Chester Square Planning Proposal

Peer Review
Transport Impact Assessment

Prepared by: GTA Consultants (NSW) Pty Ltd for City of Canterbury Bankstown

on 17/03/2020

Reference: N183790

Issue #: A

GTAconsultants

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Quality Record

Issue	Date	Description	Prepared By	Checked By	Approved By	Signed
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1. INTRODUCTION

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1.1. Background

In 2012/13, the former Bankstown City Council completed an extensive urban design, traffic and transport, social needs and economic analysis of the north west of the LGA as part of developing a strategic Local Area Plan (LAP).

The LAP recommended a range of building height and floor space ratio controls that would encourage the redevelopment of the Chester Hill Village Centre. Council subsequently implemented these changes in 2016 through an amendment to Bankstown Local Environmental Plan 2015.

In relation to a specific site, 1 Leicester Street, Chester Hill (Chester Square Shopping Centre) an increased building height of 20 metres and an FSR of 2.5:1 was adopted. The shopping centre is currently a single storey building of approximately 8,300 square metres of floor area with an FSR of 0.49:1.

In August 2019, City of Canterbury Bankstown Council (Council) received a planning proposal from the Holdmark Group relating to Chester Square Shopping Centre seeking to increase the building height to 65 metres and increase the FSR to 4.53:1.

As part of both assessing the planning proposal for Chester Square Shopping Centre and considering the outcomes that current controls are delivering, Council is seeking to review controls for the Zone B2 Local Centre land north of the railway line at Chester Hill.

Council engaged GTA Consultants (GTA) to independently peer review the Transport Impact Assessment[1] included as part of the Chester Square Planning Proposal (hereby referred to as the Chester Square TIA). In addition, Council has requested that GTA also complete a broader review of the Chester Hill Village Centre and make recommendations in relation to broader traffic and transport related matters that should be further considered as part of detail planning for the precinct.

1.2. Purpose of this Report

The purpose of this peer review is to objectively consider the impact of future traffic generation, parking demand and accessibility characteristics of the proposal.

This report sets out an assessment of the impacts associated with the proposed development as represented in the Chester Square TIA, with consideration of the following:

- existing traffic and parking conditions
- likely parking requirements for the proposal
- the traffic generating characteristics of the proposed development
- the transport impact of the development proposal on the surrounding road network
- the suitability of any potential mitigation measures proposed to mitigate the traffic effects of the proposal
- suitability of the documented access arrangements for the site.

[1] Transport Impact Assessment, Mixed Use Development Planning Proposal, 1 Leicester Street Chester Hill, prepared by Ason Group dated 2 August 2019

1.3. References

In preparing this report, reference has been made to the following:

- an inspection of the site and its surrounds completed on Thursday 6 February 2020
- Transport Impact Assessment, Mixed Use Development Planning Proposal, 1 Leicester Street Chester Hill, prepared by Ason Group, dated 2 August 2019
- Chester Hill Planning Proposal Urban Design Review, Place Design Group, dated 7 February 2020
- Bankstown Development Control Plan (DCP) 2015
- Roads and Maritime Services (Roads and Maritime), Guide to Traffic Generating Developments (Guide) 2002 and Technical Direction Updated Traffic Surveys (TDT 2013/ 04a)
- other documents and data as referenced in this report.

2. SUMMARY OF PLANNING PROPOSAL

02

2.1. Subject Site

The subject site is at 1 Leicester Street, Chester Hill. It has a frontage of about 210 metres to Leicester Street and Frost Lane, and 80 metres to Bent Street and Priam Street. The site is currently zoned B2 Local Centre and is occupied by Chester Square Shopping Centre.

The surrounding properties include a mix of residential dwellings and commercial and retail land uses. Industrial lands are further to the west. The location of the site and surrounding land uses within this context are shown in Figure 2.1.

Figure 2.1: Subject site and its environs

Base image source: Sydway

2.2. Planning Proposal Overview

The proposal includes a mixed-use development comprising residential apartments, retail floor area and a small amount of commercial space covering a site area of 1.67 hectares. It includes two levels of basement parking with access appearing to be primarily via Bent Street to the west with service vehicles using Bent Street and Priam Street.

A summary of the planning proposal is outlined in Table 2.1.

Table 2.1: Planning Proposal area schedule

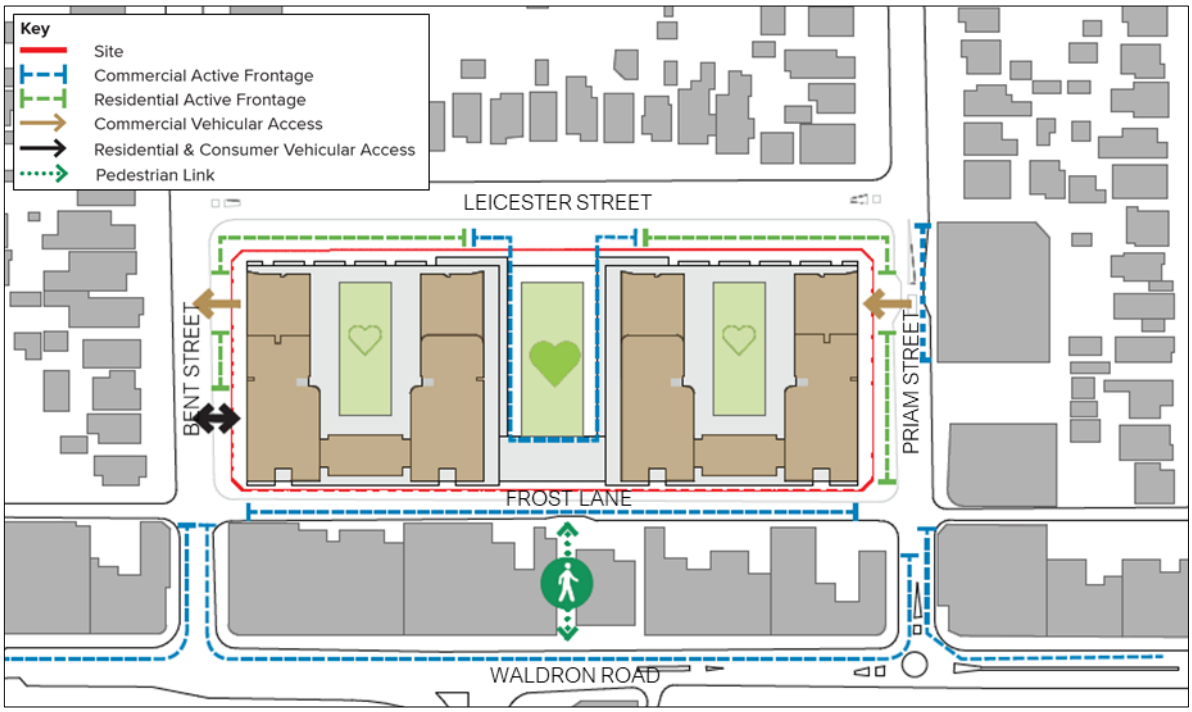
Use	Size
Residential	648 apartments
Retail	15,763m^2 GFA
Commercial	1,000m^2 GFA

2.3. Vehicle Access and Road Network

The planning proposal includes a single two-way site access driveway on Bent Street in the south-west corner of the site. Service vehicle access is proposed to be separated with an entry on Priam Street in the north-east corner of the site and exit on Bent Street in the north-west corner. The site layout plans indicate an upper basement loading dock extending the length of the site and along the northern boundary. This layout would allow east to west service vehicle access, with various docks accessed from this underground through site link.

The proposed site access arrangements are indicatively shown in Figure 2.2.

Figure 2.2: Proposed site access arrangements



Base image source: Chester Square Planning Proposal Urban Design Report, Turner, August 2019

2.4. Car Parking and Loading

The Chester Square TIA states that Chester Square Shopping Centre currently has a total of 350 parking spaces, including the following breakdown:

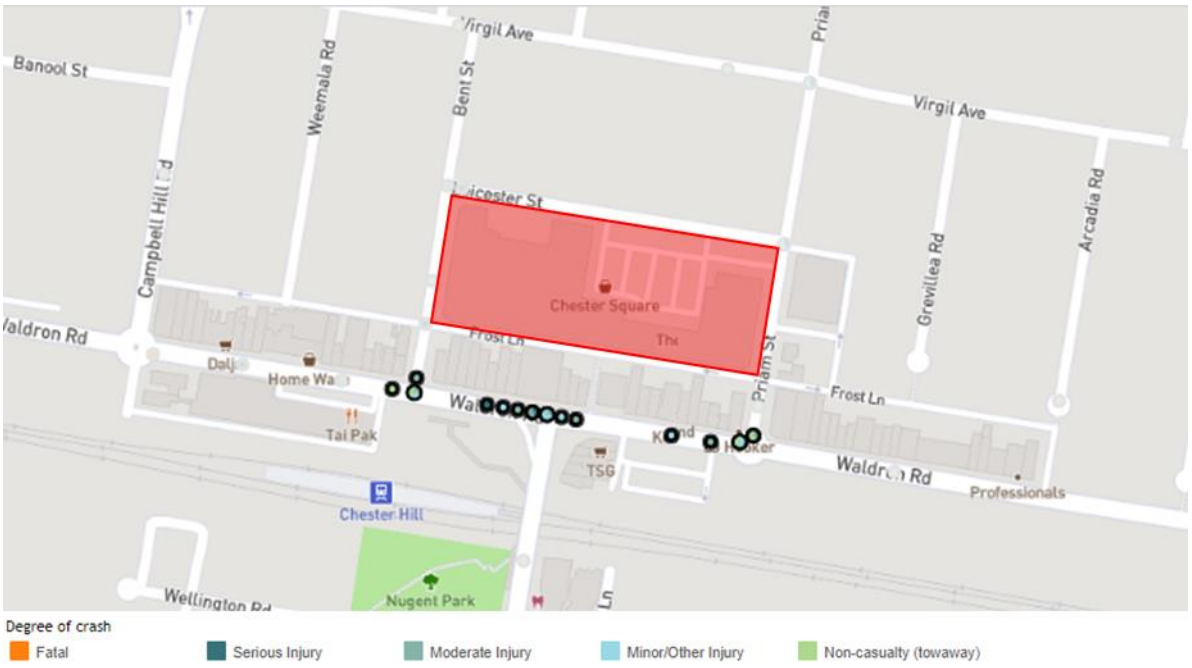
- 150 basement parking spaces
- 170 at grade parking spaces, including four accessible parking spaces
- 30 staff spaces.

The Chester Square TIA indicates that the planning proposal will result in an off-street car parking requirement of between 1,300 and 1,400 spaces for the proposed uses and based on the parking rates set out in Bankstown DCP 2015.

2.5. Crash History

An analysis of the most recent five-year period of available crash data between 2014 and 2018 has been undertaken based on the crash data supplied by TfNSW Centre for Road Safety for Waldron Road near the site. The locations and severity of the crash data is shown in Figure 2.3.

Figure 2.3: TfNSW Centre for Road Safety historical crash data



Source: https://roadsafety.transport.nsw.gov.au accessed 3 March 2020

Figure 2.3 indicates that 22 crashes have occurred along Waldron Road near the site. A closer review of these crashes indicates that the most reoccurring of these are rear-end crashes (32 per cent), which are typical crashes for urban intersections. It appears six crashes were pedestrian related.

The Waldron Road/ Bent Street intersection and the Waldron Road/ Priam Street roundabout saw 13 crashes, including moderate injury, minor/ other injury and non-casualty (towaway). These crashes were typical T-intersection and roundabout crashes whereby turning vehicles collide with through vehicles.

The Waldron Road/ Chester Hill Road saw seven crashes which included typical T- intersection and rear end crashes. The intersection and along Waldron Road saw crashes whereby pedestrians cross with through vehicles.

Based on the above, the available crash data at this location does not indicate that the proposal will compromise the safety of the surrounding road environment.

3. REVIEW OF REPORT METHODOLOGY

03

3.1. Preamble

GTA has completed a peer review of the Chester Square TIA dated 2 August 2019. This review considers the report methodology and comments on the general approach from a traffic, transport and parking perspective and makes recommendations where relevant.

