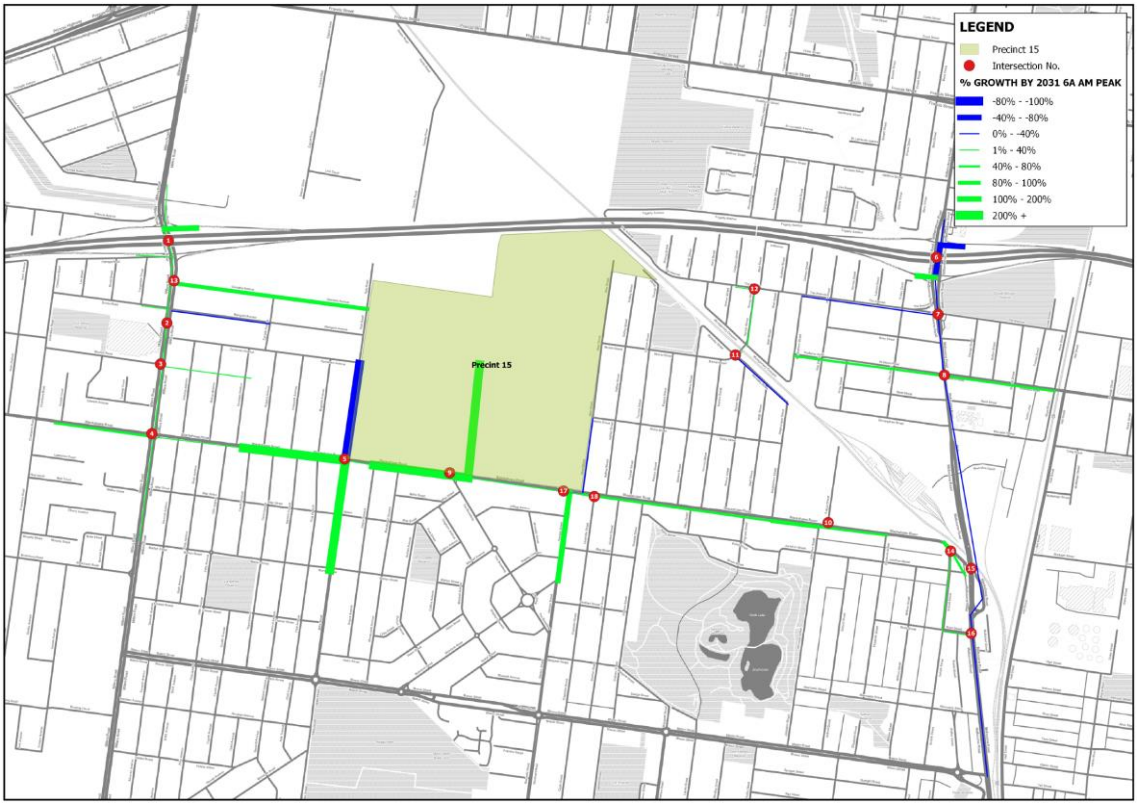


Figure 6.9: Strategic Model Output – PM Peak Approach Link Changes

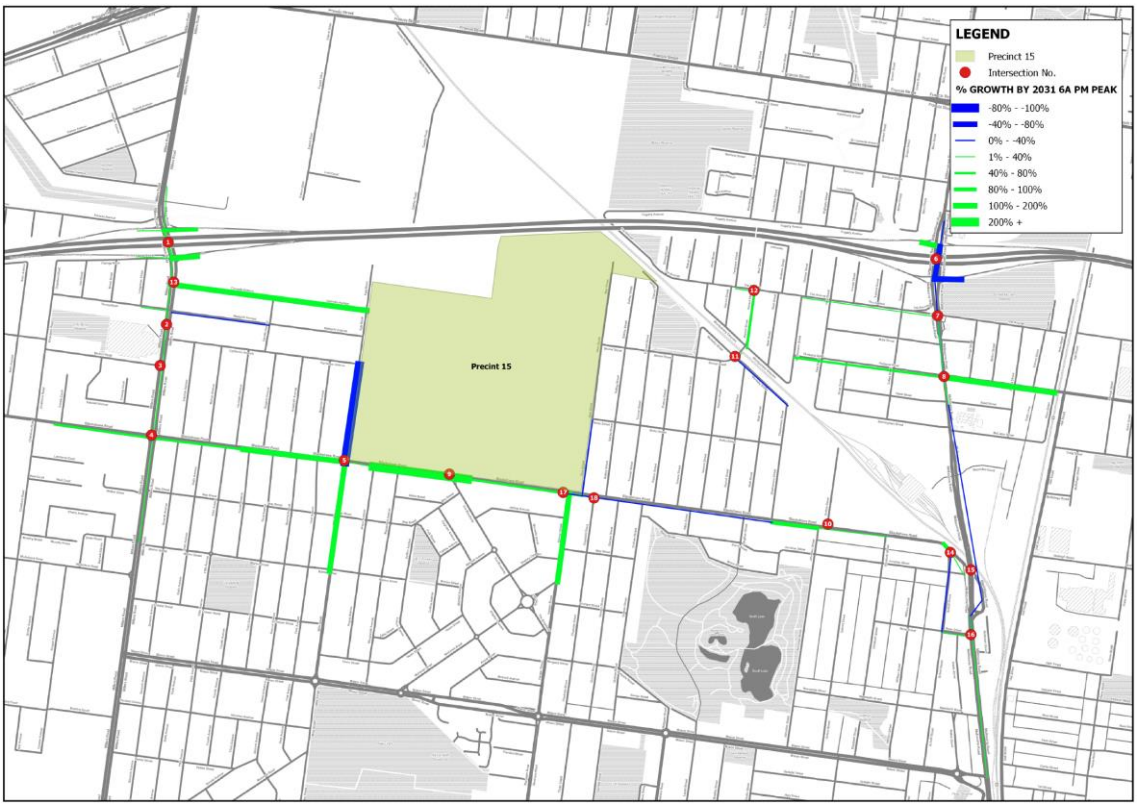



Figure 6.10: Strategic Model Output – PM Peak Departure Link Changes

It is noted that Scenario 6a not only includes the development of Precinct 15 (subject site), but Precinct 16, Precinct 20 and other 'business as usual' background development growth expected up to 2031 in and affecting the area. This includes the construction of the Western Distributor and widening of the West Gate Freeway, which based on the CIA Model is expected to attract additional traffic volumes through improved travel times and additional network capacity, as well as redirecting some traffic flows due to changes in travel routes and access locations to the freeway network.

Ultimately, the CIA Model indicates that there will be increased traffic volumes on Millers Road trying to access the interchange with the West Gate Freeway and Western Distributor (last access point before the Yarra River) and a reduction in traffic volumes on Melbourne Road, as it won't be possible to access the Western Distributor from the interchange with the West Gate Freeway, so less people will want to use utilise this interchange.

### 6.3.2 Peak Hour Traffic Volumes

The percentage changes on each link to the key intersections cannot be directly applied to the existing traffic movement volumes, as they won't balance across the intersection approaches and departures, and/or between the up and down-stream intersections. This is mainly due to strategic modelling not considering the road network at an intersection operation level. As such, a level of interpretation and iteration is required to apply these link increases to the turning volumes to get future volumes that generally balance and reflect how people are expected to access the area into the future.

By applying the link percentage changes indicated in Figure 6.7 to Figure 6.10 to the existing turning movement volumes in Figure 6.5 and Figure 6.6, and following some interpretation and iteration to try and balance them as appropriately as possible, the resulting expected future turning movement volumes are shown in Figure 6.11 and Figure 6.12.

Figure 6.11: Future Traffic Volumes – AM Peak Hour

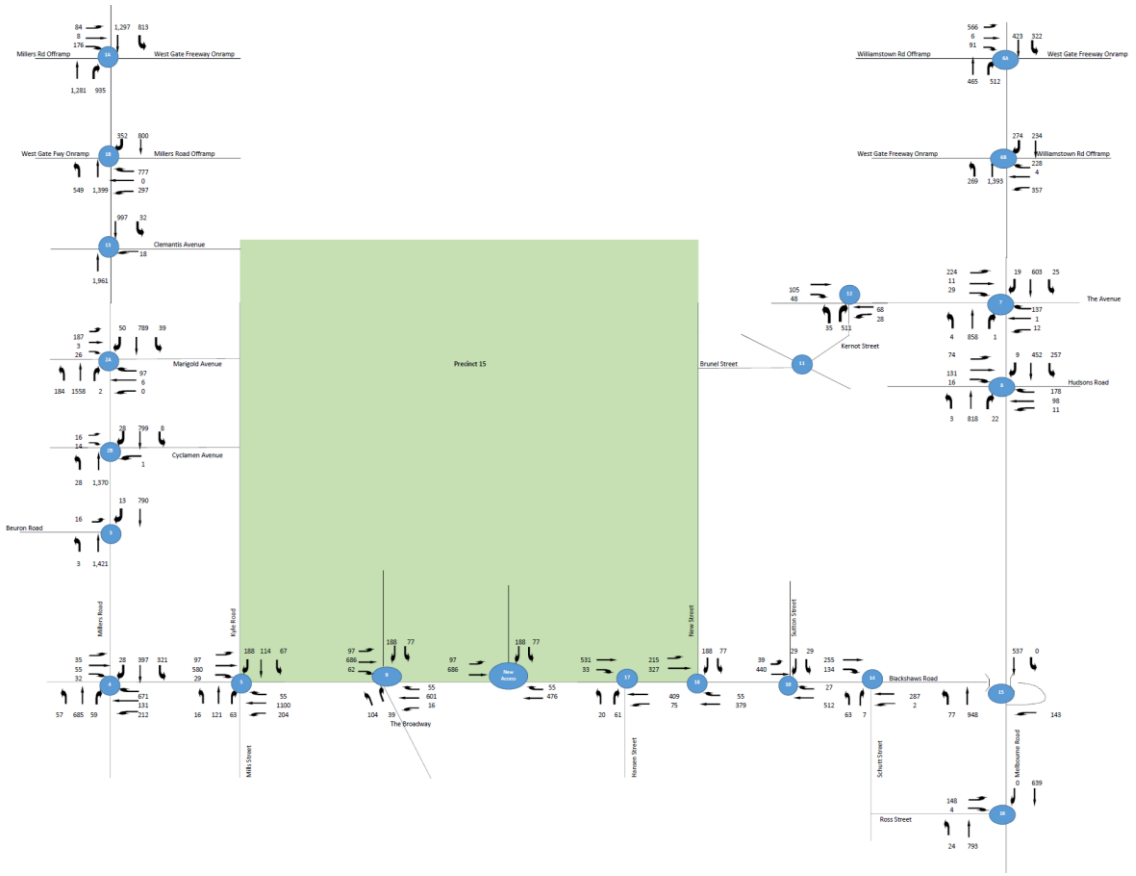
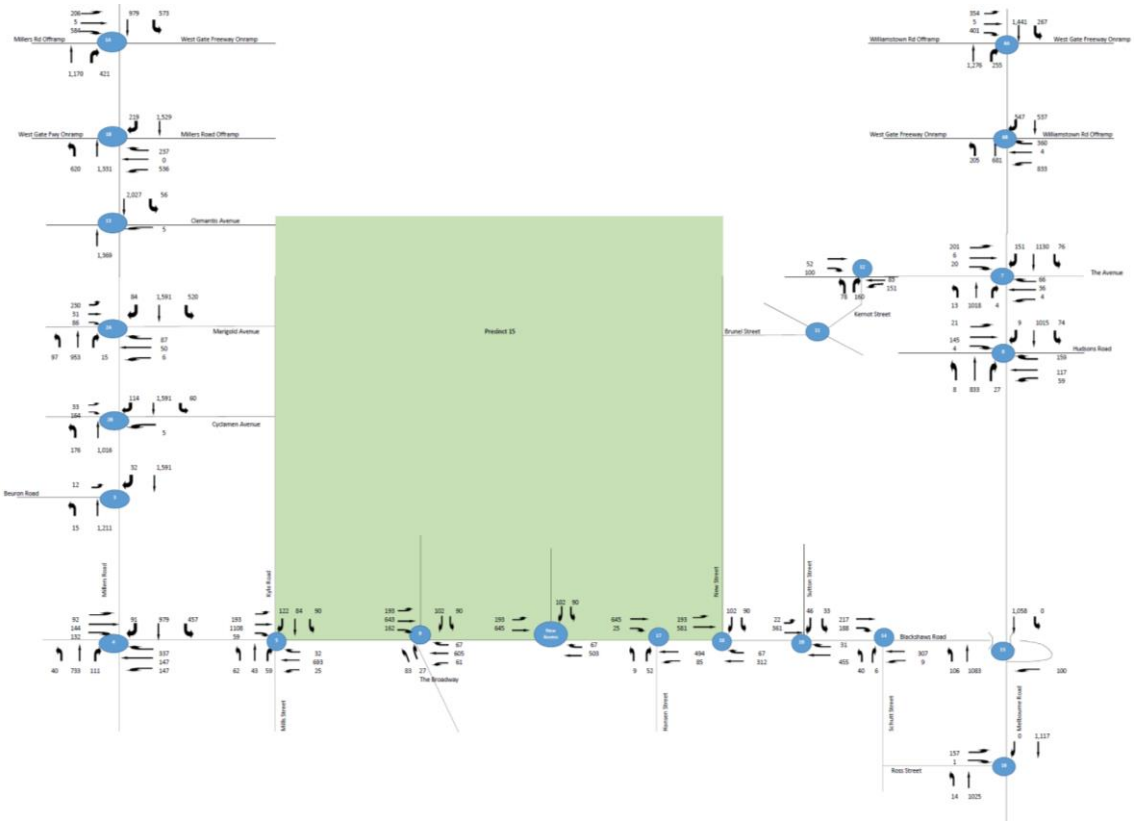



Figure 6.12: Future Traffic Volumes – PM Peak Hour



### 6.3.3 Intersection Operation

The operation of the key intersections have been assessed using the SIDRA models, based on the future traffic movement volumes noted above, to understand the expected change in intersection operation expected from 2015 to 2031, under Scenario 6a.

The expected future DOS of each intersection in the AM and PM peak hours is shown in Table 6.3 and Table 6.4 respectively, with full results presented in Appendix B of this report.

**Table 6.3: Future Conditions DOS – AM Peak Hour**

| Intersection | | DOS |
|---|---|---|
| West Gate Freeway North / Millers Road | Intersections Networked | 1.50 |
| West Gate Freeway South / Millers Road | | 1.96 |
| Millers Road / Clematis Avenue | | 0.71 |
| Millers Road / Marigold Avenue | | 1.39 |
| Millers Road / Cyclamen Avenue | | 1.40 |
| Millers Road / Beuron Road | | 1.00 |
| Millers Road / Blackshaws Road | | 1.69 |
| West Gate Freeway North / Melbourne Road | Intersections Networked | 0.59 |
| West Gate Freeway South / Melbourne Road | | 1.05 |
| Melbourne Road / The Avenue | | 0.91 |
| Melbourne Road / Hudsons Road | | 0.89 |
| Blackshaws Road / Kyle Road / Mills Street | | 0.85 |
| Blackshaws Road / The Broadway [1] | Intersections Networked | 0.93 |
| Blackshaws Road / New Connector Road [1] | | 0.90 |
| Blackshaws Road / Hansen Street | | 0.44 |
| Blackshaws Road / New Street | | 0.33 |
| Blackshaws Road / Sutton Street | | 0.38 |
| Blackshaws Road / Schutt Street | | 0.21 |
| Melbourne Road / Blackshaws Road | | 0.28 |
| Melbourne Road / Ross Street | | 0.25 |
| The Avenue / Kernot Street | | 0.70 |

[1] Proposed signalised intersections with new connector streets into the site assessed as a network due to their proximity

**Table 6.4: Future Conditions DOS – PM Peak Hour**

| Intersection | | DOS |
|---|---|---|
| West Gate Freeway North / Millers Road | Intersections Networked | 2.81 |
| West Gate Freeway South / Millers Road | | 1.35 |
| Millers Road / Clematis Avenue | | 0.73 |
| Millers Road / Marigold Avenue | | 0.89 |
| Millers Road / Cyclamen Avenue | | 0.77 |
| Millers Road / Beuron Road | | 0.38 |
| Millers Road / Blackshaws Road | | 0.80 |
| West Gate Freeway North / Melbourne Road | Intersections Networked | 1.17 |
| West Gate Freeway South / Melbourne Road | | 1.48 |
| Melbourne Road / The Avenue | | 0.69 |
| Melbourne Road / Hudsons Road | | 0.93 |
| Blackshaws Road / Kyle Road / Mills Street | | 0.77 |
| Blackshaws Road / The Broadway [1] | Intersections Networked | 0.91 |
| Blackshaws Road / New Connector Road [1] | | 0.90 |
| Blackshaws Road / Hansen Street | | 0.50 |

| | |
|---|---|
| Blackshaws Road / New Street | 0.74 |
| Blackshaws Road / Sutton Street | 0.31 |
| Blackshaws Road / Schutt Street | 0.21 |
| Melbourne Road / Blackshaws Road | 0.53 |
| Melbourne Road / Ross Street | 0.34 |
| The Avenue / Kernot Street | 0.30 |

[1] Proposed signalised intersections with new connector streets into the site assessed as a network due to their proximity

Table 6.3 and Table 6.4 indicate that the interchanges and intersections along Millers Road are not expected to operate within acceptable levels into the future. This is considered to be mostly due to the Western Distributor and widening of the West Gate Freeway, rather than the development of the subject site or the other significant development sites in Hobsons Bay. This is reflected in the CIA report by GHD, which states the below in the executive summary.

*"Millers Road south of West Gate Freeway would remain congested with or without the full development [under Scenario 6a]. However, for most of the road network, the development would have little impact on traffic conditions, which remain relatively uncongested."*

As such, it is expected as part of the Western Distributor and widening of the West Gate Freeway that modifications to the interchanges will occur to support the additional traffic volumes they attract in the future. However, at this time, the Western Distributor project is not sufficiently advanced to advise what changes will be made to the interchanges, and therefore it is only possible to advise at this time that the existing interchanges and the on-ramp metering arrangements will be inadequate.

On this basis it is assumed that the interchanges will be modified (physical layout and/or metering arrangements) as part of the Western Distributor and widening of the West Gate Freeway to accommodate the future traffic volumes expected to be attracted (i.e. will provide a similar level of service to those currently experienced).

Should the interchanges be suitably modified then queuing back from them won't impact the operation of the adjacent intersections of Millers Road with Clematis Avenue, Marigold Avenue and Cyclamen Avenue, which can then be expected to operate satisfactorily into the future as they will only have to manage relatively low volumes of side road traffic.

The key intersection where there are significant intersecting volumes that need to be managed, which will also increase with the development of Precinct 15, is the Millers Road / Blackshaws Road intersection. As such, the future operation of this intersection has been looked at as a standalone SIDRA Model (i.e. not within the network function and being impacted by the interchange) to understand if it can be expected to operate appropriately in the future. In this regard, the modelling indicates that the intersection will have an AM DOS of 1.13, which upon closer inspection of the standalone SIDRA model, relates to the through movement on the north approach. However, the right-turn movement from the eastern approach also has a DOS of 0.97.

As such, there is a need to consider mitigating works at the Millers Road / Blackshaws Road intersection, with the most obvious improvements being to split phase the east and west approaches due to their very different volumes and the ability to have right-turns from both lanes (kerbside lane would support through and right movements) on at least the east approach. This would not only help the east approach to operate within an acceptable level, but potentially provide more green time to the north and south approaches, to address the high DOS of the through movement on the north approach.

When the standalone Millers Road / Blackshaws Road SIDRA Model is modified to have split phasing the resulting DOS in the AM peak period is 0.99 on the north approach and 0.92 on the east approach. While the overall intersection DOS is above the ideal 0.95 level, it is only

marginally above the ideal level and is better than the unmodified arrangements. Furthermore, the movement relating to the additional traffic generated by Precinct 15 (each approach) has a DOS less than 0.95.

## 6.4 Local Road Network

The local road network to the east and west of Precinct 15 is used at times to avoid congestion on Millers Road and Melbourne Road, such as through The Avenue. Broadly speaking, the ability for vehicles to undertake such rat-running activities is dependent on the intersection arrangements with these two main arterial roads. Discussion on the current arrangements and future potential for rat-running to increase are discussed below.

### 6.4.1 Millers Road

The only intersection between Millers Road and the local road network that provides full turning movements over its length between the West Gate Freeway and Blackshaws Road is Marigold Avenue. The other intersections have left-in / left-out give way controlled arrangements.

As such, during the AM peak period when queuing back along Millers Road from the West Gate Freeway occurs, the only ability for traffic from Precinct 15 to try and avoid this queuing is through the signalised intersection with Marigold Avenue. However, the capacity of this approach is limited by the amount of green time that is allocated to it, and the volume of traffic coming out of Altona Gate that right-turns needing to filter through. As such, unless additional green time is provided to the approach, or the access arrangements for Altona Gate are changed, then it is not expected to be an attractive alternative route to Blackshaws Road.

In the PM peak period, there is limited queuing along Millers Road, so only a limited number of vehicles are expected to turn left into the various local roads to access Precinct 15. The amount of traffic that will consider using the local road network will be dependent on what the comparative vehicle speeds will be on each route. Given the narrow carriageway widths, kerbside parking and traffic calming measures along the local roads, Blackshaws Road route is expected to be more attractive for the majority accessing Precinct 15.

### 6.4.2 Melbourne Road

There are many intersections between Melbourne Road and the local road network that provide full turning movements over its length between the West Gate Freeway and Blackshaws Road. However, only The Avenue and Hudsons Road are signalised, and so create suitable opportunities for vehicles to enter the Melbourne Road traffic stream.

Notwithstanding, the Hudsons Road approach to Melbourne Road has limited capacity, with only one approach lane facilitating all movements, and so this does not attract a significant rat running volume.

The Avenue on the other hand provides a left-turn slip lane to Melbourne Road, and so the associated vehicle movement can push its way into the Melbourne Road traffic stream. The current traffic volume undertaking this movement in the AM peak hour is 715 vehicles. There is not considered to be any more capacity to support additional vehicles completing this movement. Also, Melbourne Road becomes less attractive in the future once the Western Distributor is built. As such, this existing rat running route is not expected to become any worse due to Precinct 15.

What could be considered to address this existing issue is to signalise the left-turn from The Avenue. However, the impact of the existing displaced traffic volumes would need to be

considered, and this is only recommended to be completed following the reduction in traffic volumes expected on Melbourne Road once the Western Distributor is completed.

## 6.5 Internal Road Network

Based on the CIA Model, Precinct 15 is anticipated to generate the following peak hour traffic volumes:

- AM Peak Hour = 1,324 vehicles out and 886 vehicles in
- PM Peak Hour = 1,068 vehicles out and 1,328 vehicles in.

It has been assumed that 50% of the above total traffic volumes will utilise the two proposed linked signalised intersections on Blackshaws Road, with the remaining 50% utilising the other site access points to Kyle Road, Blackshaws Road and New Street.

On this basis, up to 1,200 vehicles are expected in a peak hour to access the site through one of the new signalised intersections. Across a day that could be up to 12,000 vehicles, which exceeds the theoretical capacity of a connector road (i.e. 7,000 vehicles based on Table C1 of Clause 56.06 of the Hobsons Bay Planning Scheme).

However, the SIDRA analysis of the two proposed signalised intersections on Blackshaws Road has been undertaken and found to operate within acceptable levels following full development of the site and other anticipated background growth affecting Blackshaws Road until 2031. To ensure this volume of traffic is able to be accommodated, the following are recommended for the connector streets that carry these volumes into the site:

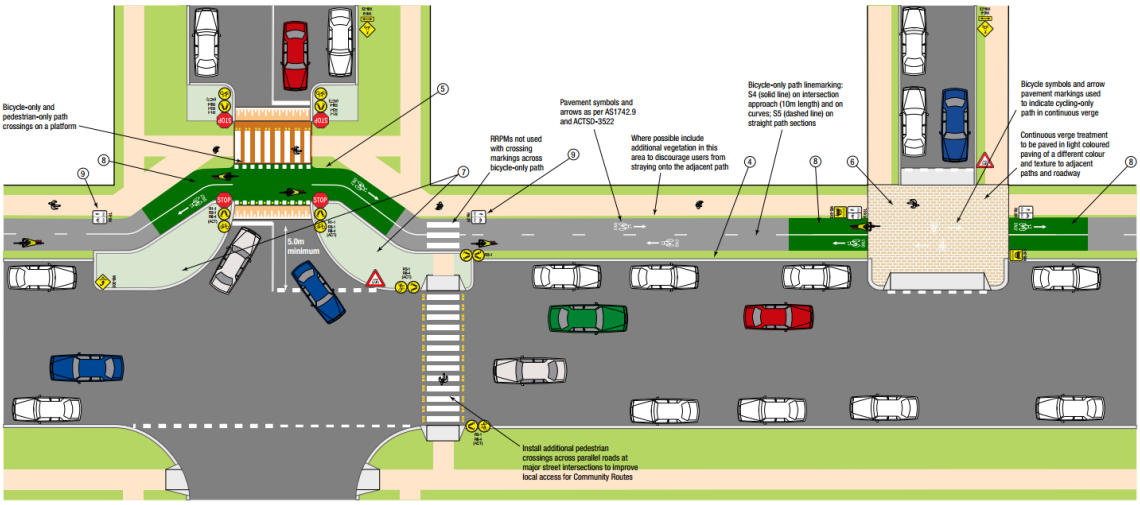
- Have two approach lanes to Blackshaws Road that extend at least 80m
- Not have intersecting roads or property access points over the initial 80m into the site
- Not have kerbside parking until after the first local road to maintain suitable carriageway capacity.

For other roads that make up Precinct 15, typical intersection layouts and no stopping restrictions on approaches are expected to be sufficient to manage the anticipated accessing traffic volumes. However, given that separated bicycle facilities are proposed on one side of the internal connector roads, specific crossing facilities of intersecting roads are recommended. In this regard, the following crossing facilities are proposed, dependent on what road type they are crossing:

- Access Lane – Continuous verge treatment with mixed intersection environment, as shown in Figure 6.13 (intersection on the right)
- Access Street – Bend out treatment with raised bicycle and zebra crossing, as shown in Figure 6.13 (intersection on the left)
- Connector Street - Radial roundabout design with raised bicycle and zebra crossing, as shown in Figure 6.14, except that the crossing facility is only required on the approach the separated bicycle facility extends across, not all approaches.

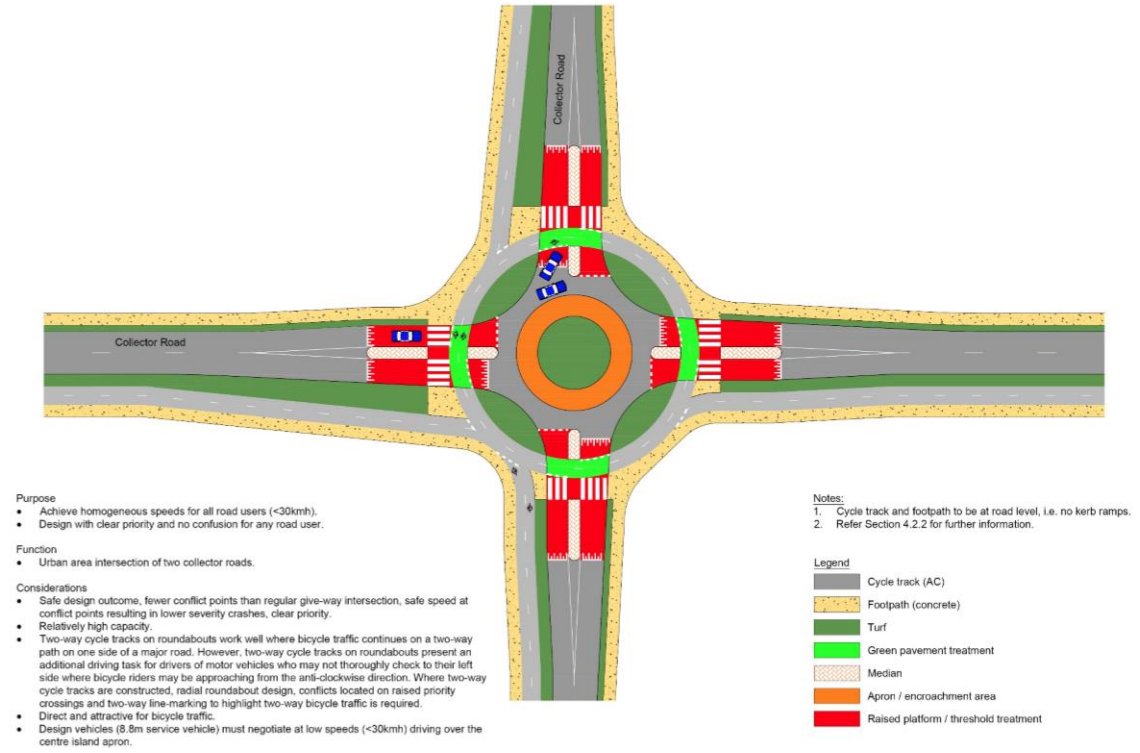
It is noted that a roundabout has been indicated in Figure 6.14 for where the separated bicycle facilities along one side of a connector street crosses another connector street. This is because roundabouts are recommended where the connector streets intersect internal to the site and with Kyle Road and New Street. Roundabouts are recommended on the basis that the traffic volumes will be too high for give way controlled intersections, and that signalised intersections at these locations are not appropriate as they would provide a lower level of service to all modes and a poor amenity outcome for the residential precinct.

**Figure 6.13: Separated Bicycle Crossing Facility of Access Lane and Access Street**




Source: http://activeinfrastructure.net.au/practitioner-tool/docs/id-b5tdhzn19ukmaemi/ACTSD-0505-160218-2wayBicycle-onlyPaths.pdf

**Figure 6.14: Separated Bicycle Crossing Facility of Connector Street (roundabout)**




Source: Queensland Department of Transport and Main Roads, Technical Note 128, Selection and Design of Cycle Tracks, May 2015

## 6.6 Mitigating Measures

On the basis of the above discussions and analysis, it is considered that the anticipated traffic generated by the proposed rezoning and development of Precinct 15 can be accommodated by the surrounding road network following full development of the site and other expected background development in the area until 2031, subject to the following mitigating road works to the existing road infrastructure:

- At the Millers Road / Blackshaws Road signalised intersection:
  - Extend the right-turn lane on the east approach of the intersection by 240m to 300m through modification to road markings and introduction of parking restrictions that at least restricts kerbside parking during the commuter peaks.
  - Convert the through lane on the east approach of the intersection to a through and right turn lane by modifying the directional arrow markings.
  - Modify the intersection phasing to have a split phasing for the east and west approaches.
- Increase the lengths of 'No Stopping' parking restrictions and install line marked right turn lanes on Blackshaws Road at the unsignalised intersections with Schutt Street, New Street and Hansen Street.

It will be necessary to install traffic signals at the two new site access intersections on Blackshaws Road associated with the connector streets. The approaches to these signalised intersections from within the site require two approaches lanes for 80m that are clear of intersections, property access points and kerbside parking.

Additionally, the internal road network layout should provide specific crossing facilities to support the separated bicycle facilities on one side of the connector streets.

# 7. Integrated Transport Response



## 7.1 Overview

As mentioned in Section 5.5, the CIA Model assumes mode splits that are considered to be on the low side in regard to the proportion of alternative transport modes that people should be encouraged to use to access the site. Also mentioned is that this is potentially due to the current limited accessibility of Precinct 15 by alternative transport modes being maintained in the future 2031 year CIA Model. As such, a higher proportion of alternative transport use is being aimed for, which is more similar to those achieved in Maribyrnong.

On this basis, the following mode split targets are being aimed for as part of Precinct 15:

- Car / Truck Driver = 53%
- Car Passenger = 24%
- Public Transport = 18%
- Active Transport = 5%.

Details of how these mode splits will be supported as part of the development of Precinct 15 are set out in this section of the report.

## 7.2 Active Transport

Active transport consists of walking and cycling. These modes are often not well planned for, as they only make up for a small proportion of the overall trip numbers and due to the vulnerability of their use, require facilities that have priority over and take capacity away from motor vehicles.

However, a mode split target of 5% has been set for the development of Precinct 15. The key trips that are being targeted to achieve this active transport mode share are the following:

- Commuters accessing the Melbourne CBD
- Short local trips within 5km.

### 7.2.1 Commuters Accessing the Melbourne CBD

Based on ABS Method of Travel to Work mode splits for those that are employed in the suburb of Melbourne in 2011, a bicycle mode split of 4% was recorded. However, this mode split has been increasing over the last five years, and based on the City of Melbourne's Bike Plan, they are aiming to increase this mode share to 10% by 2030.

Given that Hobsons Bay is adjacent to the City of Melbourne (they share the municipal boundary down the centre of the Yarra River) and the Federation Trail is to be extended as part of the Western Distributor and provide a continuous separated bicycle facility into the Melbourne CBD, Precinct 15 is well placed to achieve such a mode share for those accessing the Melbourne CBD.

Upon interrogation of the CIA Model, approximately 26% of people from Precinct 15 access the Melbourne CBD. As such, a total mode share of 2.6% of Precinct 15 could well be cycling to the Melbourne CBD.

To support these trips, which would equate to approximately 110 bicycles in a peak hour, a connection from the site to the Federation Trail is required and is being proposed via a shared path on the southwest side of the freight line north of Watson Street.

### 7.2.2 Local Trips (5km)

In order to achieve the 5% active transport mode share being aimed for Precinct 15, and given that 2.6% of active transport trips will be cycling to and from the CBD, then another 2.4% of trips will need to occur by walking or cycling. Given that 2% of all trips in Hobsons Bay already occur by walking, then the other 0.4% should be able to be achieved through bicycle facilities supporting the various trips that occur within 5km of Precinct 15.

Based on the CIA Modelling, there will be a total of 1630 trips (35% of all) in the AM and 1965 trips (40% of all) in the PM peak two hour periods that start or end within 5km of Precinct 15. The proportion of trips by distance in the AM and PM peak two hour periods for Precinct 15 are shown in Figure 7.1 and Figure 7.2.

**Figure 7.1: Trip Distances in the AM Peak Two Hours**

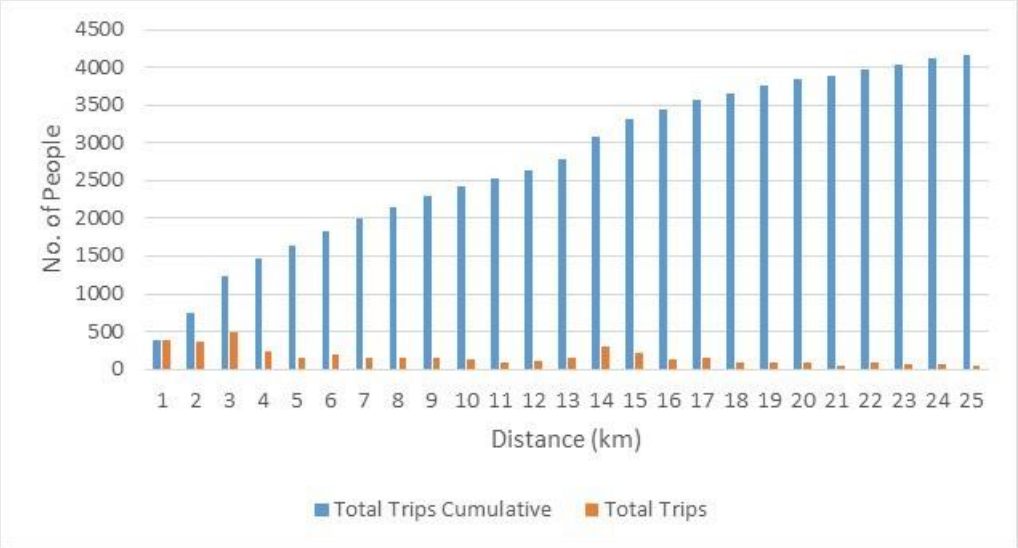



**Figure 7.2: Trip Distances in the PM Peak Two Hours**

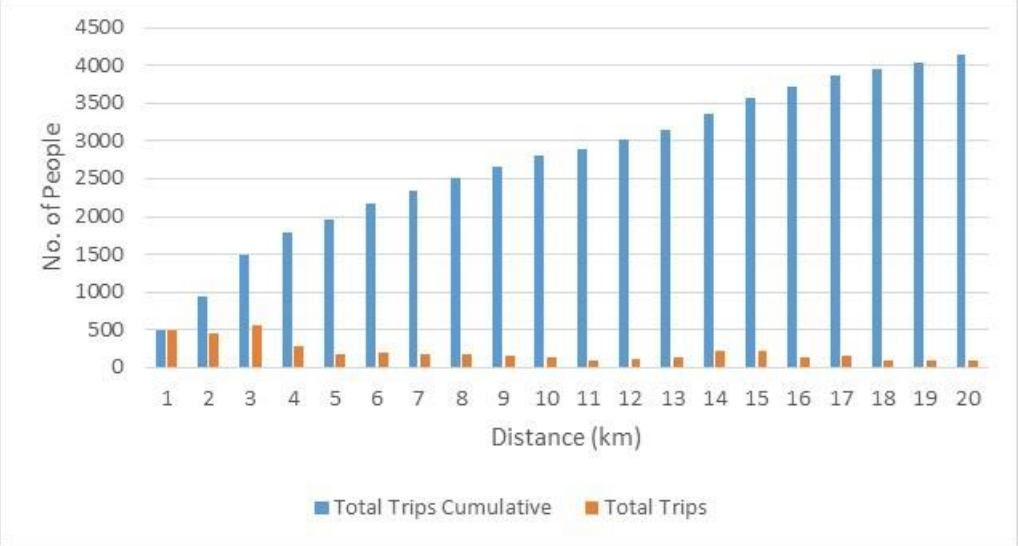



Figure 7.3 has been prepared to show where these short trips occur in order to understand where facilities would be best placed to encourage walking and cycling over these short trips.