A site visit was completed on a typical Thursday afternoon peak period in February 2020 to observe existing conditions, especially traffic conditions, pedestrian and cyclist activity and public transport activity. Key to this was observing current site access arrangements and traffic movements in and out of the site and broader distribution across the road network.

The site observations confirmed a level of constraint in the surrounding area from a traffic perspective, noting the following:

- There are limited crossing points of the existing railway line that bisects the area. This has long been recognised as a key contributor to traffic congestion in and around not only Chester Hill, but also the surrounding areas. This contributes to congestion around the Waldron Road/ Chester Road intersection in particular.
- Waldron Road functions as the key east-west road through the area along the northern side of the railway line however is limited in its capacity to carry large volumes of traffic due to its lane configuration (generally limited to one lane in each direction) and route through the town centre.
- Chester Hill Road lane configuration and constraints associated with traversing the rail line result in queuing for northbound vehicles on approach to Waldron Road.

Based on the above, the capacity of the existing road network to cater for the increase in traffic associated with the Planning Proposal is considered critical to the review.

3.2. Existing Conditions

Detailing key aspects of the existing conditions included as part of the Chester Square TIA is critical to the interpretation of the local area and sets the tone for the Planning Proposal and traffic distribution generally. This review has focused on the traffic survey methodology and intersection modelling given the size of the Planning Proposal would present a somewhat significant traffic impact on the local and regional area. The modelling has been reviewed against and calibrated to the site observations.

3.2.1. Traffic Volumes

Section 3.4 of the Chester Square TIA details the existing traffic volumes in the weekday AM and PM, and Saturday midday peak hours. It is understood that the surveys were completed on Thursday 6 June and Saturday 8 June 2019 which do not coincide with any school or public holiday period and are considered suitable for the purpose of the assessment. The report does not indicate what hours were surveyed and when the peak hours occurred in the respective peak periods. Based on historical surveys GTA has completed at the Chester Hill Road/ Waldron Road and Waldron Road/ Priam Street intersections, the weekday peak hours are likely to occur between 8am and 9am, and between 5pm and 6pm on weekdays.

For the purposes of this review, GTA has based our analysis and recommendations on the traffic survey results outlined in the Chester Square TIA, assuming two per cent heavy vehicles given the function of the surrounding roads.

3.2.2. Intersection Operation

The operation of the key intersections within the study area have been assessed using SIDRA INTERSECTION[2] (SIDRA), a computer based modelling package which calculates intersection performance.

The commonly used measure of intersection performance, as defined by the Transport for NSW, is vehicle delay. SIDRA determines the average delay that vehicles encounter and provides a measure of the level of service.

Table 3.1 shows the criteria that SIDRA adopts in assessing the level of service.

Table 3.1: SIDRA level of service criteria

Level of service (LOS)	Average delay per vehicle (secs/veh)	Traffic signals, roundabout	Give way & stop sign
A	Less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Near capacity	Near capacity, accident study required
E	57 to 70	At capacity, at signals incidents will cause excessive delays	At capacity, requires other control mode
F	Greater than 70	Extra capacity required	Extreme delay, major treatment required

GTA has used SIDRA to model the three surveyed intersections along Waldron Road based on assessing the validity of the modelling results included in the Chester Square TIA. The Waldron Road corridor north of the railway line is the key east-west route through Chester Hill and the surrounding area. It has long provided convenient east-west access through the local area. Congestion is known to occur along its length during weekday (and weekend) peak periods.

As discussed, GTA completed a site visit during a typical Thursday afternoon peak period in February 2020 to better understand existing conditions in and around Chester Hill and the Chester Square site specifically. Traffic in the local area and especially at the Waldron Road/ Chester Hill Road signalised intersection has long experienced some level of queuing and delay. Traffic is a key component of the planning proposal and therefore necessitates detailed assessment. Observations of traffic signal phase times, vehicle queuing and bus activity at the intersection are key in this regard.

Some specific site observations include:

- Waldron Road/ Chester Hill Road intersection:
    - left turn from Chester Hill Road to Waldron Road functions as the primary movement with the right turn having substantially less traffic than the left turn
    - left turn slip lane and dedicated Waldron Road bus lane has somewhat eased historical congestion through the area by adopting the left turn lane as the full-length lane (being the primary lane) and the right turn lane as a 25-metre short lane

[2] Program used under license from Akcelik & Associates Pty Ltd.

  - northbound Chester Hill Road queues still occur and extend south of the rail line
  - pedestrians are afforded protection and triggered by demand only
  - eastbound Waldron Road traffic afforded a short turn bay with 'back to back' turn bays (with the right turn bay for westbound traffic at Bent Street) limiting capacity in the area generally
- Chester Square site access arrangements currently via the three main site frontages on Bent Street, Leicester Street and Priam Street
- main loading dock access via Leicester Street in the north-west corner of the site
- localised intersections generally operate well as priority controlled, with little delay.

The three Waldron Road intersections were set up as a SIDRA network model, similar to that presented in the Chester Square TIA. The models were run based on the observed cycle times at the Chester Hill Road/ Waldron Road intersection, with the SIDRA calculated phase times then validated against what was observed. The queue lengths calculated by SIDRA were then compared against the observed peak period queue lengths.

Table 3.2 presents a summary of the existing operation of the key intersections based on the above analysis.

Table 3.2: Existing operating conditions

Intersection	Peak	Leg	Degree of saturation (DOS)	Average delay (sec)	Average queue (m)	Level of service (LOS)
Waldron Road/ Bent Street	AM	East	0.41	11	7	A
		North	0.05	23	1	B
		West	0.39	4	0	A
	PM	East	0.57	13	16	A
		North	0.17	34	2	C
		West	0.39	4	0	A
	Saturday	East	0.14	8	2	A
		North	0.16	24	2	B
		West	0.37	4	0	A
Chester Hill Road/ Waldron Road	AM	South	0.69	19	28	B
		East	0.63	18	60	B
		West	0.68	9	40	A
		Overall	**0.69**	**15**	**60**	**B**
	PM	South	0.76	20	43	B
		East	0.81	21	91	B
		West	0.74	12	40	A
		Overall	**0.81**	**17**	**91**	**B**
	Saturday	South	0.75	22	28	B
		East	0.72	17	73	B
		West	0.71	10	39	A

Intersection	Peak	Leg	Degree of saturation (DOS)	Average delay (sec)	Average queue (m)	Level of service (LOS)
		Overall	**0.75**	**15**	**73**	**B**
Waldron Road/ Priam Street	AM	East	0.56	9	15	A
		North	0.45	14	10	A
		West	0.67	10	18	A
	PM	East	0.90	15	38	B
		North	0.59	16	15	B
		West	0.65	11	16	A
	Saturday	East	0.71	10	20	A
		North	0.49	14	12	A
		West	0.61	11	14	A

Table 3.2 indicates that the above intersections generally operate well at satisfactory LOS (LOS D or better) in both the weekday peak hours. There is existing queuing on Waldron Road in both directions in both peak periods. The right turn from Bent Street to Waldron Street is a difficult turn which experiences some level of delay, however the traffic signals on either side of this intersection do provide for some gaps in traffic.

The GTA existing conditions model indicates that the average delay at the Waldron Road/ Priam Street roundabout is significantly less than the modelling results for this intersection in the Chester Square TIA. Sensitivity testing indicates this difference is primarily due to the geometry modelling assumptions for the left turn lane from Chester Hill Road to Waldron Road as discussed above, with this change having flow on effects to the Waldron Road/ Priam Street intersection. The Chester Square TIA states that a movement at the Waldron Road/ Priam Street intersection experiences 201 seconds delay in the weekday PM peak hour, however site observation indicate this is an unlikely representation of existing conditions. Site observations indicate that actual delay at this intersection is generally much lower. No information regarding queue lengths or degree of saturation was detailed in the Chester Square TIA.

It is recommended that modelling for the Chester Square TIA be reviewed to ensure it is reflective of existing conditions.

3.3. Car Parking

The car parking requirements for different development types are set out in Bankstown DCP 2015. It is noted that for retail uses, DCP 2015 recommends that a parking study be completed to determine a suitable provision. Given that this is a Planning Proposal, a rate of one space per 40 square metres GFA has been assumed based on rates provided in other DCPs around Sydney, with this rate to be investigated further in the Development Application stage. For the purposes of calculating the parking requirements for the proposed 648 apartments, 20 per cent have been assumed to be one-bedroom, 50 per cent 2-bedroom and 30 per cent 3-bedroom.

A summary of the DCP 2015 parking requirements for the proposal is provided in Table 3.3.

Table 3.3: Bankstown DCP 2015 car parking requirements

Use	Description	Size	Car parking rate	Car parking requirement
Residential	1 bedroom	130 apartments	1.0 spaces per apartment	130
	2 bedrooms	324 apartments	1.2 spaces per apartment	389
	3 bedrooms	194 apartments	1.5 spaces per apartment	292
	Visitor	648 apartments	1 space per 5 apartments	130
Retail		15,763m^2 GFA	1 space per 40m^2 GFA	394
Commercial		1,000m^2 GFA	1 space per 40m^2 GFA	25
			Total	**1,360**

Table 3.3 indicates the proposed development will likely generate a DCP 2015 parking requirement of around 1,360 parking space.

The Chester Square TIA indicates the proposal will likely generate a DCP 2015 parking requirement of between 1,300 and 1,400 parking spaces, consistent with Table 3.3. It is recognised that considering the proposed land uses and site location next to Chester Hill Station and a variety of supporting bus routes, there may be potential for shared use of parking spaces between the various uses to further reduce the total on-site parking provision. This would need to be explored further as part of any future DA, however GTA support the intention specified in the Chester Square TIA and the inclusion of a preliminary Green Travel Plan.

3.4. Traffic Analysis

Key to any transport assessment for a proposed development is estimating the likely traffic generation, distribution of traffic around the site, traffic impact on the surrounding road network and assessment of whether any infrastructure upgrades are required to mitigate the traffic related impacts.

In this regard, this section provides a review of the traffic generation and distribution assumptions included in the Chester Square TIA, and the resultant impact on the surrounding road network.

3.4.1. Traffic Generation

The traffic generation rates referenced in the Chester Square TIA for the residential and commercial components of the site were sourced from the Roads and Maritime Guide to Traffic Generating Developments 2002 (the Guide) and Technical Direction: Updated Traffic Surveys (TDT 2013/04a). The retail rates for the site were derived from surveys of the existing site accesses, with a five per cent reduction to take into consideration the intensification of the retail component and additional residential land uses.

GTA agrees with the use of the residential and commercial rates referenced in the Guide and TDT2013/04a which take into consideration the surrounding public transport provision and surrounding residential catchments which in turn promote a level of active travel.

In reviewing the retail rates for the site, it appears that the Priam Street staff access was not included in the traffic counts and therefore trips associated with this access were excluded from the derived traffic generation rates. It is acknowledged that this access provides for staff parking only which would likely have different traffic generation characteristics than the main retail accesses, however the number of staff parking spaces in this location accounts for around nine per cent of the total parking supply for the site. This amounts to a considerable number of vehicles not accounted for. Overall, the existing traffic generation estimates for the site may have been underestimated.

The five per cent reduction to the existing traffic generation rate equates to a reduction of between about 50 and 100 trips associated with the proposal in any peak hour. Assuming one person per bedroom based on the indicative split of residential apartments outlined in Table 3.3, the proposal could be expected to accommodate 1,360 residents. This also equates to almost two people per apartment. Based on this and assuming the reduction in trips outlined above are all associated with internal resident trips, this would equate to up to seven per cent of residents accessing the retail in any peak hour. This is considered appropriate.

Based on the traffic generation estimates outlined in the Chester Square TIA, the proposal will likely generate up to 1,950 trips per hour in any peak hour (or 975 one-way trips assuming 50:50 split between entries and exits). Noting that any on-site car park will need to provide security access control (and time restricted parking controls) given its location near Chester Hill Station, any single access driveway will likely be able to service 400 to 500 vehicles per hour per lane. This assumes a card reader or number plate recognition (NPR) technology (based on Appendix D in AS/NZS 2890.1:2004). Based on this, it appears that the planning proposal will need an absolute minimum of two separate access driveways, with the retail accesses likely requiring a minimum two inbound lanes and two outbound lanes.