Figure 7.3: 5km or Less Trip Locations

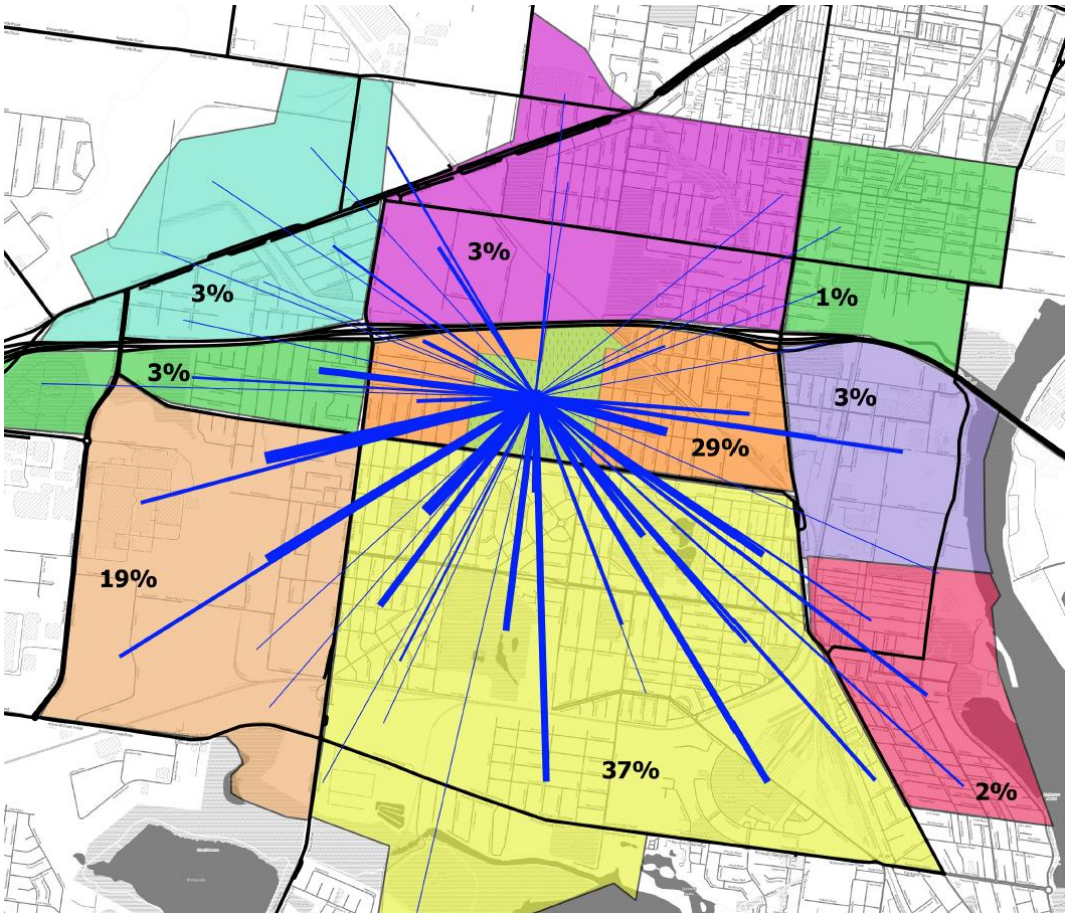



Figure 7.3 indicates that the majority of trips that start or end within 5km occur to the east, south and southwest. On this basis, pedestrian and bicycle facilities should be provided to support these trips.

The pedestrian network in the surrounding area is generally well developed, so the above indicated directions are able to be accessed on foot.

In terms of the bicycle network, there are limited facilities that exist and connect the site to the above areas. However, based on the Hobsons Bay Strategic Bicycle Plan, a network of on-street facilities is proposed to the south. As such, on-road bicycle lanes along The Broadway from Blackshaws Road to Hansen Street can be provided, as long as the traffic lanes can be 3.0m wide on a bus route, which will provide a connection into these proposed facilities.

To the east, there is an off-road path on the south side of Birmingham Street proposed, which could be linked into via on-road mixed traffic bicycle facilities on Aloha Street and the existing fright line crossing to the north of Stephenson Street. This could eventually help support improved pedestrian and bicycle access to the Spotswood Station.

The area to the southwest of the site can be accessed via on-road mixed traffic bicycle facilities on Cyclamen Avenue and across Millers Road, where facilities are proposed along Chambers Road in the future.

Given the above, there is considered to be suitable opportunity to provide for active transport trips to and from Precinct 15, which should at a minimum achieve the associated targeted 5% mode split for active transport.

## 7.3 Public Transport

The CIA Model estimates that 12% of people accessing Precinct 15 will do so via public transport, noting that park and ride users are included in those numbers. However, a higher public transport mode split of 18% is being targeted. This is considered to be able to be achieved through the following:

- Providing a local bus route that connects with Spotswood Station
- Improved service frequency and priority of services in the vicinity of Precinct 15.

### 7.3.1 Local Bus Route

Currently the local bus route 432 travels along a circuitous route between the Altona Gate Bus Interchange and Yarraville Station. In the future, it will be able to travel east-west through Precinct 15, which will improve its travel time and make it more attractive.

In addition, a model run has been completed that tests which of the following two routes perform better for Precinct 15 and the broader area:

- Through Precinct 15, Spotswood Station, Newport Station, Mason Street, Chambers Road and Altona Gate
- Through Precinct 15, Old Bradmill Site, Yarraville Station, Newport Station, Mason Street, Chambers Road and Altona Gate.

The boarding numbers for the two route options passing through Precinct 15 based on a 20-minute frequency in both directions are presented in Table 7.1.

**Table 7.1: Local Bus Route Model Run – Spotswood vs Yarraville Station Boarding Numbers**

| Route | AM Peak 2 Hour | | | PM Peak 2 Hour | | |
|---|---|---|---|---|---|---|
| | @ P15 | Other | Total | @ P15 | Other | Total |
| Spotswood | 204 | 330 | 534 | 28 | 518 | 546 |
| Yarraville | 74 | 173 | 247 | 24 | 429 | 453 |

Based on Table 7.1, should the local bus route go to Spotswood Station instead of Yarraville Station, it can be expected to move more people both from Precinct 15 and the broader area. The difference is over double the number of people in the AM peak and 20% more in the PM peak for boarding numbers and even higher for Precinct 15, which should enable the site to achieve the 18% public transport mode share target. However, it is not in the control of the development to provide a local bus service through Precinct 15 that connects with the Spotswood Station.

It is noted that the existing local road network around the Spotswood Station has restrictive widths and ability to support bus services, especially if they need to turn around. However, there are the following potential loops if services need to turn around, rather than travel along Hall Street as modelled above:

- Hudsons Road, Raleigh Street, Craig Street and Hall Street
- Hudsons Road, Hope Street, McLister Street and Melbourne Road
  (signals at the Melbourne Road / McLister Street / Birmingham Street intersection would support proposed bicycle connection to the station).

It is also noted that improved access to rail from Precinct 15 would help reduce the need to provide for parking at the train stations for park and ride activities. These trips also contribute to local traffic volumes during the commuter peaks, so reducing them will help the broader community.

### 7.3.2 Bus Frequency & Priority

Providing increased bus frequencies on key routes and/or improved priority for all routes should help improve service reliability, which is a key determinant from a user perspective on their use (assuming the routes are generally accessible and match desired travel patterns).

While the frequencies of the bus services will be set by PTV, there is opportunity as part of the development of Precinct 15 to improve bus priorities at new and upgraded intersections. This is recommended to be achieved through the provision of a detector in up or down stream bus stops of signalised intersections, as well as providing in lane bus stops on local roads, which are also a local area traffic calming measure.

The likely impact of such priority measures on user numbers has not been determined at this time, but they are recommended to be implemented where specific development synergies occur, such as the new signalised intersections and re-programming of the Millers Road / Blackshaws Road intersection.

# 8. Car Parking



## 8.1 Existing

Car parking (subject to various time and clearway restrictions) is generally provided on each of the roads in the vicinity of Precinct 15.

GTA Consultants compiled an inventory of publicly available on-street car parking along the frontages of the subject site. The inventory identified a total of 192 on-street spaces, including 147 spaces that are unrestricted during business hours.

On-site observations indicate that current on-street car parking demands along the frontages of the subject site are generally low.

## 8.2 Future

### Residential Dwellings

Car parking for the proposed residential dwelling lots should be provided in accordance with the requirements of Clause 52.06 of the Hobsons Bay Planning Scheme through a minimum provision of single garages for one and two bedroom dwellings and double garages for three or more bedroom dwellings. Visitor car parking demands are expected to be able to be accommodated on-street.

### Apartments

Integrated car parking facilities should be provided for any apartment buildings, with a typical on-site car parking provision of one space for one and two bedroom apartments and two spaces for three or more bedroom apartments.

Residential visitor car parking demands are expected to be able to be accommodated on-street.

Consideration could also be given to reducing the above car parking provision to help encourage the use of alternative transport modes, especially for any small one-bedroom dwellings or if on-site car share facilities are provided.

### Mixed Use Town Centre & Business Area

While the specific details for approx. 5,550sqm of retail floor space and 7,000sqm of leasable office floor space within a mixed use zone have not been confirmed at this time, it is expected to include typical shop, supermarket, café uses, medical centre facilities and offices.

It is likely that a provision of in the order of 250 car spaces will be needed for the 5,550sqm of retail floor space and 245 car spaces for the 7,000sqm of leasable office floor space to be consistent with the statutory car parking rates for such land uses within Clause 52.06 of the Hobsons Bay Planning Scheme. A future permit application for the mixed use town centre and business area would include a detailed parking assessment, including the impacts of shared parking arrangements.

# 9. Planning Requirements Checklist



## 9.1 Preamble

As the proposal is only in the Development / Structure Plan and rezoning phase, the details are still being developed. However, eventually the development of the site will need to accord with the requirements of Clause 56 of the Hobson Bay Planning Scheme. Therefore, this section of the report assesses the proposed development against the access and mobility requirements set out within Clause 56.06 of the Planning Scheme for subdivisions.

Clause 56 of the Hobsons Bay Planning Scheme sets out the following purpose:

*"To implement the State Planning Policy Framework and the Local Planning Policy Framework, including the Municipal Strategic Statement and local planning policies.*

*To create liveable and sustainable neighbourhoods and urban places with character and identify.*

*To achieve residential subdivision outcomes that appropriately respond to the site and its context for:*

- *Metropolitan Melbourne growth areas*
- ***Infill sites within established residential areas***
- *Regional cities and towns*

*To ensure residential subdivision design appropriately provides for:*

- *Policy implementation*
- *Liveable and sustainable communities*
- *Resident lot design*
- *Urban landscape*
- ***Access and mobility management***
- *Integrated water management*
- *Site management*
- *Utilities."*

Clause 56 consists of a number of provisions made up of objectives and standards for implementation within the design of a new subdivision. The Clause states the following in respect to objectives and standards:

- *"Objectives. An objective describes the desired outcome to be achieved in the completed subdivision.*
- *Standards. A standard contains the requirements to meet the objective.*

*A standard should normally be met. However, if the responsible authority is satisfied that an application for an alternative design solution meets the objective, the alternative design solution may be considered."*

The relevant transport and access areas of Clause 56 that will be considered within this report is Clause 56.06, which aims to:

*"achieve an urban structure where compact and walkable neighbourhoods are clustered to support larger activity centres on the Principal Public Transport Network in Metropolitan Melbourne and on the regional public transport network outside Metropolitan Melbourne.*

*To provide for walking (including persons with impaired mobility), cycling, public transport and other motor vehicles in an integrated manner.*

*To contribute to reduced car dependence, improved energy efficiency, reduced greenhouse gas emissions and reduced air pollution."*

Standard C14 of the Clause requires that a plan of the layout of the neighbourhood be prepared that meets the objectives of:

- Clause 56.06-2 Walking and cycling network
- Clause 56.06-3 Public Transport network
- Clause 56.06-4 Neighbourhood street network.

Clause 56.06 divides walking and cycling facilities, public transport facilities and street network design into two areas, being Network Objectives and Detail Objectives, of which much of the latter is a matter for detailed design and therefore only the general intent agreed to at this stage.

## 9.2 Walking and Cycling

### Statutory Requirements

The walking and cycling network and detailed objectives set out within Clause 56.06-2 and 56.06-5 respectively state the following:

***Clause 56.06-2***

- *"To contribute to community health and well-being by encouraging walking and cycling as part of the daily lives of residents, employees and visitors.*
- *To provide safe and direct movement through and between neighbourhoods by pedestrian and cyclists.*
- *To reduce car use, greenhouse gas emissions and air pollution."*

***Clause 56.06-5***

- *"To design and construct footpaths, shared cycle path networks that are safe, comfortably, well-constructed and accessible for people with disabilities.*
- *To design footpaths to accommodate wheelchairs, prams, scooters and other footpath vehicles"*

Standards C15 and C18 set out the requirements that should be met to meet the objectives of these Clauses.

### Proposed Treatments

Footpaths of 1.8m in width will generally be provided on both sides of the roads within the site. Shared paths of at least 3.0m in width are envisaged through the site within the open space areas and 3.0m wide dedicated bicycle facilities on one side of the connector streets and some local access streets. The on-road traffic volume and speed environments on the other street in the study area will generally be consistent with Figure 2.2 of the Cycling Aspects of Austroads Guides (2014). This is considered to provide a suitable level of access for pedestrians and cyclists of all abilities expected to be generated within and potential to travel through the Precinct.

To support longer trips and integrate with the broad active transport network, a connection will be provided to the eventual extension of the Federation Trail along the southwest side of the freight line to the north of Watson Street.

There are also proposed to be mixed traffic bicycle facilities on Cyclamen Avenue to connect with Altona Gate Shopping Centre and the bus interchange to the west, as well as mixed traffic bicycle facilities on Aloha Street to connect with the proposed off-road local bicycle route along Birmingham Street and McLister Street, connecting to the Spotswood Station to the east.

To the south, there are already many facilities that exist or are proposed through the Hobsons bay Strategic Bicycle Plan. However, to integrate best with the subject site, on-road bicycle lanes are proposed along The Broadway between Blackshaws Road and Hansen Street.

### Compliance to Clause 56

The objectives of Clauses 56.06-2 and 56.06-5 are considered to be met as follows:

- *A majority of lots would be within a reasonable walking distance of the following amenities:*
  - Public transport - bus services currently operate along Kyle Road and Blackshaws Road with the potential for services to operate along the connector streets within the proposed development.
  - Neighbourhood shops - there is a mixed use zone proposed as part of the development, with the Altona North Major Activity Centre also proximately located to the west.
  - Public open space – suitable green belts and passive open space, including the 'Quarry Park' are been contemplated.
  - Community facilities – these are expected to be provided as part of the mixed use zone and public open spaces.
- The walking and cycling network through the subdivision is logical and generally follows the pattern of streets and public open spaces as follows:
  - Access Lanes - shared pedestrian, cycle and motor vehicle facilities on street.
  - Access Streets - shared cycle facilities on street, dedicated footpaths.
  - Connector Streets - marked cycle lanes on street and shared paths or separated bicycle paths on one side of the road where possible.
  - Public Open Spaces - shared paths through open spaces connecting to other facilities where possible.
- The walking and cycling network links into existing facilities allowing the cycling network to connect into the regional network.
- Where cul de sacs are provided, walking and cycling connections are provided where possible.
- The proposed road reservations are sufficient to provide footpaths and cycle paths in line with the requirements of Table C1 of the Clause.

## 9.3 Public Transport

### Statutory Requirements

Clause 56.06-3 and 56.06-6 set out the public transport network and detailed design objectives for subdivisions as follows:

***Clause 56.06-3***

*"To provide an arterial road and neighbourhood street network that supports a direct efficient and safe public transport system.*

*To encourage maximum use of public transport."*

***Clause 56.06-6***

*"To provide for the safe, efficient operation of public transport and the comfort and convenience of public transport users; and.*

*To provide public transport stops that are accessible to people with disabilities."*

Standards C16 and C19 set out the standards that need to be met in relation to bus routes and the location and design of bus and tram stops.

### Proposed Treatments

Provision has been made to accommodate future bus routes on the connector streets within the Precinct, with the ability to accommodate future kerbside bus stops along the east-west connector street between Kyle Road and New Street.

In combination with the surrounding existing bus routes almost the whole of the subject site would be within 400m walking distance of a bus stop if a future route operates along the connector streets.

### Compliance with Clause 56

Section 2.5 of this report discusses the integrated transport network surrounding the development site from which it is apparent that public transport would be accessible to residents within the new subdivision.

Although the proposed development is considered large enough to suggest that public transport services through the site could be viable, the implementation of these services is a matter for the public transport operators and DEDJTR. However, the objectives of Clause 56.06-3 and 56.06-6 are considered to be met from a planning perspective.

## 9.4 Neighbourhood Street

### Statutory Requirements

Clauses 56.06.4 and 56.06-7 set out the neighbourhood street network and detail objectives and aims as follows:

***Clause 56.06.4***

*"Provide for a direct, safe and easy movement through and between neighbourhoods for pedestrians, cyclists, public transport and other motor vehicles using the neighbourhood street network."*

***Clause 56.06.7***

*"To design and construct street carriageways and verges so that the geometry and traffic speeds provide an accessible and safe neighbourhood street system for all users."*

Standards C17 and C20 set out a number of standards that should be met to achieve the aims of Clauses 56.06-4 and Clause 56.06-7.

### Proposed Treatments

The proposed subdivision would connect into the existing street network at the following locations:

- Two new linked signalised intersections on Blackshaws Road at the following locations:
  - Intersection with The Broadway and a new connector street into the site
  - 220m east of The Broadway with a new connector street into the site
- New roundabout with Kyle Road and a new connector street into the site between Marigold Avenue and Cyclamen Avenue
- New roundabout with New Street, Brunel Street and a new connector street into the site
- Additional unsignalised intersections with Blackshaws Road, Kyle Road and New Street.

In terms of the internal neighbourhood street network, an indicative street hierarchy is shown in Figure 9.1.

**Figure 9.1: Indicative Street Network Hierarchy**


Source: VPA

## Compliance with Clause 56

Table 9.1 assesses the proposed road hierarchy against the requirements of Clause 56.06-7 of the Hobsons Bay Planning Scheme.

**Table 9.1: Proposed Road Hierarchy Details**

| Street Type | Target Speed | Indicative Road Reservation Width | Parking Provision | Theoretical Capacity Daily Traffic Volume | Anticipated Peak Daily Traffic Volume |
|---|---|---|---|---|---|
| Access Lane | 10kph | 6.0m to 8.0m | None | 300 vehicles per day | <300 vpd |
| Access Street – Level 1 | 30kph | 16m | Kerbside parking along one side of the road | 1,000 to 2,000 vehicles per day | <2,000 vpd |
| Access Street – Level 2 | 40kph | 19m | Kerbside parking along both sides of the road | 2,000 to 3,000 vehicles per day | |
| Connector Street | 50kph | 25m | Kerbside or indented parking on both sides of the road | 3,000 to 7,000 vehicles per day | 6,500 vpd[3] [1] |
| Connector Street – Boulevard | 50kph | 26m | Potential for indented parking on both sides of the road | 3,000 to 7,000 vehicles per day | |

[1] The short sections of the north-south connector streets intersecting with the signalised intersections on Blackshaws Road are expected to carry up to 12,000 vpd, but will be suitably designed to accommodate such traffic volumes.

As indicated within Table 9.1, the proposed road hierarchy accords with the minimum requirements necessary to allow carriageways, footpaths and cycle paths to be accommodated appropriate to the road type as specified within Table C1 of Clause 56.06.

It is noted that all road reservations include additional widths at intersections in order to incorporate the visibility splay requirements set out within Standard C20.

The speed targets for the internal street network would be met due to the inclusion of the following and with reference to Table 8.1 in the VicRoads Traffic Engineering Manual Volume 1, Chapter 8: Local Area Traffic Management:

- network design incorporating bends as slow points
- reducing block lengths and/or introduction of one-way sections
- provision of slow points or other similar suitable treatments to limit maximum leg lengths to achieve target speed.

The design of the latter would be undertaken as part of the detailed design of the street network and those that would be located on connector streets should be designed to accommodate buses.

The contemplated internal road network is anticipated to accommodate traffic volumes less than the associated road type's theoretical capacity.

In addition, it is noted that no dedicated on-road bicycle lanes are proposed on the connector streets. Instead, separated bicycle facilities are being proposed on one side of the connector street carriageways within the road reserves, and with suitable crossing facilities they would be appropriate for the majority of potential users.

Moreover, if vehicle speeds are managed appropriately on the connector streets mixed traffic conditions are considered to be appropriate for those users that wish to cycle on the road. Furthermore, widening the carriageway to accommodate dedicated bicycle lanes is considered to be counterproductive in trying to manage vehicle speeds.

# 10. Conclusion



Based on the analysis and discussions presented within this report, the following conclusions are made:

i There is sufficient capacity within the immediate road network to accommodate the additional traffic movements anticipated as part of the development of Precinct 15, subject to the following mitigating road works:

- At the Millers Road / Blackshaws Road signalised intersection:
  - Extend the right-turn lane on the east approach of the intersection by 240m to 300m through modification to road markings and introduction of parking restrictions that at least restricts kerbside parking during the commuter peaks.
  - Convert the through lane on the east approach of the intersection to a through and right turn lane by modifying the directional arrow markings.
  - Modify the intersection phasing to have a split phasing for the east and west approaches.
- Increase the lengths of 'No Stopping' parking restrictions and install line marked right turn lanes on Blackshaws Road at the unsignalised intersections with Schutt Street, New Street and Hansen Street.
- Install linked traffic signals at the two new site access intersections on Blackshaws Road associated with the connector streets. The approaches to these signalised intersections from within the site require two approaches lanes for 80m that are clear of intersections, property access points and kerbside parking.
- Install roundabouts at the intersections between the internal connector streets and with Kyle Road and New Street.
- Provide specific crossing facilities on the internal road network layout to support the separated bicycle facilities on one side of the connector streets.

ii In addition, the following facilities are recommended to support alternative transport modes in accessing the site:

- Pedestrian crossing facilities on most approaches to the two proposed signalised intersections along Blackshaws Road
- A shared path connection to the Federation Trail along the southwest side of the freight line from Watson Street
- Mixed traffic bicycle facilities along the length of Cyclamen Avenue, and supporting crossing treatments of Kyle Road and Millers Road
- Mixed traffic bicycle facilities along the length of Aloha Street, and supporting crossing treatments of New Street and Stephenson Street
- On-road bicycle lanes on The Broadway between Blackshaws Road and Hansen Street with mixed traffic bicycle facilities through the roundabout intersections.
- Advocate for a local bus route service through Precinct 15 that connects with Spotswood Station
- Detectors in up or down stream bus stops of the proposed signalised intersections on Blackshaws Road and as part of the re-programming of the Millers Road / Blackshaws Road intersection
- Advocate for in lane bus stops on local roads, which will also provide a local area traffic calming measure.

# Appendix A



## Existing SIDRA Model Results

# MOVEMENT SUMMARY

## Site: 2880N [2880N- West Gate Freeway/ Melbourne Road- AM (8:00-9:00)]

## Network: N101 [AM PEAK Existing (8:00-9:00) 2880/1303/4965]

New Site
Signals - Fixed Time Coordinated  Cycle Time = 130 seconds (Network Cycle Time - User-Given)
Common Control Group: 2880 [West Gate Fwy/Melbourne Rd]

**Movement Performance - Vehicles**

| Mov ID | OD Mov | Demand Flows Total veh/h | Demand Flows HV % | Arrival Flows Total veh/h | Arrival Flows HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | 95% Back of Queue Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Melbourne Road | | | | | | | | | | | | | |
| 2 | T1 | 978 | 9.0 | 978 | 9.0 | 0.363 | 3.3 | LOS A | 5.3 | 39.7 | 0.18 | 0.16 | 55.1 |
| 3 | R2 | 1127 | 9.0 | 1040 | 9.1 | 0.606 | 21.6 | LOS C | 16.1 | 121.8 | 0.53 | 0.76 | 36.5 |
| Approach | | 2105 | 9.0 | 2018 N1 | 9.1 | 0.606 | 12.7 | LOS B | 16.1 | 121.8 | 0.36 | 0.47 | 43.6 |
| North: Melbourne Road | | | | | | | | | | | | | |
| 7 | L2 | 872 | 13.0 | 872 | 13.0 | 0.513 | 5.8 | LOS A | 0.0 | 0.0 | 0.00 | 0.52 | 54.4 |
| 8 | T1 | 398 | 6.1 | 398 | 6.1 | 0.620 | 52.7 | LOS D | 12.2 | 85.5 | 0.96 | 0.80 | 22.1 |
| Approach | | 1269 | 10.9 | 1269 | 10.9 | 0.620 | 20.5 | LOS C | 12.2 | 86.3 | 0.30 | 0.61 | 42.8 |
| West: Exit Ramp Inbound | | | | | | | | | | | | | |
| 10 | L2 | 214 | 12.8 | 214 | 12.8 | 0.339 | 6.8 | LOS A | 1.8 | 14.2 | 0.20 | 0.61 | 52.9 |
| 11 | T1 | 6 | 0.0 | 6 | 0.0 | 0.421 | 69.7 | LOS E | 2.3 | 17.0 | 1.00 | 0.73 | 27.1 |
| 12 | R2 | 63 | 6.7 | 63 | 6.7 | 0.421 | 75.4 | LOS E | 2.3 | 17.0 | 1.00 | 0.73 | 17.6 |
| Approach | | 283 | 11.2 | 283 | 11.2 | 0.421 | 23.5 | LOS C | 2.3 | 17.0 | 0.40 | 0.64 | 41.4 |
| All Vehicles | | 3658 | 9.8 | 3571 N1 | 10.1 | 0.620 | 16.4 | LOS B | 16.1 | 121.8 | 0.34 | 0.53 | 43.0 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Network Model Accuracy Level (largest change in degree of saturation for any lane): 12.5 %
Number of Iterations: 10 (maximum specified: 10)

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Average Back of Queue Distance m | Prop. Queued | Effective Stop Rate per ped |
|---|---|---|---|---|---|---|---|---|
| P2 | East Full Crossing | 53 | 45.0 | LOS E | 0.2 | 0.2 | 0.83 | 0.83 |
| P3 | North Full Crossing | 53 | 57.4 | LOS E | 0.2 | 0.2 | 0.94 | 0.94 |
| P4 | West Full Crossing | 53 | 6.5 | LOS A | 0.1 | 0.1 | 0.32 | 0.32 |
| All Pedestrians | | 158 | 36.3 | LOS D | | | 0.70 | 0.70 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

## Site: 2881S [2881S- West Gate Freeeway/Millers Road- AM (8:00-9:00)]

## Network: N101 [2881/2882/2893/3501 - AM Existing]

New Site
Signals - Fixed Time Coordinated  Cycle Time = 110 seconds (Network Cycle Time - User-Given)
Common Control Group: 2881 [West Gate Freeway/Millers Road]

**Movement Performance - Vehicles**

| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Arrival Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Millers Road | | | | | | | | | | | | | |
| 1 | L2 | 525 | 6.0 | 525 | 6.0 | 0.699 | 8.9 | LOS A | 9.3 | 68.3 | 0.42 | 0.66 | 47.7 |
| 2 | T1 | 1339 | 6.1 | 1339 | 6.1 | 1.051 | 51.2 | LOS D | 21.1 | 155.0 | 0.77 | 0.99 | 13.1 |
| Approach | | 1864 | 6.0 | 1864 | 6.0 | 1.051 | 39.3 | LOS D | 21.1 | 155.0 | 0.67 | 0.89 | 16.6 |
| East: West Gate Exit Ramp Outbound | | | | | | | | | | | | | |
| 4 | L2 | 257 | 13.1 | 257 | 13.1 | 0.252 | 8.0 | LOS A | 2.8 | 22.2 | 0.29 | 0.64 | 47.9 |
| 5 | T1 | 1 | 0.0 | 1 | 0.0 | 0.631 | 51.0 | LOS D | 5.9 | 46.1 | 0.99 | 0.83 | 31.1 |
| 6 | R2 | 253 | 12.9 | 253 | 12.9 | 0.631 | 56.0 | LOS E | 7.6 | 59.1 | 0.99 | 0.82 | 21.4 |
| Approach | | 511 | 13.0 | 511 | 13.0 | 0.631 | 31.8 | LOS C | 7.6 | 59.1 | 0.64 | 0.73 | 29.8 |
| North: Millers Road | | | | | | | | | | | | | |
| 8 | T1 | 793 | 6.0 | 793 | 6.0 | 0.664 | 14.0 | LOS B | 11.5 | 84.8 | 0.56 | 0.49 | 17.2 |
| 9 | R2 | 199 | 5.8 | 199 | 5.8 | 1.023 | 107.7 | LOS F | 15.2 | 112.1 | 1.00 | 1.16 | 14.7 |
| Approach | | 992 | 5.9 | 992 | 5.9 | 1.023 | 32.8 | LOS C | 15.2 | 112.1 | 0.65 | 0.62 | 15.6 |
| All Vehicles | | 3366 | 7.1 | 3366 | 7.1 | 1.051 | 36.3 | LOS D | 21.1 | 155.0 | 0.66 | 0.79 | 18.7 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Network Model Accuracy Level (largest change in degree of saturation for any lane): 4.1 %
Number of Iterations: 10 (maximum specified: 10)

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate per ped |
|---|---|---|---|---|---|---|---|---|
| P1 | South Full Crossing | 53 | 23.9 | LOS C | 0.1 | 0.1 | 0.89 | 0.89 |
| P2 | East Full Crossing | 53 | 28.4 | LOS C | 0.1 | 0.1 | 0.72 | 0.72 |
| P4 | West Full Crossing | 53 | 10.1 | LOS B | 0.1 | 0.1 | 0.43 | 0.43 |
| All Pedestrians | | 158 | 20.8 | LOS C | | | 0.68 | 0.68 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

## Site: 101 [Millers Road/Clemantis Avenue- AM (8:00-9:00) ]

## Network: N101 [2881/2882/2893/3501 - AM Existing]

New Site
Stop (Two-Way)

**Movement Performance - Vehicles**

| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Arrival Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Millers Road | | | | | | | | | | | | | |
| 2 | T1 | 1826 | 6.0 | 1826 | 6.0 | 0.973 | 0.8 | LOS A | 26.6 | 195.7 | 0.00 | 0.00 | 52.3 |
| Approach | | 1826 | 6.0 | 1826 | 6.0 | 0.973 | 0.8 | NA | 26.6 | 195.7 | 0.00 | 0.00 | 52.3 |
| East: Clemantis Avenue | | | | | | | | | | | | | |
| 4 | L2 | 16 | 6.7 | 16 | 6.7 | 0.019 | 10.0 | LOS B | 0.1 | 0.5 | 0.39 | 0.86 | 46.5 |
| Approach | | 16 | 6.7 | 16 | 6.7 | 0.019 | 10.0 | LOS B | 0.1 | 0.5 | 0.39 | 0.86 | 46.5 |
| North: Millers Road | | | | | | | | | | | | | |
| 7 | L2 | 31 | 0.0 | 31 | 0.0 | 0.186 | 5.5 | LOS A | 0.0 | 0.0 | 0.00 | 0.05 | 56.5 |
| 8 | T1 | 1024 | 5.0 | 1024 | 5.0 | 0.186 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.02 | 58.5 |
| Approach | | 1055 | 4.9 | 1055 | 4.9 | 0.186 | 0.2 | NA | 0.0 | 0.0 | 0.00 | 0.02 | 58.2 |
| All Vehicles | | 2897 | 5.6 | 2897 | 5.6 | 0.973 | 0.6 | NA | 26.6 | 195.7 | 0.00 | 0.01 | 54.4 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Network Model Accuracy Level (largest change in degree of saturation for any lane): 4.1 %
Number of Iterations: 10 (maximum specified: 10)

# MOVEMENT SUMMARY

## Site: 2882N [2882N Millers Road/ Marigold Avenue/ Duosa Avenue- AM (8:00-9:00)]

## Network: N101 [2881/2882/2893/3501 - AM Existing]

New Site
Signals - Fixed Time Coordinated  Cycle Time = 110 seconds (Network Cycle Time - User-Given)
Common Control Group: 2882 [Millers Rd/Duosa Rd/Marigold Ave/Cyclamen Ave]

**Movement Performance - Vehicles**

| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Arrival Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Millers Road | | | | | | | | | | | | | |
| 1 | L2 | 121 | 0.0 | 121 | 0.0 | 0.109 | 8.4 | LOS A | 0.8 | 5.3 | 0.13 | 0.60 | 46.9 |
| 2 | T1 | 1442 | 6.1 | 1442 | 6.1 | 0.733 | 2.7 | LOS A | 12.3 | 90.5 | 0.21 | 0.19 | 42.8 |
| 3 | R2 | 2 | 0.0 | 2 | 0.0 | 0.021 | 60.2 | LOS E | 0.1 | 0.8 | 0.97 | 0.61 | 21.9 |
| Approach | | 1565 | 5.6 | 1565 | 5.6 | 0.733 | 3.2 | LOS A | 12.3 | 90.5 | 0.21 | 0.23 | 43.0 |
| East: Marigold Avenue | | | | | | | | | | | | | |
| 4 | L2 | 1 | 0.0 | 1 | 0.0 | 0.763 | 63.1 | LOS E | 6.4 | 44.6 | 1.00 | 0.90 | 19.9 |
| 5 | T1 | 6 | 0.0 | 6 | 0.0 | 0.763 | 57.6 | LOS E | 6.4 | 44.6 | 1.00 | 0.90 | 29.6 |
| 6 | R2 | 102 | 0.0 | 102 | 0.0 | 0.763 | 63.2 | LOS E | 6.4 | 44.6 | 1.00 | 0.90 | 19.9 |
| Approach | | 109 | 0.0 | 109 | 0.0 | 0.763 | 62.8 | LOS E | 6.4 | 44.6 | 1.00 | 0.90 | 20.6 |
| North: Millers Road | | | | | | | | | | | | | |
| 7 | L2 | 33 | 6.5 | 33 | 6.5 | 0.031 | 9.8 | LOS A | 0.3 | 2.2 | 0.19 | 0.60 | 45.0 |
| 8 | T1 | 755 | 5.0 | 755 | 5.0 | 0.333 | 3.8 | LOS A | 4.6 | 33.6 | 0.18 | 0.15 | 36.4 |
| 9 | R2 | 53 | 6.0 | 53 | 6.0 | 0.542 | 66.3 | LOS E | 3.0 | 22.3 | 1.00 | 0.75 | 20.6 |
| Approach | | 840 | 5.1 | 840 | 5.1 | 0.542 | 7.9 | LOS A | 4.6 | 33.6 | 0.23 | 0.21 | 31.3 |
| West: Duosa Avenue | | | | | | | | | | | | | |
| 10 | L2 | 179 | 0.0 | 179 | 0.0 | 0.331 | 38.5 | LOS D | 7.5 | 52.8 | 0.83 | 0.78 | 26.7 |
| 11 | T1 | 3 | 0.0 | 3 | 0.0 | 0.090 | 40.7 | LOS D | 1.2 | 8.6 | 0.86 | 0.70 | 34.4 |
| 12 | R2 | 24 | 0.0 | 24 | 0.0 | 0.090 | 46.3 | LOS D | 1.2 | 8.6 | 0.86 | 0.70 | 24.4 |
| Approach | | 206 | 0.0 | 206 | 0.0 | 0.331 | 39.5 | LOS D | 7.5 | 52.8 | 0.83 | 0.77 | 26.6 |
| All Vehicles | | 2721 | 4.8 | 2721 | 4.8 | 0.763 | 9.8 | LOS A | 12.3 | 90.5 | 0.29 | 0.29 | 31.9 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Network Model Accuracy Level (largest change in degree of saturation for any lane): 4.1 %
Number of Iterations: 10 (maximum specified: 10)

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate per ped |
|---|---|---|---|---|---|---|---|---|
| P1 | South Full Crossing | 53 | 49.3 | LOS E | 0.2 | 0.2 | 0.95 | 0.95 |
| P2 | East Full Crossing | 53 | 10.5 | LOS B | 0.1 | 0.1 | 0.44 | 0.44 |
| P3 | North Full Crossing | 53 | 49.3 | LOS E | 0.2 | 0.2 | 0.95 | 0.95 |
| P4 | West Full Crossing | 53 | 12.8 | LOS B | 0.1 | 0.1 | 0.48 | 0.48 |
| All Pedestrians | | 211 | 30.5 | LOS D | | | 0.70 | 0.70 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

## Site: 2882S [2882S Millers Road/ Cyclamen Ave/Altona Gate Carpark - AM(8:00-9:00)]

## Network: N101 [2881/2882/2893/3501 - AM Existing]

New Site
Signals - Fixed Time Coordinated  Cycle Time = 110 seconds (Network Cycle Time - User-Given)
Common Control Group: 2882 [Millers Rd/Duosa Rd/Marigold Ave/Cyclamen Ave]