Most traffic will also be generated by the retail uses with well-planned mixed-use developments ideally separating resident access from non-resident access. This is critical to the planning proposal and should be further considered as part of any such further planning for the site. Allowing for separate access driveways also ensures the traffic impacts on the surrounding road network are mitigated as best possible, with distribution able to be better managed.

3.4.2. Distribution and Assignment

The directional distribution and assignment of traffic generated by the planning proposal will be influenced by a number of factors, including the:

- configuration of the arterial road network in the immediate vicinity of the site
- existing operation of intersections providing access between the local and arterial road network
- distribution of households in the vicinity of the site
- surrounding employment centres, retail centres and schools in relation to the site (for residential uses)
- likely distribution of employee and visitor residences in relation to the site (for commercial and retail uses)
- configuration of access points to the site.

Surrounding local road network constraints can also influence traffic routes to and from the site.

The Chester Square TIA indicates that the trip distribution estimated for the site was determined with reference to 2016 Journey to Work data and travel patterns from the existing traffic flows within the study area. Based on this, the Chester Square TIA is understood to have assessed the following directional distribution of development traffic:

- North via Bent Street: 62 per cent
- East via Waldron Road: 38 per cent.

While there is an obvious residential catchment north and east of the site, the catchment south of the site is arguably equal or larger. Connections with key roads in and out of the local area should also be considered when assigning development traffic.

Clearly development traffic would use Waldron Road to travel east and west north of the railway line, and Chester Hill Road to travel access residential areas and the Hume Highway further to the south. As

discussed, with limited crossings of the railway line, Chester Hill Road will be a key traffic route used by future residents and customers.

Considering the limited storage capacity for the right turn from Waldron Road to Chester Hill Road, this will likely have a reasonably significant impact on the SIDRA model results. Further to this, although the Chester Square TIA states that the existing traffic volumes were used to estimate the likely future distribution of traffic, the assumed distribution of 62 per cent north and 38 per cent east goes against the distribution that existing traffic volumes suggest (i.e. in the AM, PM and Saturday peak hours, traffic volumes at the Bent Street access all indicate more vehicles exit to the south than north). There was also no distribution of development traffic via Chester Hill Road. This does not reflect existing (or future) likely travel patterns through the area.

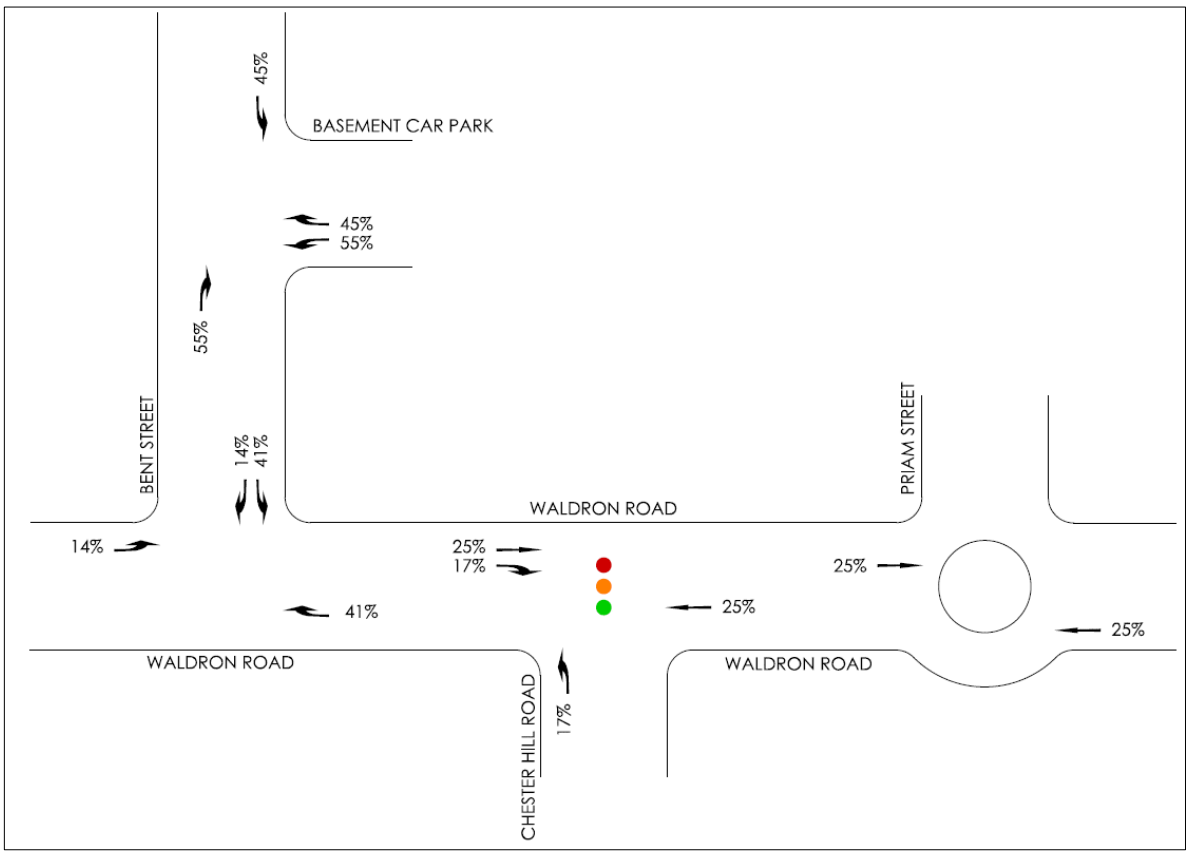
As discussed, the proposal would also trigger the need for more than one access for the proposed uses, with the Chester Square TIA assessing all traffic entering/ exiting via an indicative Bent Street access. Providing secondary accesses on Leicester Street and Priam Street would further effect traffic distribution, with this likely increasing traffic volumes on the minor approach to the Priam Street intersection and possibly reducing through traffic along Waldron Road. Further assessment of this is recommended as part of the planning proposal.

GTA has completed an analysis of the existing traffic volumes detailed in Section 3.4.2 of the Chester Square TIA and represent a more considered traffic distribution based on the single access on Bent Street. This is as follows:

- to/ from the north at Bent Street access: 45% of development traffic
- to/ from the south at Bent Street access: 55% of development traffic
    - to/ from the west at the Bent Street/ Waldron Road intersection: 25% of development traffic through this intersection
    - to/ from the east at the Bent Street/ Waldron Road intersection: 75% of development traffic through this intersection
        - to/ from the east at the Waldron Road/ Chester Hill Road intersection: 40% of development traffic through this intersection
        - to/ from the east at the Waldron Road/ Chester Hill Road intersection: 60% of development traffic through this intersection
            - to/ from the east at the Waldron Road/ Priam Street intersection: 100% of development traffic through this intersection.

Based on the above analysis, the traffic distribution shown in Figure 3.1 is considered more appropriate for assessing development traffic, albeit while maintaining the assumption of just a single site access on Bent Street (which is impractical in itself).

Figure 3.1: Potential directional distribution



The arrival and departure distibution detailed in Table 6 of the Chester Square TIA is consistent with industry standards and appropriate for assessing the planning proposal.

3.4.3. Traffic Impact

The Chester Square TIA has completed an assessment of the operation of key intersections in 2021 (anticipated opening year) based on data from the Strategic Traffic Forecasting Model (STFM). As discussed in Section 3.2, it is unclear whether modelling completed in the Chester Square TIA for existing conditions was calibrated to conditions observed on site and therefore SIDRA modelling results for future conditions may therefore not be valid. The STFM data shown in Appendix A of the Chester Square TIA seems to relate to traffic growth rates to 2026 rather than 2021. Clarification as to the reason behind using 2026 growth rates as opposed to a year closer to the 2021 opening year should be provided in this regard.

It also noted the Chester Square TIA indicates that some critical turning movements including the left turn from Chester Hill Road to Waldron Road and the right turn from Waldron Road to Chester Hill Road decrease significantly between the existing traffic volumes and “2021 with development” traffic volumes despite STFM data indicating growth along these sections of the road network. Clarification should be provided on the growth rates used, with the Chester Square TIA updated if required based on the corrected “2021 no development” traffic volumes.

For the purposes of the peer review, GTA has estimated the “2021 no development” traffic volumes assumed in the Chester Square TIA by subtracting the assumed distribution of traffic generated by the development from the traffic volumes outlined in Section 5.4.1 of the Chester Square TIA. Following this, GTA has estimated the “2021 with development” traffic volumes through the key intersections based on the

recommended distribution outlined in Figure 3.1 and the 1,123, 1,638 and 1,950 trips estimated for the Planning Proposal in the AM, PM and Saturday peak hours respectively. The anticipated traffic volumes through the three Waldron Road intersections have been assessed in the SIDRA network model, with results summarised in Table 3.4.

Table 3.4: 2021 with development operating conditions

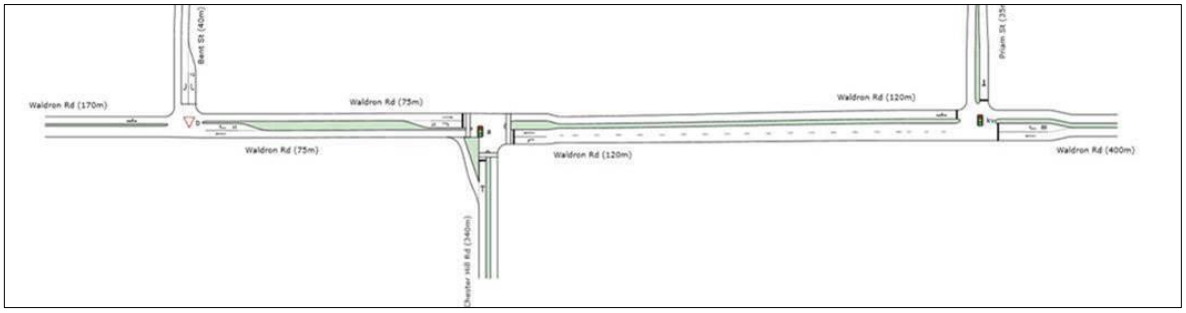
Intersection	Peak	Leg	Degree of Saturation (DOS)	Average Delay (sec)	Average Queue (m)	Level of Service (LOS)
Waldron Road/ Bent Street	AM	East	0.64	14	23	A
		North	0.70	56	9	D
		West	0.42	4	5	A
	PM	East	0.64	14	23	A
		North	0.52	46	6	D
		West	0.41	4	13	A
	Saturday	East	0.43	10	7	A
		North	0.61	44	8	D
		West	0.39	4	21	A
Chester Hill Road/ Waldron Road	AM	South	0.75	20	35	B
		East	0.78	20	90	B
		West	0.84	17	70	B
		Overall	**0.84**	**19**	**90**	**B**
	PM	South	0.87	22	58	B
		East	0.77	17	91	B
		West	0.86	17	70	B
		Overall	**0.87**	**18**	**91**	**B**
	Saturday	South	0.88	23	31	B
		East	0.79	16	100	B
		West	0.88	19	70	B
		Overall	**0.88**	**19**	**100**	**B**
Waldron Road/ Priam Street	AM	East	0.82	10	20	A
		North	0.51	18	11	B
		West	0.71	9	22	A
	PM	East	1.31	296	506	F
		North	0.60	23	14	B
		West	0.75	9	26	A
	Saturday	East	1.31	290	495	F
		North	0.545	21	12	B
		West	0.74	9	26	A

Table 3.4 indicates that the Waldron Road/ Priam Street roundabout would be over capacity in the PM and Saturday peak hours in 2021 with the anticipated increase in traffic associated with the development, with significant delays on the east approach to the intersection. The other intersections are expected to operate within their capacity and a satisfactory LOS (LOS D or better) in the AM and PM peak hours, however the SIDRA models indicate that there would be latent demand whereby vehicles are not able to enter the model due to congestion at the roundabout.

3.4.4. Mitigation Measures

To offset the impact of the development traffic on the surrounding road network, the Chester Square TIA investigated the impact of upgrading the Waldron Road/ Priam Street roundabout to traffic signals. The SIDRA model that was assessed is shown in Figure 3.2.

Figure 3.2: Chester Square TIA Waldron Road mitigated layout



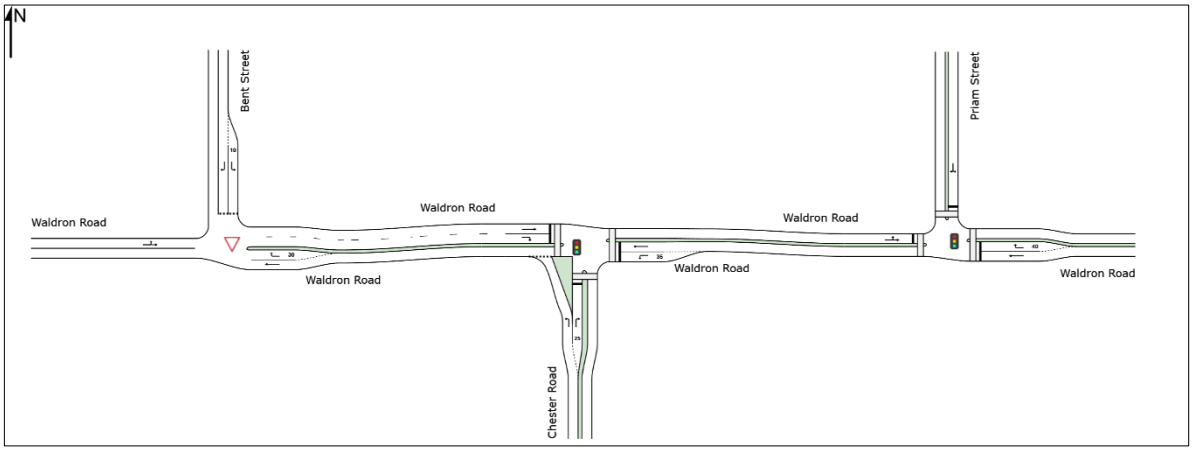
Source: Transport Impact Assessment, Mixed Use Development Planning Proposal, 1 Leicester Street Chester Hill, prepared by Ason Group dated 2 August 2019

Section 2.4 of the Transport for NSW Traffic Signal Design guidelines states that a signalised marked foot crossing must be provided on each leg of a signalised intersection, whereas the proposed mitigated layout included in the Chester Square TIA does not included any marked foot crossings on any of the approaches. This will ultimately result in more favourable modelling results in SIDRA though we note uncertainty as to any such specific reasons for omitting the crossings.

Preliminary SIDRA modelling was completed on the proposed mitigated layout with the inclusion of the marked foot crossings at the Waldron Road/ Priam Street intersection based on the anticipated distribution discussed in Section 3.4.2 of this assessment The results indicate that the Waldron Road/ Chester Hill Road intersection would exceed its capacity. However, modelling indicates that a satisfactory level of service could potentially be achieved by lengthening the right turn bay from Waldron Road to Chester Hill Road to extend to Bent Street to increase its capacity. This would likely result in the loss of around 10 on-street parking spaces on the northern side of Waldron Road. The existing arrangement for the left turn lane from Waldron Road to Chester Hill Road was also maintained for the modelling, whereas this was extended in the Chester Square TIA.

The tested mitigated layout for Waldron Road is shown in Figure 3.3.

Figure 3.3: Waldron Road mitigated layout



3.4.5. Traffic Analysis Summary

While it is acknowledged that the modelling completed in the Chester Square TIA is high level at this stage given the project is at a Planning Proposal stage, it is recommended that the analysis be reviewed and updated as required to address the following items:

- Traffic generation estimates for the site do not seem to consider the existing staff car park accessed off Priam Street, which accounts for around nine per cent of the existing car parking supply for the site.
- While it is recognised that the project is at a Planning Proposal stage, the indicative location and quantum of site accesses and supporting traffic modelling does not seem to provide an appropriate level of detail to adequately assess the traffic impact of the Planning Proposal.
- The anticipated distribution of traffic does not seem to align with surveyed traffic volumes at the surrounding key intersections.
- 2026 STFM data looks to have been used to calculated 2021 traffic volumes.
- Some traffic volumes for critical movements at intersections decrease in the "2021 with development" scenario when compared to existing conditions (e.g. turns between Waldron Road and Chester Hill Road. The Chester Square TIA should be reviewed to ensure "2021 without development" traffic volumes through the surrounding key intersections are correct.
- SIDRA modelling for existing conditions does not seem to reflect site observations and therefore the future conditions modelling is unlikely to be calibrated either.
- Modelled mitigation measures for the Priam Street/ Waldron Road do not align with Transport for NSW requirements for signalised intersections.

4. OTHER CONSIDERATIONS

04

4.1. Waldron Road Pedestrianisation Concept

Place Design Group completed an Urban Design Review of the Planning Proposal dated 7 February 2020, with one of the recommendations including revitalisation of the public realm. The Urban Design review recommends the possible narrowing of Waldron Road and expanding of the pedestrian area to allow for a range of uses and events to occur such as outdoor dining.

The concept explores limiting private vehicle access to the eastern end of the Chester Hill Centre while still allowing buses along the full length via an at-grade plaza space with bus shelters as demonstrated in Figure 4.1.

Figure 4.1: Recommended reconfiguration of Waldron Road

Base image source: Chester Hill Planning Proposal Urban Design Review prepared by Place Design Group dated 7 February 2020

From a transport perspective, it is understood that the vision is for Waldron Road to be modified to a shared zone for a section of the road between Chester Hill Road and Priam Street, with this section of road only able to be used by buses.

GTA support the recommendation for the widening of the pedestrianised area between Frost Lane and Waldron Road through property acquisition of the Australia Post site, as this would greatly improve pedestrian amenity and reinforce a strong desire line between the railway station and the Chester Square Shopping Centre. That said, the recommended vision for Waldron Road would require significantly more detailed analysis to determine its feasibility. As mentioned in the Urban Design Review, "*Previous planning documents as well as current planning controls all emphasis the importance of Waldron Road as the 'main street' of Chester Hill*". This is highlighted by its classification as a Regional Road and being the key east-west road in the area, providing connection between Woodville Road to the west and the Hume Highway and Olympic Drive to the east via various other Regional Roads.

Considering this, closing off a section of Waldron Road to create a pedestrianised area goes against its intended function as a key collector road. As a result, local roads including residential street surrounding the Centre would likely see a significant increase in traffic volumes, as through vehicle traffic would be diverted around the Centre onto Priam Street, Leicester Street and Bent Street or via Hector Street, Wellington Road and Chester Hill Road to the south of the rail line. This would likely have significant impacts to travel times for

vehicles travelling through Chester Hill, as well as negatively impact operation of lower order local intersections which have not been designed to accommodate high traffic volumes.

In addition, the recommended conversion of the section of Waldron Road to a shared zone would not meet Transport for NSW requirements, as shared zones are not permitted to be located along bus routes.

In order to fully assess the feasibility of closing the section of Waldron Road to general traffic, further detailed analysis would be required which would likely include a microsimulation traffic model of the town centre and origin-destination analysis to understand the likely diversion routes of traffic to surrounding roads.

While a shared zone/ partial road closure treatment along this section of Waldron Road requires further investigation, some other measures which could be implemented to slow traffic through Chester Hill town centre and improve pedestrian amenity generally may include the following:

- Implement 40km/h high pedestrian activity area (subject to TfNSW criteria).
- Improve and expand the public domain and pedestrian amenity to shift the priority away from vehicle movement and more towards pedestrians (and cyclists).
- Improve on-street parking (perhaps with indented bays and landscaping) with limits on available manoeuvring to create more 'friction', regulate vehicle speed and reduce through traffic convenience.
- Reduce on-street parking duration of stay limits to increase parking turnover and further contribute to traffic 'friction'. Longer duration of stay parking would remain available in a redeveloped Chester Square shopping centre.
- Consider opportunities to limit travel lane widths while improving pedestrian and cyclist amenity. Minimum 3.2-metre-wide travel lanes are required for bus routes.
- Incentivise active retail frontages to further encourage pedestrian activity and north-south movement.

4.2. Potential Alternative Access Arrangements

In reviewing the plans for the Planning Proposal, it is also understood that the loading dock arrangement through the site results in a level of constraint with vehicle access while the intent of having residential and commercial frontages along Leicester Street and Priam Street is acknowledge. That said, the residential component of the site is anticipated to generate up to 162 trips in a peak hour which is about a third of the traffic generated by the site on Leicester Street on a Saturday. Considering this, revising the site access arrangement to provide the residential access on Leicester Street would lessen the concentration of traffic around the proposed Bent Street access while still reducing existing traffic along Leicester Street by up to 66 per cent in a peak hour and maintaining the intended function of the road as a local residential street.

As stated previously, traffic generation associated with the retail component of the site is expected to require at least two site accesses. If one was provided on Bent Street and the other was provided on Priam Street, this would allow better distribution of traffic around the Centre, while also reducing the impact on the existing Waldron Road/ Chester Hill Road intersection as any vehicle trips to/from the east would be able to use the Priam Street access without having travel through the Waldron Road/ Chester Hill Road intersection. This also aligns with the intent to create a more pedestrianised area between Chester Hill Centre and Chester Hill Station.

5. CONCLUSIONS AND RECOMMENDATIONS

05

5.1. Summary

GTA has completed a transport review of the Transport Impact Assessment prepared by Ason Group dated 2 August 2019 for the Chester Square Planning Proposal. The purpose of the review is to objectively consider the impact of future traffic generation, parking demand and accessibility characteristics of the proposal. The review is to inform Council of any potential shortcomings in the Chester Square TIA which should be further investigated in the Planning Proposal or Development Application for the site, as well as provide recommendations for broader traffic and transport aspects that should be further considered as part of detail planning for the precinct.

The three key items for the project are considered to be the following:

1. the proposed site layout and vehicle access points
2. traffic distribution and traffic modelling
3. the incorporation of the site and its public domain with the surrounding precinct.

In summary, the following conclusions and recommendations are made:

- Existing SIDRA modelling is recommended to be updated and calibrated against current operating conditions, with these models then to be used for future conditions modelling.
- The proposal will likely generate a DCP 2015 car parking requirement of between 1,300 and 1,400 spaces, with there being potential for this provision to be decreased through implementation of sustainable travel initiatives and shared use of parking spaces between the various land uses.
- It is recommended that traffic generation estimates for the site be updated to consider the existing staff car park accessed off Priam Street, considering this accounts for around nine per cent of the existing car parking supply for the site.
- The traffic generation estimates for the residential and commercial components of the site are considered appropriate given the location of the site.
- It is recommended that the anticipated distribution of traffic be updated to reflect the existing distribution of traffic at the key surveyed intersections.
- While it is recognised that the project is at a Planning Proposal stage, the indicative location and quantum of site accesses and supporting traffic modelling does not seem to provide an appropriate level of detail to adequately assess the traffic impact of the Planning Proposal.
- It is unclear how “2021 without development” traffic volumes were calculated, as it seems that some turning movements at key intersections reduce when compared with existing turning movements despite STFM data indicating increased traffic growth.
- Clarification should be provided as to the reason behind using 2026 STFM growth rates for calculating 2021 future traffic volumes.
- The adopted arrival and departure split of traffic for the proposed land uses is considered appropriate.
- Modelled mitigation measures for the Priam Street/ Waldron Road do not align with Transport for NSW requirements for signalised intersections.
- Preliminary SIDRA modelling indicates that with upgrading of the Priam Street/ Waldron Road intersection and lengthening of turning bays, the additional traffic generated could potentially be accommodated on the surrounding network, subject to clarification of the above concerns and recommendations.
- While the intent of Waldron Road pedestrianisation concept recommended in the Place Design Group Urban Design Review of the Planning Proposal is acknowledged, the recommendation does not align

with the intended function of Waldron Road and further detailed analysis such as microsimulation traffic modelling would likely be required to support such a proposal.

- It is recommended the location of the access points be further refined to better understand the likely traffic distribution of traffic around the site.