**Movement Performance - Vehicles**

| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Arrival Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Millers Road | | | | | | | | | | | | | |
| 1 | L2 | 28 | 7.4 | 28 | 7.4 | 0.016 | 4.9 | LOS A | 0.0 | 0.0 | 0.00 | 0.52 | 52.3 |
| 2 | T1 | 1456 | 6.9 | 1456 | 6.9 | 0.510 | 4.9 | LOS A | 7.0 | 52.9 | 0.23 | 0.20 | 34.1 |
| Approach | | 1484 | 7.0 | 1484 | 7.0 | 0.510 | 4.9 | LOS A | 7.0 | 52.9 | 0.23 | 0.21 | 33.5 |
| East: Cyclamen Avenue | | | | | | | | | | | | | |
| 4 | L2 | 4 | 0.0 | 4 | 0.0 | 0.004 | 6.2 | LOS A | 0.0 | 0.1 | 0.14 | 0.57 | 50.0 |
| Approach | | 4 | 0.0 | 4 | 0.0 | 0.004 | 6.2 | LOS A | 0.0 | 0.1 | 0.14 | 0.57 | 50.0 |
| North: Millers Road | | | | | | | | | | | | | |
| 7 | L2 | 2 | 0.0 | 2 | 0.0 | 0.002 | 6.9 | LOS A | 0.0 | 0.1 | 0.07 | 0.58 | 48.4 |
| 8 | T1 | 755 | 5.0 | 755 | 5.0 | 0.333 | 2.8 | LOS A | 3.0 | 22.1 | 0.13 | 0.12 | 41.6 |
| 9 | R2 | 26 | 4.0 | 26 | 4.0 | 0.095 | 7.7 | LOS A | 0.1 | 1.0 | 0.14 | 0.58 | 48.1 |
| Approach | | 783 | 5.0 | 783 | 5.0 | 0.333 | 3.0 | LOS A | 3.0 | 22.1 | 0.13 | 0.13 | 42.6 |
| West: Altona Gate Car-park | | | | | | | | | | | | | |
| 10 | L2 | 17 | 0.0 | 17 | 0.0 | 0.022 | 6.7 | LOS A | 0.1 | 0.8 | 0.19 | 0.59 | 49.4 |
| 12 | R2 | 15 | 0.0 | 15 | 0.0 | 0.022 | 45.2 | LOS D | 0.3 | 2.3 | 0.85 | 0.66 | 24.5 |
| Approach | | 32 | 0.0 | 32 | 0.0 | 0.022 | 24.7 | LOS C | 0.3 | 2.3 | 0.49 | 0.62 | 33.6 |
| All Vehicles | | 2303 | 6.2 | 2303 | 6.2 | 0.510 | 4.5 | LOS A | 7.0 | 52.9 | 0.20 | 0.19 | 36.4 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Network Model Accuracy Level (largest change in degree of saturation for any lane): 4.1 %
Number of Iterations: 10 (maximum specified: 10)

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate per ped |
|---|---|---|---|---|---|---|---|---|
| P3 | North Full Crossing | 53 | 49.3 | LOS E | 0.2 | 0.2 | 0.95 | 0.95 |
| P4 | West Full Crossing | 53 | 14.3 | LOS B | 0.1 | 0.1 | 0.51 | 0.51 |
| All Pedestrians | | 105 | 31.8 | LOS D | | | 0.73 | 0.73 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

\V106380-Millers Road Network.sip7

# MOVEMENT SUMMARY

## Site: 2893 [2893- Millers Road/Beuron Road - AM (8:00-9:00)]

## Network: N101 [2881/2882/2893/3501 - AM Existing]

New Site
Signals - Fixed Time Coordinated  Cycle Time = 110 seconds (Network Cycle Time - User-Given)

**Movement Performance - Vehicles**

| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Arrival Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Millers Road | | | | | | | | | | | | | |
| 1 | L2 | 3 | 0.0 | 3 | 0.0 | 0.295 | 6.9 | LOS A | 3.1 | 22.8 | 0.14 | 0.13 | 56.1 |
| 2 | T1 | 1491 | 6.6 | 1491 | 6.6 | 0.366 | 1.2 | LOS A | 3.2 | 23.7 | 0.13 | 0.12 | 55.4 |
| Approach | | 1494 | 6.6 | 1494 | 6.6 | 0.366 | 1.2 | LOS A | 3.2 | 23.7 | 0.13 | 0.12 | 55.4 |
| North: Millers Road | | | | | | | | | | | | | |
| 8 | T1 | 755 | 5.0 | 755 | 5.0 | 0.200 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 60.0 |
| 9 | R2 | 14 | 0.0 | 14 | 0.0 | 0.135 | 63.3 | LOS E | 0.8 | 5.3 | 1.00 | 0.69 | 21.1 |
| Approach | | 768 | 4.9 | 768 | 4.9 | 0.200 | 1.1 | LOS A | 0.8 | 5.3 | 0.02 | 0.01 | 49.6 |
| West: Beuron Road | | | | | | | | | | | | | |
| 10 | L2 | 17 | 0.0 | 17 | 0.0 | 0.166 | 62.2 | LOS E | 0.9 | 6.4 | 0.98 | 0.69 | 19.9 |
| Approach | | 17 | 0.0 | 17 | 0.0 | 0.166 | 62.2 | LOS E | 0.9 | 6.4 | 0.98 | 0.69 | 19.9 |
| All Vehicles | | 2279 | 6.0 | 2279 | 6.0 | 0.366 | 1.7 | LOS A | 3.2 | 23.7 | 0.10 | 0.08 | 52.6 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Network Model Accuracy Level (largest change in degree of saturation for any lane): 4.1 %
Number of Iterations: 10 (maximum specified: 10)

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate per ped |
|---|---|---|---|---|---|---|---|---|
| P4 | West Full Crossing | 53 | 2.2 | LOS A | 0.0 | 0.0 | 0.20 | 0.20 |
| All Pedestrians | | 53 | 2.2 | LOS A | | | 0.20 | 0.20 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

## Site: 3501 [3501-Millers Road/Blackshaws Road- AM (8:00-9:00)]

## Network: N101 [2881/2882/2893/3501 - AM Existing]

New Site
Signals - Fixed Time Coordinated  Cycle Time = 110 seconds (Network Cycle Time - User-Given)

**Movement Performance - Vehicles**

| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Arrival Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Millers Road | | | | | | | | | | | | | |
| 1 | L2 | 59 | 5.4 | 59 | 5.4 | 0.040 | 6.3 | LOS A | 0.3 | 2.0 | 0.15 | 0.58 | 53.5 |
| 2 | T1 | 1169 | 6.8 | 1169 | 6.8 | 0.784 | 27.9 | LOS C | 26.6 | 195.8 | 0.85 | 0.76 | 31.5 |
| 3 | R2 | 62 | 6.8 | 62 | 6.8 | 0.643 | 65.7 | LOS E | 3.6 | 26.5 | 1.00 | 0.80 | 28.5 |
| Approach | | 1291 | 6.7 | 1291 | 6.7 | 0.784 | 28.7 | LOS C | 26.6 | 195.8 | 0.82 | 0.75 | 32.3 |
| East: Blackshaws Road | | | | | | | | | | | | | |
| 4 | L2 | 72 | 4.4 | 72 | 4.4 | 0.244 | 25.8 | LOS C | 3.6 | 26.5 | 0.78 | 0.70 | 42.8 |
| 5 | T1 | 44 | 4.8 | 44 | 4.8 | 0.244 | 20.1 | LOS C | 3.6 | 26.5 | 0.78 | 0.70 | 43.4 |
| 6 | R2 | 226 | 4.2 | 226 | 4.2 | 0.499 | 34.6 | LOS C | 9.2 | 66.6 | 0.87 | 0.79 | 28.5 |
| Approach | | 342 | 4.3 | 342 | 4.3 | 0.499 | 30.9 | LOS C | 9.2 | 66.6 | 0.84 | 0.76 | 34.3 |
| North: Millers Road | | | | | | | | | | | | | |
| 7 | L2 | 176 | 4.8 | 176 | 4.8 | 0.124 | 5.9 | LOS A | 0.3 | 2.1 | 0.05 | 0.56 | 52.1 |
| 8 | T1 | 488 | 8.0 | 488 | 8.0 | 0.210 | 10.9 | LOS B | 3.3 | 23.8 | 0.36 | 0.30 | 48.4 |
| 9 | R2 | 56 | 5.7 | 56 | 5.7 | 0.573 | 67.0 | LOS E | 3.2 | 23.6 | 1.00 | 0.76 | 23.9 |
| Approach | | 720 | 7.0 | 720 | 7.0 | 0.573 | 14.0 | LOS B | 3.3 | 24.2 | 0.33 | 0.40 | 45.5 |
| West: Blackshaws Road | | | | | | | | | | | | | |
| 10 | L2 | 63 | 5.0 | 63 | 5.0 | 0.444 | 39.9 | LOS D | 5.5 | 40.2 | 0.90 | 0.83 | 27.9 |
| 11 | T1 | 99 | 5.3 | 99 | 5.3 | 0.444 | 34.3 | LOS C | 5.5 | 40.2 | 0.90 | 0.83 | 37.7 |
| 12 | R2 | 57 | 5.6 | 57 | 5.6 | 0.117 | 31.3 | LOS C | 2.1 | 15.1 | 0.75 | 0.71 | 39.2 |
| Approach | | 219 | 5.3 | 219 | 5.3 | 0.444 | 35.1 | LOS D | 5.5 | 40.2 | 0.86 | 0.80 | 35.9 |
| All Vehicles | | 2572 | 6.3 | 2572 | 6.3 | 0.784 | 25.4 | LOS C | 26.6 | 195.8 | 0.69 | 0.66 | 36.4 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Network Model Accuracy Level (largest change in degree of saturation for any lane): 4.1 %
Number of Iterations: 10 (maximum specified: 10)

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate per ped |
|---|---|---|---|---|---|---|---|---|
| P1 | South Full Crossing | 53 | 49.3 | LOS E | 0.2 | 0.2 | 0.95 | 0.95 |
| P2 | East Full Crossing | 53 | 22.3 | LOS C | 0.1 | 0.1 | 0.64 | 0.64 |
| P3 | North Full Crossing | 53 | 49.3 | LOS E | 0.2 | 0.2 | 0.95 | 0.95 |
| P4 | West Full Crossing | 53 | 22.3 | LOS C | 0.1 | 0.1 | 0.64 | 0.64 |
| All Pedestrians | | 211 | 35.8 | LOS D | | | 0.79 | 0.79 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

## Site: 2881N [2881N- West Gate Freeway/Millers Rd - PM Existing]

## Network: N101 [2881/2882/2893/3501 - PM Existing]

New Site
Signals - Fixed Time Coordinated  Cycle Time = 110 seconds (Network Cycle Time - User-Given)
Common Control Group: 2881 [West Gate Freeway/Millers Road]

**Movement Performance - Vehicles**

| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Arrival Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Millers Road | | | | | | | | | | | | | |
| 2 | T1 | 789 | 4.0 | 789 | 4.0 | 0.448 | 20.6 | LOS C | 14.9 | 107.8 | 0.69 | 0.61 | 39.7 |
| 3 | R2 | 284 | 3.0 | 284 | 3.0 | 0.419 | 24.4 | LOS C | 8.6 | 61.6 | 0.60 | 0.75 | 36.4 |
| Approach | | 1074 | 3.7 | 1074 | 3.7 | 0.448 | 21.6 | LOS C | 14.9 | 107.8 | 0.67 | 0.65 | 38.8 |
| North: Millers Road | | | | | | | | | | | | | |
| 7 | L2 | 258 | 6.1 | 258 | 6.1 | 0.216 | 7.4 | LOS A | 2.4 | 18.0 | 0.26 | 0.63 | 52.6 |
| 8 | T1 | 629 | 8.4 | 629 | 8.4 | 0.920 | 61.6 | LOS E | 15.2 | 115.9 | 0.98 | 1.02 | 20.4 |
| Approach | | 887 | 7.7 | 887 | 7.7 | 0.920 | 45.9 | LOS D | 15.2 | 115.9 | 0.77 | 0.90 | 27.7 |
| West: West Gate Exist Ramp Inbound | | | | | | | | | | | | | |
| 10 | L2 | 199 | 4.8 | 199 | 4.8 | 0.420 | 42.0 | LOS D | 8.9 | 64.9 | 0.88 | 0.80 | 35.3 |
| 11 | T1 | 5 | 0.0 | 5 | 0.0 | 0.924 | 67.9 | LOS E | 19.3 | 140.6 | 1.00 | 1.05 | 27.2 |
| 12 | R2 | 564 | 5.0 | 564 | 5.0 | 0.924 | 73.6 | LOS E | 20.1 | 146.9 | 1.00 | 1.05 | 17.8 |
| Approach | | 768 | 4.9 | 768 | 4.9 | 0.924 | 65.3 | LOS E | 20.1 | 146.9 | 0.97 | 0.99 | 22.4 |
| All Vehicles | | 2729 | 5.4 | 2729 | 5.4 | 0.924 | 41.8 | LOS D | 20.1 | 146.9 | 0.79 | 0.83 | 29.1 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Network Model Accuracy Level (largest change in degree of saturation for any lane): 2.6 %
Number of Iterations: 10 (maximum specified: 10)

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate per ped |
|---|---|---|---|---|---|---|---|---|
| P2 | East Full Crossing | 53 | 38.6 | LOS D | 0.1 | 0.1 | 0.84 | 0.84 |
| P3 | North Full Crossing | 53 | 41.1 | LOS E | 0.1 | 0.1 | 0.87 | 0.87 |
| P4 | West Full Crossing | 53 | 18.1 | LOS B | 0.1 | 0.1 | 0.57 | 0.57 |
| All Pedestrians | | 158 | 32.6 | LOS D | | | 0.76 | 0.76 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

## Site: 2881S [2881S- West Gate Freeeway/Millers Road- PM Existing]

## Network: N101 [2881/2882/2893/3501 - PM Existing]

New Site
Signals - Fixed Time Coordinated  Cycle Time = 110 seconds (Network Cycle Time - User-Given)
Common Control Group: 2881 [West Gate Freeway/Millers Road]

**Movement Performance - Vehicles**

| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Arrival Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Millers Road | | | | | | | | | | | | | |
| 1 | L2 | 522 | 3.0 | 522 | 3.0 | 0.605 | 14.2 | LOS B | 14.4 | 103.1 | 0.76 | 0.79 | 43.5 |
| 2 | T1 | 898 | 2.9 | 898 | 2.9 | 0.605 | 19.6 | LOS B | 17.2 | 123.7 | 0.69 | 0.62 | 14.7 |
| Approach | | 1420 | 3.0 | 1420 | 3.0 | 0.605 | 17.6 | LOS B | 17.2 | 123.7 | 0.72 | 0.68 | 29.8 |
| East: West Gate Exit Ramp Outbound | | | | | | | | | | | | | |
| 4 | L2 | 466 | 12.0 | 466 | 12.0 | 0.594 | 15.8 | LOS B | 13.0 | 100.4 | 0.64 | 0.77 | 40.0 |
| 5 | T1 | 1 | 0.0 | 1 | 0.0 | 0.861 | 66.1 | LOS E | 5.0 | 38.2 | 1.00 | 0.95 | 27.6 |
| 6 | R2 | 160 | 11.8 | 160 | 11.8 | 0.861 | 71.8 | LOS E | 5.0 | 38.2 | 1.00 | 0.95 | 18.1 |
| Approach | | 627 | 11.9 | 627 | 11.9 | 0.861 | 30.2 | LOS C | 13.0 | 100.4 | 0.73 | 0.81 | 30.6 |
| North: Millers Road | | | | | | | | | | | | | |
| 8 | T1 | 1331 | 4.0 | 1331 | 4.0 | 0.856 | 20.1 | LOS C | 29.0 | 210.2 | 0.82 | 0.78 | 20.4 |
| 9 | R2 | 184 | 4.0 | 184 | 4.0 | 0.935 | 75.5 | LOS E | 11.4 | 82.8 | 1.00 | 0.99 | 20.6 |
| Approach | | 1515 | 4.0 | 1515 | 4.0 | 0.935 | 26.9 | LOS C | 29.0 | 210.2 | 0.84 | 0.81 | 20.5 |
| All Vehicles | | 3562 | 5.0 | 3562 | 5.0 | 0.935 | 23.8 | LOS C | 29.0 | 210.2 | 0.77 | 0.76 | 26.2 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Network Model Accuracy Level (largest change in degree of saturation for any lane): 2.6 %
Number of Iterations: 10 (maximum specified: 10)

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate per ped |
|---|---|---|---|---|---|---|---|---|
| P1 | South Full Crossing | 53 | 27.6 | LOS C | 0.1 | 0.1 | 0.89 | 0.89 |
| P2 | East Full Crossing | 53 | 38.6 | LOS D | 0.1 | 0.1 | 0.84 | 0.84 |
| P4 | West Full Crossing | 53 | 16.4 | LOS B | 0.1 | 0.1 | 0.55 | 0.55 |
| All Pedestrians | | 158 | 27.5 | LOS C | | | 0.76 | 0.76 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

## Site: 101 [Millers Road/Clemantis Avenue - PM Existing]

## Network: N101 [2881/2882/2893/3501 - PM Existing]

New Site
Stop (Two-Way)

**Movement Performance - Vehicles**

| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Arrival Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Millers Road | | | | | | | | | | | | | |
| 2 | T1 | 1335 | 3.6 | 1335 | 3.6 | 0.397 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 59.9 |
| Approach | | 1335 | 3.6 | 1335 | 3.6 | 0.397 | 0.0 | NA | 0.0 | 0.0 | 0.00 | 0.00 | 59.9 |
| East: Clemantis Avenue | | | | | | | | | | | | | |
| 4 | L2 | 4 | 0.0 | 4 | 0.0 | 0.008 | 13.1 | LOS B | 0.0 | 0.2 | 0.58 | 0.85 | 43.3 |
| Approach | | 4 | 0.0 | 4 | 0.0 | 0.008 | 13.1 | LOS B | 0.0 | 0.2 | 0.58 | 0.85 | 43.3 |
| North: Millers Road | | | | | | | | | | | | | |
| 7 | L2 | 48 | 4.3 | 48 | 4.3 | 0.408 | 5.5 | LOS A | 0.0 | 0.0 | 0.00 | 0.04 | 56.4 |
| 8 | T1 | 1721 | 5.0 | 1721 | 5.0 | 0.408 | 0.0 | LOS A | 3.8 | 28.0 | 0.00 | 0.02 | 58.5 |
| Approach | | 1769 | 5.0 | 1769 | 5.0 | 0.408 | 0.2 | NA | 3.8 | 28.0 | 0.00 | 0.02 | 58.2 |
| All Vehicles | | 3108 | 4.4 | 3108 | 4.4 | 0.408 | 0.1 | NA | 3.8 | 28.0 | 0.00 | 0.01 | 58.7 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Network Model Accuracy Level (largest change in degree of saturation for any lane): 2.6 %
Number of Iterations: 10 (maximum specified: 10)

# MOVEMENT SUMMARY

## Site: 2882N [2882N Millers Road/ Marigold Avenue/ Duosa Avenue- PM Existing]

## Network: N101 [2881/2882/2893/3501 - PM Existing]

New Site
Signals - Fixed Time Coordinated  Cycle Time = 110 seconds (Network Cycle Time - User-Given)
Common Control Group: 2882 [Millers Rd/Duosa Rd/Marigold Ave/Cyclamen Ave]

**Movement Performance - Vehicles**

| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Arrival Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Millers Road | | | | | | | | | | | | | |
| 1 | L2 | 96 | 5.5 | 96 | 5.5 | 0.120 | 13.6 | LOS B | 1.4 | 9.9 | 0.28 | 0.64 | 41.8 |
| 2 | T1 | 953 | 4.4 | 953 | 4.4 | 0.573 | 8.4 | LOS A | 9.3 | 68.1 | 0.38 | 0.34 | 25.3 |
| 3 | R2 | 16 | 0.0 | 16 | 0.0 | 0.156 | 64.0 | LOS E | 0.9 | 6.2 | 1.00 | 0.69 | 21.1 |
| Approach | | 1064 | 4.5 | 1064 | 4.5 | 0.573 | 9.7 | LOS A | 9.3 | 68.1 | 0.38 | 0.37 | 29.0 |
| East: Marigold Avenue | | | | | | | | | | | | | |
| 4 | L2 | 5 | 0.0 | 5 | 0.0 | 0.656 | 59.3 | LOS E | 5.9 | 41.4 | 1.00 | 0.84 | 20.9 |
| 5 | T1 | 16 | 0.0 | 16 | 0.0 | 0.656 | 53.7 | LOS D | 5.9 | 41.4 | 1.00 | 0.84 | 30.7 |
| 6 | R2 | 86 | 0.0 | 86 | 0.0 | 0.656 | 59.3 | LOS E | 5.9 | 41.4 | 1.00 | 0.84 | 20.9 |
| Approach | | 107 | 0.0 | 107 | 0.0 | 0.656 | 58.5 | LOS E | 5.9 | 41.4 | 1.00 | 0.84 | 22.7 |
| North: Millers Road | | | | | | | | | | | | | |
| 7 | L2 | 72 | 4.4 | 72 | 4.4 | 0.066 | 10.9 | LOS B | 0.8 | 6.0 | 0.23 | 0.62 | 44.2 |
| 8 | T1 | 1456 | 5.0 | 1456 | 5.0 | 0.710 | 9.0 | LOS A | 17.9 | 130.6 | 0.46 | 0.42 | 23.5 |
| 9 | R2 | 214 | 4.9 | 214 | 4.9 | 0.570 | 38.6 | LOS D | 9.2 | 67.3 | 0.84 | 0.79 | 28.1 |
| Approach | | 1741 | 5.0 | 1741 | 5.0 | 0.710 | 12.7 | LOS B | 17.9 | 130.6 | 0.50 | 0.47 | 27.1 |
| West: Duosa Avenue | | | | | | | | | | | | | |
| 10 | L2 | 227 | 0.9 | 227 | 0.9 | 0.277 | 26.1 | LOS C | 7.6 | 53.9 | 0.67 | 0.76 | 32.6 |
| 11 | T1 | 33 | 0.0 | 33 | 0.0 | 0.373 | 43.5 | LOS D | 5.4 | 38.0 | 0.92 | 0.77 | 33.8 |
| 12 | R2 | 79 | 1.3 | 79 | 1.3 | 0.373 | 49.1 | LOS D | 5.4 | 38.0 | 0.92 | 0.77 | 23.9 |
| Approach | | 339 | 0.9 | 339 | 0.9 | 0.373 | 33.1 | LOS C | 7.6 | 53.9 | 0.75 | 0.76 | 30.4 |
| All Vehicles | | 3252 | 4.2 | 3252 | 4.2 | 0.710 | 15.3 | LOS B | 17.9 | 130.6 | 0.50 | 0.48 | 27.8 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Network Model Accuracy Level (largest change in degree of saturation for any lane): 2.6 %
Number of Iterations: 10 (maximum specified: 10)

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate per ped |
|---|---|---|---|---|---|---|---|---|
| P1 | South Full Crossing | 53 | 49.3 | LOS E | 0.2 | 0.2 | 0.95 | 0.95 |
| P2 | East Full Crossing | 53 | 10.5 | LOS B | 0.1 | 0.1 | 0.44 | 0.44 |
| P3 | North Full Crossing | 53 | 49.3 | LOS E | 0.2 | 0.2 | 0.95 | 0.95 |
| P4 | West Full Crossing | 53 | 22.3 | LOS C | 0.1 | 0.1 | 0.64 | 0.64 |
| All Pedestrians | | 211 | 32.8 | LOS D | | | 0.74 | 0.74 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

## Site: 2880S [2880S- West Gate Freeway/Melbourne Road- AM (8:00-9:00)]

## Network: N101 [AM PEAK Existing (8:00-9:00) 2880/1303/4965]

New Site
Signals - Fixed Time Coordinated  Cycle Time = 130 seconds (Network Cycle Time - User-Given)
Common Control Group: 2880 [West Gate Fwy/Melbourne Rd]

**Movement Performance - Vehicles**

| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Arrival Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Melbourne Road | | | | | | | | | | | | | |
| 1 | L2 | 312 | 6.1 | 312 | 6.1 | 0.211 | 6.4 | LOS A | 1.5 | 11.1 | 0.12 | 0.58 | 50.2 |
| 2 | T1 | 1611 | 7.0 | 1611 | 7.0 | 1.086 | 110.3 | LOS F | 25.3 | 187.7 | 0.65 | 1.06 | 9.7 |
| Approach | | 1922 | 6.8 | 1922 | 6.8 | 1.086 | 93.4 | LOS F | 25.3 | 187.7 | 0.56 | 0.98 | 7.1 |
| East: Exit Ramp Outbound | | | | | | | | | | | | | |
| 4 | L2 | 404 | 10.9 | 404 | 10.9 | 0.315 | 6.5 | LOS A | 2.7 | 20.9 | 0.18 | 0.61 | 49.7 |
| 5 | T1 | 4 | 0.0 | 4 | 0.0 | 0.884 | 68.2 | LOS E | 20.1 | 153.5 | 1.00 | 0.97 | 27.2 |
| 6 | R2 | 559 | 10.9 | 559 | 10.9 | 0.884 | 73.9 | LOS E | 20.1 | 153.5 | 1.00 | 0.97 | 17.8 |
| Approach | | 967 | 10.9 | 967 | 10.9 | 0.884 | 45.7 | LOS D | 20.1 | 153.5 | 0.66 | 0.82 | 24.4 |
| North: Melbourne Road | | | | | | | | | | | | | |
| 8 | T1 | 264 | 6.0 | 264 | 6.0 | 0.381 | 18.8 | LOS B | 4.4 | 32.2 | 0.43 | 0.35 | 15.9 |
| 9 | R2 | 189 | 6.1 | 189 | 6.1 | 0.629 | 75.3 | LOS E | 6.3 | 46.2 | 1.00 | 0.79 | 19.5 |
| Approach | | 454 | 6.0 | 454 | 6.0 | 0.629 | 42.4 | LOS D | 6.3 | 46.2 | 0.67 | 0.53 | 18.7 |
| All Vehicles | | 3343 | 7.9 | 3343 | 7.9 | 1.086 | 72.7 | LOS E | 25.3 | 187.7 | 0.61 | 0.87 | 12.4 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Network Model Accuracy Level (largest change in degree of saturation for any lane): 12.5 %
Number of Iterations: 10 (maximum specified: 10)

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate per ped |
|---|---|---|---|---|---|---|---|---|
| P1 | South Full Crossing | 53 | 44.1 | LOS E | 0.2 | 0.2 | 0.82 | 0.82 |
| P2 | East Full Crossing | 53 | 21.3 | LOS C | 0.1 | 0.1 | 0.79 | 0.79 |
| P4 | West Full Crossing | 53 | 47.5 | LOS E | 0.2 | 0.2 | 0.86 | 0.86 |
| All Pedestrians | | 158 | 37.6 | LOS D | | | 0.82 | 0.82 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

## Site: 2882S [2882S Millers Road/ Cyclamen Ave/Altona Gate Carpark - PM Existing]

## Network: N101 [2881/2882/2893/3501 - PM Existing]

New Site
Signals - Fixed Time Coordinated  Cycle Time = 110 seconds (Network Cycle Time - User-Given)
Common Control Group: 2882 [Millers Rd/Duosa Rd/Marigold Ave/Cyclamen Ave]

**Movement Performance - Vehicles**

| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Arrival Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Millers Road | | | | | | | | | | | | | |
| 1 | L2 | 269 | 3.1 | 269 | 3.1 | 0.148 | 4.9 | LOS A | 0.0 | 0.0 | 0.00 | 0.52 | 52.5 |
| 2 | T1 | 1014 | 4.3 | 1014 | 4.3 | 0.405 | 22.6 | LOS C | 14.0 | 100.2 | 0.75 | 0.65 | 11.9 |
| Approach | | 1283 | 4.0 | 1283 | 4.0 | 0.405 | 18.9 | LOS B | 14.0 | 100.2 | 0.59 | 0.62 | 23.3 |
| East: Cyclamen Avenue | | | | | | | | | | | | | |
| 4 | L2 | 17 | 0.0 | 17 | 0.0 | 0.029 | 6.9 | LOS A | 0.1 | 0.9 | 0.20 | 0.59 | 49.1 |
| Approach | | 17 | 0.0 | 17 | 0.0 | 0.029 | 6.9 | LOS A | 0.1 | 0.9 | 0.20 | 0.59 | 49.1 |
| North: Millers Road | | | | | | | | | | | | | |
| 7 | L2 | 63 | 6.7 | 63 | 6.7 | 0.059 | 6.5 | LOS A | 0.2 | 1.3 | 0.06 | 0.58 | 48.4 |
| 8 | T1 | 1456 | 6.0 | 1456 | 6.0 | 0.646 | 3.7 | LOS A | 11.1 | 81.6 | 0.22 | 0.20 | 37.9 |
| 9 | R2 | 104 | 6.1 | 104 | 6.1 | 0.185 | 13.2 | LOS B | 1.7 | 12.8 | 0.55 | 0.70 | 42.8 |
| Approach | | 1623 | 6.0 | 1623 | 6.0 | 0.646 | 4.4 | LOS A | 11.1 | 81.6 | 0.24 | 0.25 | 40.3 |
| West: Altona Gate Car-park | | | | | | | | | | | | | |
| 10 | L2 | 32 | 0.0 | 32 | 0.0 | 0.030 | 7.9 | LOS A | 0.3 | 2.3 | 0.26 | 0.61 | 47.9 |
| 12 | R2 | 151 | 0.0 | 151 | 0.0 | 0.223 | 47.4 | LOS D | 3.5 | 24.4 | 0.89 | 0.75 | 23.8 |
| Approach | | 182 | 0.0 | 182 | 0.0 | 0.223 | 40.6 | LOS D | 3.5 | 24.4 | 0.78 | 0.73 | 26.1 |
| All Vehicles | | 3105 | 4.8 | 3105 | 4.8 | 0.646 | 12.5 | LOS B | 14.0 | 100.2 | 0.42 | 0.43 | 29.1 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Network Model Accuracy Level (largest change in degree of saturation for any lane): 2.6 %
Number of Iterations: 10 (maximum specified: 10)

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate per ped |
|---|---|---|---|---|---|---|---|---|
| P3 | North Full Crossing | 53 | 49.3 | LOS E | 0.2 | 0.2 | 0.95 | 0.95 |
| P4 | West Full Crossing | 53 | 24.3 | LOS C | 0.1 | 0.1 | 0.67 | 0.67 |
| All Pedestrians | | 105 | 36.8 | LOS D | | | 0.81 | 0.81 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

\V106380-Millers Road Network.sip7

# MOVEMENT SUMMARY

## Site: 2893 [2893- Millers Road/Beuron Road - PM Existing]

## Network: N101 [2881/2882/2893/3501 - PM Existing]

New Site
Signals - Fixed Time Coordinated  Cycle Time = 110 seconds (Network Cycle Time - User-Given)

**Movement Performance - Vehicles**

| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Arrival Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Millers Road | | | | | | | | | | | | | |
| 1 | L2 | 15 | 0.0 | 15 | 0.0 | 0.342 | 7.7 | LOS A | 5.3 | 38.7 | 0.25 | 0.24 | 55.0 |
| 2 | T1 | 1201 | 3.8 | 1201 | 3.8 | 0.342 | 2.0 | LOS A | 5.3 | 38.7 | 0.22 | 0.21 | 52.7 |
| Approach | | 1216 | 3.7 | 1216 | 3.7 | 0.342 | 2.1 | LOS A | 5.3 | 38.7 | 0.22 | 0.21 | 52.8 |
| North: Millers Road | | | | | | | | | | | | | |
| 8 | T1 | 1456 | 6.0 | 1456 | 6.0 | 0.388 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 59.9 |
| 9 | R2 | 29 | 0.0 | 29 | 0.0 | 0.291 | 64.4 | LOS E | 1.7 | 11.7 | 1.00 | 0.72 | 20.9 |
| Approach | | 1485 | 5.9 | 1485 | 5.9 | 0.388 | 1.3 | LOS A | 1.7 | 11.7 | 0.02 | 0.01 | 48.5 |
| West: Beuron Road | | | | | | | | | | | | | |
| 10 | L2 | 12 | 0.0 | 12 | 0.0 | 0.141 | 62.8 | LOS E | 0.6 | 4.4 | 0.98 | 0.68 | 19.8 |
| Approach | | 12 | 0.0 | 12 | 0.0 | 0.141 | 62.8 | LOS E | 0.6 | 4.4 | 0.98 | 0.68 | 19.8 |
| All Vehicles | | 2713 | 4.9 | 2713 | 4.9 | 0.388 | 1.9 | LOS A | 5.3 | 38.7 | 0.11 | 0.10 | 50.3 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Network Model Accuracy Level (largest change in degree of saturation for any lane): 2.6 %
Number of Iterations: 10 (maximum specified: 10)

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate per ped |
|---|---|---|---|---|---|---|---|---|
| P4 | West Full Crossing | 53 | 2.2 | LOS A | 0.0 | 0.0 | 0.20 | 0.20 |
| All Pedestrians | | 53 | 2.2 | LOS A | | | 0.20 | 0.20 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

## Site: 3501 [3501-Millers Road/Blackshaws Road- PM Existing]

## Network: N101 [2881/2882/2893/3501 - PM Existing]

New Site
Signals - Fixed Time Coordinated  Cycle Time = 110 seconds (Network Cycle Time - User-Given)

**Movement Performance - Vehicles**

| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Arrival Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Millers Road | | | | | | | | | | | | | |
| 1 | L2 | 55 | 3.8 | 55 | 3.8 | 0.038 | 6.8 | LOS A | 0.4 | 2.8 | 0.20 | 0.59 | 53.2 |
| 2 | T1 | 839 | 4.0 | 839 | 4.0 | 0.595 | 29.1 | LOS C | 16.6 | 118.8 | 0.83 | 0.71 | 30.8 |
| 3 | R2 | 114 | 2.8 | 114 | 2.8 | 0.858 | 69.6 | LOS E | 6.9 | 49.3 | 1.00 | 0.96 | 27.7 |
| Approach | | 1007 | 3.9 | 1007 | 3.9 | 0.858 | 32.5 | LOS C | 16.6 | 118.8 | 0.81 | 0.73 | 31.4 |
| East: Blackshaws Road | | | | | | | | | | | | | |
| 4 | L2 | 111 | 3.8 | 111 | 3.8 | 0.542 | 33.2 | LOS C | 7.2 | 51.8 | 0.91 | 0.83 | 39.7 |
| 5 | T1 | 111 | 3.8 | 111 | 3.8 | 0.542 | 27.6 | LOS C | 7.2 | 51.8 | 0.91 | 0.83 | 40.2 |
| 6 | R2 | 241 | 3.9 | 241 | 3.9 | 0.510 | 34.0 | LOS C | 9.7 | 70.2 | 0.87 | 0.80 | 28.8 |
| Approach | | 462 | 3.9 | 462 | 3.9 | 0.542 | 32.3 | LOS C | 9.7 | 70.2 | 0.89 | 0.81 | 35.1 |
| North: Millers Road | | | | | | | | | | | | | |
| 7 | L2 | 392 | 6.2 | 392 | 6.2 | 0.289 | 9.0 | LOS A | 7.3 | 53.7 | 0.48 | 0.70 | 49.0 |
| 8 | T1 | 1080 | 7.5 | 1080 | 7.5 | 0.549 | 32.7 | LOS C | 18.5 | 140.4 | 0.94 | 0.82 | 34.8 |
| 9 | R2 | 96 | 5.5 | 96 | 5.5 | 0.536 | 53.7 | LOS D | 4.9 | 35.7 | 0.95 | 0.77 | 27.1 |
| Approach | | 1567 | 7.1 | 1567 | 7.1 | 0.549 | 28.0 | LOS C | 18.5 | 140.4 | 0.83 | 0.78 | 36.9 |
| West: Blackshaws Road | | | | | | | | | | | | | |
| 10 | L2 | 63 | 1.7 | 63 | 1.7 | 0.436 | 37.5 | LOS D | 5.5 | 38.7 | 0.90 | 0.81 | 28.9 |
| 11 | T1 | 99 | 1.1 | 99 | 1.1 | 0.436 | 31.9 | LOS C | 5.5 | 38.7 | 0.90 | 0.81 | 38.6 |
| 12 | R2 | 91 | 1.2 | 91 | 1.2 | 0.188 | 31.2 | LOS C | 3.3 | 23.2 | 0.78 | 0.73 | 39.4 |
| Approach | | 253 | 1.3 | 253 | 1.3 | 0.436 | 33.1 | LOS C | 5.5 | 38.7 | 0.86 | 0.78 | 37.1 |
| All Vehicles | | 3289 | 5.2 | 3289 | 5.2 | 0.858 | 30.4 | LOS C | 18.5 | 140.4 | 0.83 | 0.77 | 35.1 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Network Model Accuracy Level (largest change in degree of saturation for any lane): 2.6 %
Number of Iterations: 10 (maximum specified: 10)

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate per ped |
|---|---|---|---|---|---|---|---|---|
| P1 | South Full Crossing | 53 | 49.3 | LOS E | 0.2 | 0.2 | 0.95 | 0.95 |
| P2 | East Full Crossing | 53 | 24.3 | LOS C | 0.1 | 0.1 | 0.67 | 0.67 |
| P3 | North Full Crossing | 53 | 49.3 | LOS E | 0.2 | 0.2 | 0.95 | 0.95 |
| P4 | West Full Crossing | 53 | 26.3 | LOS C | 0.1 | 0.1 | 0.69 | 0.69 |
| All Pedestrians | | 211 | 37.3 | LOS D | | | 0.81 | 0.81 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

## Site: 9 [Blackshaws Road/The Broadway- AM (7:45-8:45) ]

New Site
Stop (Two-Way)

| Movement Performance - Vehicles | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
| South: The Broadway | | | | | | | | | | | |
| 1 | L2 | 109 | 2.0 | 0.335 | 11.7 | LOS B | 1.5 | 10.4 | 0.65 | 1.02 | 46.8 |
| 3 | R2 | 41 | 0.0 | 0.335 | 30.2 | LOS D | 1.5 | 10.4 | 0.65 | 1.02 | 46.9 |
| Approach | | 151 | 1.5 | 0.335 | 16.7 | LOS C | 1.5 | 10.4 | 0.65 | 1.02 | 46.9 |
| East: Blackshaws Road | | | | | | | | | | | |
| 4 | L2 | 17 | 0.0 | 0.009 | 5.6 | LOS A | 0.0 | 0.0 | 0.00 | 0.53 | 54.9 |
| 5 | T1 | 428 | 0.0 | 0.220 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 60.0 |
| Approach | | 445 | 0.0 | 0.220 | 0.2 | NA | 0.0 | 0.0 | 0.00 | 0.02 | 59.7 |
| West: Blackshaws Road | | | | | | | | | | | |
| 11 | T1 | 582 | 3.0 | 0.362 | 0.5 | LOS A | 0.9 | 6.6 | 0.16 | 0.07 | 58.8 |
| 12 | R2 | 65 | 2.0 | 0.362 | 8.0 | LOS A | 0.9 | 6.6 | 0.16 | 0.07 | 56.5 |
| Approach | | 647 | 2.9 | 0.362 | 1.2 | NA | 0.9 | 6.6 | 0.16 | 0.07 | 58.5 |
| All Vehicles | | 1243 | 1.7 | 0.362 | 2.8 | NA | 1.5 | 10.4 | 0.16 | 0.17 | 57.2 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

## Site: 9 [Blackshaws Road/The Broadway- PM (4:45-5:45)]

New Site
Stop (Two-Way)

| Movement Performance - Vehicles | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
| South: The Broadway | | | | | | | | | | | |
| 1 | L2 | 85 | 1.0 | 0.291 | 12.3 | LOS B | 1.1 | 8.1 | 0.69 | 1.04 | 46.4 |
| 3 | R2 | 28 | 0.0 | 0.291 | 33.9 | LOS D | 1.1 | 8.1 | 0.69 | 1.04 | 46.4 |
| Approach | | 114 | 0.8 | 0.291 | 17.7 | LOS C | 1.1 | 8.1 | 0.69 | 1.04 | 46.4 |
| East: Blackshaws Road | | | | | | | | | | | |
| 4 | L2 | 64 | 0.0 | 0.035 | 5.6 | LOS A | 0.0 | 0.0 | 0.00 | 0.53 | 54.9 |
| 5 | T1 | 547 | 0.0 | 0.281 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 59.9 |
| Approach | | 612 | 0.0 | 0.281 | 0.6 | NA | 0.0 | 0.0 | 0.00 | 0.06 | 59.4 |
| West: Blackshaws Road | | | | | | | | | | | |
| 11 | T1 | 449 | 5.0 | 0.410 | 2.1 | LOS A | 2.7 | 19.8 | 0.45 | 0.23 | 56.2 |
| 12 | R2 | 172 | 1.0 | 0.410 | 9.3 | LOS A | 2.7 | 19.8 | 0.45 | 0.23 | 54.2 |
| Approach | | 621 | 3.9 | 0.410 | 4.1 | NA | 2.7 | 19.8 | 0.45 | 0.23 | 55.6 |
| All Vehicles | | 1346 | 1.9 | 0.410 | 3.7 | NA | 2.7 | 19.8 | 0.26 | 0.22 | 56.3 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

## Site: 5 [Blackshaws Road/Kyle Road/Mills Street AM (8:00-9:00)]

New Site
Signals - Fixed Time Isolated Cycle Time = 30 seconds (Practical Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

**Movement Performance - Vehicles**

| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Mills Street | | | | | | | | | | | |
| 1 | L2 | 59 | 1.0 | 0.277 | 17.4 | LOS B | 1.4 | 9.9 | 0.88 | 0.72 | 47.1 |
| 2 | T1 | 45 | 1.0 | 0.277 | 11.9 | LOS B | 1.4 | 9.9 | 0.88 | 0.72 | 48.1 |
| 3 | R2 | 105 | 1.0 | 0.294 | 17.5 | LOS B | 1.4 | 10.1 | 0.89 | 0.75 | 45.6 |
| Approach | | 209 | 1.0 | 0.294 | 16.3 | LOS B | 1.4 | 10.1 | 0.89 | 0.74 | 46.5 |
| East: Blackshaws Road | | | | | | | | | | | |
| 4 | L2 | 17 | 4.0 | 0.340 | 12.7 | LOS B | 2.7 | 19.9 | 0.73 | 0.62 | 52.0 |
| 5 | T1 | 427 | 4.0 | 0.340 | 7.1 | LOS A | 2.7 | 19.9 | 0.73 | 0.62 | 53.3 |
| 6 | R2 | 34 | 4.0 | 0.340 | 12.7 | LOS B | 2.4 | 17.2 | 0.73 | 0.63 | 51.6 |
| Approach | | 478 | 4.0 | 0.340 | 7.7 | LOS A | 2.7 | 19.9 | 0.73 | 0.62 | 53.1 |
| North: Kyle Road | | | | | | | | | | | |
| 7 | L2 | 25 | 2.0 | 0.147 | 17.0 | LOS B | 0.7 | 5.1 | 0.86 | 0.68 | 47.7 |
| 8 | T1 | 80 | 2.0 | 0.147 | 11.5 | LOS B | 0.7 | 5.1 | 0.86 | 0.66 | 49.7 |
| 9 | R2 | 4 | 2.0 | 0.147 | 17.0 | LOS B | 0.7 | 5.0 | 0.86 | 0.64 | 49.0 |
| Approach | | 109 | 2.0 | 0.147 | 13.0 | LOS B | 0.7 | 5.1 | 0.86 | 0.66 | 49.2 |
| West: Blackshaws Road | | | | | | | | | | | |
| 10 | L2 | 13 | 0.0 | 0.390 | 12.8 | LOS B | 3.2 | 23.6 | 0.75 | 0.63 | 52.1 |
| 11 | T1 | 518 | 7.0 | 0.390 | 7.3 | LOS A | 3.2 | 23.6 | 0.75 | 0.64 | 53.3 |
| 12 | R2 | 25 | 0.0 | 0.390 | 12.8 | LOS B | 2.9 | 21.6 | 0.75 | 0.64 | 51.9 |
| Approach | | 556 | 6.5 | 0.390 | 7.6 | LOS A | 3.2 | 23.6 | 0.75 | 0.64 | 53.2 |
| All Vehicles | | 1353 | 4.4 | 0.390 | 9.4 | LOS A | 3.2 | 23.6 | 0.77 | 0.65 | 51.7 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate per ped |
|---|---|---|---|---|---|---|---|---|
| P1 | South Full Crossing | 53 | 9.6 | LOS A | 0.0 | 0.0 | 0.80 | 0.80 |
| P2 | East Full Crossing | 53 | 9.6 | LOS A | 0.0 | 0.0 | 0.80 | 0.80 |
| P3 | North Full Crossing | 53 | 9.6 | LOS A | 0.0 | 0.0 | 0.80 | 0.80 |
| P4 | West Full Crossing | 53 | 9.6 | LOS A | 0.0 | 0.0 | 0.80 | 0.80 |
| All Pedestrians | | 211 | 9.6 | LOS A | | | 0.80 | 0.80 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

## Site: 5 [Blackshaws Road/Kyle Road/Mills Street PM (4:00-5:00)]

New Site
Signals - Fixed Time Isolated Cycle Time = 30 seconds (Practical Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

**Movement Performance - Vehicles**

| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Mills Street | | | | | | | | | | | |
| 1 | L2 | 26 | 0.0 | 0.202 | 17.2 | LOS B | 1.0 | 7.2 | 0.87 | 0.69 | 48.0 |
| 2 | T1 | 65 | 0.0 | 0.202 | 11.7 | LOS B | 1.0 | 7.2 | 0.87 | 0.69 | 48.7 |
| 3 | R2 | 55 | 0.0 | 0.202 | 17.3 | LOS B | 0.9 | 6.4 | 0.87 | 0.72 | 46.4 |
| Approach | | 146 | 0.0 | 0.202 | 14.7 | LOS B | 1.0 | 7.2 | 0.87 | 0.70 | 47.7 |
| East: Blackshaws Road | | | | | | | | | | | |
| 4 | L2 | 8 | 3.0 | 0.471 | 13.1 | LOS B | 4.1 | 29.4 | 0.78 | 0.67 | 51.9 |
| 5 | T1 | 634 | 3.0 | 0.471 | 7.6 | LOS A | 4.1 | 29.4 | 0.78 | 0.67 | 53.1 |
| 6 | R2 | 37 | 3.0 | 0.471 | 13.2 | LOS B | 3.7 | 26.3 | 0.78 | 0.68 | 51.5 |
| Approach | | 679 | 3.0 | 0.471 | 7.9 | LOS A | 4.1 | 29.4 | 0.78 | 0.67 | 53.0 |
| North: Kyle Road | | | | | | | | | | | |
| 7 | L2 | 43 | 0.0 | 0.161 | 17.1 | LOS B | 0.8 | 5.5 | 0.86 | 0.70 | 46.8 |
| 8 | T1 | 43 | 0.0 | 0.161 | 11.6 | LOS B | 0.8 | 5.5 | 0.86 | 0.69 | 48.2 |
| 9 | R2 | 28 | 0.0 | 0.161 | 17.1 | LOS B | 0.7 | 5.0 | 0.86 | 0.69 | 47.4 |
| Approach | | 115 | 0.0 | 0.161 | 15.0 | LOS B | 0.8 | 5.5 | 0.86 | 0.69 | 47.5 |
| West: Blackshaws Road | | | | | | | | | | | |
| 10 | L2 | 4 | 3.0 | 0.376 | 12.8 | LOS B | 3.1 | 22.4 | 0.75 | 0.62 | 52.2 |
| 11 | T1 | 515 | 3.0 | 0.376 | 7.2 | LOS A | 3.1 | 22.4 | 0.75 | 0.63 | 53.4 |
| 12 | R2 | 24 | 3.0 | 0.376 | 12.8 | LOS B | 2.8 | 20.1 | 0.75 | 0.64 | 51.8 |
| Approach | | 543 | 3.0 | 0.376 | 7.5 | LOS A | 3.1 | 22.4 | 0.75 | 0.63 | 53.4 |
| All Vehicles | | 1483 | 2.5 | 0.471 | 9.0 | LOS A | 4.1 | 29.4 | 0.78 | 0.66 | 52.1 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate per ped |
|---|---|---|---|---|---|---|---|---|
| P1 | South Full Crossing | 53 | 9.6 | LOS A | 0.0 | 0.0 | 0.80 | 0.80 |
| P2 | East Full Crossing | 53 | 9.6 | LOS A | 0.0 | 0.0 | 0.80 | 0.80 |
| P3 | North Full Crossing | 53 | 9.6 | LOS A | 0.0 | 0.0 | 0.80 | 0.80 |
| P4 | West Full Crossing | 53 | 9.6 | LOS A | 0.0 | 0.0 | 0.80 | 0.80 |
| All Pedestrians | | 211 | 9.6 | LOS A | | | 0.80 | 0.80 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

## Site: 10 [Blackshaws Road/Sutton Street AM (8:00-9:00)]

Stop (Two-Way)

| Movement Performance - Vehicles | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
| East: Blackshaws Road | | | | | | | | | | | |
| 5 | T1 | 276 | 0.0 | 0.164 | 0.2 | LOS A | 0.3 | 1.8 | 0.10 | 0.06 | 59.1 |
| 6 | R2 | 28 | 0.0 | 0.164 | 6.8 | LOS A | 0.3 | 1.8 | 0.10 | 0.06 | 56.9 |
| Approach | | 304 | 0.0 | 0.164 | 0.8 | NA | 0.3 | 1.8 | 0.10 | 0.06 | 58.9 |
| North: Sutton Street | | | | | | | | | | | |
| 7 | L2 | 31 | 0.0 | 0.081 | 9.3 | LOS A | 0.3 | 2.0 | 0.44 | 0.92 | 50.7 |
| 9 | R2 | 31 | 4.0 | 0.081 | 11.6 | LOS B | 0.3 | 2.0 | 0.44 | 0.92 | 50.0 |
| Approach | | 61 | 2.0 | 0.081 | 10.4 | LOS B | 0.3 | 2.0 | 0.44 | 0.92 | 50.4 |
| West: Blackshaws Road | | | | | | | | | | | |
| 10 | L2 | 41 | 0.0 | 0.172 | 5.6 | LOS A | 0.0 | 0.0 | 0.00 | 0.08 | 57.7 |
| 11 | T1 | 284 | 4.0 | 0.172 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.08 | 59.3 |
| Approach | | 325 | 3.5 | 0.172 | 0.7 | NA | 0.0 | 0.0 | 0.00 | 0.08 | 59.1 |
| All Vehicles | | 691 | 1.8 | 0.172 | 1.6 | NA | 0.3 | 2.0 | 0.08 | 0.14 | 58.1 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

## Site: 10 [Blackshaws Road/Sutton Street PM (4:30-5:30)]

Stop (Two-Way)

| Movement Performance - Vehicles | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
| East: Blackshaws Road | | | | | | | | | | | |
| 5 | T1 | 432 | 0.0 | 0.244 | 0.1 | LOS A | 0.3 | 2.0 | 0.07 | 0.04 | 59.3 |
| 6 | R2 | 33 | 0.0 | 0.244 | 6.4 | LOS A | 0.3 | 2.0 | 0.07 | 0.04 | 57.1 |
| Approach | | 464 | 0.0 | 0.244 | 0.5 | NA | 0.3 | 2.0 | 0.07 | 0.04 | 59.2 |
| North: Sutton Street | | | | | | | | | | | |
| 7 | L2 | 19 | 0.0 | 0.097 | 8.8 | LOS A | 0.3 | 2.3 | 0.44 | 0.95 | 50.1 |
| 9 | R2 | 43 | 0.0 | 0.097 | 12.1 | LOS B | 0.3 | 2.3 | 0.44 | 0.95 | 49.7 |
| Approach | | 62 | 0.0 | 0.097 | 11.1 | LOS B | 0.3 | 2.3 | 0.44 | 0.95 | 49.8 |
| West: Blackshaws Road | | | | | | | | | | | |
| 10 | L2 | 23 | 0.0 | 0.118 | 5.6 | LOS A | 0.0 | 0.0 | 0.00 | 0.06 | 57.8 |
| 11 | T1 | 206 | 0.0 | 0.118 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.06 | 59.4 |
| Approach | | 229 | 0.0 | 0.118 | 0.6 | NA | 0.0 | 0.0 | 0.00 | 0.06 | 59.3 |
| All Vehicles | | 756 | 0.0 | 0.244 | 1.4 | NA | 0.3 | 2.3 | 0.08 | 0.12 | 58.3 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

## Site: 12 [Kernot Street/ The Avenue PM(4:45-5:45)]

New Site
Stop (Two-Way)

| Movement Performance - Vehicles | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
| South: Kernot Street | | | | | | | | | | | |
| 1 | L2 | 63 | 0.0 | 0.197 | 8.3 | LOS A | 0.8 | 5.4 | 0.24 | 0.92 | 51.5 |
| 3 | R2 | 132 | 1.0 | 0.197 | 9.1 | LOS A | 0.8 | 5.4 | 0.24 | 0.92 | 51.0 |
| Approach | | 195 | 0.7 | 0.197 | 8.8 | LOS A | 0.8 | 5.4 | 0.24 | 0.92 | 51.1 |
| East: The Avenue | | | | | | | | | | | |
| 4 | L2 | 185 | 0.0 | 0.134 | 5.6 | LOS A | 0.0 | 0.0 | 0.00 | 0.43 | 54.8 |
| 5 | T1 | 67 | 0.0 | 0.134 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.43 | 56.2 |
| Approach | | 253 | 0.0 | 0.134 | 4.1 | NA | 0.0 | 0.0 | 0.00 | 0.43 | 55.2 |
| West: The Avenue | | | | | | | | | | | |
| 11 | T1 | 43 | 2.0 | 0.078 | 0.8 | LOS A | 0.4 | 2.6 | 0.34 | 0.39 | 55.5 |
| 12 | R2 | 79 | 0.0 | 0.078 | 6.3 | LOS A | 0.4 | 2.6 | 0.34 | 0.39 | 53.6 |
| Approach | | 122 | 0.7 | 0.078 | 4.3 | NA | 0.4 | 2.6 | 0.34 | 0.39 | 54.3 |
| All Vehicles | | 569 | 0.4 | 0.197 | 5.8 | NA | 0.8 | 5.4 | 0.15 | 0.59 | 53.5 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

## Site: 1303 [1303- Melbourne Road/The Avenue - AM (8:00-9:00)]

## Network: N101 [AM PEAK Existing (8:00-9:00) 2880/1303/4965]

New Site
Signals - Fixed Time Coordinated  Cycle Time = 130 seconds (Network Cycle Time - User-Given)

**Movement Performance - Vehicles**

| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Arrival Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Melbourne Road | | | | | | | | | | | | | |
| 1 | L2 | 5 | 0.0 | 5 | 0.0 | 0.459 | 15.9 | LOS B | 11.4 | 85.0 | 0.39 | 0.35 | 46.8 |
| 2 | T1 | 1025 | 8.0 | 1025 | 8.0 | 0.480 | 6.8 | LOS A | 11.4 | 85.0 | 0.27 | 0.25 | 40.6 |
| 3 | R2 | 1 | 0.0 | 1 | 0.0 | 0.009 | 68.2 | LOS E | 0.1 | 0.5 | 0.98 | 0.59 | 22.8 |
| Approach | | 1032 | 8.0 | 1032 | 8.0 | 0.480 | 6.9 | LOS A | 11.4 | 85.0 | 0.28 | 0.25 | 39.4 |
| East: The Avenue | | | | | | | | | | | | | |
| 4 | L2 | 8 | 0.0 | 8 | 0.0 | 0.030 | 45.0 | LOS D | 0.6 | 4.5 | 0.79 | 0.63 | 25.2 |
| 5 | T1 | 5 | 0.0 | 5 | 0.0 | 0.030 | 39.4 | LOS D | 0.6 | 4.5 | 0.79 | 0.63 | 35.3 |
| 6 | R2 | 144 | 0.0 | 144 | 0.0 | 0.892 | 83.5 | LOS F | 11.4 | 79.8 | 1.00 | 1.04 | 16.2 |
| Approach | | 158 | 0.0 | 158 | 0.0 | 0.892 | 80.0 | LOS E | 11.4 | 79.8 | 0.98 | 1.00 | 17.1 |
| North: Melbourne Road | | | | | | | | | | | | | |
| 7 | L2 | 21 | 5.0 | 21 | 5.0 | 0.305 | 16.2 | LOS B | 8.1 | 59.9 | 0.40 | 0.37 | 44.7 |
| 8 | T1 | 691 | 5.9 | 691 | 5.9 | 0.305 | 8.9 | LOS A | 8.1 | 59.9 | 0.34 | 0.31 | 27.9 |
| 9 | R2 | 26 | 8.0 | 26 | 8.0 | 0.325 | 74.9 | LOS E | 1.8 | 13.2 | 1.00 | 0.71 | 20.0 |
| Approach | | 738 | 6.0 | 738 | 6.0 | 0.325 | 11.5 | LOS B | 8.1 | 59.9 | 0.36 | 0.32 | 27.5 |
| West: The Avenue | | | | | | | | | | | | | |
| 10 | L2 | 753 | 4.1 | 753 | 4.1 | 0.893 | 49.5 | LOS D | 26.3 | 190.3 | 0.86 | 1.00 | 23.4 |
| 11 | T1 | 12 | 0.0 | 12 | 0.0 | 0.132 | 43.7 | LOS D | 2.3 | 16.1 | 0.84 | 0.71 | 33.7 |
| 12 | R2 | 34 | 0.0 | 34 | 0.0 | 0.132 | 49.2 | LOS D | 2.3 | 16.1 | 0.84 | 0.71 | 23.6 |
| Approach | | 798 | 3.8 | 798 | 3.8 | 0.893 | 49.4 | LOS D | 26.3 | 190.3 | 0.85 | 0.99 | 23.5 |
| All Vehicles | | 2725 | 5.8 | 2725 | 5.8 | 0.893 | 24.8 | LOS C | 26.3 | 190.3 | 0.51 | 0.53 | 25.9 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Network Model Accuracy Level (largest change in degree of saturation for any lane): 12.5 %
Number of Iterations: 10 (maximum specified: 10)

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate per ped |
|---|---|---|---|---|---|---|---|---|
| P1 | South Full Crossing | 53 | 50.1 | LOS E | 0.2 | 0.2 | 0.88 | 0.88 |
| P2 | East Full Crossing | 53 | 17.8 | LOS B | 0.1 | 0.1 | 0.52 | 0.52 |
| P3 | North Full Crossing | 53 | 53.7 | LOS E | 0.2 | 0.2 | 0.91 | 0.91 |
| P4 | West Full Crossing | 53 | 13.4 | LOS B | 0.1 | 0.1 | 0.45 | 0.45 |
| All Pedestrians | | 211 | 33.8 | LOS D | | | 0.69 | 0.69 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

## Site: 12 [Kernot Street/ The Avenue AM (7:45-8:45)]

New Site
Stop (Two-Way)

| Movement Performance - Vehicles | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
| South: Kernot Street | | | | | | | | | | | |
| 1 | L2 | 37 | 0.0 | 0.606 | 9.5 | LOS A | 5.5 | 38.5 | 0.44 | 0.96 | 50.4 |
| 3 | R2 | 538 | 1.0 | 0.606 | 10.7 | LOS B | 5.5 | 38.5 | 0.44 | 0.96 | 49.9 |
| Approach | | 575 | 0.9 | 0.606 | 10.7 | LOS B | 5.5 | 38.5 | 0.44 | 0.96 | 50.0 |
| East: The Avenue | | | | | | | | | | | |
| 4 | L2 | 27 | 0.0 | 0.038 | 5.5 | LOS A | 0.0 | 0.0 | 0.00 | 0.22 | 56.5 |
| 5 | T1 | 45 | 0.0 | 0.038 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.22 | 58.0 |
| Approach | | 73 | 0.0 | 0.038 | 2.1 | NA | 0.0 | 0.0 | 0.00 | 0.22 | 57.4 |
| West: The Avenue | | | | | | | | | | | |
| 11 | T1 | 117 | 0.0 | 0.089 | 0.1 | LOS A | 0.3 | 1.9 | 0.10 | 0.17 | 58.1 |
| 12 | R2 | 47 | 0.0 | 0.089 | 5.7 | LOS A | 0.3 | 1.9 | 0.10 | 0.17 | 56.0 |
| Approach | | 164 | 0.0 | 0.089 | 1.7 | NA | 0.3 | 1.9 | 0.10 | 0.17 | 57.4 |
| All Vehicles | | 812 | 0.7 | 0.606 | 8.1 | NA | 5.5 | 38.5 | 0.34 | 0.73 | 51.9 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

## Site: 1 [New Street/Blackshaws Road AM Peak Exisitng]

New Street / Blackshaws Road
Stop (Two-Way)

| Movement Performance - Vehicles | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
| East: Blackshaws Road | | | | | | | | | | | |
| 5 | T1 | 322 | 9.0 | 0.175 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 60.0 |
| 6 | R2 | 16 | 0.0 | 0.024 | 9.2 | LOS A | 0.1 | 0.6 | 0.56 | 0.73 | 50.4 |
| Approach | | 338 | 8.6 | 0.175 | 0.4 | NA | 0.1 | 0.6 | 0.03 | 0.03 | 59.4 |
| North: New Street | | | | | | | | | | | |
| 7 | L2 | 13 | 0.0 | 0.211 | 10.8 | LOS B | 0.7 | 5.1 | 0.70 | 1.00 | 47.1 |
| 9 | R2 | 64 | 0.0 | 0.211 | 17.3 | LOS C | 0.7 | 5.1 | 0.70 | 1.00 | 46.7 |
| Approach | | 77 | 0.0 | 0.211 | 16.2 | LOS C | 0.7 | 5.1 | 0.70 | 1.00 | 46.8 |
| West: Blackshaws Road | | | | | | | | | | | |
| 10 | L2 | 289 | 5.0 | 0.344 | 5.6 | LOS A | 0.0 | 0.0 | 0.00 | 0.27 | 55.8 |
| 11 | T1 | 344 | 5.0 | 0.344 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.27 | 57.5 |
| Approach | | 634 | 5.0 | 0.344 | 2.6 | NA | 0.0 | 0.0 | 0.00 | 0.27 | 56.7 |
| All Vehicles | | 1048 | 5.8 | 0.344 | 2.9 | NA | 0.7 | 5.1 | 0.06 | 0.25 | 56.7 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

## Site: 1 [New Street/Blackshaws Road PM Peak Exisitng]

New Street / Blackshaws Road
Stop (Two-Way)

| Movement Performance - Vehicles | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
| East: Blackshaws Road | | | | | | | | | | | |
| 5 | T1 | 400 | 4.0 | 0.210 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 60.0 |
| 6 | R2 | 6 | 0.0 | 0.009 | 8.7 | LOS A | 0.0 | 0.2 | 0.54 | 0.67 | 50.8 |
| Approach | | 406 | 3.9 | 0.210 | 0.2 | NA | 0.0 | 0.2 | 0.01 | 0.01 | 59.8 |
| North: New Street | | | | | | | | | | | |
| 7 | L2 | 135 | 0.0 | 0.203 | 11.1 | LOS B | 0.8 | 5.5 | 0.57 | 0.97 | 50.0 |
| 9 | R2 | 9 | 0.0 | 0.203 | 20.0 | LOS C | 0.8 | 5.5 | 0.57 | 0.97 | 49.5 |
| Approach | | 144 | 0.0 | 0.203 | 11.7 | LOS B | 0.8 | 5.5 | 0.57 | 0.97 | 50.0 |
| West: Blackshaws Road | | | | | | | | | | | |
| 10 | L2 | 123 | 4.0 | 0.314 | 5.6 | LOS A | 0.0 | 0.0 | 0.00 | 0.12 | 57.0 |
| 11 | T1 | 467 | 4.0 | 0.314 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.12 | 58.8 |
| Approach | | 591 | 4.0 | 0.314 | 1.2 | NA | 0.0 | 0.0 | 0.00 | 0.12 | 58.4 |
| All Vehicles | | 1141 | 3.5 | 0.314 | 2.2 | NA | 0.8 | 5.5 | 0.07 | 0.19 | 57.7 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

## Site: 0 [Melbourne Road / Ross Street - AM Peak Hour Existing]

Melbourne Road / Ross Street
Stop (Two-Way)

| Movement Performance - Vehicles | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
| South: Melbourne Road | | | | | | | | | | | |
| 1 | L2 | 20 | 7.0 | 0.289 | 5.7 | LOS A | 0.0 | 0.0 | 0.00 | 0.02 | 57.8 |
| 2 | T1 | 1057 | 7.0 | 0.289 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.01 | 59.8 |
| Approach | | 1077 | 7.0 | 0.289 | 0.1 | NA | 0.0 | 0.0 | 0.00 | 0.01 | 59.8 |
| North: Melbourne Road | | | | | | | | | | | |
| 8 | T1 | 757 | 4.0 | 0.199 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 60.0 |
| 9 | R2 | 18 | 4.0 | 0.051 | 14.8 | LOS B | 0.2 | 1.2 | 0.76 | 0.90 | 47.1 |
| Approach | | 775 | 4.0 | 0.199 | 0.4 | NA | 0.2 | 1.2 | 0.02 | 0.02 | 59.6 |
| West: Ross Street | | | | | | | | | | | |
| 10 | L2 | 152 | 1.0 | 0.323 | 16.0 | LOS C | 1.2 | 8.8 | 0.75 | 1.05 | 47.5 |
| 12 | R2 | 4 | 1.0 | 0.085 | 72.9 | LOS F | 0.2 | 1.5 | 0.96 | 1.00 | 27.3 |
| Approach | | 156 | 1.0 | 0.323 | 17.5 | LOS C | 1.2 | 8.8 | 0.76 | 1.05 | 46.5 |
| All Vehicles | | 2008 | 5.4 | 0.323 | 1.6 | NA | 1.2 | 8.8 | 0.07 | 0.10 | 58.4 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

## Site: 0 [Melbourne Road / Scott Street - PM Peak Hour Existing]

Melbourne Road / Ross Street
Stop (Two-Way)

| Movement Performance - Vehicles | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
| South: Melbourne Road | | | | | | | | | | | |
| 1 | L2 | 14 | 3.0 | 0.270 | 5.6 | LOS A | 0.0 | 0.0 | 0.00 | 0.02 | 58.0 |
| 2 | T1 | 1016 | 3.0 | 0.270 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.01 | 59.9 |
| Approach | | 1031 | 3.0 | 0.270 | 0.1 | NA | 0.0 | 0.0 | 0.00 | 0.01 | 59.8 |
| North: Melbourne Road | | | | | | | | | | | |
| 8 | T1 | 1424 | 6.0 | 0.379 | 0.1 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 59.9 |
| 9 | R2 | 48 | 6.0 | 0.124 | 14.3 | LOS B | 0.4 | 3.2 | 0.75 | 0.89 | 47.4 |
| Approach | | 1472 | 6.0 | 0.379 | 0.5 | NA | 0.4 | 3.2 | 0.02 | 0.03 | 59.4 |
| West: Ross Street | | | | | | | | | | | |
| 10 | L2 | 112 | 0.0 | 0.218 | 14.1 | LOS B | 0.8 | 5.3 | 0.70 | 1.01 | 48.5 |
| 12 | R2 | 1 | 0.0 | 0.110 | 322.6 | LOS F | 0.3 | 1.8 | 0.99 | 1.00 | 9.5 |
| Approach | | 113 | 0.0 | 0.218 | 16.9 | LOS C | 0.8 | 5.3 | 0.70 | 1.01 | 46.8 |
| All Vehicles | | 2616 | 4.6 | 0.379 | 1.1 | NA | 0.8 | 5.3 | 0.04 | 0.06 | 58.9 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

## Site: 1 [Schutt Street / Blackshaws Road - AM Peak Hour Existing]

Blackshaws Road / Schutt Street
Giveway / Yield (Two-Way)

| Movement Performance - Vehicles | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
| South: Schutt Street | | | | | | | | | | | |
| 1 | L2 | 36 | 0.0 | 0.036 | 6.2 | LOS A | 0.1 | 1.0 | 0.27 | 0.57 | 52.8 |
| 3 | R2 | 4 | 0.0 | 0.036 | 8.6 | LOS A | 0.1 | 1.0 | 0.27 | 0.57 | 52.3 |
| Approach | | 40 | 0.0 | 0.036 | 6.4 | LOS A | 0.1 | 1.0 | 0.27 | 0.57 | 52.7 |
| East: Blackshaws Road | | | | | | | | | | | |
| 4 | L2 | 2 | 2.0 | 0.085 | 5.6 | LOS A | 0.0 | 0.0 | 0.00 | 0.01 | 58.2 |
| 5 | T1 | 162 | 2.0 | 0.085 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.01 | 59.9 |
| Approach | | 164 | 2.0 | 0.085 | 0.1 | NA | 0.0 | 0.0 | 0.00 | 0.01 | 59.9 |
| West: Blackshaws Road | | | | | | | | | | | |
| 11 | T1 | 160 | 3.0 | 0.084 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 60.0 |
| 12 | R2 | 129 | 3.0 | 0.107 | 6.2 | LOS A | 0.4 | 3.2 | 0.29 | 0.59 | 52.2 |
| Approach | | 289 | 3.0 | 0.107 | 2.8 | NA | 0.4 | 3.2 | 0.13 | 0.26 | 56.2 |
| All Vehicles | | 494 | 2.4 | 0.107 | 2.2 | NA | 0.4 | 3.2 | 0.10 | 0.20 | 57.1 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

## Site: 1 [Schutt Street / Blackshas Road - PM Peak Hour Existing]

Blackshaws Road / Schutt Street
Giveway / Yield (Two-Way)

| Movement Performance - Vehicles | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
| South: Schutt Street | | | | | | | | | | | |
| 1 | L2 | 38 | 1.0 | 0.042 | 6.8 | LOS A | 0.2 | 1.1 | 0.39 | 0.61 | 52.4 |
| 3 | R2 | 3 | 1.0 | 0.042 | 9.5 | LOS A | 0.2 | 1.1 | 0.39 | 0.61 | 51.9 |
| Approach | | 41 | 1.0 | 0.042 | 7.0 | LOS A | 0.2 | 1.1 | 0.39 | 0.61 | 52.3 |
| East: Blackshaws Road | | | | | | | | | | | |
| 4 | L2 | 8 | 2.0 | 0.156 | 5.6 | LOS A | 0.0 | 0.0 | 0.00 | 0.02 | 58.1 |
| 5 | T1 | 292 | 2.0 | 0.156 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.02 | 59.8 |
| Approach | | 300 | 2.0 | 0.156 | 0.2 | NA | 0.0 | 0.0 | 0.00 | 0.02 | 59.8 |
| West: Blackshaws Road | | | | | | | | | | | |
| 11 | T1 | 124 | 1.0 | 0.064 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 60.0 |
| 12 | R2 | 107 | 1.0 | 0.102 | 6.8 | LOS A | 0.4 | 2.9 | 0.40 | 0.64 | 52.0 |
| Approach | | 232 | 1.0 | 0.102 | 3.2 | NA | 0.4 | 2.9 | 0.18 | 0.30 | 56.0 |
| All Vehicles | | 573 | 1.5 | 0.156 | 1.9 | NA | 0.4 | 2.9 | 0.10 | 0.17 | 57.6 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

## Site: 1 [Hansen Street/Blackshaws Road - AM Peak Existing]

Hansen Street / Blackshaws Road
Stop (Two-Way)

| Movement Performance - Vehicles | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
| South: Hansen Street | | | | | | | | | | | |
| 1 | L2 | 17 | 2.0 | 0.264 | 10.8 | LOS B | 0.9 | 6.6 | 0.73 | 1.01 | 45.4 |
| 3 | R2 | 64 | 2.0 | 0.264 | 21.3 | LOS C | 0.9 | 6.6 | 0.73 | 1.01 | 45.0 |
| Approach | | 81 | 2.0 | 0.264 | 19.2 | LOS C | 0.9 | 6.6 | 0.73 | 1.01 | 45.1 |
| East: Blackshaws Road | | | | | | | | | | | |
| 4 | L2 | 34 | 9.0 | 0.208 | 5.7 | LOS A | 0.0 | 0.0 | 0.00 | 0.05 | 57.4 |
| 5 | T1 | 347 | 9.0 | 0.208 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.05 | 59.5 |
| Approach | | 381 | 9.0 | 0.208 | 0.5 | NA | 0.0 | 0.0 | 0.00 | 0.05 | 59.3 |
| West: Blackshaws Road | | | | | | | | | | | |
| 11 | T1 | 559 | 5.0 | 0.296 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 59.9 |
| 12 | R2 | 15 | 5.0 | 0.016 | 7.4 | LOS A | 0.1 | 0.4 | 0.44 | 0.63 | 51.5 |
| Approach | | 574 | 5.0 | 0.296 | 0.2 | NA | 0.1 | 0.4 | 0.01 | 0.02 | 59.7 |
| All Vehicles | | 1036 | 6.2 | 0.296 | 1.8 | NA | 0.9 | 6.6 | 0.06 | 0.11 | 58.1 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

## Site: 1 [Hansen Street/Blackshaws Road - PM Peak Existing]

Hansen Street / Blackshaws Road
Stop (Two-Way)

| Movement Performance - Vehicles | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
| South: Hansen Street | | | | | | | | | | | |
| 1 | L2 | 9 | 1.0 | 0.166 | 11.0 | LOS B | 0.5 | 3.7 | 0.76 | 0.99 | 45.5 |
| 3 | R2 | 37 | 1.0 | 0.166 | 21.2 | LOS C | 0.5 | 3.7 | 0.76 | 0.99 | 45.1 |
| Approach | | 46 | 1.0 | 0.166 | 19.1 | LOS C | 0.5 | 3.7 | 0.76 | 0.99 | 45.2 |
| East: Blackshaws Road | | | | | | | | | | | |
| 4 | L2 | 60 | 4.0 | 0.301 | 5.6 | LOS A | 0.0 | 0.0 | 0.00 | 0.06 | 57.6 |
| 5 | T1 | 509 | 4.0 | 0.301 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.06 | 59.4 |
| Approach | | 569 | 4.0 | 0.301 | 0.6 | NA | 0.0 | 0.0 | 0.00 | 0.06 | 59.2 |
| West: Blackshaws Road | | | | | | | | | | | |
| 11 | T1 | 459 | 4.0 | 0.241 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 59.9 |
| 12 | R2 | 18 | 4.0 | 0.025 | 8.8 | LOS A | 0.1 | 0.7 | 0.53 | 0.71 | 50.6 |
| Approach | | 477 | 4.0 | 0.241 | 0.4 | NA | 0.1 | 0.7 | 0.02 | 0.03 | 59.5 |
| All Vehicles | | 1093 | 3.9 | 0.301 | 1.3 | NA | 0.5 | 3.7 | 0.04 | 0.09 | 58.6 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