A.SIDRA MODELLING RESULTS

A

USER REPORT FOR NETWORK SITE

Project: 200212sid-N183790 Chester Square Planning Proposal - Peer Review

Template: Default Site User Report

Site: [Chester Hill Road/ Waldron Road - AM Ex]

Network: 7 [Existing AM]

Site Category: -
Signals - Fixed Time Isolated Cycle Time = 80 seconds (Site User-Given Cycle Time)

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

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Chester Road														
1	L2	356	2.0	356	2.0	0.361	8.5	LOS A	2.9	20.8	0.46	0.67	0.46	37.6
3	R2	157	2.0	157	2.0	0.685	43.8	LOS D	3.9	27.6	1.00	0.85	1.11	18.4
Approach		513	2.0	513	2.0	0.685	19.3	LOS B	3.9	27.6	0.63	0.72	0.66	28.6
East: Waldron Road														
4	L2	98	2.0	98	2.0	0.087	11.3	LOS A	0.9	6.7	0.43	0.65	0.43	36.9
5	T1	456	2.0	456	2.0	0.626	19.6	LOS B	8.4	60.1	0.82	0.72	0.82	16.0
Approach		554	2.0	554	2.0	0.626	18.1	LOS B	8.4	60.1	0.75	0.71	0.75	21.3
West: Waldron Road														
11	T1	565	2.0	565	2.0	0.680	5.4	LOS A	5.7	40.4	0.46	0.41	0.46	26.2
12	R2	241	2.0	241	2.0	0.382	18.4	LOS B	3.8	27.3	0.75	0.77	0.75	30.4
Approach		806	2.0	806	2.0	0.680	9.3	LOS A	5.7	40.4	0.55	0.52	0.55	29.0
All Vehicles		1873	2.0	1873	2.0	0.685	14.7	LOS B	8.4	60.1	0.63	0.63	0.64	26.6

Site Level of Service (LOS) Method: Delay (RTA NSW). 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.

Site: [Waldron Road/ Bent Street - AM Ex]

Network: 7 [Existing AM]

Site Category: -
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Waldron Road														
5	T1	702	2.0	702	2.0	0.368	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
6	R2	100	2.0	100	2.0	0.121	8.4	LOS A	0.2	1.3	0.57	0.74	0.57	35.3
Approach		802	2.0	802	2.0	0.368	1.1	NA	0.2	1.3	0.07	0.09	0.07	45.4
North: Bent Street														
7	L2	135	2.0	135	2.0	0.159	8.0	LOS A	0.3	2.0	0.59	0.75	0.59	34.7
9	R2	11	2.0	11	2.0	0.054	22.8	LOS B	0.1	0.5	0.84	0.93	0.84	23.4
Approach		145	2.0	145	2.0	0.159	9.0	LOS A	0.3	2.0	0.61	0.76	0.61	33.3
West: Waldron Road														
10	L2	75	2.0	75	2.0	0.392	4.3	LOS A	0.0	0.0	0.00	0.05	0.00	47.4
11	T1	676	2.0	676	2.0	0.392	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	46.2
Approach		751	2.0	751	2.0	0.392	0.4	NA	0.0	0.0	0.00	0.05	0.00	46.6
All Vehicles		1698	2.0	1698	2.0	0.392	1.5	NA	0.3	2.0	0.09	0.13	0.09	43.3

Site Level of Service (LOS) Method: Delay (RTA NSW). 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.

Site Category: -
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Waldron Road														
5	T1	454	2.0	454	2.0	0.556	4.9	LOS A	2.1	15.0	0.54	0.57	0.54	40.9
6	R2	193	2.0	193	2.0	0.556	7.8	LOS A	2.1	15.0	0.54	0.57	0.54	44.9
6u	U	8	2.0	8	2.0	0.556	9.1	LOS A	2.1	15.0	0.54	0.57	0.54	44.8
Approach		655	2.0	655	2.0	0.556	5.8	LOS A	2.1	15.0	0.54	0.57	0.54	42.8
North: Priam Street														
7	L2	195	2.0	195	2.0	0.447	10.1	LOS A	1.4	10.2	0.85	0.87	0.89	42.2
9	R2	107	2.0	107	2.0	0.447	12.4	LOS A	1.4	10.2	0.85	0.87	0.89	38.6
9u	U	1	2.0	1	2.0	0.447	13.8	LOS A	1.4	10.2	0.85	0.87	0.89	43.4
Approach		303	2.0	303	2.0	0.447	10.9	LOS A	1.4	10.2	0.85	0.87	0.89	41.3
West: Waldron Road														
10	L2	114	2.0	114	2.0	0.671	6.7	LOS A	2.6	18.2	0.58	0.63	0.60	42.7
11	T1	587	2.0	587	2.0	0.671	6.2	LOS A	2.6	18.2	0.58	0.63	0.60	42.4
12u	U	21	2.0	21	2.0	0.671	10.4	LOS A	2.6	18.2	0.58	0.63	0.60	29.6
Approach		722	2.0	722	2.0	0.671	6.4	LOS A	2.6	18.2	0.58	0.63	0.60	42.3
All Vehicles		1680	2.0	1680	2.0	0.671	7.0	LOS A	2.6	18.2	0.61	0.65	0.63	42.3

Site Level of Service (LOS) Method: Delay (RTA NSW). 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.
Roundabout Capacity Model: SIDRA Standard.
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.

USER REPORT FOR NETWORK SITE

Project: 200212sid-N183790 Chester Square Planning Proposal - Peer Review

Template: Default Site User Report

Site: [Waldron Road/ Bent Street - PM Ex]

Network: 6 [Existing PM]

Site Category: -
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Waldron Road														
5	T1	893	2.0	893	2.0	0.466	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
6	R2	180	2.0	180	2.0	0.218	8.7	LOS A	0.4	2.6	0.60	0.78	0.60	35.0
Approach		1073	2.0	1073	2.0	0.466	1.5	NA	0.4	2.6	0.10	0.13	0.10	44.1
North: Bent Street														
7	L2	172	2.0	172	2.0	0.205	8.1	LOS A	0.4	2.7	0.60	0.77	0.60	34.5
9	R2	22	2.0	22	2.0	0.174	34.6	LOS C	0.2	1.6	0.91	0.97	0.93	18.7
Approach		194	2.0	194	2.0	0.205	11.2	LOS A	0.4	2.7	0.64	0.79	0.64	30.9
West: Waldron Road														
10	L2	68	2.0	68	2.0	0.393	4.3	LOS A	0.0	0.0	0.00	0.05	0.00	47.5
11	T1	684	2.0	684	2.0	0.393	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	46.5
Approach		753	2.0	753	2.0	0.393	0.4	NA	0.0	0.0	0.00	0.05	0.00	46.8
All Vehicles		2019	2.0	2019	2.0	0.466	2.0	NA	0.4	2.7	0.11	0.16	0.11	41.8

Site Level of Service (LOS) Method: Delay (RTA NSW). 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.

Site: [Chester Hill Road/ Waldron Road - PM Ex]

Network: 6 [Existing PM]

Site Category: -
Signals - Fixed Time Isolated Cycle Time = 80 seconds (Site User-Given Cycle Time)

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

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Chester Road														
1	L2	499	2.0	499	2.0	0.628	11.7	LOS A	6.1	43.3	0.65	0.75	0.65	34.4
3	R2	139	2.0	139	2.0	0.759	47.2	LOS D	3.6	25.7	1.00	0.90	1.24	17.5
Approach		638	2.0	638	2.0	0.759	19.5	LOS B	6.1	43.3	0.72	0.78	0.78	28.5
East: Waldron Road														
4	L2	151	2.0	151	2.0	0.134	11.5	LOS A	1.5	10.7	0.45	0.66	0.45	36.7
5	T1	587	2.0	587	2.0	0.806	23.9	LOS B	12.7	90.5	0.87	0.85	0.98	13.9
Approach		738	2.0	738	2.0	0.806	21.4	LOS B	12.7	90.5	0.78	0.81	0.87	19.9
West: Waldron Road														
11	T1	555	2.0	555	2.0	0.735	5.9	LOS A	5.5	39.2	0.42	0.39	0.44	25.2
12	R2	304	2.0	304	2.0	0.529	23.9	LOS B	5.7	40.3	0.87	0.86	0.97	27.5
Approach		859	2.0	859	2.0	0.735	12.3	LOS A	5.7	40.3	0.58	0.56	0.63	26.8
All Vehicles		2235	2.0	2235	2.0	0.806	17.3	LOS B	12.7	90.5	0.69	0.71	0.75	25.2

Site Level of Service (LOS) Method: Delay (RTA NSW). 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.

Site Category: -
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Waldron Road														
5	T1	562	2.0	562	2.0	0.900	11.1	LOS A	5.3	37.5	0.74	0.76	0.96	35.8
6	R2	221	2.0	221	2.0	0.900	13.9	LOS A	5.3	37.5	0.74	0.76	0.96	41.9
6u	U	14	2.0	14	2.0	0.900	15.3	LOS B	5.3	37.5	0.74	0.76	0.96	41.5
Approach		797	2.0	797	2.0	0.900	12.0	LOS A	5.3	37.5	0.74	0.76	0.96	38.5
North: Priam Street														
7	L2	234	2.0	234	2.0	0.588	12.5	LOS A	2.0	14.5	0.88	0.98	1.09	40.9
9	R2	118	2.0	118	2.0	0.588	14.9	LOS B	2.0	14.5	0.88	0.98	1.09	36.8
9u	U	6	2.0	6	2.0	0.588	16.2	LOS B	2.0	14.5	0.88	0.98	1.09	42.2
Approach		358	2.0	358	2.0	0.588	13.4	LOS A	2.0	14.5	0.88	0.98	1.09	39.9
West: Waldron Road														
10	L2	47	2.0	47	2.0	0.648	7.2	LOS A	2.3	16.3	0.61	0.68	0.65	42.2
11	T1	537	2.0	537	2.0	0.648	6.7	LOS A	2.3	16.3	0.61	0.68	0.65	41.9
12u	U	47	2.0	47	2.0	0.648	10.9	LOS A	2.3	16.3	0.61	0.68	0.65	28.6
Approach		632	2.0	632	2.0	0.648	7.1	LOS A	2.3	16.3	0.61	0.68	0.65	41.5
All Vehicles		1786	2.0	1786	2.0	0.900	10.5	LOS A	5.3	37.5	0.72	0.77	0.88	39.7

Site Level of Service (LOS) Method: Delay (RTA NSW). 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.
Roundabout Capacity Model: SIDRA Standard.
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.

USER REPORT FOR NETWORK SITE

Project: 200212sid-N183790 Chester Square Planning Proposal - Peer Review

Template: Default Site User Report

Site: [Waldron Road/ Bent Street - Sat Ex]

Network: 11 [Existing Sat]

Site Category: -
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Waldron Road														
5	T1	729	2.0	729	2.0	0.382	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
6	R2	123	2.0	123	2.0	0.142	8.2	LOS A	0.2	1.6	0.55	0.73	0.55	35.6
Approach		853	2.0	853	2.0	0.382	1.2	NA	0.2	1.6	0.08	0.11	0.08	45.0
North: Bent Street														
7	L2	207	2.0	207	2.0	0.232	7.8	LOS A	0.4	3.1	0.59	0.75	0.59	34.9
9	R2	32	2.0	32	2.0	0.163	23.8	LOS B	0.2	1.6	0.86	0.94	0.86	22.9
Approach		239	2.0	239	2.0	0.232	9.9	LOS A	0.4	3.1	0.63	0.78	0.63	32.3
West: Waldron Road														
10	L2	85	2.0	85	2.0	0.374	4.3	LOS A	0.0	0.0	0.00	0.06	0.00	47.2
11	T1	631	2.0	631	2.0	0.374	0.0	LOS A	0.0	0.0	0.00	0.06	0.00	45.5
Approach		716	2.0	716	2.0	0.374	0.5	NA	0.0	0.0	0.00	0.06	0.00	46.1
All Vehicles		1807	2.0	1807	2.0	0.382	2.1	NA	0.4	3.1	0.12	0.18	0.12	41.6

Site Level of Service (LOS) Method: Delay (RTA NSW). 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.