**Site: 4965 [4965- Melbourne Road/Hudson Road - AM (8:00-9:00)]**

**Network: N101 [AM PEAK Existing (8:00-9:00) 2880/1303/4965]**

New Site
Signals - Fixed Time Coordinated  Cycle Time = 130 seconds (Network Cycle Time - User-Given)

**Movement Performance - Vehicles**

| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Arrival Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Melbourne Road | | | | | | | | | | | | | |
| 1 | L2 | 4 | 0.0 | 4 | 0.0 | 0.431 | 19.8 | LOS B | 16.3 | 119.5 | 0.57 | 0.51 | 47.5 |
| 2 | T1 | 957 | 5.9 | 957 | 5.9 | 0.431 | 14.2 | LOS B | 16.3 | 119.5 | 0.57 | 0.51 | 41.1 |
| 3 | R2 | 25 | 0.0 | 25 | 0.0 | 0.589 | 81.9 | LOS F | 1.8 | 12.5 | 1.00 | 0.74 | 25.3 |
| Approach | | 986 | 5.8 | 986 | 5.8 | 0.589 | 15.9 | LOS B | 16.3 | 119.5 | 0.58 | 0.51 | 39.9 |
| East: Hudson Road | | | | | | | | | | | | | |
| 4 | L2 | 13 | 0.0 | 13 | 0.0 | 0.143 | 45.7 | LOS D | 3.3 | 23.6 | 0.81 | 0.65 | 35.3 |
| 5 | T1 | 55 | 3.8 | 55 | 3.8 | 0.143 | 40.2 | LOS D | 3.3 | 23.6 | 0.81 | 0.65 | 35.8 |
| 6 | R2 | 101 | 29.2 | 101 | 29.2 | 0.903 | 85.8 | LOS F | 7.5 | 65.4 | 1.00 | 1.00 | 16.0 |
| Approach | | 168 | 18.8 | 168 | 18.8 | 0.903 | 68.0 | LOS E | 7.5 | 65.4 | 0.92 | 0.86 | 23.3 |
| North: Melbourne Road | | | | | | | | | | | | | |
| 7 | L2 | 139 | 5.3 | 139 | 5.3 | 0.298 | 15.0 | LOS B | 6.7 | 48.9 | 0.35 | 0.46 | 45.4 |
| 8 | T1 | 538 | 5.1 | 538 | 5.1 | 0.298 | 8.8 | LOS A | 6.7 | 48.9 | 0.33 | 0.34 | 48.9 |
| 9 | R2 | 9 | 0.0 | 9 | 0.0 | 0.221 | 79.7 | LOS E | 0.7 | 4.6 | 1.00 | 0.66 | 20.6 |
| Approach | | 686 | 5.1 | 686 | 5.1 | 0.298 | 11.1 | LOS B | 6.7 | 48.9 | 0.34 | 0.37 | 47.3 |
| West: Hudson Road | | | | | | | | | | | | | |
| 10 | L2 | 42 | 5.0 | 42 | 5.0 | 0.659 | 65.7 | LOS E | 9.5 | 68.8 | 1.00 | 0.83 | 20.0 |
| 11 | T1 | 91 | 4.7 | 91 | 4.7 | 0.659 | 60.1 | LOS E | 9.5 | 68.8 | 1.00 | 0.83 | 29.7 |
| 12 | R2 | 19 | 0.0 | 19 | 0.0 | 0.659 | 65.7 | LOS E | 9.5 | 68.8 | 1.00 | 0.83 | 29.4 |
| Approach | | 152 | 4.2 | 152 | 4.2 | 0.659 | 62.3 | LOS E | 9.5 | 68.8 | 1.00 | 0.83 | 27.5 |
| All Vehicles | | 1993 | 6.5 | 1993 | 6.5 | 0.903 | 22.2 | LOS C | 16.3 | 119.5 | 0.56 | 0.52 | 37.8 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Network Model Accuracy Level (largest change in degree of saturation for any lane): 12.5 %
Number of Iterations: 10 (maximum specified: 10)

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate per ped |
|---|---|---|---|---|---|---|---|---|
| P1 | South Full Crossing | 53 | 48.4 | LOS E | 0.2 | 0.2 | 0.86 | 0.86 |
| P2 | East Full Crossing | 53 | 13.0 | LOS B | 0.1 | 0.1 | 0.45 | 0.45 |
| P3 | North Full Crossing | 53 | 59.3 | LOS E | 0.2 | 0.2 | 0.96 | 0.96 |
| P4 | West Full Crossing | 53 | 13.0 | LOS B | 0.1 | 0.1 | 0.45 | 0.45 |
| All Pedestrians | | 211 | 33.4 | LOS D | | | 0.68 | 0.68 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

## Site: 2880N [2880N- West Gate Freeway/ Melbourne Road- PM (5:00-6:00)]

## Network: N101 [PM PEAK Existing (5:00-6:00) 2880/1303/4965 ]

New Site
Signals - Fixed Time Coordinated Cycle Time = 120 seconds (Network Cycle Time - User-Given)
Common Control Group: 2880 [West Gate Fwy/Melbourne Rd]

**Movement Performance - Vehicles**

| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Arrival Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Melbourne Road | | | | | | | | | | | | | |
| 2 | T1 | 1528 | 7.0 | 1512 | 7.0 | 0.839 | 13.4 | LOS B | 29.0 | 215.2 | 0.67 | 0.63 | 45.7 |
| 3 | R2 | 528 | 7.0 | 528 | 7.0 | 0.896 | 75.9 | LOS E | 17.1 | 126.6 | 1.00 | 0.96 | 21.3 |
| Approach | | 2057 | 7.0 | 2041 N1 | 7.0 | 0.896 | 29.6 | LOS C | 29.0 | 215.2 | 0.76 | 0.72 | 35.2 |
| North: Melbourne Road | | | | | | | | | | | | | |
| 7 | L2 | 554 | 6.1 | 554 | 6.1 | 0.902 | 51.8 | LOS D | 46.5 | 342.5 | 1.00 | 1.01 | 32.9 |
| 8 | T1 | 1007 | 5.2 | 1007 | 5.2 | 0.902 | 44.0 | LOS D | 46.5 | 342.5 | 0.87 | 0.90 | 24.8 |
| Approach | | 1561 | 5.5 | 1561 | 5.5 | 0.902 | 46.8 | LOS D | 46.5 | 342.5 | 0.91 | 0.94 | 28.3 |
| West: Exit Ramp Inbound | | | | | | | | | | | | | |
| 10 | L2 | 517 | 11.0 | 517 | 11.0 | 0.712 | 18.7 | LOS B | 20.0 | 152.9 | 0.78 | 0.83 | 45.2 |
| 11 | T1 | 5 | 0.0 | 5 | 0.0 | 0.892 | 68.6 | LOS E | 9.4 | 72.0 | 0.99 | 1.00 | 27.2 |
| 12 | R2 | 280 | 10.9 | 280 | 10.9 | 0.892 | 74.3 | LOS E | 9.4 | 72.0 | 0.99 | 1.00 | 17.7 |
| Approach | | 802 | 10.9 | 802 | 10.9 | 0.892 | 38.5 | LOS D | 20.0 | 152.9 | 0.86 | 0.89 | 33.8 |
| All Vehicles | | 4420 | 7.2 | 4404 N1 | 7.2 | 0.902 | 37.3 | LOS D | 46.5 | 342.5 | 0.83 | 0.83 | 32.3 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Network Model Accuracy Level (largest change in degree of saturation for any lane): 0.8 %
Number of Iterations: 4 (maximum specified: 10)

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate per ped |
|---|---|---|---|---|---|---|---|---|
| P2 | East Full Crossing | 53 | 28.8 | LOS C | 0.1 | 0.1 | 0.69 | 0.69 |
| P3 | North Full Crossing | 53 | 38.5 | LOS D | 0.1 | 0.1 | 0.80 | 0.80 |
| P4 | West Full Crossing | 53 | 10.9 | LOS B | 0.1 | 0.1 | 0.43 | 0.43 |
| All Pedestrians | | 158 | 26.0 | LOS C | | | 0.64 | 0.64 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

## Site: 2880S [2880S- West Gate Freeway/Melbourne Road- PM (5:00-6:00)]

## Network: N101 [PM PEAK Existing (5:00-6:00) 2880/1303/4965 ]

New Site
Signals - Fixed Time Coordinated  Cycle Time = 120 seconds (Network Cycle Time - User-Given)
Common Control Group: 2880 [West Gate Fwy/Melbourne Rd]

**Movement Performance - Vehicles**

| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Arrival Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Melbourne Road | | | | | | | | | | | | | |
| 1 | L2 | 189 | 3.9 | 189 | 3.9 | 0.147 | 6.8 | LOS A | 1.2 | 8.3 | 0.15 | 0.59 | 49.7 |
| 2 | T1 | 1081 | 4.0 | 1081 | 4.0 | 0.468 | 18.3 | LOS B | 12.9 | 93.2 | 0.50 | 0.43 | 21.0 |
| Approach | | 1271 | 4.0 | 1271 | 4.0 | 0.468 | 16.6 | LOS B | 12.9 | 93.2 | 0.45 | 0.45 | 25.3 |
| East: Exit Ramp Outbound | | | | | | | | | | | | | |
| 4 | L2 | 1109 | 10.0 | 1109 | 10.0 | 1.097 | 145.5 | LOS F | 111.8 | 849.7 | 1.00 | 1.37 | 10.7 |
| 5 | T1 | 4 | 0.0 | 4 | 0.0 | 0.984 | 89.0 | LOS F | 39.2 | 298.1 | 1.00 | 1.11 | 23.6 |
| 6 | R2 | 947 | 10.0 | 947 | 10.0 | 0.984 | 94.4 | LOS F | 40.4 | 307.2 | 1.00 | 1.11 | 14.9 |
| Approach | | 2061 | 10.0 | 2061 | 10.0 | 1.097 | 121.9 | LOS F | 111.8 | 849.7 | 1.00 | 1.25 | 12.3 |
| North: Melbourne Road | | | | | | | | | | | | | |
| 8 | T1 | 926 | 4.0 | 926 | 4.0 | 0.641 | 29.3 | LOS C | 21.1 | 153.0 | 0.81 | 0.71 | 18.2 |
| 9 | R2 | 392 | 4.0 | 392 | 4.0 | 0.465 | 48.6 | LOS D | 9.8 | 71.1 | 0.90 | 0.81 | 27.8 |
| Approach | | 1318 | 4.0 | 1318 | 4.0 | 0.641 | 35.0 | LOS D | 21.1 | 153.0 | 0.83 | 0.74 | 22.8 |
| All Vehicles | | 4649 | 6.6 | 4649 | 6.6 | 1.097 | 68.5 | LOS E | 111.8 | 849.7 | 0.80 | 0.89 | 15.3 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Network Model Accuracy Level (largest change in degree of saturation for any lane): 0.8 %
Number of Iterations: 4 (maximum specified: 10)

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate per ped |
|---|---|---|---|---|---|---|---|---|
| P1 | South Full Crossing | 53 | 24.8 | LOS C | 0.1 | 0.1 | 0.64 | 0.64 |
| P2 | East Full Crossing | 53 | 10.9 | LOS B | 0.1 | 0.1 | 0.43 | 0.43 |
| P4 | West Full Crossing | 53 | 30.2 | LOS D | 0.1 | 0.1 | 0.71 | 0.71 |
| All Pedestrians | | 158 | 21.9 | LOS C | | | 0.59 | 0.59 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

## Site: 1303 [1303- Melbourne Road/The Avenue - PM (5:00-6:00)]

## Network: N101 [PM PEAK Existing (5:00-6:00) 2880/1303/4965 ]

New Site
Signals - Fixed Time Coordinated  Cycle Time = 120 seconds (Network Cycle Time - User-Given)

**Movement Performance - Vehicles**

| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Arrival Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Melbourne Road | | | | | | | | | | | | | |
| 1 | L2 | 14 | 0.0 | 14 | 0.0 | 0.519 | 34.7 | LOS C | 24.1 | 174.6 | 0.91 | 0.81 | 34.9 |
| 2 | T1 | 973 | 4.0 | 973 | 4.0 | 0.519 | 27.7 | LOS C | 24.1 | 174.6 | 0.89 | 0.79 | 19.1 |
| Approach | | 986 | 3.9 | 986 | 3.9 | 0.519 | 27.8 | LOS C | 24.1 | 174.6 | 0.89 | 0.79 | 19.5 |
| East: The Avenue | | | | | | | | | | | | | |
| 4 | L2 | 4 | 0.0 | 4 | 0.0 | 0.121 | 53.5 | LOS D | 1.8 | 12.4 | 0.90 | 0.67 | 23.5 |
| 5 | T1 | 31 | 0.0 | 31 | 0.0 | 0.121 | 48.0 | LOS D | 1.8 | 12.4 | 0.90 | 0.67 | 33.5 |
| 6 | R2 | 69 | 0.0 | 69 | 0.0 | 0.297 | 55.7 | LOS E | 3.7 | 26.0 | 0.93 | 0.76 | 21.4 |
| Approach | | 104 | 0.0 | 104 | 0.0 | 0.297 | 53.3 | LOS D | 3.7 | 26.0 | 0.92 | 0.73 | 25.7 |
| North: Melbourne Road | | | | | | | | | | | | | |
| 7 | L2 | 103 | 6.1 | 98 | 6.0 | 0.656 | 11.2 | LOS B | 16.8 | 123.7 | 0.38 | 0.40 | 49.2 |
| 8 | T1 | 1504 | 6.0 | 1424 | 5.9 | 0.656 | 6.1 | LOS A | 16.8 | 123.7 | 0.39 | 0.39 | 33.1 |
| 9 | R2 | 201 | 5.8 | 190 | 5.6 | 0.533 | 53.1 | LOS D | 10.6 | 77.6 | 0.99 | 0.82 | 24.7 |
| Approach | | 1808 | 6.0 | 1712 N1 | 5.9 | 0.656 | 11.6 | LOS B | 16.8 | 123.7 | 0.46 | 0.44 | 31.3 |
| West: The Avenue | | | | | | | | | | | | | |
| 10 | L2 | 228 | 4.1 | 228 | 4.1 | 0.150 | 11.0 | LOS B | 1.9 | 14.0 | 0.40 | 0.66 | 44.5 |
| 11 | T1 | 6 | 0.0 | 6 | 0.0 | 0.139 | 49.0 | LOS D | 1.4 | 10.3 | 0.90 | 0.71 | 32.0 |
| 12 | R2 | 21 | 5.0 | 21 | 5.0 | 0.139 | 54.5 | LOS D | 1.4 | 10.3 | 0.90 | 0.71 | 22.1 |
| Approach | | 256 | 4.1 | 256 | 4.1 | 0.150 | 15.5 | LOS B | 1.9 | 14.0 | 0.45 | 0.67 | 40.5 |
| All Vehicles | | 3155 | 5.0 | 3059 N1 | 5.2 | 0.656 | 18.6 | LOS B | 24.1 | 174.6 | 0.61 | 0.58 | 27.3 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Network Model Accuracy Level (largest change in degree of saturation for any lane): 0.8 %
Number of Iterations: 4 (maximum specified: 10)

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate per ped |
|---|---|---|---|---|---|---|---|---|
| P1 | South Full Crossing | 53 | 51.5 | LOS E | 0.2 | 0.2 | 0.93 | 0.93 |
| P2 | East Full Crossing | 53 | 18.2 | LOS B | 0.1 | 0.1 | 0.55 | 0.55 |
| P3 | North Full Crossing | 53 | 54.3 | LOS E | 0.2 | 0.2 | 0.95 | 0.95 |
| P4 | West Full Crossing | 53 | 17.6 | LOS B | 0.1 | 0.1 | 0.54 | 0.54 |
| All Pedestrians | | 211 | 35.4 | LOS D | | | 0.74 | 0.74 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

**Site: 4965 [4965- Melbourne Road/Hudson Road - PM (5:00 - 6:00)]**

**Network: N101 [PM PEAK Existing (5:00-6:00) 2880/1303/4965 ]**

New Site
Signals - Fixed Time Coordinated  Cycle Time = 120 seconds (Network Cycle Time - User-Given)

**Movement Performance - Vehicles**

| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Arrival Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Melbourne Road | | | | | | | | | | | | | |
| 1 | L2 | 8 | 0.0 | 8 | 0.0 | 0.397 | 20.9 | LOS C | 13.8 | 99.2 | 0.60 | 0.54 | 46.8 |
| 2 | T1 | 827 | 2.9 | 827 | 2.9 | 0.397 | 15.2 | LOS B | 13.8 | 99.2 | 0.60 | 0.53 | 40.1 |
| 3 | R2 | 26 | 4.0 | 26 | 4.0 | 0.583 | 76.1 | LOS E | 1.7 | 12.5 | 1.00 | 0.74 | 26.3 |
| Approach | | 862 | 2.9 | 862 | 2.9 | 0.583 | 17.2 | LOS B | 13.8 | 99.2 | 0.61 | 0.53 | 39.0 |
| East: Hudson Road | | | | | | | | | | | | | |
| 4 | L2 | 63 | 8.3 | 63 | 8.3 | 0.236 | 40.3 | LOS D | 5.5 | 41.1 | 0.80 | 0.71 | 36.4 |
| 5 | T1 | 60 | 8.8 | 60 | 8.8 | 0.236 | 34.7 | LOS C | 5.5 | 41.1 | 0.80 | 0.71 | 37.2 |
| 6 | R2 | 129 | 8.9 | 129 | 8.9 | 0.919 | 80.9 | LOS F | 9.0 | 67.6 | 1.00 | 1.02 | 16.6 |
| Approach | | 253 | 8.8 | 253 | 8.8 | 0.919 | 59.8 | LOS E | 9.0 | 67.6 | 0.90 | 0.87 | 25.9 |
| North: Melbourne Road | | | | | | | | | | | | | |
| 7 | L2 | 101 | 7.3 | 96 | 7.2 | 0.672 | 24.9 | LOS C | 28.5 | 211.2 | 0.76 | 0.71 | 39.5 |
| 8 | T1 | 1387 | 7.0 | 1312 | 6.9 | 0.672 | 19.2 | LOS B | 29.2 | 216.4 | 0.77 | 0.71 | 41.2 |
| 9 | R2 | 9 | 11.1 | 9 | 11.0 | 0.208 | 72.8 | LOS E | 0.6 | 4.3 | 0.99 | 0.66 | 21.7 |
| Approach | | 1498 | 7.0 | 1416 N1 | 6.9 | 0.672 | 20.0 | LOS B | 29.2 | 216.4 | 0.77 | 0.71 | 40.8 |
| West: Hudson Road | | | | | | | | | | | | | |
| 10 | L2 | 13 | 0.0 | 13 | 0.0 | 0.182 | 55.2 | LOS E | 2.4 | 17.3 | 0.92 | 0.71 | 22.5 |
| 11 | T1 | 29 | 3.6 | 29 | 3.6 | 0.182 | 49.7 | LOS D | 2.4 | 17.3 | 0.92 | 0.71 | 32.5 |
| 12 | R2 | 4 | 0.0 | 4 | 0.0 | 0.182 | 55.3 | LOS E | 2.4 | 17.3 | 0.92 | 0.71 | 32.1 |
| Approach | | 46 | 2.3 | 46 | 2.3 | 0.182 | 51.7 | LOS D | 2.4 | 17.3 | 0.92 | 0.71 | 30.3 |
| All Vehicles | | 2659 | 5.8 | 2577 N1 | 6.0 | 0.919 | 23.5 | LOS C | 29.2 | 216.4 | 0.73 | 0.67 | 37.6 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Network Model Accuracy Level (largest change in degree of saturation for any lane): 0.8 %
Number of Iterations: 4 (maximum specified: 10)

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate per ped |
|---|---|---|---|---|---|---|---|---|
| P1 | South Full Crossing | 53 | 41.8 | LOS E | 0.1 | 0.1 | 0.84 | 0.84 |
| P2 | East Full Crossing | 53 | 14.0 | LOS B | 0.1 | 0.1 | 0.48 | 0.48 |
| P3 | North Full Crossing | 53 | 54.3 | LOS E | 0.2 | 0.2 | 0.95 | 0.95 |
| P4 | West Full Crossing | 53 | 14.0 | LOS B | 0.1 | 0.1 | 0.48 | 0.48 |
| All Pedestrians | | 211 | 31.0 | LOS D | | | 0.69 | 0.69 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

## Site: 2881N [2881N- West Gate Freeway/Millers Rd- AM (8:00-9:00)]

## Network: N101 [2881/2882/2893/3501 - AM Existing]

New Site
Signals - Fixed Time Coordinated  Cycle Time = 110 seconds (Network Cycle Time - User-Given)
Common Control Group: 2881 [West Gate Freeway/Millers Road]

**Movement Performance - Vehicles**

| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Arrival Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Millers Road | | | | | | | | | | | | | |
| 2 | T1 | 1006 | 7.9 | 1006 | 7.9 | 0.466 | 12.1 | LOS B | 13.8 | 102.9 | 0.49 | 0.44 | 44.8 |
| 3 | R2 | 574 | 8.1 | 574 | 8.1 | 0.876 | 47.4 | LOS D | 17.4 | 130.6 | 0.97 | 1.00 | 25.1 |
| Approach | | 1580 | 8.0 | 1580 | 8.0 | 0.876 | 24.9 | LOS C | 17.4 | 130.6 | 0.67 | 0.64 | 34.8 |
| North: Millers Road | | | | | | | | | | | | | |
| 7 | L2 | 492 | 7.9 | 492 | 7.9 | 0.511 | 17.4 | LOS B | 14.4 | 107.4 | 0.65 | 0.76 | 46.0 |
| 8 | T1 | 815 | 8.0 | 815 | 8.0 | 0.539 | 33.4 | LOS C | 12.4 | 92.6 | 0.87 | 0.75 | 28.8 |
| Approach | | 1306 | 8.0 | 1306 | 8.0 | 0.539 | 27.4 | LOS C | 14.4 | 107.4 | 0.79 | 0.75 | 36.2 |
| West: West Gate Exist Ramp Inbound | | | | | | | | | | | | | |
| 10 | L2 | 108 | 6.8 | 108 | 6.8 | 0.421 | 53.1 | LOS D | 5.5 | 40.4 | 0.96 | 0.78 | 31.9 |
| 11 | T1 | 8 | 0.0 | 8 | 0.0 | 0.406 | 47.6 | LOS D | 4.6 | 34.2 | 0.95 | 0.78 | 32.2 |
| 12 | R2 | 177 | 7.7 | 177 | 7.7 | 0.406 | 53.2 | LOS D | 4.7 | 35.4 | 0.95 | 0.78 | 22.1 |
| Approach | | 294 | 7.2 | 294 | 7.2 | 0.421 | 53.0 | LOS D | 5.5 | 40.4 | 0.95 | 0.78 | 26.8 |
| All Vehicles | | 3180 | 7.9 | 3180 | 7.9 | 0.876 | 28.5 | LOS C | 17.4 | 130.6 | 0.74 | 0.70 | 34.4 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Network Model Accuracy Level (largest change in degree of saturation for any lane): 4.1 %
Number of Iterations: 10 (maximum specified: 10)

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate per ped |
|---|---|---|---|---|---|---|---|---|
| P2 | East Full Crossing | 53 | 28.4 | LOS C | 0.1 | 0.1 | 0.72 | 0.72 |
| P3 | North Full Crossing | 53 | 49.3 | LOS E | 0.2 | 0.2 | 0.95 | 0.95 |
| P4 | West Full Crossing | 53 | 11.4 | LOS B | 0.1 | 0.1 | 0.46 | 0.46 |
| All Pedestrians | | 158 | 29.7 | LOS C | | | 0.71 | 0.71 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# Appendix B

## Future SIDRA Model Results

# MOVEMENT SUMMARY

## Site: 2880N [2880N- West Gate Freeway/ Melbourne Road- AM (8:00-9:00) Post Dev]

## Network: N101 [AM PEAK Post Dev (8:00-9:00) 2880/1303/4965 ]

New Site
Signals - Fixed Time Coordinated Cycle Time = 130 seconds (Network Cycle Time - User-Given)
Common Control Group: 2880 [West Gate Fwy/Melbourne Rd]

**Movement Performance - Vehicles**

| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Arrival Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Melbourne Road | | | | | | | | | | | | | |
| 2 | T1 | 842 | 48.0 | 842 | 48.0 | 0.405 | 5.3 | LOS A | 6.8 | 67.5 | 0.26 | 0.23 | 52.4 |
| 3 | R2 | 927 | 18.0 | 874 | 18.0 | 0.585 | 30.4 | LOS C | 17.4 | 140.7 | 0.68 | 0.79 | 31.6 |
| Approach | | 1769 | 32.3 | 1716 N1 | 32.7 | 0.585 | 18.1 | LOS B | 17.4 | 140.7 | 0.48 | 0.52 | 39.3 |
| North: Melbourne Road | | | | | | | | | | | | | |
| 7 | L2 | 462 | 48.1 | 462 | 48.1 | 0.334 | 6.1 | LOS A | 0.0 | 0.0 | 0.00 | 0.50 | 53.2 |
| 8 | T1 | 445 | 17.0 | 445 | 17.0 | 0.590 | 39.5 | LOS D | 15.0 | 104.8 | 0.86 | 0.72 | 26.3 |
| Approach | | 907 | 32.8 | 907 | 32.8 | 0.590 | 22.5 | LOS C | 15.0 | 104.8 | 0.42 | 0.61 | 40.0 |
| West: Exit Ramp Inbound | | | | | | | | | | | | | |
| 10 | L2 | 243 | 0.0 | 243 | 0.0 | 0.347 | 7.1 | LOS A | 2.6 | 18.1 | 0.24 | 0.63 | 53.0 |
| 11 | T1 | 6 | 0.0 | 6 | 0.0 | 0.594 | 70.8 | LOS E | 3.4 | 24.1 | 1.00 | 0.77 | 26.8 |
| 12 | R2 | 96 | 0.0 | 96 | 0.0 | 0.594 | 76.3 | LOS E | 3.4 | 24.1 | 1.00 | 0.77 | 17.4 |
| Approach | | 345 | 0.0 | 345 | 0.0 | 0.594 | 27.5 | LOS C | 3.4 | 24.1 | 0.46 | 0.67 | 39.2 |
| All Vehicles | | 3022 | 28.8 | 2969 N1 | 29.3 | 0.594 | 20.5 | LOS C | 17.4 | 140.7 | 0.46 | 0.56 | 39.5 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Network Model Accuracy Level (largest change in degree of saturation for any lane): 4.6 %
Number of Iterations: 10 (maximum specified: 10)

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate per ped |
|---|---|---|---|---|---|---|---|---|
| P2 | East Full Crossing | 53 | 33.3 | LOS D | 0.1 | 0.1 | 0.72 | 0.72 |
| P3 | North Full Crossing | 53 | 53.7 | LOS E | 0.2 | 0.2 | 0.91 | 0.91 |
| P4 | West Full Crossing | 53 | 3.7 | LOS A | 0.0 | 0.0 | 0.24 | 0.24 |
| All Pedestrians | | 158 | 30.2 | LOS D | | | 0.62 | 0.62 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

## Site: 2881S [2881S- West Gate Freeeway/Millers Road- AM (8:00-9:00) - Post Dev ]

## Network: N101 [2881/2882/2893/3501 - AM Post Dev]

New Site
Signals - Fixed Time Coordinated  Cycle Time = 110 seconds (Network Cycle Time - User-Given)
Common Control Group: 2881 [West Gate Freeway/Millers Road]

**Movement Performance - Vehicles**

| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Arrival Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Millers Road | | | | | | | | | | | | | |
| 1 | L2 | 578 | 10.0 | 572 | 10.1 | 0.471 | 9.6 | LOS A | 11.8 | 89.8 | 0.47 | 0.68 | 46.4 |
| 2 | T1 | 1473 | 9.9 | 1151 | 10.1 | 1.296 | 175.6 | LOS F | 20.4 | 155.0 | 0.83 | 1.65 | 8.5 |
| Approach | | 2051 | 10.0 | 1723[N1] | 10.1 | 1.296 | 120.5 | LOS F | 20.4 | 155.0 | 0.71 | 1.33 | 7.3 |
| East: West Gate Exit Ramp Outbound | | | | | | | | | | | | | |
| 4 | L2 | 313 | 1.0 | 313 | 1.0 | 0.283 | 8.4 | LOS A | 3.9 | 27.8 | 0.32 | 0.65 | 47.3 |
| 5 | T1 | 1 | 0.0 | 1 | 0.0 | 1.974 | 947.3 | LOS F | 86.6 | 611.6 | 1.00 | 2.56 | 3.6 |
| 6 | R2 | 818 | 1.0 | 818 | 1.0 | 1.974 | 950.9 | LOS F | 128.2 | 905.6 | 1.00 | 2.55 | 1.9 |
| Approach | | 1132 | 1.0 | 1132 | 1.0 | 1.974 | 690.5 | LOS F | 128.2 | 905.6 | 0.81 | 2.03 | 2.6 |
| North: Millers Road | | | | | | | | | | | | | |
| 8 | T1 | 842 | 18.0 | 675 | 18.3 | 0.646 | 22.4 | LOS C | 12.8 | 103.4 | 0.73 | 0.63 | 12.0 |
| 9 | R2 | 371 | 17.9 | 267 | 17.9 | 1.273 | 319.1 | LOS F | 16.2 | 130.6 | 1.00 | 1.87 | 6.0 |
| Approach | | 1213 | 18.0 | 942[N1] | 18.2 | 1.273 | 106.5 | LOS F | 16.2 | 130.6 | 0.80 | 0.98 | 7.0 |
| All Vehicles | | 4395 | 9.9 | 3797[N1] | 11.4 | 1.974 | 286.9 | LOS F | 128.2 | 905.6 | 0.76 | 1.45 | 4.0 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Network Model Accuracy Level (largest change in degree of saturation for any lane): 8.5 %
Number of Iterations: 10 (maximum specified: 10)

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate per ped |
|---|---|---|---|---|---|---|---|---|
| P1 | South Full Crossing | 53 | 23.4 | LOS C | 0.1 | 0.1 | 0.89 | 0.89 |
| P2 | East Full Crossing | 53 | 30.6 | LOS D | 0.1 | 0.1 | 0.75 | 0.75 |
| P4 | West Full Crossing | 53 | 11.4 | LOS B | 0.1 | 0.1 | 0.46 | 0.46 |
| All Pedestrians | | 158 | 21.8 | LOS C | | | 0.70 | 0.70 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

## Site: 101 [Millers Road/Clemantis Avenue- AM (8:00-9:00) - Post Dev]

## Network: N101 [2881/2882/2893/3501 - AM Post Dev]

New Site
Stop (Two-Way)

**Movement Performance - Vehicles**

| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Arrival Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Millers Road | | | | | | | | | | | | | |
| 2 | T1 | 2064 | 10.0 | 1710 | 10.2 | 0.704 | 0.0 | LOS A | 26.1 | 198.8 | 0.00 | 0.00 | 59.5 |
| Approach | | 2064 | 10.0 | 1710[N1] | 10.2 | 0.704 | 0.0 | NA | 26.1 | 198.8 | 0.00 | 0.00 | 59.5 |
| East: Clemantis Avenue | | | | | | | | | | | | | |
| 4 | L2 | 19 | 11.1 | 19 | 11.1 | 0.022 | 10.0 | LOS A | 0.1 | 0.6 | 0.36 | 0.87 | 46.8 |
| Approach | | 19 | 11.1 | 19 | 11.1 | 0.022 | 10.0 | LOS A | 0.1 | 0.6 | 0.36 | 0.87 | 46.8 |
| North: Millers Road | | | | | | | | | | | | | |
| 7 | L2 | 34 | 6.3 | 28 | 5.9 | 0.159 | 5.5 | LOS A | 0.0 | 0.0 | 0.00 | 0.06 | 56.1 |
| 8 | T1 | 1049 | 5.0 | 875 | 4.7 | 0.159 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.02 | 58.5 |
| Approach | | 1083 | 5.1 | 903[N1] | 4.7 | 0.159 | 0.2 | NA | 0.0 | 0.0 | 0.00 | 0.02 | 58.1 |
| All Vehicles | | 3166 | 8.3 | 2632[N1] | 10.0 | 0.704 | 0.2 | NA | 26.1 | 198.8 | 0.00 | 0.01 | 58.4 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Network Model Accuracy Level (largest change in degree of saturation for any lane): 8.5 %
Number of Iterations: 10 (maximum specified: 10)

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

# MOVEMENT SUMMARY

## Site: 2882N [2882N Millers Road/ Marigold Avenue/ Duosa Avenue- AM (8:00-9:00) - Post Dev]

## Network: N101 [2881/2882/2893/3501 - AM Post Dev]

New Site
Signals - Fixed Time Coordinated  Cycle Time = 110 seconds (Network Cycle Time - User-Given)
Common Control Group: 2882 [Millers Rd/Duosa Rd/Marigold Ave/Cyclamen Ave]

**Movement Performance - Vehicles**

| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Arrival Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Millers Road | | | | | | | | | | | | | |
| 1 | L2 | 194 | 10.9 | 192 | 10.8 | 0.185 | 12.4 | LOS B | 2.8 | 21.2 | 0.29 | 0.65 | 42.6 |
| 2 | T1 | 1640 | 11.0 | 1271 | 11.2 | 1.141 | 89.9 | LOS F | 18.0 | 138.7 | 0.71 | 1.15 | 13.6 |
| 3 | R2 | 2 | 0.0 | 2 | 0.0 | 0.021 | 62.2 | LOS E | 0.1 | 0.8 | 1.00 | 0.61 | 21.5 |
| Approach | | 1836 | 11.0 | 1465 N1 | 11.1 | 1.141 | 79.8 | LOS E | 18.0 | 138.7 | 0.65 | 1.08 | 6.7 |
| East: Marigold Avenue | | | | | | | | | | | | | |
| 4 | L2 | 1 | 0.0 | 1 | 0.0 | 1.391 | 432.8 | LOS F | 19.8 | 138.6 | 1.00 | 1.72 | 4.0 |
| 5 | T1 | 6 | 0.0 | 6 | 0.0 | 1.391 | 427.2 | LOS F | 19.8 | 138.6 | 1.00 | 1.72 | 7.4 |
| 6 | R2 | 102 | 0.0 | 102 | 0.0 | 1.391 | 432.8 | LOS F | 19.8 | 138.6 | 1.00 | 1.72 | 4.0 |
| Approach | | 109 | 0.0 | 109 | 0.0 | 1.391 | 432.5 | LOS F | 19.8 | 138.6 | 1.00 | 1.72 | 4.2 |
| North: Millers Road | | | | | | | | | | | | | |
| 7 | L2 | 53 | 6.0 | 45 | 5.7 | 0.042 | 11.4 | LOS B | 0.6 | 4.1 | 0.25 | 0.62 | 43.6 |
| 8 | T1 | 831 | 4.9 | 704 | 4.7 | 0.310 | 4.9 | LOS A | 5.4 | 39.6 | 0.22 | 0.19 | 32.5 |
| 9 | R2 | 53 | 6.0 | 45 | 5.7 | 0.458 | 65.8 | LOS E | 2.6 | 18.7 | 1.00 | 0.74 | 20.7 |
| Approach | | 936 | 5.1 | 793 N1 | 4.8 | 0.458 | 8.7 | LOS A | 5.4 | 39.6 | 0.27 | 0.25 | 30.4 |
| West: Duosa Avenue | | | | | | | | | | | | | |
| 10 | L2 | 197 | 3.2 | 197 | 3.2 | 0.373 | 39.1 | LOS D | 8.4 | 60.6 | 0.84 | 0.79 | 26.5 |
| 11 | T1 | 3 | 0.0 | 3 | 0.0 | 0.101 | 40.8 | LOS D | 1.4 | 10.0 | 0.87 | 0.71 | 34.3 |
| 12 | R2 | 27 | 3.8 | 27 | 3.8 | 0.101 | 46.5 | LOS D | 1.4 | 10.0 | 0.87 | 0.71 | 24.4 |
| Approach | | 227 | 3.2 | 227 | 3.2 | 0.373 | 40.0 | LOS D | 8.4 | 60.6 | 0.85 | 0.78 | 26.4 |
| All Vehicles | | 3108 | 8.3 | 2595 N1 | 9.9 | 1.391 | 69.4 | LOS E | 19.8 | 138.7 | 0.57 | 0.83 | 9.2 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Network Model Accuracy Level (largest change in degree of saturation for any lane): 8.5 %
Number of Iterations: 10 (maximum specified: 10)

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate per ped |
|---|---|---|---|---|---|---|---|---|
| P1 | South Full Crossing | 53 | 49.3 | LOS E | 0.2 | 0.2 | 0.95 | 0.95 |
| P2 | East Full Crossing | 53 | 10.9 | LOS B | 0.1 | 0.1 | 0.45 | 0.45 |
| P3 | North Full Crossing | 53 | 49.3 | LOS E | 0.2 | 0.2 | 0.95 | 0.95 |
| P4 | West Full Crossing | 53 | 13.3 | LOS B | 0.1 | 0.1 | 0.49 | 0.49 |
| All Pedestrians | | 211 | 30.7 | LOS D | | | 0.71 | 0.71 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