Site: [Chester Hill Road/ Waldron Road - Sat Ex]

Network: 11 [Existing Sat]

Site Category: -
Signals - Fixed Time Isolated Cycle Time = 80 seconds (Site User-Given Cycle Time)

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

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Chester Road														
1	L2	319	2.0	319	2.0	0.352	9.6	LOS A	2.9	20.9	0.50	0.68	0.50	36.5
3	R2	155	2.0	155	2.0	0.751	46.1	LOS D	4.0	28.3	1.00	0.89	1.21	17.8
Approach		474	2.0	474	2.0	0.751	21.5	LOS B	4.0	28.3	0.67	0.75	0.73	27.3
East: Waldron Road														
4	L2	142	2.0	142	2.0	0.122	10.6	LOS A	1.3	9.4	0.42	0.65	0.42	37.4
5	T1	548	2.0	548	2.0	0.722	18.7	LOS B	10.3	73.2	0.83	0.74	0.84	16.5
Approach		691	2.0	691	2.0	0.722	17.1	LOS B	10.3	73.2	0.74	0.72	0.75	22.7
West: Waldron Road														
11	T1	565	2.0	565	2.0	0.712	5.0	LOS A	5.5	38.9	0.44	0.39	0.44	27.2
12	R2	257	2.0	257	2.0	0.458	21.0	LOS B	4.6	32.8	0.83	0.80	0.83	29.0
Approach		822	2.0	822	2.0	0.712	10.0	LOS A	5.5	38.9	0.56	0.52	0.56	28.4
All Vehicles		1986	2.0	1986	2.0	0.751	15.2	LOS B	10.3	73.2	0.65	0.64	0.67	26.1

Site Level of Service (LOS) Method: Delay (RTA NSW). 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.

Site: [Waldron Road/ Priam Street - Sat Ex]

Network: 11 [Existing Sat]

Site Category: -
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Waldron Road														
5	T1	528	2.0	528	2.0	0.710	5.5	LOS A	2.9	20.3	0.67	0.62	0.67	40.4
6	R2	224	2.0	224	2.0	0.710	8.3	LOS A	2.9	20.3	0.67	0.62	0.67	44.6
6u	U	13	2.0	13	2.0	0.710	9.7	LOS A	2.9	20.3	0.67	0.62	0.67	44.5
Approach		765	2.0	765	2.0	0.710	6.4	LOS A	2.9	20.3	0.67	0.62	0.67	42.4
North: Priam Street														
7	L2	235	2.0	235	2.0	0.494	10.2	LOS A	1.6	11.6	0.84	0.88	0.92	42.1
9	R2	106	2.0	106	2.0	0.494	12.6	LOS A	1.6	11.6	0.84	0.88	0.92	38.6
9u	U	1	2.0	1	2.0	0.494	13.9	LOS A	1.6	11.6	0.84	0.88	0.92	43.4
Approach		342	2.0	342	2.0	0.494	11.0	LOS A	1.6	11.6	0.84	0.88	0.92	41.4
West: Waldron Road														
10	L2	52	2.0	52	2.0	0.609	6.8	LOS A	2.0	14.2	0.58	0.65	0.60	42.5
11	T1	505	2.0	505	2.0	0.609	6.3	LOS A	2.0	14.2	0.58	0.65	0.60	42.2
12u	U	52	2.0	52	2.0	0.609	10.5	LOS A	2.0	14.2	0.58	0.65	0.60	29.3
Approach		608	2.0	608	2.0	0.609	6.7	LOS A	2.0	14.2	0.58	0.65	0.60	41.8
All Vehicles		1716	2.0	1716	2.0	0.710	7.4	LOS A	2.9	20.3	0.67	0.68	0.69	41.9

Site Level of Service (LOS) Method: Delay (RTA NSW). 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.
Roundabout Capacity Model: SIDRA Standard.
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.

USER REPORT FOR NETWORK SITE

Project: 200212sid-N183790 Chester Square Planning Proposal - Peer Review

Template: Default Site User Report

Site: [Waldron Road/ Bent Street - AM Fut]

Network: 3 [Future AM]

Site Category: -
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Waldron Road														
5	T1	729	2.0	729	2.0	0.382	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
6	R2	292	2.0	292	2.0	0.383	10.6	LOS A	0.8	5.7	0.68	0.92	0.85	33.1
Approach		1021	2.0	1021	2.0	0.383	3.0	NA	0.8	5.7	0.20	0.26	0.24	40.3
North: Bent Street														
7	L2	312	2.0	312	2.0	0.763	16.5	LOS B	1.6	11.4	0.67	1.21	1.57	26.1
9	R2	97	2.0	97	2.0	0.679	53.7	LOS D	1.2	8.8	0.96	1.17	1.61	14.1
Approach		408	2.0	408	2.0	0.763	25.3	LOS B	1.6	11.4	0.74	1.20	1.58	21.2
West: Waldron Road														
10	L2	107	2.0	107	2.0	0.424	4.3	LOS A	0.7	4.7	0.00	0.07	0.00	47.1
11	T1	703	2.0	703	2.0	0.424	0.0	LOS A	0.7	4.7	0.00	0.07	0.00	45.1
Approach		811	2.0	811	2.0	0.424	0.6	NA	0.7	4.7	0.00	0.07	0.00	45.9
All Vehicles		2240	2.0	2240	2.0	0.763	6.2	NA	1.6	11.4	0.22	0.37	0.40	32.9

Site Level of Service (LOS) Method: Delay (RTA NSW). 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.

Site: [Chester Hill Road/ Waldron Road - AM Fut]

Network: 3 [Future AM]

Site Category: -
Signals - Fixed Time Isolated Cycle Time = 80 seconds (Site User-Given Cycle Time)

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

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Chester Road														
1	L2	420	2.0	420	2.0	0.548	11.6	LOS A	4.9	34.7	0.61	0.73	0.61	34.5
3	R2	138	2.0	138	2.0	0.753	47.1	LOS D	3.6	25.4	1.00	0.90	1.23	17.5
Approach		558	2.0	558	2.0	0.753	20.4	LOS B	4.9	34.7	0.71	0.77	0.77	28.0
East: Waldron Road														
4	L2	101	2.0	101	2.0	0.088	10.9	LOS A	0.9	6.7	0.42	0.64	0.42	37.2
5	T1	612	2.0	612	2.0	0.777	21.4	LOS B	12.6	89.7	0.87	0.82	0.93	15.0
Approach		713	2.0	713	2.0	0.777	19.9	LOS B	12.6	89.7	0.80	0.79	0.85	19.4
West: Waldron Road														
11	T1	718	2.0	718	2.0	0.842	14.5	LOS A	9.8	70.0	0.47	0.54	0.62	14.6
12	R2	292	2.0	292	2.0	0.524	24.0	LOS B	5.5	39.2	0.88	0.85	0.95	27.4
Approach		1009	2.0	1009	2.0	0.842	17.2	LOS B	9.8	70.0	0.59	0.63	0.71	21.3
All Vehicles		2280	2.0	2280	2.0	0.842	18.9	LOS B	12.6	89.7	0.69	0.72	0.77	22.9

Site Level of Service (LOS) Method: Delay (RTA NSW). 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.

Site: [Waldron Road/ Priam Street - AM Fut]

Network: 3 [Future AM]

Site Category: -
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Waldron Road														
5	T1	609	2.0	609	2.0	0.814	5.4	LOS A	2.8	19.6	0.61	0.59	0.62	40.9
6	R2	112	2.0	112	2.0	0.814	8.3	LOS A	2.8	19.6	0.61	0.59	0.62	44.9
6u	U	8	2.0	8	2.0	0.814	9.6	LOS A	2.8	19.6	0.61	0.59	0.62	44.8
Approach		729	2.0	729	2.0	0.814	5.9	LOS A	2.8	19.6	0.61	0.59	0.62	42.0
North: Priam Street														
7	L2	142	2.0	142	2.0	0.504	14.1	LOS A	1.6	11.4	0.93	0.97	1.08	40.0
9	R2	112	2.0	112	2.0	0.504	16.4	LOS B	1.6	11.4	0.93	0.97	1.08	35.5
9u	U	1	2.0	1	2.0	0.504	17.7	LOS B	1.6	11.4	0.93	0.97	1.08	41.4
Approach		255	2.0	255	2.0	0.504	15.1	LOS B	1.6	11.4	0.93	0.97	1.08	38.6
West: Waldron Road														
10	L2	93	2.0	93	2.0	0.708	5.7	LOS A	3.1	22.1	0.52	0.54	0.52	43.0
11	T1	741	2.0	741	2.0	0.708	5.2	LOS A	3.1	22.1	0.52	0.54	0.52	42.8
12u	U	22	2.0	22	2.0	0.708	9.3	LOS A	3.1	22.1	0.52	0.54	0.52	30.3
Approach		856	2.0	856	2.0	0.708	5.3	LOS A	3.1	22.1	0.52	0.54	0.52	42.7
All Vehicles		1840	2.0	1840	2.0	0.814	6.9	LOS A	3.1	22.1	0.61	0.62	0.64	41.6

Site Level of Service (LOS) Method: Delay (RTA NSW). 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.
Roundabout Capacity Model: SIDRA Standard.
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.

USER REPORT FOR NETWORK SITE

Project: 200212sid-N183790 Chester Square Planning Proposal - Peer Review

Template: Default Site User Report

Site: [Waldron Road/ Bent Street - PM Fut]

Network: 5 [Future PM]

Site Category: -
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Aver. Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Waldron Road														
5	T1	928	2.0	797	2.0	0.418	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
6	R2	336	2.0	288	2.0	0.363	10.1	LOS A	0.8	5.4	0.66	0.90	0.80	33.6
Approach		1264	2.0	1086[N1]	2.0	0.418	2.7	NA	0.8	5.4	0.18	0.24	0.21	41.1
North: Bent Street														
7	L2	332	2.0	332	2.0	0.821	19.8	LOS B	2.0	14.5	0.68	1.35	1.92	23.9
9	R2	71	2.0	71	2.0	0.531	47.1	LOS D	0.8	6.0	0.94	1.08	1.31	15.4
Approach		402	2.0	402	2.0	0.821	24.6	LOS B	2.0	14.5	0.73	1.31	1.81	21.4
West: Waldron Road														
10	L2	71	2.0	71	2.0	0.408	4.3	LOS A	1.8	13.1	0.00	0.05	0.00	47.5
11	T1	712	2.0	712	2.0	0.408	0.0	LOS A	1.8	13.1	0.00	0.05	0.00	46.5
Approach		782	2.0	782	2.0	0.408	0.4	NA	1.8	13.1	0.00	0.05	0.00	46.8
All Vehicles		2448	2.0	2270[N1]	2.2	0.821	5.8	NA	2.0	14.5	0.21	0.36	0.42	33.5

Site Level of Service (LOS) Method: Delay (RTA NSW). 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.

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

Site: [Chester Hill Road/ Waldron Road - PM Fut]

Network: 5 [Future PM]

Site Category: -
Signals - Fixed Time Isolated Cycle Time = 80 seconds (Site User-Given Cycle Time)

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

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Aver. Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Chester Road														
1	L2	540	2.0	540	2.0	0.748	16.2	LOS B	8.7	61.8	0.77	0.83	0.82	30.9
3	R2	120	2.0	120	2.0	0.874	53.7	LOS D	3.4	24.0	1.00	1.02	1.56	16.1
Approach		660	2.0	660	2.0	0.874	23.1	LOS B	8.7	61.8	0.81	0.86	0.95	26.5
East: Waldron Road														
4	L2	156	2.0	121	2.0	0.102	10.1	LOS A	1.1	7.6	0.40	0.64	0.40	37.8
5	T1	884	2.0	688	2.0	0.797	19.8	LOS B	14.0	99.4	0.84	0.81	0.91	15.9
Approach		1040	2.0	810[N1]	2.0	0.797	18.4	LOS B	14.0	99.4	0.77	0.78	0.83	20.6
West: Waldron Road														
11	T1	796	2.0	796	2.0	0.863	16.2	LOS B	9.8	70.0	0.46	0.55	0.63	13.5
12	R2	251	2.0	251	2.0	0.489	23.2	LOS B	4.9	34.5	0.88	0.82	0.88	27.8
Approach		1046	2.0	1046	2.0	0.863	17.9	LOS B	9.8	70.0	0.56	0.61	0.69	19.8
All Vehicles		2746	2.0	2516[N1]	2.2	0.874	19.4	LOS B	14.0	99.4	0.70	0.73	0.80	22.4

Site Level of Service (LOS) Method: Delay (RTA NSW). 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.

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

Site: [Waldron Road/ Priam Street - PM Fut]

Network: 5 [Future PM]

Site Category: -
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Waldron Road														
5	T1	858	2.0	858	2.0	1.329	307.5	LOS F	73.5	523.3	1.00	4.70	8.57	4.4
6	R2	138	2.0	138	2.0	1.329	310.4	LOS F	73.5	523.3	1.00	4.70	8.57	8.8
6u	U	15	2.0	15	2.0	1.329	311.7	LOS F	73.5	523.3	1.00	4.70	8.57	8.0
Approach		1011	2.0	1011	2.0	1.329	308.0	LOS F	73.5	523.3	1.00	4.70	8.57	5.1
North: Priam Street														
7	L2	122	2.0	122	2.0	0.606	19.5	LOS B	2.0	14.4	0.97	1.11	1.33	37.5
9	R2	122	2.0	122	2.0	0.606	21.9	LOS B	2.0	14.4	0.97	1.11	1.33	32.1
9u	U	6	2.0	6	2.0	0.606	23.2	LOS B	2.0	14.4	0.97	1.11	1.33	38.9
Approach		251	2.0	251	2.0	0.606	20.8	LOS B	2.0	14.4	0.97	1.11	1.33	35.4
West: Waldron Road														
10	L2	49	2.0	49	2.0	0.752	5.7	LOS A	3.6	25.6	0.58	0.55	0.58	42.7
11	T1	778	2.0	778	2.0	0.752	5.2	LOS A	3.6	25.6	0.58	0.55	0.58	42.4
12u	U	49	2.0	49	2.0	0.752	9.4	LOS A	3.6	25.6	0.58	0.55	0.58	29.7
Approach		877	2.0	877	2.0	0.752	5.5	LOS A	3.6	25.6	0.58	0.55	0.58	42.2
All Vehicles		2138	2.0	2138	2.0	1.329	150.2	LOS F	73.5	523.3	0.83	2.58	4.45	10.0

Site Level of Service (LOS) Method: Delay (RTA NSW). 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.
Roundabout Capacity Model: SIDRA Standard.
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.

USER REPORT FOR NETWORK SITE

Project: 200212sid-N183790 Chester Square Planning Proposal - Peer Review

Template: Default Site User Report

Site: [Waldron Road/ Bent Street - Sat Fut]

Network: 12 [Future Sat]

Site Category: -
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Waldron Road														
5	T1	759	2.0	657	2.0	0.345	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
6	R2	419	2.0	363	2.0	0.432	10.2	LOS A	1.0	7.4	0.66	0.93	0.87	33.5
Approach		1178	2.0	1020[N1]	2.0	0.432	3.6	NA	1.0	7.4	0.24	0.33	0.31	39.3
North: Bent Street														
7	L2	416	2.0	416	2.0	0.959	39.0	LOS C	5.2	37.3	0.69	2.20	3.85	15.8
9	R2	97	2.0	97	2.0	0.608	43.8	LOS D	1.1	7.6	0.94	1.12	1.46	16.2
Approach		513	2.0	513	2.0	0.959	39.9	LOS C	5.2	37.3	0.74	1.99	3.40	15.9
West: Waldron Road														
10	L2	85	2.0	85	2.0	0.387	4.3	LOS A	2.9	20.5	0.00	0.06	0.00	47.3
11	T1	656	2.0	656	2.0	0.387	0.0	LOS A	2.9	20.5	0.00	0.06	0.00	45.7
Approach		741	2.0	741	2.0	0.387	0.5	NA	2.9	20.5	0.00	0.06	0.00	46.2
All Vehicles		2432	2.0	2274[N1]	2.1	0.959	10.8	NA	5.2	37.3	0.27	0.62	0.91	27.2

Site Level of Service (LOS) Method: Delay (RTA NSW). 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.

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

Site: [Chester Hill Road/ Waldron Road - Sat Fut]

Network: 12 [Future Sat]

Site Category: -
Signals - Fixed Time Isolated Cycle Time = 80 seconds (Site User-Given Cycle Time)

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

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Aver. Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Chester Road														
1	L2	352	2.0	352	2.0	0.528	12.6	LOS A	4.3	30.7	0.63	0.73	0.63	33.7
3	R2	121	2.0	121	2.0	0.881	54.3	LOS D	3.4	24.4	1.00	1.03	1.59	16.0
Approach		473	2.0	473	2.0	0.881	23.3	LOS B	4.3	30.7	0.73	0.81	0.88	26.3
East: Waldron Road														
4	L2	147	2.0	122	2.0	0.097	9.0	LOS A	1.0	6.8	0.35	0.63	0.35	38.8
5	T1	888	2.0	735	2.0	0.788	17.1	LOS B	14.0	100.0	0.81	0.77	0.86	17.5
Approach		1036	2.0	857[N1]	2.0	0.788	16.0	LOS B	14.0	100.0	0.74	0.75	0.78	22.1
West: Waldron Road														
11	T1	856	2.0	856	2.0	0.877	18.1	LOS B	9.8	70.0	0.49	0.59	0.67	12.4
12	R2	200	2.0	200	2.0	0.444	22.3	LOS B	3.7	26.4	0.85	0.80	0.85	28.2
Approach		1056	2.0	1056	2.0	0.877	18.9	LOS B	9.8	70.0	0.56	0.63	0.70	17.9
All Vehicles		2564	2.0	2385[N1]	2.2	0.881	18.7	LOS B	14.0	100.0	0.66	0.71	0.77	21.7

Site Level of Service (LOS) Method: Delay (RTA NSW). 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.

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

Site: [Waldron Road/ Priam Street - Sat Fut]

Network: 12 [Future Sat]

Site Category: -
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Waldron Road														
5	T1	868	2.0	868	2.0	1.305	286.0	LOS F	69.5	494.8	1.00	4.30	7.80	4.7
6	R2	115	2.0	115	2.0	1.305	288.9	LOS F	69.5	494.8	1.00	4.30	7.80	9.3
6u	U	13	2.0	13	2.0	1.305	290.2	LOS F	69.5	494.8	1.00	4.30	7.80	8.5
Approach		996	2.0	996	2.0	1.305	286.4	LOS F	69.5	494.8	1.00	4.30	7.80	5.4
North: Priam Street														
7	L2	112	2.0	112	2.0	0.545	17.7	LOS B	1.7	12.0	0.96	1.04	1.21	38.3
9	R2	111	2.0	111	2.0	0.545	20.1	LOS B	1.7	12.0	0.96	1.04	1.21	33.1
9u	U	1	2.0	1	2.0	0.545	21.4	LOS B	1.7	12.0	0.96	1.04	1.21	39.7
Approach		223	2.0	223	2.0	0.545	18.9	LOS B	1.7	12.0	0.96	1.04	1.21	36.3
West: Waldron Road														
10	L2	54	2.0	54	2.0	0.744	5.4	LOS A	3.7	26.4	0.53	0.52	0.53	42.9
11	T1	794	2.0	794	2.0	0.744	4.9	LOS A	3.7	26.4	0.53	0.52	0.53	42.6
12u	U	54	2.0	54	2.0	0.744	9.1	LOS A	3.7	26.4	0.53	0.52	0.53	30.1
Approach		901	2.0	901	2.0	0.744	5.2	LOS A	3.7	26.4	0.53	0.52	0.53	42.4
All Vehicles		2120	2.0	2120	2.0	1.305	138.7	LOS F	69.5	494.8	0.80	2.35	4.02	10.5

Site Level of Service (LOS) Method: Delay (RTA NSW). 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.
Roundabout Capacity Model: SIDRA Standard.
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.

USER REPORT FOR NETWORK SITE

Project: 200212sid-N183790 Chester Square Planning Proposal - Peer Review

Template: Default Site User Report

Site: [Waldron Road/ Bent Street - AM Mit]

Network: 8 [Future AM Mit]

Site Category: -
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Waldron Road														
5	T1	729	2.0	729	2.0	0.382	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
6	R2	292	2.0	292	2.0	0.383	10.6	LOS A	0.8	5.8	0.68	0.92	0.86	33.5
Approach		1021	2.0	1021	2.0	0.383	3.0	NA	0.8	5.8	0.20	0.26	0.24	40.5
North: Bent Street														
7	L2	312	2.0	312	2.0	0.658	13.2	LOS A	1.3	9.3	0.67	1.09	1.26	28.9
9	R2	97	2.0	97	2.0	0.695	56.1	LOS D	1.3	9.1	0.96	1.18	1.64	13.7
Approach		408	2.0	408	2.0	0.695	23.4	LOS B	1.3	9.3	0.74	1.11	1.35	22.2
West: Waldron Road														
10	L2	107	2.0	107	2.0	0.690	4.3	LOS A	0.0	0.0	0.00	0.07	0.00	46.9
11	T1	703	2.0	703	2.0	0.690	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	44.8
Approach		811	2.0	811	2.0	0.690	0.6	NA	0.0	0.0	0.00	0.07	0.00	45.6
All Vehicles		2240	2.0	2240	2.0	0.695	5.9	NA	1.3	9.3	0.22	0.35	0.36	33.6

Site Level of Service (LOS) Method: Delay (RTA NSW). 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.

Site: [Chester Hill Road/ Waldron Road - AM Mit]

Network: 8 [Future AM Mit]

Site Category: -
Signals - Fixed Time Coordinated Cycle Time = 80 seconds (Network User-Given Cycle Time)

Timings based on settings in the Network Timing dialog
Phase Times determined by the program
Downstream lane blockage effects included in determining phase times
Phase Sequence: Variable Phasing
Reference Phase: Phase A
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Chester Road														
1	L2	420	2.0	420	2.0	0.542	11.1	LOS A	4.7	33.3	0.59	0.72	0.59	35.0
3	R2	138	2.0	138	2.0	0.831	50.3	LOS D	3.8	27.0	1.00	0.99	1.42	16.8
Approach		558	2.0	558	2.0	0.831	20.8	LOS B	4.7	33.3	0.69	0.79	0.80	27.7
East: Waldron Road														
4	L2	101	2.0	101	2.0	0.088	10.8	LOS A	0.8	5.8	0.36	0.63	0.36	37.3
5	T1	612	2.0	612	2.0	0.797	21.4	LOS B	12.0	85.2	0.81	0.78	0.88	15.0
Approach		713	2.0	713	2.0	0.797	19.9	LOS B	12.0	85.2	0.75	0.75	0.81	19.4
West: Waldron Road														
11	T1	718	2.0	718	2.0	0.650	6.6	LOS A	9.2	65.3	0.58	0.53	0.58	23.8
12	R2	292	2.0	292	2.0	0.522	23.9	LOS B	5.5	39.2	0.88	0.85	0.94	27.5
Approach		1009	2.0	1009	2.0	0.650	11.6	LOS A	9.2	65.3	0.67	0.62	0.68	26.1
All Vehicles		2280	2.0	2280	2.0	0.831	16.5	LOS B	12.0	85.2	0.70	0.70	0.75	24.6

Site Level of Service (LOS) Method: Delay (RTA NSW). 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.