## Site: 2882S [2882S Millers Road/ Cyclamen Ave/Altona Gate Carpark - AM(8:00-9:00) - Post Dev]

## Network: N101 [2881/2882/2893/3501 - AM Post Dev]

New Site
Signals - Fixed Time Coordinated  Cycle Time = 110 seconds (Network Cycle Time - User-Given)
Common Control Group: 2882 [Millers Rd/Duosa Rd/Marigold Ave/Cyclamen Ave]

**Movement Performance - Vehicles**

| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Arrival Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Millers Road | | | | | | | | | | | | | |
| 1 | L2 | 29 | 10.7 | 28 | 10.3 | 0.016 | 4.9 | LOS A | 0.0 | 0.0 | 0.00 | 0.52 | 52.1 |
| 2 | T1 | 1456 | 11.9 | 1253 | 12.2 | 1.473 | 314.7 | LOS F | 15.5 | 119.1 | 0.78 | 2.13 | 8.5 |
| Approach | | 1485 | 11.8 | 1281 N1 | 12.2 | 1.473 | 307.9 | LOS F | 15.5 | 119.1 | 0.76 | 2.09 | 1.2 |
| East: Cyclamen Avenue | | | | | | | | | | | | | |
| 4 | L2 | 4 | 0.0 | 4 | 0.0 | 0.004 | 6.4 | LOS A | 0.0 | 0.2 | 0.16 | 0.57 | 49.8 |
| Approach | | 4 | 0.0 | 4 | 0.0 | 0.004 | 6.4 | LOS A | 0.0 | 0.2 | 0.16 | 0.57 | 49.8 |
| North: Millers Road | | | | | | | | | | | | | |
| 7 | L2 | 8 | 0.0 | 7 | 0.0 | 0.006 | 8.4 | LOS A | 0.0 | 0.3 | 0.12 | 0.59 | 46.8 |
| 8 | T1 | 841 | 6.0 | 721 | 5.9 | 0.320 | 5.2 | LOS A | 4.9 | 36.2 | 0.23 | 0.20 | 32.9 |
| 9 | R2 | 29 | 7.1 | 25 | 7.1 | 0.151 | 36.4 | LOS D | 1.0 | 7.1 | 0.98 | 0.70 | 29.4 |
| Approach | | 879 | 6.0 | 753 N1 | 5.9 | 0.320 | 6.3 | LOS A | 4.9 | 36.2 | 0.25 | 0.22 | 32.7 |
| West: Altona Gate Car-park | | | | | | | | | | | | | |
| 10 | L2 | 17 | 0.0 | 17 | 0.0 | 0.027 | 30.8 | LOS C | 0.6 | 4.3 | 0.71 | 0.64 | 30.2 |
| 12 | R2 | 15 | 0.0 | 15 | 0.0 | 0.022 | 45.2 | LOS D | 0.3 | 2.3 | 0.85 | 0.66 | 24.5 |
| Approach | | 32 | 0.0 | 32 | 0.0 | 0.027 | 37.5 | LOS D | 0.6 | 4.3 | 0.77 | 0.65 | 27.3 |
| All Vehicles | | 2400 | 9.5 | 2070 N1 | 11.0 | 1.473 | 193.4 | LOS F | 15.5 | 119.1 | 0.58 | 1.39 | 2.1 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Network Model Accuracy Level (largest change in degree of saturation for any lane): 8.5 %
Number of Iterations: 10 (maximum specified: 10)

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate per ped |
|---|---|---|---|---|---|---|---|---|
| P3 | North Full Crossing | 53 | 49.3 | LOS E | 0.2 | 0.2 | 0.95 | 0.95 |
| P4 | West Full Crossing | 53 | 14.8 | LOS B | 0.1 | 0.1 | 0.52 | 0.52 |
| All Pedestrians | | 105 | 32.0 | LOS D | | | 0.73 | 0.73 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

## Site: 2893 [2893- Millers Road/Beuron Road - AM (8:00-9:00) - Post Dev]

## Network: N101 [2881/2882/2893/3501 - AM Post Dev]

New Site
Signals - Fixed Time Coordinated  Cycle Time = 110 seconds (Network Cycle Time - User-Given)

**Movement Performance - Vehicles**

| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Arrival Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Millers Road | | | | | | | | | | | | | |
| 1 | L2 | 3 | 0.0 | 3 | 0.0 | 0.185 | 12.9 | LOS B | 9.0 | 70.7 | 0.76 | 0.66 | 49.8 |
| 2 | T1 | 1505 | 12.5 | 1225 | 12.7 | 0.983 | 45.8 | LOS D | 50.5 | 391.7 | 0.91 | 1.07 | 22.2 |
| Approach | | 1508 | 12.5 | 1228 N1 | 12.7 | 0.983 | 45.7 | LOS D | 50.5 | 391.7 | 0.91 | 1.07 | 14.9 |
| North: Millers Road | | | | | | | | | | | | | |
| 8 | T1 | 832 | 5.9 | 718 | 5.9 | 0.191 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 60.0 |
| 9 | R2 | 14 | 0.0 | 12 | 0.0 | 0.117 | 63.2 | LOS E | 0.7 | 4.6 | 1.00 | 0.68 | 21.2 |
| Approach | | 845 | 5.9 | 730 N1 | 5.8 | 0.191 | 1.0 | LOS A | 0.7 | 4.6 | 0.02 | 0.01 | 50.3 |
| West: Beuron Road | | | | | | | | | | | | | |
| 10 | L2 | 17 | 0.0 | 17 | 0.0 | 0.166 | 62.2 | LOS E | 0.9 | 6.4 | 0.98 | 0.69 | 19.9 |
| Approach | | 17 | 0.0 | 17 | 0.0 | 0.166 | 62.2 | LOS E | 0.9 | 6.4 | 0.98 | 0.69 | 19.9 |
| All Vehicles | | 2371 | 10.0 | 1975 N1 | 12.0 | 0.983 | 29.3 | LOS C | 50.5 | 391.7 | 0.58 | 0.68 | 17.1 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Network Model Accuracy Level (largest change in degree of saturation for any lane): 8.5 %
Number of Iterations: 10 (maximum specified: 10)

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate per ped |
|---|---|---|---|---|---|---|---|---|
| P4 | West Full Crossing | 53 | 2.4 | LOS A | 0.0 | 0.0 | 0.21 | 0.21 |
| All Pedestrians | | 53 | 2.4 | LOS A | | | 0.21 | 0.21 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

## Site: 3501 [3501-Millers Road/Blackshaws Road- AM (8:00-9:00) - Post Dev]

## Network: N101 [2881/2882/2893/3501 - AM Post Dev]

New Site
Signals - Fixed Time Coordinated  Cycle Time = 110 seconds (Network Cycle Time - User-Given)

**Movement Performance - Vehicles**

| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Arrival Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Millers Road | | | | | | | | | | | | | |
| 1 | L2 | 60 | 5.3 | 60 | 5.3 | 0.082 | 25.2 | LOS C | 1.9 | 14.1 | 0.64 | 0.68 | 42.0 |
| 2 | T1 | 731 | 7.2 | 731 | 7.2 | 1.355 | 273.3 | LOS F | 84.2 | 619.7 | 0.96 | 1.87 | 11.7 |
| 3 | R2 | 62 | 6.8 | 62 | 6.8 | 0.175 | 45.3 | LOS D | 2.8 | 20.7 | 0.87 | 0.74 | 33.9 |
| Approach | | 853 | 7.0 | 853 | 7.0 | 1.355 | 239.2 | LOS F | 84.2 | 619.7 | 0.93 | 1.70 | 7.7 |
| East: Blackshaws Road | | | | | | | | | | | | | |
| 4 | L2 | 223 | 25.0 | 223 | 25.0 | 0.424 | 18.5 | LOS B | 8.3 | 70.6 | 0.63 | 0.72 | 46.3 |
| 5 | T1 | 138 | 25.2 | 138 | 25.2 | 0.424 | 12.6 | LOS B | 8.3 | 70.6 | 0.63 | 0.72 | 47.6 |
| 6 | R2 | 706 | 25.0 | 706 | 25.0 | 1.125 | 179.1 | LOS F | 79.7 | 678.1 | 1.00 | 1.48 | 9.0 |
| Approach | | 1067 | 25.0 | 1067 | 25.0 | 1.125 | 124.0 | LOS F | 79.7 | 678.1 | 0.87 | 1.22 | 15.1 |
| North: Millers Road | | | | | | | | | | | | | |
| 7 | L2 | 338 | 5.0 | 293 | 4.9 | 0.204 | 6.0 | LOS A | 0.7 | 4.9 | 0.07 | 0.57 | 52.0 |
| 8 | T1 | 433 | 8.3 | 377 | 8.7 | 0.750 | 57.8 | LOS E | 7.3 | 53.5 | 1.00 | 0.84 | 26.3 |
| 9 | R2 | 29 | 3.6 | 26 | 3.5 | 0.259 | 63.0 | LOS E | 1.4 | 10.1 | 0.98 | 0.71 | 24.8 |
| Approach | | 800 | 6.7 | 696 N1 | 6.9 | 0.750 | 36.2 | LOS D | 7.3 | 54.6 | 0.61 | 0.72 | 33.2 |
| West: Blackshaws Road | | | | | | | | | | | | | |
| 10 | L2 | 37 | 40.0 | 37 | 40.0 | 0.471 | 55.8 | LOS E | 4.8 | 45.5 | 0.96 | 0.87 | 22.7 |
| 11 | T1 | 58 | 40.0 | 58 | 40.0 | 0.471 | 49.8 | LOS D | 4.8 | 45.5 | 0.96 | 0.87 | 32.6 |
| 12 | R2 | 34 | 40.6 | 34 | 40.6 | 0.156 | 29.9 | LOS C | 0.9 | 8.7 | 0.91 | 0.72 | 39.3 |
| Approach | | 128 | 40.2 | 128 | 40.2 | 0.471 | 46.3 | LOS D | 4.8 | 45.5 | 0.94 | 0.83 | 31.8 |
| All Vehicles | | 2848 | 15.2 | 2745 N1 | 15.8 | 1.355 | 133.9 | LOS F | 84.2 | 678.1 | 0.83 | 1.22 | 14.1 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Network Model Accuracy Level (largest change in degree of saturation for any lane): 8.5 %
Number of Iterations: 10 (maximum specified: 10)

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate per ped |
|---|---|---|---|---|---|---|---|---|
| P1 | South Full Crossing | 53 | 29.9 | LOS C | 0.1 | 0.1 | 0.74 | 0.74 |
| P2 | East Full Crossing | 53 | 49.3 | LOS E | 0.2 | 0.2 | 0.95 | 0.95 |
| P3 | North Full Crossing | 53 | 49.3 | LOS E | 0.2 | 0.2 | 0.95 | 0.95 |
| P4 | West Full Crossing | 53 | 37.7 | LOS D | 0.1 | 0.1 | 0.83 | 0.83 |
| All Pedestrians | | 211 | 41.5 | LOS E | | | 0.87 | 0.87 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

## Site: 2881N [2881N- West Gate Freeway/Millers Rd - PM Post Dev]

## Network: N101 [2881/2882/2893/3501 - PM Post Dev]

New Site
Signals - Fixed Time Coordinated  Cycle Time = 110 seconds (Network Cycle Time - User-Given)
Common Control Group: 2881 [West Gate Freeway/Millers Road]

**Movement Performance - Vehicles**

| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Arrival Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Millers Road | | | | | | | | | | | | | |
| 2 | T1 | 1232 | 2.0 | 1183 | 2.0 | 0.520 | 12.2 | LOS B | 18.5 | 131.5 | 0.55 | 0.49 | 46.0 |
| 3 | R2 | 443 | 1.9 | 443 | 1.9 | 0.665 | 34.2 | LOS C | 17.8 | 126.9 | 0.80 | 0.82 | 31.7 |
| Approach | | 1675 | 1.9 | 1626 N1 | 2.0 | 0.665 | 18.2 | LOS B | 18.5 | 131.5 | 0.62 | 0.58 | 41.0 |
| North: Millers Road | | | | | | | | | | | | | |
| 7 | L2 | 603 | 9.9 | 603 | 9.9 | 0.558 | 12.1 | LOS B | 14.1 | 107.0 | 0.55 | 0.74 | 49.2 |
| 8 | T1 | 1031 | 10.4 | 1031 | 10.4 | 1.405 | 347.6 | LOS F | 78.3 | 594.7 | 0.98 | 2.09 | 9.2 |
| Approach | | 1634 | 10.2 | 1634 | 10.2 | 1.405 | 223.7 | LOS F | 78.3 | 594.7 | 0.82 | 1.59 | 9.5 |
| West: West Gate Exist Ramp Inbound | | | | | | | | | | | | | |
| 10 | L2 | 217 | 32.0 | 217 | 32.0 | 1.050 | 139.6 | LOS F | 20.1 | 178.9 | 1.00 | 1.32 | 18.1 |
| 11 | T1 | 5 | 0.0 | 5 | 0.0 | 2.807 | 1704.8 | LOS F | 101.6 | 905.5 | 1.00 | 3.08 | 2.1 |
| 12 | R2 | 615 | 32.4 | 615 | 32.4 | 2.807 | 1710.8 | LOS F | 101.6 | 905.5 | 1.00 | 3.06 | 1.1 |
| Approach | | 837 | 32.1 | 837 | 32.1 | 2.807 | 1303.6 | LOS F | 101.6 | 905.5 | 1.00 | 2.61 | 1.7 |
| All Vehicles | | 4145 | 11.3 | 4096 N1 | 11.4 | 2.807 | 362.8 | LOS F | 101.6 | 905.5 | 0.78 | 1.40 | 6.1 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Network Model Accuracy Level (largest change in degree of saturation for any lane): 15.9 %
Number of Iterations: 10 (maximum specified: 10)

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate per ped |
|---|---|---|---|---|---|---|---|---|
| P2 | East Full Crossing | 53 | 28.4 | LOS C | 0.1 | 0.1 | 0.72 | 0.72 |
| P3 | North Full Crossing | 53 | 49.3 | LOS E | 0.2 | 0.2 | 0.95 | 0.95 |
| P4 | West Full Crossing | 53 | 11.4 | LOS B | 0.1 | 0.1 | 0.46 | 0.46 |
| All Pedestrians | | 158 | 29.7 | LOS C | | | 0.71 | 0.71 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

## Site: 2881S [2881S- West Gate Freeeway/Millers Road- PM Post Dev]

## Network: N101 [2881/2882/2893/3501 - PM Post Dev]

New Site
Signals - Fixed Time Coordinated  Cycle Time = 110 seconds (Network Cycle Time - User-Given)
Common Control Group: 2881 [West Gate Freeway/Millers Road]

**Movement Performance - Vehicles**

| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Arrival Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Millers Road | | | | | | | | | | | | | |
| 1 | L2 | 653 | 4.0 | 653 | 4.0 | 0.768 | 15.5 | LOS B | 21.4 | 155.0 | 0.71 | 0.81 | 42.8 |
| 2 | T1 | 1401 | 3.3 | 1401 | 3.3 | 0.768 | 11.6 | LOS B | 21.4 | 155.0 | 0.55 | 0.53 | 21.1 |
| Approach | | 2054 | 3.5 | 2054 | 3.5 | 0.768 | 12.8 | LOS B | 21.4 | 155.0 | 0.60 | 0.62 | 33.1 |
| East: West Gate Exit Ramp Outbound | | | | | | | | | | | | | |
| 4 | L2 | 564 | 0.9 | 564 | 0.9 | 1.291 | 329.4 | LOS F | 89.7 | 633.3 | 1.00 | 1.86 | 5.2 |
| 5 | T1 | 1 | 0.0 | 1 | 0.0 | 1.244 | 289.3 | LOS F | 17.8 | 125.6 | 1.00 | 1.54 | 10.3 |
| 6 | R2 | 249 | 0.8 | 249 | 0.8 | 1.244 | 294.8 | LOS F | 17.8 | 125.6 | 1.00 | 1.54 | 5.7 |
| Approach | | 815 | 0.9 | 815 | 0.9 | 1.291 | 318.7 | LOS F | 89.7 | 633.3 | 1.00 | 1.76 | 5.4 |
| North: Millers Road | | | | | | | | | | | | | |
| 8 | T1 | 1609 | 12.0 | 1114 | 8.9 | 1.081 | 119.7 | LOS F | 34.7 | 261.1 | 1.00 | 1.57 | 4.8 |
| 9 | R2 | 231 | 11.9 | 231 | 11.9 | 1.346 | 384.8 | LOS F | 33.9 | 261.1 | 1.00 | 1.92 | 5.7 |
| Approach | | 1840 | 12.0 | 1345 N1 | 9.4 | 1.346 | 165.2 | LOS F | 34.7 | 261.1 | 1.00 | 1.63 | 5.2 |
| All Vehicles | | 4708 | 6.4 | 4213 N1 | 7.1 | 1.346 | 120.6 | LOS F | 89.7 | 633.3 | 0.81 | 1.16 | 8.1 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Network Model Accuracy Level (largest change in degree of saturation for any lane): 15.9 %
Number of Iterations: 10 (maximum specified: 10)

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate per ped |
|---|---|---|---|---|---|---|---|---|
| P1 | South Full Crossing | 53 | 28.0 | LOS C | 0.1 | 0.1 | 0.89 | 0.89 |
| P2 | East Full Crossing | 53 | 28.4 | LOS C | 0.1 | 0.1 | 0.72 | 0.72 |
| P4 | West Full Crossing | 53 | 10.1 | LOS B | 0.1 | 0.1 | 0.43 | 0.43 |
| All Pedestrians | | 158 | 22.2 | LOS C | | | 0.68 | 0.68 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

## Site: 101 [Millers Road/Clemantis Avenue - PM Post Dev]

## Network: N101 [2881/2882/2893/3501 - PM Post Dev]

New Site
Stop (Two-Way)

**Movement Performance - Vehicles**

| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Arrival Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Millers Road | | | | | | | | | | | | | |
| 2 | T1 | 1441 | 4.0 | 1441 | 4.0 | 0.732 | 0.1 | LOS A | 8.6 | 62.8 | 0.00 | 0.00 | 59.1 |
| Approach | | 1441 | 4.0 | 1441 | 4.0 | 0.732 | 0.1 | NA | 8.6 | 62.8 | 0.00 | 0.00 | 59.1 |
| East: Clemantis Avenue | | | | | | | | | | | | | |
| 4 | L2 | 5 | 0.0 | 5 | 0.0 | 0.011 | 12.9 | LOS B | 0.0 | 0.3 | 0.58 | 0.85 | 43.5 |
| Approach | | 5 | 0.0 | 5 | 0.0 | 0.011 | 12.9 | LOS B | 0.0 | 0.3 | 0.58 | 0.85 | 43.5 |
| North: Millers Road | | | | | | | | | | | | | |
| 7 | L2 | 59 | 3.6 | 45 | 2.4 | 0.467 | 5.5 | LOS A | 0.0 | 0.0 | 0.00 | 0.03 | 56.5 |
| 8 | T1 | 2134 | 3.0 | 1623 | 2.0 | 0.467 | 0.0 | LOS A | 19.1 | 136.1 | 0.00 | 0.02 | 58.4 |
| Approach | | 2193 | 3.0 | 1668 N1 | 2.1 | 0.467 | 0.2 | NA | 19.1 | 136.1 | 0.00 | 0.02 | 58.2 |
| All Vehicles | | 3639 | 3.4 | 3115 N1 | 4.0 | 0.732 | 0.2 | NA | 19.1 | 136.1 | 0.00 | 0.01 | 58.4 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Network Model Accuracy Level (largest change in degree of saturation for any lane): 15.9 %
Number of Iterations: 10 (maximum specified: 10)

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

# MOVEMENT SUMMARY

## Site: 2882N [2882N Millers Road/ Marigold Avenue/ Duosa Avenue- PM Post Dev]

## Network: N101 [2881/2882/2893/3501 - PM Post Dev]

New Site
Signals - Fixed Time Coordinated  Cycle Time = 110 seconds (Network Cycle Time - User-Given)
Common Control Group: 2882 [Millers Rd/Duosa Rd/Marigold Ave/Cyclamen Ave]

**Movement Performance - Vehicles**

| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Arrival Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Millers Road | | | | | | | | | | | | | |
| 1 | L2 | 102 | 5.2 | 102 | 5.2 | 0.101 | 11.7 | LOS B | 1.2 | 8.8 | 0.24 | 0.63 | 43.4 |
| 2 | T1 | 1003 | 3.7 | 1003 | 3.7 | 0.474 | 5.4 | LOS A | 7.2 | 52.6 | 0.26 | 0.23 | 31.9 |
| 3 | R2 | 16 | 0.0 | 16 | 0.0 | 0.117 | 58.9 | LOS E | 0.8 | 5.8 | 0.96 | 0.69 | 22.3 |
| Approach | | 1121 | 3.8 | 1121 | 3.8 | 0.474 | 6.8 | LOS A | 7.2 | 52.6 | 0.27 | 0.27 | 34.2 |
| East: Marigold Avenue | | | | | | | | | | | | | |
| 4 | L2 | 6 | 0.0 | 6 | 0.0 | 0.891 | 71.8 | LOS E | 9.6 | 66.9 | 1.00 | 1.03 | 18.5 |
| 5 | T1 | 53 | 0.0 | 53 | 0.0 | 0.891 | 66.2 | LOS E | 9.6 | 66.9 | 1.00 | 1.03 | 28.0 |
| 6 | R2 | 92 | 0.0 | 92 | 0.0 | 0.891 | 71.8 | LOS E | 9.6 | 66.9 | 1.00 | 1.03 | 18.5 |
| Approach | | 151 | 0.0 | 151 | 0.0 | 0.891 | 69.8 | LOS E | 9.6 | 66.9 | 1.00 | 1.03 | 22.4 |
| North: Millers Road | | | | | | | | | | | | | |
| 7 | L2 | 547 | 5.0 | 441 | 4.6 | 0.435 | 19.9 | LOS B | 12.3 | 89.3 | 0.56 | 0.75 | 37.2 |
| 8 | T1 | 1675 | 5.0 | 1350 | 4.7 | 0.785 | 19.9 | LOS B | 17.9 | 130.6 | 0.77 | 0.71 | 13.5 |
| 9 | R2 | 88 | 4.8 | 71 | 4.4 | 0.544 | 58.4 | LOS E | 3.8 | 27.8 | 0.98 | 0.76 | 22.3 |
| Approach | | 2311 | 5.0 | 1863[N1] | 4.6 | 0.785 | 21.4 | LOS C | 17.9 | 130.6 | 0.73 | 0.72 | 23.4 |
| West: Duosa Avenue | | | | | | | | | | | | | |
| 10 | L2 | 242 | 0.9 | 242 | 0.9 | 0.401 | 36.4 | LOS D | 10.1 | 70.9 | 0.82 | 0.80 | 27.6 |
| 11 | T1 | 33 | 0.0 | 33 | 0.0 | 0.418 | 43.9 | LOS D | 6.0 | 42.6 | 0.93 | 0.78 | 33.6 |
| 12 | R2 | 92 | 1.1 | 92 | 1.1 | 0.418 | 49.5 | LOS D | 6.0 | 42.6 | 0.93 | 0.78 | 23.7 |
| Approach | | 366 | 0.9 | 366 | 0.9 | 0.418 | 40.3 | LOS D | 10.1 | 70.9 | 0.86 | 0.79 | 27.3 |
| All Vehicles | | 3948 | 4.1 | 3500[N1] | 4.6 | 0.891 | 20.8 | LOS C | 17.9 | 130.6 | 0.61 | 0.60 | 25.6 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Network Model Accuracy Level (largest change in degree of saturation for any lane): 15.9 %
Number of Iterations: 10 (maximum specified: 10)

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate per ped |
|---|---|---|---|---|---|---|---|---|
| P1 | South Full Crossing | 53 | 49.3 | LOS E | 0.2 | 0.2 | 0.95 | 0.95 |
| P2 | East Full Crossing | 53 | 12.8 | LOS B | 0.1 | 0.1 | 0.48 | 0.48 |
| P3 | North Full Crossing | 53 | 49.3 | LOS E | 0.2 | 0.2 | 0.95 | 0.95 |
| P4 | West Full Crossing | 53 | 15.3 | LOS B | 0.1 | 0.1 | 0.53 | 0.53 |
| All Pedestrians | | 211 | 31.7 | LOS D | | | 0.73 | 0.73 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

## Site: 2880S [2880S- West Gate Freeway/Melbourne Road- AM (8:00-9:00) - Post Dev]

## Network: N101 [AM PEAK Post Dev (8:00-9:00) 2880/1303/4965 ]

New Site
Signals - Fixed Time Coordinated  Cycle Time = 130 seconds (Network Cycle Time - User-Given)
Common Control Group: 2880 [West Gate Fwy/Melbourne Rd]

**Movement Performance - Vehicles**

| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Arrival Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Melbourne Road | | | | | | | | | | | | | |
| 1 | L2 | 283 | 17.8 | 283 | 17.8 | 0.210 | 6.7 | LOS A | 1.5 | 12.0 | 0.12 | 0.58 | 49.3 |
| 2 | T1 | 1466 | 18.0 | 1466 | 18.0 | 1.051 | 85.0 | LOS F | 23.2 | 187.7 | 0.61 | 0.92 | 12.2 |
| Approach | | 1749 | 18.0 | 1749 | 18.0 | 1.051 | 72.3 | LOS E | 23.2 | 187.7 | 0.53 | 0.86 | 8.9 |
| East: Exit Ramp Outbound | | | | | | | | | | | | | |
| 4 | L2 | 376 | 66.1 | 376 | 66.1 | 0.397 | 7.5 | LOS A | 3.4 | 36.7 | 0.22 | 0.61 | 49.3 |
| 5 | T1 | 4 | 0.0 | 4 | 0.0 | 0.891 | 78.1 | LOS E | 9.1 | 98.9 | 1.00 | 1.01 | 25.4 |
| 6 | R2 | 240 | 65.8 | 240 | 65.8 | 0.891 | 84.5 | LOS F | 9.1 | 98.9 | 1.00 | 1.01 | 16.3 |
| Approach | | 620 | 65.5 | 620 | 65.5 | 0.891 | 37.8 | LOS D | 9.1 | 99.0 | 0.53 | 0.76 | 27.6 |
| North: Melbourne Road | | | | | | | | | | | | | |
| 8 | T1 | 246 | 0.0 | 246 | 0.0 | 0.211 | 30.2 | LOS C | 6.1 | 43.0 | 0.70 | 0.56 | 11.0 |
| 9 | R2 | 288 | 0.0 | 288 | 0.0 | 0.673 | 73.8 | LOS E | 9.4 | 66.0 | 1.00 | 0.82 | 19.8 |
| Approach | | 535 | 0.0 | 535 | 0.0 | 0.673 | 53.7 | LOS D | 9.4 | 66.0 | 0.86 | 0.70 | 17.9 |
| All Vehicles | | 2904 | 24.8 | 2904 | 24.8 | 1.051 | 61.5 | LOS E | 23.2 | 187.7 | 0.59 | 0.81 | 13.9 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Network Model Accuracy Level (largest change in degree of saturation for any lane): 4.6 %
Number of Iterations: 10 (maximum specified: 10)

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate per ped |
|---|---|---|---|---|---|---|---|---|
| P1 | South Full Crossing | 53 | 49.2 | LOS E | 0.2 | 0.2 | 0.87 | 0.87 |
| P2 | East Full Crossing | 53 | 14.5 | LOS B | 0.1 | 0.1 | 0.65 | 0.65 |
| P4 | West Full Crossing | 53 | 35.5 | LOS D | 0.1 | 0.1 | 0.74 | 0.74 |
| All Pedestrians | | 158 | 33.1 | LOS D | | | 0.75 | 0.75 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

## Site: 2882S [2882S Millers Road/ Cyclamen Ave/Altona Gate Carpark - PM Post Dev]

## Network: N101 [2881/2882/2893/3501 - PM Post Dev]

New Site
Signals - Fixed Time Coordinated  Cycle Time = 110 seconds (Network Cycle Time - User-Given)
Common Control Group: 2882 [Millers Rd/Duosa Rd/Marigold Ave/Cyclamen Ave]

**Movement Performance - Vehicles**

| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Arrival Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Millers Road | | | | | | | | | | | | | |
| 1 | L2 | 195 | 4.9 | 195 | 4.9 | 0.108 | 4.9 | LOS A | 0.0 | 0.0 | 0.00 | 0.52 | 52.4 |
| 2 | T1 | 1083 | 5.0 | 1083 | 5.0 | 0.408 | 11.4 | LOS B | 11.5 | 81.8 | 0.44 | 0.38 | 20.0 |
| Approach | | 1278 | 4.9 | 1278 | 4.9 | 0.408 | 10.4 | LOS B | 11.5 | 81.8 | 0.37 | 0.40 | 29.7 |
| East: Cyclamen Avenue | | | | | | | | | | | | | |
| 4 | L2 | 5 | 0.0 | 5 | 0.0 | 0.008 | 8.3 | LOS A | 0.1 | 0.4 | 0.29 | 0.59 | 47.4 |
| Approach | | 5 | 0.0 | 5 | 0.0 | 0.008 | 8.3 | LOS A | 0.1 | 0.4 | 0.29 | 0.59 | 47.4 |
| North: Millers Road | | | | | | | | | | | | | |
| 7 | L2 | 63 | 6.7 | 54 | 6.0 | 0.054 | 7.8 | LOS A | 0.3 | 2.1 | 0.10 | 0.59 | 47.1 |
| 8 | T1 | 1675 | 4.0 | 1434 | 3.6 | 0.773 | 5.8 | LOS A | 13.9 | 100.5 | 0.34 | 0.31 | 31.3 |
| 9 | R2 | 120 | 4.4 | 103 | 3.9 | 0.280 | 10.6 | LOS B | 1.1 | 8.1 | 0.33 | 0.64 | 45.1 |
| Approach | | 1858 | 4.1 | 1591 N1 | 3.7 | 0.773 | 6.1 | LOS A | 13.9 | 100.5 | 0.33 | 0.34 | 35.7 |
| West: Altona Gate Car-park | | | | | | | | | | | | | |
| 10 | L2 | 35 | 0.0 | 35 | 0.0 | 0.038 | 7.5 | LOS A | 0.3 | 2.3 | 0.24 | 0.60 | 48.3 |
| 12 | R2 | 173 | 0.0 | 173 | 0.0 | 0.232 | 45.7 | LOS D | 3.9 | 27.5 | 0.88 | 0.76 | 24.4 |
| Approach | | 207 | 0.0 | 207 | 0.0 | 0.232 | 39.3 | LOS D | 3.9 | 27.5 | 0.77 | 0.73 | 26.6 |
| All Vehicles | | 3348 | 4.2 | 3081 N1 | 4.5 | 0.773 | 10.1 | LOS B | 13.9 | 100.5 | 0.38 | 0.40 | 31.3 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Network Model Accuracy Level (largest change in degree of saturation for any lane): 15.9 %
Number of Iterations: 10 (maximum specified: 10)

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate per ped |
|---|---|---|---|---|---|---|---|---|
| P3 | North Full Crossing | 53 | 49.3 | LOS E | 0.2 | 0.2 | 0.95 | 0.95 |
| P4 | West Full Crossing | 53 | 17.0 | LOS B | 0.1 | 0.1 | 0.56 | 0.56 |
| All Pedestrians | | 105 | 33.1 | LOS D | | | 0.75 | 0.75 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

## Site: 2893 [2893- Millers Road/Beuron Road - PM Post Dev]

## Network: N101 [2881/2882/2893/3501 - PM Post Dev]

New Site
Signals - Fixed Time Coordinated  Cycle Time = 110 seconds (Network Cycle Time - User-Given)

**Movement Performance - Vehicles**

| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Arrival Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Millers Road | | | | | | | | | | | | | |
| 1 | L2 | 16 | 0.0 | 16 | 0.0 | 0.270 | 5.8 | LOS A | 0.6 | 4.4 | 0.03 | 0.05 | 57.2 |
| 2 | T1 | 1275 | 4.7 | 1275 | 4.7 | 0.344 | 0.9 | LOS A | 5.4 | 38.2 | 0.11 | 0.10 | 56.4 |
| Approach | | 1291 | 4.6 | 1291 | 4.6 | 0.344 | 1.0 | LOS A | 5.4 | 38.2 | 0.10 | 0.10 | 56.2 |
| North: Millers Road | | | | | | | | | | | | | |
| 8 | T1 | 1675 | 4.0 | 1454 | 3.6 | 0.382 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 59.9 |
| 9 | R2 | 4 | 25.0 | 4 | 22.8 | 0.041 | 62.7 | LOS E | 0.2 | 1.7 | 1.00 | 0.64 | 21.0 |
| Approach | | 1679 | 4.1 | 1458 N1 | 3.6 | 0.382 | 0.2 | LOS A | 0.2 | 1.7 | 0.00 | 0.00 | 58.1 |
| West: Beuron Road | | | | | | | | | | | | | |
| 10 | L2 | 13 | 0.0 | 13 | 0.0 | 0.125 | 61.9 | LOS E | 0.7 | 4.8 | 0.98 | 0.68 | 20.0 |
| Approach | | 13 | 0.0 | 13 | 0.0 | 0.125 | 61.9 | LOS E | 0.7 | 4.8 | 0.98 | 0.68 | 20.0 |
| All Vehicles | | 2982 | 4.3 | 2761 N1 | 4.7 | 0.382 | 0.8 | LOS A | 5.4 | 38.2 | 0.05 | 0.05 | 55.3 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Network Model Accuracy Level (largest change in degree of saturation for any lane): 15.9 %
Number of Iterations: 10 (maximum specified: 10)

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate per ped |
|---|---|---|---|---|---|---|---|---|
| P4 | West Full Crossing | 53 | 2.4 | LOS A | 0.0 | 0.0 | 0.21 | 0.21 |
| All Pedestrians | | 53 | 2.4 | LOS A | | | 0.21 | 0.21 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

## Site: 3501 [3501-Millers Road/Blackshaws Road- PM Post Dev]

## Network: N101 [2881/2882/2893/3501 - PM Post Dev]

New Site
Signals - Fixed Time Coordinated  Cycle Time = 110 seconds (Network Cycle Time - User-Given)

**Movement Performance - Vehicles**

| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Arrival Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Millers Road | | | | | | | | | | | | | |
| 1 | L2 | 42 | 5.0 | 42 | 5.0 | 0.031 | 7.1 | LOS A | 0.3 | 2.4 | 0.21 | 0.59 | 52.9 |
| 2 | T1 | 772 | 5.2 | 772 | 5.2 | 0.796 | 42.6 | LOS D | 17.8 | 129.2 | 0.95 | 0.87 | 25.2 |
| 3 | R2 | 117 | 3.6 | 117 | 3.6 | 0.789 | 65.4 | LOS E | 6.8 | 49.0 | 1.00 | 0.90 | 28.6 |
| Approach | | 931 | 5.0 | 931 | 5.0 | 0.796 | 43.9 | LOS D | 17.8 | 129.2 | 0.92 | 0.86 | 27.0 |
| East: Blackshaws Road | | | | | | | | | | | | | |
| 4 | L2 | 155 | 17.0 | 155 | 17.0 | 0.516 | 29.0 | LOS C | 9.7 | 77.6 | 0.82 | 0.81 | 41.4 |
| 5 | T1 | 155 | 17.0 | 155 | 17.0 | 0.516 | 23.2 | LOS C | 9.7 | 77.6 | 0.82 | 0.81 | 42.2 |
| 6 | R2 | 355 | 17.2 | 355 | 17.2 | 0.581 | 25.9 | LOS C | 12.3 | 98.8 | 0.84 | 0.81 | 33.0 |
| Approach | | 664 | 17.1 | 664 | 17.1 | 0.581 | 26.0 | LOS C | 12.3 | 98.8 | 0.83 | 0.81 | 38.0 |
| North: Millers Road | | | | | | | | | | | | | |
| 7 | L2 | 481 | 3.9 | 427 | 3.5 | 0.321 | 8.5 | LOS A | 5.9 | 42.2 | 0.34 | 0.66 | 49.6 |
| 8 | T1 | 1051 | 5.5 | 933 | 5.3 | 0.648 | 39.6 | LOS D | 14.7 | 106.2 | 0.90 | 0.77 | 32.0 |
| 9 | R2 | 96 | 4.4 | 85 | 3.9 | 0.574 | 61.1 | LOS E | 4.6 | 33.0 | 0.99 | 0.78 | 25.2 |
| Approach | | 1627 | 5.0 | 1445[N1] | 4.7 | 0.648 | 31.7 | LOS C | 14.7 | 106.2 | 0.74 | 0.73 | 35.2 |
| West: Blackshaws Road | | | | | | | | | | | | | |
| 10 | L2 | 97 | 12.0 | 97 | 12.0 | 0.685 | 46.9 | LOS D | 10.6 | 81.9 | 0.97 | 0.93 | 25.3 |
| 11 | T1 | 152 | 11.8 | 152 | 11.8 | 0.685 | 41.2 | LOS D | 10.6 | 81.9 | 0.97 | 0.93 | 35.2 |
| 12 | R2 | 139 | 12.1 | 139 | 12.1 | 0.274 | 24.6 | LOS C | 4.2 | 32.4 | 0.78 | 0.75 | 42.2 |
| Approach | | 387 | 12.0 | 387 | 12.0 | 0.685 | 36.7 | LOS D | 10.6 | 81.9 | 0.90 | 0.86 | 35.6 |
| All Vehicles | | 3609 | 8.0 | 3427[N1] | 8.4 | 0.796 | 34.5 | LOS C | 17.8 | 129.2 | 0.83 | 0.80 | 33.4 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Network Model Accuracy Level (largest change in degree of saturation for any lane): 15.9 %
Number of Iterations: 10 (maximum specified: 10)