Site: [Waldron Road/ Priam Street - AM Mit]

Network: 8 [Future AM Mit]

Site Category: -
Signals - Fixed Time Coordinated Cycle Time = 80 seconds (Network User-Given Cycle Time)

Timings based on settings in the Network Timing dialog
Phase Times determined by the program
Downstream lane blockage effects included in determining phase times
Phase Sequence: Variable Phasing
Reference Phase: Phase A
Input Phase Sequence: A, C
Output Phase Sequence: A, C

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Waldron Road														
5	T1	618	0.0	618	0.0	0.820	16.7	LOS B	11.3	78.9	0.66	0.70	0.79	32.0
6	R2	112	0.0	112	0.0	0.439	24.5	LOS B	2.1	14.4	0.77	0.77	0.77	35.8
Approach		729	0.0	729	0.0	0.820	17.9	LOS B	11.3	78.9	0.68	0.71	0.79	33.0
North: Priam Street														
7	L2	142	0.0	142	0.0	0.820	44.9	LOS D	6.7	46.8	1.00	0.96	1.27	29.5
9	R2	112	0.0	112	0.0	0.820	44.9	LOS D	6.7	46.8	1.00	0.96	1.27	22.6
Approach		254	0.0	254	0.0	0.820	44.9	LOS D	6.7	46.8	1.00	0.96	1.27	27.0
West: Waldron Road														
10	L2	93	0.0	93	0.0	0.695	13.4	LOS A	11.3	79.1	0.60	0.57	0.60	40.9
11	T1	763	0.0	763	0.0	0.695	8.8	LOS A	11.3	79.1	0.60	0.57	0.60	40.1
Approach		856	0.0	856	0.0	0.695	9.3	LOS A	11.3	79.1	0.60	0.57	0.60	40.2
All Vehicles		1839	0.0	1839	0.0	0.820	17.6	LOS B	11.3	79.1	0.69	0.68	0.77	34.4

Site Level of Service (LOS) Method: Delay (RTA NSW). 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.

USER REPORT FOR NETWORK SITE

Project: 200212sid-N183790 Chester Square Planning Proposal - Peer Review

Template: Default Site User Report

Site: [Waldron Road/ Bent Street - PM Mit]

Network: 9 [Future PM Mit]

Site Category: -
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Waldron Road														
5	T1	928	2.0	928	2.0	0.486	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
6	R2	336	2.0	336	2.0	0.423	10.5	LOS A	1.0	6.8	0.68	0.93	0.87	33.6
Approach		1264	2.0	1264	2.0	0.486	2.8	NA	1.0	6.8	0.18	0.25	0.23	41.0
North: Bent Street														
7	L2	332	2.0	332	2.0	0.821	19.8	LOS B	2.0	14.5	0.68	1.35	1.92	23.9
9	R2	71	2.0	71	2.0	0.651	66.7	LOS E	1.1	7.6	0.97	1.13	1.48	12.1
Approach		402	2.0	402	2.0	0.821	28.0	LOS B	2.0	14.5	0.73	1.32	1.84	19.9
West: Waldron Road														
10	L2	71	2.0	71	2.0	0.408	4.3	LOS A	0.0	0.3	0.00	0.05	0.00	47.5
11	T1	712	2.0	712	2.0	0.408	0.0	LOS A	0.0	0.3	0.00	0.05	0.00	46.5
Approach		782	2.0	782	2.0	0.408	0.4	NA	0.0	0.3	0.00	0.05	0.00	46.8
All Vehicles		2448	2.0	2448	2.0	0.821	6.2	NA	2.0	14.5	0.21	0.36	0.42	33.0

Site Level of Service (LOS) Method: Delay (RTA NSW). 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.

Site: [Chester Hill Road/ Waldron Road - PM Mit]

Network: 9 [Future PM Mit]

Site Category: -
Signals - Fixed Time Coordinated Cycle Time = 80 seconds (Network User-Given Cycle Time)

Timings based on settings in the Network Timing dialog
Phase Times determined by the program
Downstream lane blockage effects included in determining phase times
Phase Sequence: Variable Phasing
Reference Phase: Phase A
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Chester Road														
1	L2	540	2.0	540	2.0	0.882	35.7	LOS C	13.9	99.2	0.96	1.03	1.25	21.2
3	R2	120	2.0	120	2.0	0.946	65.0	LOS E	3.8	27.3	1.00	1.16	1.89	14.1
Approach		660	2.0	660	2.0	0.946	41.0	LOS C	13.9	99.2	0.97	1.05	1.37	19.4
East: Waldron Road														
4	L2	156	2.0	156	2.0	0.126	9.8	LOS A	1.5	10.5	0.43	0.66	0.43	38.2
5	T1	884	2.0	884	2.0	0.896	31.3	LOS C	16.2	115.0	0.95	1.03	1.16	11.4
Approach		1040	2.0	1040	2.0	0.896	28.0	LOS B	16.2	115.0	0.87	0.98	1.05	15.7
West: Waldron Road														
11	T1	796	2.0	796	2.0	0.708	6.2	LOS A	9.8	70.0	0.60	0.55	0.60	24.6
12	R2	251	2.0	251	2.0	0.631	34.3	LOS C	5.2	37.3	0.96	0.94	1.26	23.1
Approach		1046	2.0	1046	2.0	0.708	12.9	LOS A	9.8	70.0	0.68	0.64	0.75	23.7
All Vehicles		2746	2.0	2746	2.0	0.946	25.4	LOS B	16.2	115.0	0.82	0.87	1.01	19.0

Site Level of Service (LOS) Method: Delay (RTA NSW). 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.

Site: [Waldron Road/ Priam Street - PM Mit]

Network: 9 [Future PM Mit]

Site Category: -
Signals - Fixed Time Coordinated Cycle Time = 80 seconds (Network User-Given Cycle Time)

Timings based on settings in the Network Timing dialog
Phase Times determined by the program
Downstream lane blockage effects included in determining phase times
Phase Sequence: Variable Phasing
Reference Phase: Phase A
Input Phase Sequence: A, C
Output Phase Sequence: A, C

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Waldron Road														
5	T1	873	0.0	873	0.0	0.978	55.9	LOS D	28.8	201.6	0.76	1.15	1.34	17.3
6	R2	138	0.0	138	0.0	0.609	30.2	LOS C	3.0	20.9	0.88	0.83	0.93	33.7
Approach		1011	0.0	1011	0.0	0.978	52.4	LOS D	28.8	201.6	0.78	1.11	1.29	19.8
North: Priam Street														
7	L2	122	0.0	122	0.0	0.928	60.9	LOS E	8.0	55.8	1.00	1.14	1.66	25.8
9	R2	122	0.0	122	0.0	0.928	60.9	LOS E	8.0	55.8	1.00	1.14	1.66	18.9
Approach		244	0.0	244	0.0	0.928	60.9	LOS E	8.0	55.8	1.00	1.14	1.66	22.8
West: Waldron Road														
10	L2	49	0.0	49	0.0	0.738	14.4	LOS A	12.5	87.8	0.65	0.61	0.65	40.3
11	T1	827	0.0	827	0.0	0.738	9.9	LOS A	12.5	87.8	0.65	0.61	0.65	39.4
Approach		877	0.0	877	0.0	0.738	10.1	LOS A	12.5	87.8	0.65	0.61	0.65	39.5
All Vehicles		2132	0.0	2132	0.0	0.978	36.0	LOS C	28.8	201.6	0.75	0.91	1.07	25.6

Site Level of Service (LOS) Method: Delay (RTA NSW). 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.

USER REPORT FOR NETWORK SITE

Project: 200212sid-N183790 Chester Square Planning Proposal - Peer Review

Template: Default Site User Report

Site: [Waldron Road/ Bent Street - Sat Mit]

Network: 13 [Future Sat Mit]

Site Category: -
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Waldron Road														
5	T1	759	2.0	759	2.0	0.398	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
6	R2	419	2.0	419	2.0	0.499	10.9	LOS A	1.3	9.5	0.69	0.98	0.99	33.2
Approach		1178	2.0	1178	2.0	0.499	3.9	NA	1.3	9.5	0.25	0.35	0.35	39.1
North: Bent Street														
7	L2	416	2.0	416	2.0	0.959	39.0	LOS C	5.2	37.3	0.69	2.20	3.85	15.8
9	R2	97	2.0	97	2.0	0.766	69.8	LOS E	1.5	10.6	0.97	1.23	1.85	11.7
Approach		513	2.0	513	2.0	0.959	44.8	LOS D	5.2	37.3	0.74	2.01	3.47	14.7
West: Waldron Road														
10	L2	85	2.0	85	2.0	0.387	4.3	LOS A	0.8	5.6	0.00	0.06	0.00	47.3
11	T1	656	2.0	656	2.0	0.387	0.0	LOS A	0.8	5.6	0.00	0.06	0.00	45.7
Approach		741	2.0	741	2.0	0.387	0.5	NA	0.8	5.6	0.00	0.06	0.00	46.2
All Vehicles		2432	2.0	2432	2.0	0.959	11.5	NA	5.2	37.3	0.28	0.61	0.90	26.6

Site Level of Service (LOS) Method: Delay (RTA NSW). 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.

Site: [Chester Hill Road/ Waldron Road - Sat Mit]

Network: 13 [Future Sat Mit]

Site Category: -
Signals - Fixed Time Coordinated Cycle Time = 80 seconds (Network User-Given Cycle Time)

Timings based on settings in the Network Timing dialog
Phase Times determined by the program
Downstream lane blockage effects included in determining phase times
Phase Sequence: Variable Phasing
Reference Phase: Phase A
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Chester Road														
1	L2	352	2.0	352	2.0	0.589	16.8	LOS B	5.4	38.2	0.76	0.78	0.76	30.3
3	R2	121	2.0	121	2.0	0.893	56.0	LOS D	3.5	25.1	1.00	1.07	1.65	15.6
Approach		473	2.0	473	2.0	0.893	26.9	LOS B	5.4	38.2	0.82	0.85	0.99	24.5
East: Waldron Road														
4	L2	147	2.0	147	2.0	0.115	8.7	LOS A	1.1	8.1	0.35	0.63	0.35	39.1
5	T1	888	2.0	888	2.0	0.859	21.0	LOS B	16.2	115.0	0.87	0.87	0.97	15.3
Approach		1036	2.0	1036	2.0	0.859	19.2	LOS B	16.2	115.0	0.80	0.84	0.88	19.9
West: Waldron Road														
11	T1	856	2.0	856	2.0	0.713	6.2	LOS A	9.8	70.0	0.60	0.56	0.60	24.5
12	R2	200	2.0	200	2.0	0.541	30.4	LOS C	4.3	30.3	0.95	0.87	1.04	24.6
Approach		1056	2.0	1056	2.0	0.713	10.8	LOS A	9.8	70.0	0.67	0.61	0.68	24.6
All Vehicles		2564	2.0	2564	2.0	0.893	17.2	LOS B	16.2	115.0	0.75	0.75	0.82	22.6

Site Level of Service (LOS) Method: Delay (RTA NSW). 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.

Site: [Waldron Road/ Priam Street - Sat Mit] Network: 13 [Future Sat Mit]

Site Category: -
Signals - Fixed Time Coordinated Cycle Time = 80 seconds (Network User-Given Cycle Time)

Timings based on settings in the Network Timing dialog
Phase Times determined by the program
Downstream lane blockage effects included in determining phase times
Phase Sequence: Variable Phasing
Reference Phase: Phase A
Input Phase Sequence: A, C
Output Phase Sequence: A, C

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Waldron Road														
5	T1	868	2.0	868	2.0	0.930	35.3	LOS C	23.0	164.1	0.74	0.95	1.08	22.8
6	R2	115	2.0	115	2.0	0.476	26.4	LOS B	2.2	15.8	0.81	0.78	0.81	35.1
Approach		983	2.0	983	2.0	0.930	34.3	LOS C	23.0	164.1	0.75	0.93	1.05	24.7
North: Priam Street														
7	L2	112	2.0	112	2.0	0.877	51.5	LOS D	6.5	46.2	1.00	1.05	1.47	27.9
9	R2	111	2.0	111	2.0	0.877	51.5	LOS D	6.5	46.2	1.00	1.05	1.47	20.9
Approach		222	2.0	222	2.0	0.877	51.5	LOS D	6.5	46.2	1.00	1.05	1.47	24.9
West: Waldron Road														
10	L2	54	2.0	54	2.0	0.708	14.0	LOS A	11.6	82.7	0.62	0.58	0.62	40.6
11	T1	794	2.0	794	2.0	0.708	9.4	LOS A	11.6	82.7	0.62	0.58	0.62	39.8
Approach		847	2.0	847	2.0	0.708	9.7	LOS A	11.6	82.7	0.62	0.58	0.62	39.9
All Vehicles		2053	2.0	2053	2.0	0.930	26.0	LOS B	23.0	164.1	0.72	0.80	0.92	29.5

Site Level of Service (LOS) Method: Delay (RTA NSW). 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.

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