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate per ped |
|---|---|---|---|---|---|---|---|---|
| P1 | South Full Crossing | 53 | 42.0 | LOS E | 0.1 | 0.1 | 0.87 | 0.87 |
| P2 | East Full Crossing | 53 | 36.1 | LOS D | 0.1 | 0.1 | 0.81 | 0.81 |
| P3 | North Full Crossing | 53 | 49.3 | LOS E | 0.2 | 0.2 | 0.95 | 0.95 |
| P4 | West Full Crossing | 53 | 36.1 | LOS D | 0.1 | 0.1 | 0.81 | 0.81 |
| All Pedestrians | | 211 | 40.9 | LOS E | | | 0.86 | 0.86 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

## Site: 2 [Blackshaws Road/Connector Road- AM (7:45-8:45) - Post Dev]

## Network: N101 [AM Post Development]

New Site
Signals - Fixed Time Coordinated  Cycle Time = 100 seconds (Network Cycle Time - Program)

**Movement Performance - Vehicles**

| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Arrival Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| East: Blackshaws Road | | | | | | | | | | | | | |
| 5 | T1 | 501 | 48.0 | 501 | 48.0 | 0.548 | 6.1 | LOS A | 10.6 | 105.1 | 0.47 | 0.43 | 50.1 |
| 6 | R2 | 58 | 7.3 | 58 | 7.3 | 0.170 | 19.1 | LOS B | 1.5 | 11.3 | 0.60 | 0.72 | 44.4 |
| Approach | | 559 | 43.8 | 559 | 43.8 | 0.548 | 7.4 | LOS A | 10.6 | 105.1 | 0.49 | 0.46 | 49.0 |
| North: Connector Road | | | | | | | | | | | | | |
| 7 | L2 | 81 | 2.6 | 81 | 2.6 | 0.318 | 48.5 | LOS D | 3.7 | 26.3 | 0.94 | 0.76 | 32.9 |
| 9 | R2 | 198 | 2.7 | 198 | 2.7 | 0.931 | 72.4 | LOS E | 12.3 | 87.9 | 1.00 | 1.06 | 18.0 |
| Approach | | 279 | 2.6 | 279 | 2.6 | 0.931 | 65.5 | LOS E | 12.3 | 87.9 | 0.98 | 0.98 | 22.5 |
| West: Blackshaws Road | | | | | | | | | | | | | |
| 10 | L2 | 102 | 7.2 | 102 | 7.2 | 0.093 | 12.0 | LOS B | 1.4 | 10.2 | 0.30 | 0.64 | 45.2 |
| 11 | T1 | 722 | 19.0 | 722 | 19.0 | 0.698 | 9.8 | LOS A | 17.4 | 141.4 | 0.54 | 0.49 | 48.9 |
| Approach | | 824 | 17.5 | 824 | 17.5 | 0.698 | 10.1 | LOS B | 17.4 | 141.4 | 0.51 | 0.51 | 48.4 |
| All Vehicles | | 1662 | 23.9 | 1662 | 23.9 | 0.931 | 18.5 | LOS B | 17.4 | 141.4 | 0.58 | 0.57 | 40.6 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Network Model Accuracy Level (largest change in degree of saturation for any lane): 1.0 %
Number of Iterations: 7 (maximum specified: 10)

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate per ped |
|---|---|---|---|---|---|---|---|---|
| P2 | East Full Crossing | 53 | 44.3 | LOS E | 0.1 | 0.1 | 0.94 | 0.94 |
| P3 | North Full Crossing | 53 | 11.5 | LOS B | 0.1 | 0.1 | 0.48 | 0.48 |
| All Pedestrians | | 105 | 27.9 | LOS C | | | 0.71 | 0.71 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

## Site: 1 [Blackshaws Road/The Broadway/Connector Road - AM (7:45-8:45) - Post Dev ]

## Network: N101 [AM Post Development]

New Site
Signals - Fixed Time Coordinated Cycle Time = 100 seconds (Network Cycle Time - Program)

**Movement Performance - Vehicles**

| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Arrival Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: The Broadway | | | | | | | | | | | | | |
| 1 | L2 | 109 | 2.0 | 109 | 2.0 | 0.480 | 44.7 | LOS D | 6.7 | 47.7 | 0.93 | 0.80 | 34.0 |
| 2 | T1 | 1 | 0.0 | 1 | 0.0 | 0.480 | 39.2 | LOS D | 6.7 | 47.7 | 0.93 | 0.80 | 34.6 |
| 3 | R2 | 41 | 0.0 | 41 | 0.0 | 0.480 | 44.7 | LOS D | 6.7 | 47.7 | 0.93 | 0.80 | 24.5 |
| Approach | | 152 | 1.4 | 152 | 1.4 | 0.480 | 44.7 | LOS D | 6.7 | 47.7 | 0.93 | 0.80 | 32.1 |
| East: Blackshaws Road | | | | | | | | | | | | | |
| 4 | L2 | 17 | 0.0 | 17 | 0.0 | 0.862 | 28.9 | LOS C | 24.7 | 227.7 | 0.70 | 0.73 | 38.3 |
| 5 | T1 | 633 | 37.9 | 633 | 37.9 | 0.862 | 23.3 | LOS C | 24.7 | 227.7 | 0.70 | 0.73 | 38.8 |
| 6 | R2 | 58 | 7.3 | 58 | 7.3 | 0.286 | 32.9 | LOS C | 2.1 | 15.3 | 0.73 | 0.75 | 32.9 |
| Approach | | 707 | 34.5 | 707 | 34.5 | 0.862 | 24.2 | LOS C | 24.7 | 227.7 | 0.70 | 0.73 | 38.2 |
| North: Connector Road | | | | | | | | | | | | | |
| 7 | L2 | 81 | 2.6 | 81 | 2.6 | 0.225 | 42.2 | LOS D | 3.4 | 24.4 | 0.88 | 0.76 | 25.4 |
| 8 | T1 | 1 | 0.0 | 1 | 0.0 | 0.225 | 36.6 | LOS D | 3.4 | 24.4 | 0.88 | 0.76 | 35.5 |
| 9 | R2 | 198 | 2.7 | 198 | 2.7 | 0.902 | 66.6 | LOS E | 11.7 | 83.9 | 1.00 | 1.04 | 28.4 |
| Approach | | 280 | 2.6 | 280 | 2.6 | 0.902 | 59.4 | LOS E | 11.7 | 83.9 | 0.96 | 0.95 | 27.8 |
| West: Blackshaws Road | | | | | | | | | | | | | |
| 10 | L2 | 102 | 7.2 | 102 | 7.2 | 0.085 | 11.3 | LOS B | 1.7 | 12.3 | 0.36 | 0.66 | 49.2 |
| 11 | T1 | 722 | 19.0 | 722 | 19.0 | 0.642 | 9.3 | LOS A | 19.1 | 155.4 | 0.59 | 0.54 | 46.1 |
| 12 | R2 | 65 | 2.0 | 65 | 2.0 | 0.198 | 26.5 | LOS C | 2.1 | 15.1 | 0.73 | 0.75 | 40.6 |
| Approach | | 889 | 16.4 | 889 | 16.4 | 0.642 | 10.8 | LOS B | 19.1 | 155.4 | 0.58 | 0.57 | 45.9 |
| All Vehicles | | 2028 | 19.7 | 2028 | 19.7 | 0.902 | 24.7 | LOS C | 24.7 | 227.7 | 0.70 | 0.70 | 37.5 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Network Model Accuracy Level (largest change in degree of saturation for any lane): 1.0 %
Number of Iterations: 7 (maximum specified: 10)

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate per ped |
|---|---|---|---|---|---|---|---|---|
| P1 | South Full Crossing | 53 | 13.0 | LOS B | 0.1 | 0.1 | 0.51 | 0.51 |
| P2 | East Full Crossing | 53 | 37.9 | LOS D | 0.1 | 0.1 | 0.87 | 0.87 |
| P3 | North Full Crossing | 53 | 14.6 | LOS B | 0.1 | 0.1 | 0.54 | 0.54 |
| P4 | West Full Crossing | 53 | 40.6 | LOS E | 0.1 | 0.1 | 0.90 | 0.90 |
| All Pedestrians | | 211 | 26.5 | LOS C | | | 0.71 | 0.71 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

## Site: 1 [Blackshaws Road/The Broadway/Connector Road - PM (4:45-5:45) - Post Dev ]

## Network: N101 [PM Post Development]

New Site
Signals - Fixed Time Coordinated Cycle Time = 100 seconds (Network Cycle Time - Program)

**Movement Performance - Vehicles**

| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Arrival Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: The Broadway | | | | | | | | | | | | | |
| 1 | L2 | 87 | 2.5 | 87 | 2.5 | 0.721 | 57.3 | LOS E | 6.0 | 43.0 | 1.00 | 0.86 | 30.5 |
| 2 | T1 | 1 | 0.0 | 1 | 0.0 | 0.721 | 51.7 | LOS D | 6.0 | 43.0 | 1.00 | 0.86 | 31.0 |
| 3 | R2 | 28 | 0.0 | 28 | 0.0 | 0.721 | 57.2 | LOS E | 6.0 | 43.0 | 1.00 | 0.86 | 21.1 |
| Approach | | 117 | 1.9 | 117 | 1.9 | 0.721 | 57.2 | LOS E | 6.0 | 43.0 | 1.00 | 0.86 | 28.7 |
| East: Blackshaws Road | | | | | | | | | | | | | |
| 4 | L2 | 64 | 0.0 | 64 | 0.0 | 0.897 | 39.7 | LOS D | 33.4 | 294.3 | 0.78 | 0.89 | 32.8 |
| 5 | T1 | 637 | 33.1 | 637 | 33.1 | 0.897 | 34.1 | LOS C | 33.4 | 294.3 | 0.78 | 0.89 | 33.2 |
| 6 | R2 | 71 | 1.5 | 71 | 1.5 | 0.274 | 23.4 | LOS C | 1.9 | 13.6 | 0.57 | 0.72 | 37.6 |
| Approach | | 772 | 27.4 | 772 | 27.4 | 0.897 | 33.6 | LOS C | 33.4 | 294.3 | 0.76 | 0.88 | 33.5 |
| North: Connector Road | | | | | | | | | | | | | |
| 7 | L2 | 95 | 3.3 | 95 | 3.3 | 0.480 | 52.7 | LOS D | 4.6 | 33.1 | 0.98 | 0.78 | 22.2 |
| 8 | T1 | 1 | 0.0 | 1 | 0.0 | 0.480 | 47.1 | LOS D | 4.6 | 33.1 | 0.98 | 0.78 | 32.2 |
| 9 | R2 | 107 | 3.9 | 107 | 3.9 | 0.879 | 66.4 | LOS E | 6.1 | 44.0 | 1.00 | 0.98 | 28.4 |
| Approach | | 203 | 3.6 | 203 | 3.6 | 0.879 | 59.9 | LOS E | 6.1 | 44.0 | 0.99 | 0.89 | 26.2 |
| West: Blackshaws Road | | | | | | | | | | | | | |
| 10 | L2 | 203 | 2.1 | 203 | 2.1 | 0.144 | 8.7 | LOS A | 2.5 | 17.8 | 0.28 | 0.65 | 51.2 |
| 11 | T1 | 677 | 20.3 | 677 | 20.3 | 0.510 | 4.6 | LOS A | 12.3 | 101.3 | 0.41 | 0.38 | 52.2 |
| 12 | R2 | 171 | 0.8 | 171 | 0.8 | 0.373 | 24.1 | LOS C | 5.6 | 39.4 | 0.75 | 0.79 | 41.7 |
| Approach | | 1051 | 13.6 | 1051 | 13.6 | 0.510 | 8.6 | LOS A | 12.3 | 101.3 | 0.44 | 0.50 | 49.0 |
| All Vehicles | | 2143 | 17.0 | 2143 | 17.0 | 0.897 | 25.1 | LOS C | 33.4 | 294.3 | 0.64 | 0.69 | 37.6 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Network Model Accuracy Level (largest change in degree of saturation for any lane): 2.5 %
Number of Iterations: 10 (maximum specified: 10)

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate per ped |
|---|---|---|---|---|---|---|---|---|
| P1 | South Full Crossing | 53 | 10.6 | LOS B | 0.1 | 0.1 | 0.46 | 0.46 |
| P2 | East Full Crossing | 53 | 44.3 | LOS E | 0.1 | 0.1 | 0.94 | 0.94 |
| P3 | North Full Crossing | 53 | 12.0 | LOS B | 0.1 | 0.1 | 0.49 | 0.49 |
| P4 | West Full Crossing | 53 | 44.3 | LOS E | 0.1 | 0.1 | 0.94 | 0.94 |
| All Pedestrians | | 211 | 27.8 | LOS C | | | 0.71 | 0.71 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

## Site: 2 [Blackshaws Road/Connector Road - PM (4:45-5:45) - Post Dev]

## Network: N101 [PM Post Development]

New Site
Signals - Fixed Time Coordinated  Cycle Time = 100 seconds (Network Cycle Time - Program)

**Movement Performance - Vehicles**

| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Arrival Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| East: Blackshaws Road | | | | | | | | | | | | | |
| 5 | T1 | 532 | 45.5 | 532 | 45.5 | 0.872 | 27.3 | LOS C | 22.8 | 222.0 | 0.61 | 0.75 | 31.9 |
| 6 | R2 | 71 | 1.5 | 71 | 1.5 | 0.197 | 18.2 | LOS B | 1.8 | 12.8 | 0.60 | 0.72 | 45.0 |
| Approach | | 602 | 40.4 | 602 | 40.4 | 0.872 | 26.3 | LOS C | 22.8 | 222.0 | 0.61 | 0.74 | 33.9 |
| North: Connector Road | | | | | | | | | | | | | |
| 7 | L2 | 95 | 3.3 | 95 | 3.3 | 0.475 | 52.7 | LOS D | 4.5 | 32.7 | 0.98 | 0.78 | 31.7 |
| 9 | R2 | 107 | 3.9 | 107 | 3.9 | 0.905 | 71.8 | LOS E | 6.6 | 47.5 | 1.00 | 1.05 | 18.1 |
| Approach | | 202 | 3.6 | 202 | 3.6 | 0.905 | 62.8 | LOS E | 6.6 | 47.5 | 0.99 | 0.92 | 24.8 |
| West: Blackshaws Road | | | | | | | | | | | | | |
| 10 | L2 | 203 | 2.1 | 203 | 2.1 | 0.171 | 12.5 | LOS B | 3.7 | 26.1 | 0.40 | 0.68 | 45.0 |
| 11 | T1 | 679 | 20.2 | 679 | 20.2 | 0.660 | 10.8 | LOS B | 17.5 | 143.6 | 0.58 | 0.52 | 48.0 |
| Approach | | 882 | 16.0 | 882 | 16.0 | 0.660 | 11.2 | LOS B | 17.5 | 143.6 | 0.54 | 0.56 | 47.3 |
| All Vehicles | | 1687 | 23.2 | 1687 | 23.2 | 0.905 | 22.8 | LOS C | 22.8 | 222.0 | 0.62 | 0.67 | 38.1 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Network Model Accuracy Level (largest change in degree of saturation for any lane): 2.5 %
Number of Iterations: 10 (maximum specified: 10)

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate per ped |
|---|---|---|---|---|---|---|---|---|
| P2 | East Full Crossing | 53 | 44.3 | LOS E | 0.1 | 0.1 | 0.94 | 0.94 |
| P3 | North Full Crossing | 53 | 10.1 | LOS B | 0.1 | 0.1 | 0.45 | 0.45 |
| All Pedestrians | | 105 | 27.2 | LOS C | | | 0.70 | 0.70 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

## Site: 5 [Blackshaws Road/Kyle Road/Mills Street AM (8:00-9:00) - Post Dev]

New Site
Signals - Fixed Time Isolated Cycle Time = 40 seconds (Practical Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

**Movement Performance - Vehicles**

| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Mills Street | | | | | | | | | | | |
| 1 | L2 | 17 | 3.0 | 0.392 | 22.5 | LOS C | 2.4 | 17.4 | 0.93 | 0.73 | 45.5 |
| 2 | T1 | 127 | 3.0 | 0.392 | 17.2 | LOS B | 2.4 | 17.4 | 0.93 | 0.74 | 46.1 |
| 3 | R2 | 66 | 3.0 | 0.392 | 24.8 | LOS C | 1.6 | 11.5 | 0.96 | 0.75 | 42.2 |
| Approach | | 211 | 3.0 | 0.392 | 20.0 | LOS C | 2.4 | 17.4 | 0.94 | 0.74 | 44.8 |
| East: Blackshaws Road | | | | | | | | | | | |
| 4 | L2 | 215 | 4.0 | 0.849 | 22.0 | LOS C | 17.7 | 140.9 | 0.92 | 1.04 | 45.1 |
| 5 | T1 | 1158 | 21.0 | 0.849 | 17.1 | LOS B | 17.7 | 140.9 | 0.93 | 1.05 | 46.2 |
| 6 | R2 | 58 | 4.0 | 0.849 | 23.3 | LOS C | 15.4 | 125.8 | 0.93 | 1.05 | 45.0 |
| Approach | | 1431 | 17.8 | 0.849 | 18.1 | LOS B | 17.7 | 140.9 | 0.93 | 1.05 | 46.0 |
| North: Kyle Road | | | | | | | | | | | |
| 7 | L2 | 71 | 2.0 | 0.576 | 23.4 | LOS C | 3.7 | 26.6 | 0.96 | 0.80 | 44.2 |
| 8 | T1 | 120 | 2.0 | 0.576 | 17.9 | LOS B | 3.7 | 26.6 | 0.96 | 0.80 | 45.2 |
| 9 | R2 | 198 | 2.0 | 0.813 | 28.9 | LOS C | 4.6 | 32.4 | 1.00 | 0.98 | 39.9 |
| Approach | | 388 | 2.0 | 0.813 | 24.5 | LOS C | 4.6 | 32.4 | 0.98 | 0.89 | 42.2 |
| West: Blackshaws Road | | | | | | | | | | | |
| 10 | L2 | 102 | 0.0 | 0.469 | 12.2 | LOS B | 5.5 | 43.4 | 0.67 | 0.63 | 51.6 |
| 11 | T1 | 611 | 20.0 | 0.469 | 7.9 | LOS A | 5.5 | 43.4 | 0.71 | 0.64 | 52.3 |
| 12 | R2 | 31 | 0.0 | 0.469 | 14.8 | LOS B | 4.6 | 36.8 | 0.76 | 0.66 | 50.4 |
| Approach | | 743 | 16.4 | 0.469 | 8.7 | LOS A | 5.5 | 43.4 | 0.71 | 0.64 | 52.1 |
| All Vehicles | | 2773 | 14.1 | 0.849 | 16.6 | LOS B | 17.7 | 140.9 | 0.88 | 0.89 | 46.8 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate per ped |
|---|---|---|---|---|---|---|---|---|
| P1 | South Full Crossing | 53 | 8.5 | LOS A | 0.0 | 0.0 | 0.65 | 0.65 |
| P2 | East Full Crossing | 53 | 14.5 | LOS B | 0.1 | 0.1 | 0.85 | 0.85 |
| P3 | North Full Crossing | 53 | 8.5 | LOS A | 0.0 | 0.0 | 0.65 | 0.65 |
| P4 | West Full Crossing | 53 | 14.5 | LOS B | 0.1 | 0.1 | 0.85 | 0.85 |
| All Pedestrians | | 211 | 11.5 | LOS B | | | 0.75 | 0.75 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

## Site: 5 [Blackshaws Road/Kyle Road/Mills Street PM (4:00-5:00) - Post Dev]

New Site
Signals - Fixed Time Isolated Cycle Time = 40 seconds (Practical Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

**Movement Performance - Vehicles**

| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Mills Street | | | | | | | | | | | |
| 1 | L2 | 65 | 1.0 | 0.373 | 23.5 | LOS C | 2.0 | 14.2 | 0.94 | 0.75 | 43.5 |
| 2 | T1 | 45 | 1.0 | 0.373 | 18.2 | LOS B | 2.0 | 14.2 | 0.94 | 0.75 | 44.2 |
| 3 | R2 | 62 | 1.0 | 0.373 | 25.8 | LOS C | 1.4 | 9.7 | 0.97 | 0.74 | 41.5 |
| Approach | | 173 | 1.0 | 0.373 | 22.9 | LOS C | 2.0 | 14.2 | 0.95 | 0.75 | 42.9 |
| East: Blackshaws Road | | | | | | | | | | | |
| 4 | L2 | 26 | 3.0 | 0.467 | 11.6 | LOS B | 5.5 | 43.8 | 0.65 | 0.57 | 52.8 |
| 5 | T1 | 729 | 17.0 | 0.467 | 7.1 | LOS A | 5.5 | 43.8 | 0.69 | 0.61 | 53.4 |
| 6 | R2 | 34 | 3.0 | 0.467 | 14.2 | LOS B | 4.8 | 37.9 | 0.74 | 0.65 | 50.8 |
| Approach | | 789 | 15.9 | 0.467 | 7.5 | LOS A | 5.5 | 43.8 | 0.69 | 0.61 | 53.2 |
| North: Kyle Road | | | | | | | | | | | |
| 7 | L2 | 95 | 0.0 | 0.611 | 24.7 | LOS C | 3.5 | 24.7 | 0.98 | 0.83 | 43.1 |
| 8 | T1 | 88 | 0.0 | 0.611 | 19.3 | LOS B | 3.5 | 24.7 | 0.98 | 0.83 | 43.8 |
| 9 | R2 | 128 | 0.0 | 0.611 | 25.8 | LOS C | 2.9 | 20.2 | 0.99 | 0.83 | 41.5 |
| Approach | | 312 | 0.0 | 0.611 | 23.6 | LOS C | 3.5 | 24.7 | 0.99 | 0.83 | 42.6 |
| West: Blackshaws Road | | | | | | | | | | | |
| 10 | L2 | 203 | 3.0 | 0.772 | 16.1 | LOS B | 14.1 | 104.8 | 0.84 | 0.87 | 48.8 |
| 11 | T1 | 1166 | 9.0 | 0.772 | 11.1 | LOS B | 14.1 | 104.8 | 0.85 | 0.87 | 50.0 |
| 12 | R2 | 62 | 3.0 | 0.772 | 17.3 | LOS B | 12.3 | 92.2 | 0.86 | 0.87 | 48.7 |
| Approach | | 1432 | 7.9 | 0.772 | 12.1 | LOS B | 14.1 | 104.8 | 0.85 | 0.87 | 49.8 |
| All Vehicles | | 2705 | 8.9 | 0.772 | 12.8 | LOS B | 14.1 | 104.8 | 0.82 | 0.78 | 49.3 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate per ped |
|---|---|---|---|---|---|---|---|---|
| P1 | South Full Crossing | 53 | 7.8 | LOS A | 0.0 | 0.0 | 0.63 | 0.63 |
| P2 | East Full Crossing | 53 | 14.5 | LOS B | 0.1 | 0.1 | 0.85 | 0.85 |
| P3 | North Full Crossing | 53 | 7.8 | LOS A | 0.0 | 0.0 | 0.63 | 0.63 |
| P4 | West Full Crossing | 53 | 14.5 | LOS B | 0.1 | 0.1 | 0.85 | 0.85 |
| All Pedestrians | | 211 | 11.2 | LOS B | | | 0.74 | 0.74 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

## Site: 10 [Blackshaws Road/Sutton Street PM (4:30-5:30)- Post Dev]

Stop (Two-Way)

| Movement Performance - Vehicles | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
| East: Blackshaws Road | | | | | | | | | | | |
| 5 | T1 | 479 | 21.0 | 0.305 | 0.2 | LOS A | 0.4 | 3.0 | 0.09 | 0.04 | 59.2 |
| 6 | R2 | 33 | 0.0 | 0.305 | 7.7 | LOS A | 0.4 | 3.0 | 0.09 | 0.04 | 57.0 |
| Approach | | 512 | 19.7 | 0.305 | 0.7 | NA | 0.4 | 3.0 | 0.09 | 0.04 | 59.0 |
| North: Sutton Street | | | | | | | | | | | |
| 7 | L2 | 35 | 0.0 | 0.174 | 9.9 | LOS A | 0.6 | 4.0 | 0.59 | 0.96 | 48.6 |
| 9 | R2 | 48 | 0.0 | 0.174 | 16.3 | LOS C | 0.6 | 4.0 | 0.59 | 0.96 | 48.2 |
| Approach | | 83 | 0.0 | 0.174 | 13.6 | LOS B | 0.6 | 4.0 | 0.59 | 0.96 | 48.4 |
| West: Blackshaws Road | | | | | | | | | | | |
| 10 | L2 | 23 | 0.0 | 0.216 | 5.6 | LOS A | 0.0 | 0.0 | 0.00 | 0.03 | 58.0 |
| 11 | T1 | 380 | 7.0 | 0.216 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.03 | 59.6 |
| Approach | | 403 | 6.6 | 0.216 | 0.3 | NA | 0.0 | 0.0 | 0.00 | 0.03 | 59.5 |
| All Vehicles | | 998 | 12.7 | 0.305 | 1.6 | NA | 0.6 | 4.0 | 0.10 | 0.12 | 58.2 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

## Site: 1303 [1303- Melbourne Road/The Avenue - AM (8:00-9:00) - Post Dev]

## Network: N101 [AM PEAK Post Dev (8:00-9:00) 2880/1303/4965 ]

New Site
Signals - Fixed Time Coordinated  Cycle Time = 130 seconds (Network Cycle Time - User-Given)

**Movement Performance - Vehicles**

| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Arrival Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Melbourne Road | | | | | | | | | | | | | |
| 1 | L2 | 4 | 0.0 | 4 | 0.0 | 0.439 | 18.4 | LOS B | 12.1 | 97.3 | 0.46 | 0.41 | 44.8 |
| 2 | T1 | 903 | 17.9 | 903 | 17.9 | 0.439 | 8.1 | LOS A | 12.1 | 97.3 | 0.31 | 0.28 | 38.6 |
| 3 | R2 | 1 | 0.0 | 1 | 0.0 | 0.009 | 70.9 | LOS E | 0.1 | 0.5 | 1.00 | 0.59 | 22.3 |
| Approach | | 908 | 17.8 | 908 | 17.8 | 0.439 | 8.2 | LOS A | 12.1 | 97.3 | 0.31 | 0.28 | 36.9 |
| East: The Avenue | | | | | | | | | | | | | |
| 4 | L2 | 13 | 0.0 | 13 | 0.0 | 0.027 | 41.7 | LOS D | 0.6 | 4.3 | 0.75 | 0.67 | 25.7 |
| 5 | T1 | 1 | 0.0 | 1 | 0.0 | 0.027 | 36.2 | LOS D | 0.6 | 4.3 | 0.75 | 0.67 | 35.8 |
| 6 | R2 | 144 | 0.0 | 144 | 0.0 | 0.893 | 83.5 | LOS F | 11.4 | 79.8 | 1.00 | 1.04 | 16.2 |
| Approach | | 158 | 0.0 | 158 | 0.0 | 0.893 | 79.9 | LOS E | 11.4 | 79.8 | 0.98 | 1.01 | 16.8 |
| North: Melbourne Road | | | | | | | | | | | | | |
| 7 | L2 | 28 | 0.0 | 28 | 0.0 | 0.319 | 15.5 | LOS B | 7.2 | 61.4 | 0.37 | 0.36 | 45.3 |
| 8 | T1 | 635 | 27.0 | 635 | 27.0 | 0.319 | 9.0 | LOS A | 7.2 | 61.4 | 0.34 | 0.32 | 27.5 |
| 9 | R2 | 20 | 0.0 | 20 | 0.0 | 0.233 | 75.9 | LOS E | 1.3 | 9.3 | 1.00 | 0.70 | 19.9 |
| Approach | | 683 | 25.1 | 683 | 25.1 | 0.319 | 11.2 | LOS B | 7.2 | 61.4 | 0.36 | 0.33 | 28.1 |
| West: The Avenue | | | | | | | | | | | | | |
| 10 | L2 | 745 | 13.8 | 745 | 13.8 | 0.909 | 56.6 | LOS E | 28.1 | 224.3 | 0.90 | 1.04 | 21.5 |
| 11 | T1 | 12 | 0.0 | 12 | 0.0 | 0.123 | 43.5 | LOS D | 2.1 | 15.0 | 0.83 | 0.71 | 33.7 |
| 12 | R2 | 31 | 0.0 | 31 | 0.0 | 0.123 | 49.1 | LOS D | 2.1 | 15.0 | 0.83 | 0.71 | 23.7 |
| Approach | | 787 | 13.1 | 787 | 13.1 | 0.909 | 56.1 | LOS E | 28.1 | 224.3 | 0.89 | 1.02 | 21.8 |
| All Vehicles | | 2537 | 17.2 | 2537 | 17.2 | 0.909 | 28.3 | LOS C | 28.1 | 224.3 | 0.55 | 0.57 | 24.3 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Network Model Accuracy Level (largest change in degree of saturation for any lane): 4.6 %
Number of Iterations: 10 (maximum specified: 10)

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate per ped |
|---|---|---|---|---|---|---|---|---|
| P1 | South Full Crossing | 53 | 50.1 | LOS E | 0.2 | 0.2 | 0.88 | 0.88 |
| P2 | East Full Crossing | 53 | 17.8 | LOS B | 0.1 | 0.1 | 0.52 | 0.52 |
| P3 | North Full Crossing | 53 | 53.7 | LOS E | 0.2 | 0.2 | 0.91 | 0.91 |
| P4 | West Full Crossing | 53 | 13.4 | LOS B | 0.1 | 0.1 | 0.45 | 0.45 |
| All Pedestrians | | 211 | 33.8 | LOS D | | | 0.69 | 0.69 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

## Site: 10 [Blackshaws Road/Sutton Street AM (8:00-9:00)- Post Dev]

Stop (Two-Way)

| Movement Performance - Vehicles | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
| East: Blackshaws Road | | | | | | | | | | | |
| 5 | T1 | 539 | 44.0 | 0.380 | 0.3 | LOS A | 0.5 | 4.6 | 0.09 | 0.04 | 59.1 |
| 6 | R2 | 28 | 0.0 | 0.380 | 9.1 | LOS A | 0.5 | 4.6 | 0.09 | 0.04 | 56.9 |
| Approach | | 567 | 41.8 | 0.380 | 0.8 | NA | 0.5 | 4.6 | 0.09 | 0.04 | 59.0 |
| North: Sutton Street | | | | | | | | | | | |
| 7 | L2 | 31 | 0.0 | 0.176 | 10.6 | LOS B | 0.6 | 4.0 | 0.69 | 0.97 | 46.9 |
| 9 | R2 | 31 | 4.0 | 0.176 | 22.9 | LOS C | 0.6 | 4.0 | 0.69 | 0.97 | 46.3 |
| Approach | | 61 | 2.0 | 0.176 | 16.8 | LOS C | 0.6 | 4.0 | 0.69 | 0.97 | 46.6 |
| West: Blackshaws Road | | | | | | | | | | | |
| 10 | L2 | 41 | 0.0 | 0.284 | 5.6 | LOS A | 0.0 | 0.0 | 0.00 | 0.05 | 57.8 |
| 11 | T1 | 463 | 16.0 | 0.284 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.05 | 59.4 |
| Approach | | 504 | 14.7 | 0.284 | 0.5 | NA | 0.0 | 0.0 | 0.00 | 0.05 | 59.3 |
| All Vehicles | | 1133 | 27.6 | 0.380 | 1.5 | NA | 0.6 | 4.6 | 0.08 | 0.09 | 58.3 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

## Site: 12 [Kernot Street/ The Avenue AM (7:45-8:45) - Post Dev]

New Site
Stop (Two-Way)

| Movement Performance - Vehicles | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
| South: Kernot Street | | | | | | | | | | | |
| 1 | L2 | 37 | 0.0 | 0.699 | 11.1 | LOS B | 7.8 | 62.7 | 0.61 | 1.07 | 49.0 |
| 3 | R2 | 538 | 18.0 | 0.699 | 13.9 | LOS B | 7.8 | 62.7 | 0.61 | 1.07 | 47.9 |
| Approach | | 575 | 16.8 | 0.699 | 13.7 | LOS B | 7.8 | 62.7 | 0.61 | 1.07 | 47.9 |
| East: The Avenue | | | | | | | | | | | |
| 4 | L2 | 29 | 0.0 | 0.064 | 5.5 | LOS A | 0.0 | 0.0 | 0.00 | 0.17 | 56.1 |
| 5 | T1 | 72 | 49.0 | 0.064 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.17 | 57.6 |
| Approach | | 101 | 34.7 | 0.064 | 1.6 | NA | 0.0 | 0.0 | 0.00 | 0.17 | 57.2 |
| West: The Avenue | | | | | | | | | | | |
| 11 | T1 | 111 | 2.0 | 0.089 | 0.2 | LOS A | 0.3 | 2.1 | 0.15 | 0.18 | 57.8 |
| 12 | R2 | 51 | 0.0 | 0.089 | 5.8 | LOS A | 0.3 | 2.1 | 0.15 | 0.18 | 55.7 |
| Approach | | 161 | 1.4 | 0.089 | 1.9 | NA | 0.3 | 2.1 | 0.15 | 0.18 | 57.1 |
| All Vehicles | | 837 | 16.0 | 0.699 | 10.0 | NA | 7.8 | 62.7 | 0.44 | 0.79 | 50.5 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

## Site: 12 [Kernot Street/ The Avenue PM(4:45-5:45) - Post Dev]

New Site
Stop (Two-Way)

| Movement Performance - Vehicles | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
| South: Kernot Street | | | | | | | | | | | |
| 1 | L2 | 82 | 0.0 | 0.299 | 8.5 | LOS A | 1.2 | 9.8 | 0.33 | 0.94 | 51.0 |
| 3 | R2 | 168 | 24.0 | 0.299 | 11.1 | LOS B | 1.2 | 9.8 | 0.33 | 0.94 | 49.6 |
| Approach | | 251 | 16.1 | 0.299 | 10.3 | LOS B | 1.2 | 9.8 | 0.33 | 0.94 | 50.0 |
| East: The Avenue | | | | | | | | | | | |
| 4 | L2 | 159 | 0.0 | 0.137 | 5.6 | LOS A | 0.0 | 0.0 | 0.00 | 0.38 | 54.9 |
| 5 | T1 | 87 | 22.0 | 0.137 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.38 | 56.4 |
| Approach | | 246 | 7.8 | 0.137 | 3.6 | NA | 0.0 | 0.0 | 0.00 | 0.38 | 55.4 |
| West: The Avenue | | | | | | | | | | | |
| 11 | T1 | 55 | 1.0 | 0.103 | 0.8 | LOS A | 0.5 | 3.5 | 0.35 | 0.40 | 55.5 |
| 12 | R2 | 105 | 0.0 | 0.103 | 6.3 | LOS A | 0.5 | 3.5 | 0.35 | 0.40 | 53.5 |
| Approach | | 160 | 0.3 | 0.103 | 4.4 | NA | 0.5 | 3.5 | 0.35 | 0.40 | 54.2 |
| All Vehicles | | 657 | 9.2 | 0.299 | 6.3 | NA | 1.2 | 9.8 | 0.21 | 0.60 | 53.0 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

## Site: 1 [New Street/Blackshaws Road AM Peak Post Dev]

New Street / Blackshaws Road
Stop (Two-Way)

| Movement Performance - Vehicles | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
| East: Blackshaws Road | | | | | | | | | | | |
| 5 | T1 | 399 | 50.0 | 0.271 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 59.9 |
| 6 | R2 | 58 | 0.0 | 0.084 | 9.1 | LOS A | 0.3 | 2.1 | 0.56 | 0.79 | 50.5 |
| Approach | | 457 | 43.7 | 0.271 | 1.2 | NA | 0.3 | 2.1 | 0.07 | 0.10 | 58.5 |
| North: New Street | | | | | | | | | | | |
| 7 | L2 | 81 | 0.0 | 0.920 | 41.3 | LOS E | 9.9 | 69.2 | 0.92 | 1.76 | 32.5 |
| 9 | R2 | 198 | 0.0 | 0.920 | 55.8 | LOS F | 9.9 | 69.2 | 0.92 | 1.76 | 32.3 |
| Approach | | 279 | 0.0 | 0.920 | 51.6 | LOS F | 9.9 | 69.2 | 0.92 | 1.76 | 32.3 |
| West: Blackshaws Road | | | | | | | | | | | |
| 10 | L2 | 226 | 5.0 | 0.330 | 5.6 | LOS A | 0.0 | 0.0 | 0.00 | 0.23 | 55.8 |
| 11 | T1 | 344 | 24.0 | 0.330 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.23 | 57.5 |
| Approach | | 571 | 16.5 | 0.330 | 2.3 | NA | 0.0 | 0.0 | 0.00 | 0.23 | 56.9 |
| All Vehicles | | 1306 | 22.5 | 0.920 | 12.4 | NA | 9.9 | 69.2 | 0.22 | 0.51 | 49.3 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

## Site: 1 [New Street/Blackshaws Road PM Peak Post Dev]

New Street / Blackshaws Road
Stop (Two-Way)

| Movement Performance - Vehicles | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
| East: Blackshaws Road | | | | | | | | | | | |
| 5 | T1 | 328 | 29.0 | 0.200 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 60.0 |
| 6 | R2 | 71 | 0.0 | 0.167 | 13.2 | LOS B | 0.6 | 4.0 | 0.74 | 0.90 | 47.8 |
| Approach | | 399 | 23.9 | 0.200 | 2.3 | NA | 0.6 | 4.0 | 0.13 | 0.16 | 57.4 |
| North: New Street | | | | | | | | | | | |
| 7 | L2 | 95 | 0.0 | 0.849 | 38.4 | LOS E | 5.9 | 41.4 | 0.94 | 1.45 | 33.3 |
| 9 | R2 | 107 | 0.0 | 0.849 | 58.0 | LOS F | 5.9 | 41.4 | 0.94 | 1.45 | 33.1 |
| Approach | | 202 | 0.0 | 0.849 | 48.8 | LOS E | 5.9 | 41.4 | 0.94 | 1.45 | 33.2 |
| West: Blackshaws Road | | | | | | | | | | | |
| 10 | L2 | 203 | 4.0 | 0.471 | 5.7 | LOS A | 0.0 | 0.0 | 0.00 | 0.15 | 56.6 |
| 11 | T1 | 612 | 22.0 | 0.471 | 0.1 | LOS A | 0.0 | 0.0 | 0.00 | 0.15 | 58.3 |
| Approach | | 815 | 17.5 | 0.471 | 1.5 | NA | 0.0 | 0.0 | 0.00 | 0.15 | 57.9 |
| All Vehicles | | 1416 | 16.8 | 0.849 | 8.5 | NA | 5.9 | 41.4 | 0.17 | 0.34 | 52.2 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

## Site: 0 [Melbourne Road / Ross Street - AM Peak Hour Post Dev]

Melbourne Road / Ross Street
Stop (Two-Way)

| Movement Performance - Vehicles | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
| South: Melbourne Road | | | | | | | | | | | |
| 1 | L2 | 25 | 7.0 | 0.246 | 5.6 | LOS A | 0.0 | 0.0 | 0.00 | 0.03 | 57.6 |
| 2 | T1 | 835 | 18.0 | 0.246 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.02 | 59.8 |
| Approach | | 860 | 17.7 | 0.246 | 0.2 | NA | 0.0 | 0.0 | 0.00 | 0.02 | 59.7 |
| North: Melbourne Road | | | | | | | | | | | |
| 8 | T1 | 673 | 15.0 | 0.189 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 60.0 |
| 9 | R2 | 17 | 4.0 | 0.033 | 11.3 | LOS B | 0.1 | 0.8 | 0.64 | 0.79 | 49.3 |
| Approach | | 689 | 14.7 | 0.189 | 0.3 | NA | 0.1 | 0.8 | 0.02 | 0.02 | 59.6 |
| West: Ross Street | | | | | | | | | | | |
| 10 | L2 | 156 | 1.0 | 0.246 | 12.8 | LOS B | 0.9 | 6.6 | 0.63 | 1.02 | 49.3 |
| 12 | R2 | 4 | 1.0 | 0.039 | 37.8 | LOS E | 0.1 | 0.8 | 0.90 | 1.00 | 36.9 |
| Approach | | 160 | 1.0 | 0.246 | 13.5 | LOS B | 0.9 | 6.6 | 0.63 | 1.02 | 48.9 |
| All Vehicles | | 1709 | 14.9 | 0.246 | 1.5 | NA | 0.9 | 6.6 | 0.07 | 0.11 | 58.5 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

## Site: 0 [Melbourne Road / Scott Street - PM Peak Hour Post Dev]

Melbourne Road / Ross Street
Stop (Two-Way)

| Movement Performance - Vehicles | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
| South: Melbourne Road | | | | | | | | | | | |
| 1 | L2 | 14 | 7.0 | 0.284 | 5.7 | LOS A | 0.0 | 0.0 | 0.00 | 0.02 | 57.8 |
| 2 | T1 | 1046 | 7.0 | 0.284 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.01 | 59.9 |
| Approach | | 1060 | 7.0 | 0.284 | 0.1 | NA | 0.0 | 0.0 | 0.00 | 0.01 | 59.8 |
| North: Melbourne Road | | | | | | | | | | | |
| 8 | T1 | 1140 | 23.0 | 0.336 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 59.9 |
| 9 | R2 | 49 | 6.0 | 0.138 | 15.2 | LOS C | 0.5 | 3.5 | 0.77 | 0.90 | 46.8 |
| Approach | | 1189 | 22.3 | 0.336 | 0.7 | NA | 0.5 | 3.5 | 0.03 | 0.04 | 59.2 |
| West: Ross Street | | | | | | | | | | | |
| 10 | L2 | 160 | 0.0 | 0.332 | 15.7 | LOS C | 1.3 | 9.1 | 0.75 | 1.05 | 47.6 |
| 12 | R2 | 1 | 0.0 | 0.066 | 201.0 | LOS F | 0.2 | 1.1 | 0.99 | 1.00 | 13.9 |
| Approach | | 161 | 0.0 | 0.332 | 16.9 | LOS C | 1.3 | 9.1 | 0.75 | 1.05 | 46.9 |
| All Vehicles | | 2410 | 14.1 | 0.336 | 1.5 | NA | 1.3 | 9.1 | 0.07 | 0.09 | 58.5 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

## Site: 1 [Schutt Street / Blackshaws Road - AM Peak Hour Post Dev]

Blackshaws Road / Schutt Street
Giveway / Yield (Two-Way)

| Movement Performance - Vehicles | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
| South: Schutt Street | | | | | | | | | | | |
| 1 | L2 | 66 | 1.0 | 0.089 | 7.3 | LOS A | 0.3 | 2.3 | 0.46 | 0.67 | 51.8 |
| 3 | R2 | 7 | 1.0 | 0.089 | 13.6 | LOS B | 0.3 | 2.3 | 0.46 | 0.67 | 51.3 |
| Approach | | 74 | 1.0 | 0.089 | 8.0 | LOS A | 0.3 | 2.3 | 0.46 | 0.67 | 51.7 |
| East: Blackshaws Road | | | | | | | | | | | |
| 4 | L2 | 2 | 0.0 | 0.205 | 5.6 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 58.2 |
| 5 | T1 | 302 | 49.0 | 0.205 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 59.9 |
| Approach | | 304 | 48.7 | 0.205 | 0.1 | NA | 0.0 | 0.0 | 0.00 | 0.00 | 59.9 |
| West: Blackshaws Road | | | | | | | | | | | |
| 11 | T1 | 268 | 16.0 | 0.152 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 60.0 |
| 12 | R2 | 141 | 3.0 | 0.149 | 7.4 | LOS A | 0.6 | 4.3 | 0.46 | 0.70 | 51.5 |
| Approach | | 409 | 11.5 | 0.152 | 2.6 | NA | 0.6 | 4.3 | 0.16 | 0.24 | 56.8 |
| All Vehicles | | 787 | 24.9 | 0.205 | 2.1 | NA | 0.6 | 4.3 | 0.13 | 0.19 | 57.4 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

## Site: 1 [Schutt Street / Blackshas Road - PM Peak Hour Post Dev]

Blackshaws Road / Schutt Street
Giveway / Yield (Two-Way)

| Movement Performance - Vehicles | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
| South: Schutt Street | | | | | | | | | | | |
| 1 | L2 | 42 | 1.0 | 0.060 | 7.2 | LOS A | 0.2 | 1.6 | 0.45 | 0.66 | 51.7 |
| 3 | R2 | 6 | 1.0 | 0.060 | 13.2 | LOS B | 0.2 | 1.6 | 0.45 | 0.66 | 51.2 |
| Approach | | 48 | 1.0 | 0.060 | 8.0 | LOS A | 0.2 | 1.6 | 0.45 | 0.66 | 51.7 |
| East: Blackshaws Road | | | | | | | | | | | |
| 4 | L2 | 9 | 2.0 | 0.197 | 5.6 | LOS A | 0.0 | 0.0 | 0.00 | 0.02 | 58.0 |
| 5 | T1 | 323 | 24.0 | 0.197 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.02 | 59.8 |
| Approach | | 333 | 23.4 | 0.197 | 0.2 | NA | 0.0 | 0.0 | 0.00 | 0.02 | 59.7 |
| West: Blackshaws Road | | | | | | | | | | | |
| 11 | T1 | 228 | 7.0 | 0.122 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 60.0 |
| 12 | R2 | 198 | 7.0 | 0.214 | 7.7 | LOS A | 0.9 | 6.7 | 0.48 | 0.72 | 51.2 |
| Approach | | 426 | 7.0 | 0.214 | 3.6 | NA | 0.9 | 6.7 | 0.22 | 0.33 | 55.6 |
| All Vehicles | | 807 | 13.4 | 0.214 | 2.4 | NA | 0.9 | 6.7 | 0.15 | 0.22 | 56.9 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

## Site: 1 [Hansen Street/Blackshaws Road - AM Peak Post Dev]

Hansen Street / Blackshaws Road
Stop (Two-Way)

| Movement Performance - Vehicles | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
| South: Hansen Street | | | | | | | | | | | |
| 1 | L2 | 21 | 5.0 | 0.435 | 16.4 | LOS C | 1.6 | 11.7 | 0.86 | 1.08 | 39.7 |
| 3 | R2 | 64 | 5.0 | 0.435 | 35.5 | LOS E | 1.6 | 11.7 | 0.86 | 1.08 | 39.4 |
| Approach | | 85 | 5.0 | 0.435 | 30.8 | LOS D | 1.6 | 11.7 | 0.86 | 1.08 | 39.5 |
| East: Blackshaws Road | | | | | | | | | | | |
| 4 | L2 | 79 | 9.0 | 0.338 | 5.7 | LOS A | 0.0 | 0.0 | 0.00 | 0.09 | 56.6 |
| 5 | T1 | 431 | 50.0 | 0.338 | 0.1 | LOS A | 0.0 | 0.0 | 0.00 | 0.09 | 58.6 |
| Approach | | 509 | 43.6 | 0.338 | 0.9 | NA | 0.0 | 0.0 | 0.00 | 0.09 | 58.2 |
| West: Blackshaws Road | | | | | | | | | | | |
| 11 | T1 | 559 | 21.0 | 0.326 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 59.9 |
| 12 | R2 | 35 | 5.0 | 0.053 | 9.3 | LOS A | 0.2 | 1.4 | 0.56 | 0.77 | 50.1 |
| Approach | | 594 | 20.1 | 0.326 | 0.6 | NA | 0.2 | 1.4 | 0.03 | 0.04 | 59.2 |
| All Vehicles | | 1188 | 29.1 | 0.435 | 2.9 | NA | 1.6 | 11.7 | 0.08 | 0.14 | 56.8 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

## Site: 4965 [4965- Melbourne Road/Hudson Road - AM (8:00-9:00) - Post Dev]

## Network: N101 [AM PEAK Post Dev (8:00-9:00) 2880/1303/4965 ]

New Site
Signals - Fixed Time Coordinated  Cycle Time = 130 seconds (Network Cycle Time - User-Given)

**Movement Performance - Vehicles**

| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Arrival Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Melbourne Road | | | | | | | | | | | | | |
| 1 | L2 | 3 | 0.0 | 3 | 0.0 | 0.492 | 27.2 | LOS C | 18.0 | 145.2 | 0.70 | 0.62 | 43.3 |
| 2 | T1 | 861 | 18.0 | 861 | 18.0 | 0.492 | 21.5 | LOS C | 18.0 | 145.2 | 0.69 | 0.61 | 35.3 |
| 3 | R2 | 23 | 18.2 | 23 | 18.2 | 0.610 | 83.2 | LOS F | 1.7 | 13.4 | 1.00 | 0.75 | 24.9 |
| Approach | | 887 | 17.9 | 887 | 17.9 | 0.610 | 23.2 | LOS C | 18.0 | 145.2 | 0.70 | 0.62 | 34.6 |
| East: Hudson Road | | | | | | | | | | | | | |
| 4 | L2 | 12 | 18.2 | 12 | 18.2 | 0.188 | 36.7 | LOS D | 5.0 | 39.8 | 0.73 | 0.61 | 38.5 |
| 5 | T1 | 103 | 16.3 | 103 | 16.3 | 0.188 | 31.0 | LOS C | 5.0 | 39.8 | 0.73 | 0.61 | 39.6 |
| 6 | R2 | 187 | 16.3 | 187 | 16.3 | 0.887 | 76.2 | LOS E | 13.2 | 105.5 | 1.00 | 0.97 | 17.4 |
| Approach | | 302 | 16.4 | 302 | 16.4 | 0.887 | 59.3 | LOS E | 13.2 | 105.5 | 0.90 | 0.83 | 25.0 |
| North: Melbourne Road | | | | | | | | | | | | | |
| 7 | L2 | 271 | 21.0 | 271 | 21.0 | 0.436 | 24.1 | LOS C | 11.8 | 97.2 | 0.55 | 0.67 | 37.8 |
| 8 | T1 | 476 | 21.0 | 476 | 21.0 | 0.436 | 16.7 | LOS B | 11.8 | 97.2 | 0.51 | 0.49 | 42.6 |
| 9 | R2 | 9 | 22.2 | 9 | 22.2 | 0.256 | 81.1 | LOS F | 0.7 | 5.5 | 1.00 | 0.67 | 20.2 |
| Approach | | 756 | 21.0 | 756 | 21.0 | 0.436 | 20.2 | LOS C | 11.8 | 97.2 | 0.53 | 0.56 | 40.2 |
| West: Hudson Road | | | | | | | | | | | | | |
| 10 | L2 | 78 | 1.4 | 78 | 1.4 | 0.871 | 74.5 | LOS E | 16.4 | 116.4 | 1.00 | 1.00 | 18.2 |
| 11 | T1 | 139 | 2.3 | 139 | 2.3 | 0.871 | 68.9 | LOS E | 16.4 | 116.4 | 1.00 | 1.00 | 27.7 |
| 12 | R2 | 17 | 0.0 | 17 | 0.0 | 0.871 | 74.5 | LOS E | 16.4 | 116.4 | 1.00 | 1.00 | 27.4 |
| Approach | | 234 | 1.8 | 234 | 1.8 | 0.871 | 71.2 | LOS E | 16.4 | 116.4 | 1.00 | 1.00 | 25.0 |
| All Vehicles | | 2179 | 17.1 | 2179 | 17.1 | 0.887 | 32.3 | LOS C | 18.0 | 145.2 | 0.70 | 0.67 | 32.7 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Network Model Accuracy Level (largest change in degree of saturation for any lane): 4.6 %
Number of Iterations: 10 (maximum specified: 10)

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate per ped |
|---|---|---|---|---|---|---|---|---|
| P1 | South Full Crossing | 53 | 37.8 | LOS D | 0.1 | 0.1 | 0.76 | 0.76 |
| P2 | East Full Crossing | 53 | 18.9 | LOS B | 0.1 | 0.1 | 0.54 | 0.54 |
| P3 | North Full Crossing | 53 | 59.3 | LOS E | 0.2 | 0.2 | 0.96 | 0.96 |
| P4 | West Full Crossing | 53 | 18.9 | LOS B | 0.1 | 0.1 | 0.54 | 0.54 |
| All Pedestrians | | 211 | 33.7 | LOS D | | | 0.70 | 0.70 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

## Site: 1 [Hansen Street/Blackshaws Road - PM Peak Post Dev]

Hansen Street / Blackshaws Road
Stop (Two-Way)

| Movement Performance - Vehicles | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
| South: Hansen Street | | | | | | | | | | | |
| 1 | L2 | 9 | 1.0 | 0.500 | 21.6 | LOS C | 1.7 | 12.2 | 0.92 | 1.08 | 34.3 |
| 3 | R2 | 55 | 1.0 | 0.500 | 49.5 | LOS E | 1.7 | 12.2 | 0.92 | 1.08 | 34.1 |
| Approach | | 64 | 1.0 | 0.500 | 45.4 | LOS E | 1.7 | 12.2 | 0.92 | 1.08 | 34.1 |
| East: Blackshaws Road | | | | | | | | | | | |
| 4 | L2 | 89 | 4.0 | 0.366 | 5.6 | LOS A | 0.0 | 0.0 | 0.00 | 0.09 | 57.1 |
| 5 | T1 | 520 | 29.0 | 0.366 | 0.1 | LOS A | 0.0 | 0.0 | 0.00 | 0.09 | 58.9 |
| Approach | | 609 | 25.3 | 0.366 | 0.9 | NA | 0.0 | 0.0 | 0.00 | 0.09 | 58.6 |
| West: Blackshaws Road | | | | | | | | | | | |
| 11 | T1 | 679 | 19.0 | 0.391 | 0.1 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 59.9 |
| 12 | R2 | 26 | 4.0 | 0.044 | 10.0 | LOS A | 0.2 | 1.1 | 0.59 | 0.79 | 49.7 |
| Approach | | 705 | 18.4 | 0.391 | 0.4 | NA | 0.2 | 1.1 | 0.02 | 0.03 | 59.4 |
| All Vehicles | | 1379 | 20.7 | 0.500 | 2.7 | NA | 1.7 | 12.2 | 0.05 | 0.10 | 57.1 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

## Site: 2880N [2880N- West Gate Freeway/ Melbourne Road- PM (5:00-6:00) - Post Dev]

## Network: N101 [PM PEAK Post Dev (5:00-6:00) 2880/1303/4965]

New Site
Signals - Fixed Time Coordinated  Cycle Time = 120 seconds (Network Cycle Time - User-Given)
Common Control Group: 2880 [West Gate Fwy/Melbourne Rd]

**Movement Performance - Vehicles**

| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Arrival Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Melbourne Road | | | | | | | | | | | | | |
| 2 | T1 | 1343 | 37.0 | 1249 | 35.0 | 0.858 | 29.6 | LOS C | 32.2 | 292.7 | 0.86 | 0.84 | 35.5 |
| 3 | R2 | 268 | 10.2 | 268 | 10.2 | 0.846 | 74.4 | LOS E | 8.5 | 65.0 | 1.00 | 0.88 | 21.5 |
| Approach | | 1612 | 32.5 | 1517 N1 | 30.6 | 0.858 | 37.5 | LOS D | 32.2 | 292.7 | 0.88 | 0.85 | 31.8 |
| North: Melbourne Road | | | | | | | | | | | | | |
| 7 | L2 | 281 | 40.8 | 281 | 40.8 | 0.810 | 25.4 | LOS C | 34.1 | 321.6 | 0.83 | 0.81 | 43.4 |
| 8 | T1 | 1517 | 28.9 | 1517 | 28.9 | 0.816 | 19.8 | LOS B | 34.1 | 321.6 | 0.68 | 0.67 | 36.1 |
| Approach | | 1798 | 30.8 | 1798 | 30.8 | 0.816 | 20.7 | LOS C | 34.1 | 321.6 | 0.70 | 0.69 | 37.8 |
| West: Exit Ramp Inbound | | | | | | | | | | | | | |
| 10 | L2 | 373 | 0.0 | 373 | 0.0 | 0.464 | 18.0 | LOS B | 11.5 | 80.4 | 0.63 | 0.76 | 45.9 |
| 11 | T1 | 5 | 0.0 | 5 | 0.0 | 1.173 | 263.9 | LOS F | 28.0 | 196.2 | 1.00 | 1.50 | 11.1 |
| 12 | R2 | 422 | 0.0 | 422 | 0.0 | 1.173 | 269.5 | LOS F | 28.0 | 196.2 | 1.00 | 1.49 | 6.2 |
| Approach | | 800 | 0.0 | 800 | 0.0 | 1.173 | 152.3 | LOS F | 28.0 | 196.2 | 0.83 | 1.15 | 13.8 |
| All Vehicles | | 4209 | 25.6 | 4115 N1 | 26.2 | 1.173 | 52.5 | LOS D | 34.1 | 321.6 | 0.79 | 0.84 | 25.9 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Network Model Accuracy Level (largest change in degree of saturation for any lane): 15.7 %
Number of Iterations: 10 (maximum specified: 10)

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate per ped |
|---|---|---|---|---|---|---|---|---|
| P2 | East Full Crossing | 53 | 18.7 | LOS B | 0.1 | 0.1 | 0.56 | 0.56 |
| P3 | North Full Crossing | 53 | 44.3 | LOS E | 0.2 | 0.2 | 0.86 | 0.86 |
| P4 | West Full Crossing | 53 | 4.8 | LOS A | 0.1 | 0.1 | 0.28 | 0.28 |
| All Pedestrians | | 158 | 22.6 | LOS C | | | 0.57 | 0.57 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

## Site: 2880S [2880S- West Gate Freeway/Melbourne Road- PM (5:00-6:00) - Post Dev]

## Network: N101 [PM PEAK Post Dev (5:00-6:00) 2880/1303/4965]

New Site
Signals - Fixed Time Coordinated  Cycle Time = 120 seconds (Network Cycle Time - User-Given)
Common Control Group: 2880 [West Gate Fwy/Melbourne Rd]

**Movement Performance - Vehicles**

| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Arrival Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Melbourne Road | | | | | | | | | | | | | |
| 1 | L2 | 216 | 9.8 | 216 | 9.8 | 0.178 | 8.6 | LOS A | 2.7 | 20.6 | 0.28 | 0.63 | 47.6 |
| 2 | T1 | 1233 | 10.1 | 1233 | 10.1 | 0.913 | 33.6 | LOS C | 24.7 | 187.7 | 0.76 | 0.82 | 12.4 |
| Approach | | 1448 | 10.0 | 1448 | 10.0 | 0.913 | 29.9 | LOS C | 24.7 | 187.7 | 0.69 | 0.79 | 17.4 |
| East: Exit Ramp Outbound | | | | | | | | | | | | | |
| 4 | L2 | 877 | 58.9 | 877 | 58.9 | 1.059 | 123.9 | LOS F | 91.6 | 965.4 | 1.00 | 1.31 | 12.2 |
| 5 | T1 | 4 | 0.0 | 4 | 0.0 | 1.484 | 513.8 | LOS F | 39.3 | 411.1 | 1.00 | 2.05 | 6.3 |
| 6 | R2 | 379 | 58.9 | 379 | 58.9 | 1.484 | 520.1 | LOS F | 39.3 | 411.1 | 1.00 | 2.04 | 3.4 |
| Approach | | 1260 | 58.7 | 1260 | 58.7 | 1.484 | 244.4 | LOS F | 91.6 | 965.4 | 1.00 | 1.53 | 6.9 |
| North: Melbourne Road | | | | | | | | | | | | | |
| 8 | T1 | 586 | 39.5 | 569 | 40.7 | 0.303 | 7.6 | LOS A | 4.8 | 44.9 | 0.30 | 0.26 | 37.6 |
| 9 | R2 | 576 | 9.7 | 576 | 9.7 | 0.880 | 61.1 | LOS E | 17.5 | 132.5 | 0.96 | 0.99 | 24.4 |
| Approach | | 1162 | 24.7 | 1145 N1 | 25.1 | 0.880 | 34.5 | LOS C | 17.5 | 132.5 | 0.63 | 0.63 | 26.5 |
| All Vehicles | | 3871 | 30.3 | 3854 N1 | 30.4 | 1.484 | 101.4 | LOS F | 91.6 | 965.4 | 0.77 | 0.99 | 11.2 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Network Model Accuracy Level (largest change in degree of saturation for any lane): 15.7 %
Number of Iterations: 10 (maximum specified: 10)

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate per ped |
|---|---|---|---|---|---|---|---|---|
| P1 | South Full Crossing | 53 | 44.3 | LOS E | 0.2 | 0.2 | 0.86 | 0.86 |
| P2 | East Full Crossing | 53 | 4.8 | LOS A | 0.1 | 0.1 | 0.28 | 0.28 |
| P4 | West Full Crossing | 53 | 19.9 | LOS B | 0.1 | 0.1 | 0.58 | 0.58 |
| All Pedestrians | | 158 | 23.0 | LOS C | | | 0.57 | 0.57 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

## Site: 1303 [1303- Melbourne Road/The Avenue - PM (5:00-6:00) Post Dev]

## Network: N101 [PM PEAK Post Dev (5:00-6:00) 2880/1303/4965]

New Site
Signals - Fixed Time Coordinated  Cycle Time = 120 seconds (Network Cycle Time - User-Given)

**Movement Performance - Vehicles**

| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Arrival Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Melbourne Road | | | | | | | | | | | | | |
| 1 | L2 | 14 | 0.0 | 14 | 0.0 | 0.691 | 30.3 | LOS C | 34.2 | 251.3 | 0.89 | 0.81 | 37.1 |
| 2 | T1 | 1072 | 6.0 | 1072 | 6.0 | 0.691 | 23.7 | LOS C | 34.2 | 251.3 | 0.86 | 0.79 | 21.2 |
| Approach | | 1085 | 5.9 | 1085 | 5.9 | 0.691 | 23.8 | LOS C | 34.2 | 251.3 | 0.86 | 0.79 | 21.6 |
| East: The Avenue | | | | | | | | | | | | | |
| 4 | L2 | 4 | 0.0 | 4 | 0.0 | 0.145 | 53.7 | LOS D | 2.2 | 15.2 | 0.90 | 0.68 | 23.5 |
| 5 | T1 | 38 | 0.0 | 38 | 0.0 | 0.145 | 48.2 | LOS D | 2.2 | 15.2 | 0.90 | 0.68 | 33.4 |
| 6 | R2 | 69 | 0.0 | 69 | 0.0 | 0.585 | 61.1 | LOS E | 4.1 | 28.8 | 0.98 | 0.82 | 20.2 |
| Approach | | 112 | 0.0 | 112 | 0.0 | 0.585 | 56.5 | LOS E | 4.1 | 28.8 | 0.95 | 0.77 | 25.3 |
| North: Melbourne Road | | | | | | | | | | | | | |
| 7 | L2 | 83 | 24.1 | 80 | 24.0 | 0.490 | 10.3 | LOS B | 9.5 | 81.1 | 0.29 | 0.32 | 49.2 |
| 8 | T1 | 1189 | 25.0 | 1149 | 25.0 | 0.490 | 5.1 | LOS A | 11.2 | 95.4 | 0.32 | 0.32 | 35.5 |
| 9 | R2 | 159 | 25.2 | 153 | 25.1 | 0.688 | 61.3 | LOS E | 8.9 | 76.0 | 1.00 | 0.84 | 22.5 |
| Approach | | 1432 | 25.0 | 1382 N1 | 24.9 | 0.688 | 11.6 | LOS B | 11.2 | 95.4 | 0.39 | 0.38 | 31.1 |
| West: The Avenue | | | | | | | | | | | | | |
| 10 | L2 | 293 | 23.0 | 293 | 23.0 | 0.378 | 18.1 | LOS B | 5.3 | 44.7 | 0.64 | 0.74 | 38.3 |
| 11 | T1 | 6 | 0.0 | 6 | 0.0 | 0.128 | 49.5 | LOS D | 1.4 | 10.4 | 0.91 | 0.71 | 31.9 |
| 12 | R2 | 21 | 5.0 | 21 | 5.0 | 0.128 | 55.1 | LOS E | 1.4 | 10.4 | 0.91 | 0.71 | 21.9 |
| Approach | | 320 | 21.4 | 320 | 21.4 | 0.378 | 21.1 | LOS C | 5.3 | 44.7 | 0.66 | 0.74 | 36.3 |
| All Vehicles | | 2948 | 16.6 | 2899 N1 | 16.9 | 0.691 | 19.0 | LOS B | 34.2 | 251.3 | 0.62 | 0.58 | 27.6 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Network Model Accuracy Level (largest change in degree of saturation for any lane): 15.7 %
Number of Iterations: 10 (maximum specified: 10)

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate per ped |
|---|---|---|---|---|---|---|---|---|
| P1 | South Full Crossing | 53 | 51.5 | LOS E | 0.2 | 0.2 | 0.93 | 0.93 |
| P2 | East Full Crossing | 53 | 14.5 | LOS B | 0.1 | 0.1 | 0.49 | 0.49 |
| P3 | North Full Crossing | 53 | 54.3 | LOS E | 0.2 | 0.2 | 0.95 | 0.95 |
| P4 | West Full Crossing | 53 | 14.0 | LOS B | 0.1 | 0.1 | 0.48 | 0.48 |
| All Pedestrians | | 211 | 33.6 | LOS D | | | 0.71 | 0.71 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

## Site: 4965 [4965- Melbourne Road/Hudson Road - PM (5:00 - 6:00) Post Dev]

## Network: N101 [PM PEAK Post Dev (5:00-6:00) 2880/1303/4965]

New Site
Signals - Fixed Time Coordinated  Cycle Time = 120 seconds (Network Cycle Time - User-Given)

**Movement Performance - Vehicles**

| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Arrival Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Melbourne Road | | | | | | | | | | | | | |
| 1 | L2 | 8 | 0.0 | 8 | 0.0 | 0.516 | 25.4 | LOS C | 15.3 | 113.4 | 0.70 | 0.63 | 44.2 |
| 2 | T1 | 877 | 7.1 | 877 | 7.1 | 0.516 | 19.6 | LOS B | 17.8 | 132.2 | 0.69 | 0.62 | 36.6 |
| 3 | R2 | 26 | 4.0 | 26 | 4.0 | 0.583 | 76.1 | LOS E | 1.7 | 12.5 | 1.00 | 0.74 | 26.3 |
| Approach | | 912 | 6.9 | 912 | 6.9 | 0.583 | 21.3 | LOS C | 17.8 | 132.2 | 0.70 | 0.62 | 36.0 |
| East: Hudson Road | | | | | | | | | | | | | |
| 4 | L2 | 62 | 3.4 | 62 | 3.4 | 0.366 | 38.1 | LOS D | 8.1 | 58.5 | 0.79 | 0.70 | 37.7 |
| 5 | T1 | 123 | 4.3 | 123 | 4.3 | 0.366 | 32.5 | LOS C | 8.1 | 58.5 | 0.79 | 0.70 | 38.4 |
| 6 | R2 | 167 | 4.4 | 167 | 4.4 | 0.929 | 80.9 | LOS F | 11.7 | 85.0 | 1.00 | 1.03 | 16.6 |
| Approach | | 353 | 4.2 | 353 | 4.2 | 0.929 | 56.5 | LOS E | 11.7 | 85.0 | 0.89 | 0.86 | 27.1 |
| North: Melbourne Road | | | | | | | | | | | | | |
| 7 | L2 | 78 | 25.7 | 75 | 25.9 | 0.634 | 27.5 | LOS C | 21.4 | 183.3 | 0.72 | 0.67 | 37.6 |
| 8 | T1 | 1068 | 26.0 | 1022 | 26.3 | 0.634 | 21.1 | LOS C | 21.9 | 187.9 | 0.73 | 0.67 | 40.0 |
| 9 | R2 | 9 | 11.1 | 9 | 11.2 | 0.211 | 74.3 | LOS E | 0.6 | 4.4 | 1.00 | 0.66 | 21.5 |
| Approach | | 1156 | 25.9 | 1106[N1] | 26.1 | 0.634 | 21.9 | LOS C | 21.9 | 187.9 | 0.74 | 0.67 | 39.5 |
| West: Hudson Road | | | | | | | | | | | | | |
| 10 | L2 | 22 | 4.8 | 22 | 4.8 | 0.724 | 61.9 | LOS E | 10.6 | 76.0 | 1.00 | 0.87 | 21.2 |
| 11 | T1 | 153 | 2.8 | 153 | 2.8 | 0.724 | 56.3 | LOS E | 10.6 | 76.0 | 1.00 | 0.87 | 31.0 |
| 12 | R2 | 4 | 0.0 | 4 | 0.0 | 0.724 | 61.9 | LOS E | 10.6 | 76.0 | 1.00 | 0.87 | 30.7 |
| Approach | | 179 | 2.9 | 179 | 2.9 | 0.724 | 57.2 | LOS E | 10.6 | 76.0 | 1.00 | 0.87 | 30.1 |
| All Vehicles | | 2599 | 14.7 | 2549[N1] | 15.0 | 0.929 | 28.9 | LOS C | 21.9 | 187.9 | 0.76 | 0.69 | 34.9 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Network Model Accuracy Level (largest change in degree of saturation for any lane): 15.7 %
Number of Iterations: 10 (maximum specified: 10)

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate per ped |
|---|---|---|---|---|---|---|---|---|
| P1 | South Full Crossing | 53 | 37.7 | LOS D | 0.1 | 0.1 | 0.79 | 0.79 |
| P2 | East Full Crossing | 53 | 16.6 | LOS B | 0.1 | 0.1 | 0.53 | 0.53 |
| P3 | North Full Crossing | 53 | 54.3 | LOS E | 0.2 | 0.2 | 0.95 | 0.95 |
| P4 | West Full Crossing | 53 | 16.6 | LOS B | 0.1 | 0.1 | 0.53 | 0.53 |
| All Pedestrians | | 211 | 31.3 | LOS D | | | 0.70 | 0.70 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

## Site: 2881N [2881N- West Gate Freeway/Millers Rd- AM (8:00-9:00) - Post Dev]

## Network: N101 [2881/2882/2893/3501 - AM Post Dev]

New Site
Signals - Fixed Time Coordinated  Cycle Time = 110 seconds (Network Cycle Time - User-Given)
Common Control Group: 2881 [West Gate Freeway/Millers Road]

**Movement Performance - Vehicles**

| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Arrival Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Millers Road | | | | | | | | | | | | | |
| 2 | T1 | 1348 | 2.0 | 933 | 2.7 | 0.432 | 14.6 | LOS B | 16.1 | 115.7 | 0.61 | 0.54 | 42.5 |
| 3 | R2 | 984 | 2.0 | 635 | 2.0 | 0.887 | 44.8 | LOS D | 18.3 | 130.6 | 0.96 | 1.00 | 26.0 |
| Approach | | 2333 | 2.0 | 1568 N1 | 2.4 | 0.887 | 26.8 | LOS C | 18.3 | 130.6 | 0.75 | 0.73 | 33.8 |
| North: Millers Road | | | | | | | | | | | | | |
| 7 | L2 | 856 | 18.0 | 856 | 18.0 | 0.977 | 72.7 | LOS E | 53.7 | 433.5 | 1.00 | 1.20 | 27.2 |
| 8 | T1 | 1365 | 18.0 | 1365 | 18.0 | 1.561 | 477.6 | LOS F | 109.3 | 883.0 | 1.00 | 2.65 | 3.7 |
| Approach | | 2221 | 18.0 | 2221 | 18.0 | 1.561 | 321.6 | LOS F | 109.3 | 883.0 | 1.00 | 2.09 | 7.0 |
| West: West Gate Exist Ramp Inbound | | | | | | | | | | | | | |
| 10 | L2 | 88 | 26.2 | 88 | 26.2 | 0.388 | 53.3 | LOS D | 4.4 | 38.1 | 0.95 | 0.77 | 31.6 |
| 11 | T1 | 8 | 0.0 | 8 | 0.0 | 0.533 | 49.1 | LOS D | 5.3 | 44.7 | 0.97 | 0.79 | 31.8 |
| 12 | R2 | 185 | 26.1 | 185 | 26.1 | 0.533 | 55.1 | LOS E | 5.3 | 44.7 | 0.97 | 0.79 | 21.7 |
| Approach | | 282 | 25.4 | 282 | 25.4 | 0.533 | 54.4 | LOS D | 5.3 | 44.7 | 0.97 | 0.79 | 25.8 |
| All Vehicles | | 4836 | 10.7 | 4071 N1 | 12.7 | 1.561 | 189.5 | LOS F | 109.3 | 883.0 | 0.90 | 1.48 | 10.4 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Network Model Accuracy Level (largest change in degree of saturation for any lane): 8.5 %
Number of Iterations: 10 (maximum specified: 10)

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate per ped |
|---|---|---|---|---|---|---|---|---|
| P2 | East Full Crossing | 53 | 30.6 | LOS D | 0.1 | 0.1 | 0.75 | 0.75 |
| P3 | North Full Crossing | 53 | 49.3 | LOS E | 0.2 | 0.2 | 0.95 | 0.95 |
| P4 | West Full Crossing | 53 | 12.8 | LOS B | 0.1 | 0.1 | 0.48 | 0.48 |
| All Pedestrians | | 158 | 30.9 | LOS D | | | 0.73 | 0.73 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

Melbourne

A Level 25, 55 Collins Street
PO Box 24055
MELBOURNE VIC 3000
P +613 9851 9600
E melbourne@gta.com.au

Brisbane

A Level 4, 283 Elizabeth Street
BRISBANE QLD 4000
GPO Box 115
BRISBANE QLD 4001
P +617 3113 5000
E brisbane@gta.com.au

Adelaide

A Suite 4, Level 1, 136 The Parade
PO Box 3421
NORWOOD SA 5067
P +618 8334 3600
E adelaide@gta.com.au

Townsville

A Level 1, 25 Sturt Street
PO Box 1064
TOWNSVILLE QLD 4810
P +617 4722 2765
E townsville@gta.com.au

Sydney

A Level 6, 15 Help Street
CHATSWOOD NSW 2067
PO Box 5254
WEST CHATSWOOD NSW 1515
P +612 8448 1800
E sydney@gta.com.au

Canberra

A Tower A, Level 5,
7 London Circuit
Canberra ACT 2600
P +612 6243 4826
E canberra@gta.com.au

Gold Coast

A Level 9, Corporate Centre 2
Box 37, 1 Corporate Court
BUNDALL QLD 4217
P +617 5510 4800
F +617 5510 4814
E goldcoast@gta.com.au

Perth

A Level 2, 5 Mill Street
PERTH WA 6000
P +618 6169 1000
E perth@gta.com.au