TRAFFIC AND PARKING IMPACT ASSESSMENT OF A PROPOSED MIXED-USE DEVELOPMENT

221-235 and 241 Homer Street and 208 Wardell Road in Earlwood

Traffic and Parking Impact Report

Prepared for: Sitex Pty Ltd

N206334A (Version 2d)

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1. INTRODUCTION

Motion Traffic Engineers was commissioned by Sitex Pty Ltd to undertake a traffic and parking impact assessment of a proposed mixed-use development at 221-235 and 241 Homer Street and 208 Wardell Road in Earlwood. The site is currently occupied by a gym, restaurant and clothing sales.

This traffic report focuses on the mixed-use development and changes in car usage and car park utilisation and additional trips from the mixed-use development.

In the course of preparing this assessment, the subject site and its environs have been inspected, plans of the development examined, and all relevant traffic and parking data collected and analysed.

2. BACKGROUND AND EXISTING CONDITIONS OF THE PROPOSED LOCATION

2.1 Location and Land Use

The proposed mixed-use development lies on the corner of Homer Street and Wardell Road and is located east of Earlwood Town Centre. The surrounding land uses are mainly residential with retail shops nearby. The proposed site is located within a *B2-Local Centre* land zoning. The site is currently occupied by a gym, restaurant and clothing sales.

Figures 1 show the location of the mixed use from aerial map perspective.

Figures 2 show the location of the mixed use from street map perspective and assessed intersections respectively.

Figure 3a and 3b shows a photograph of the site.

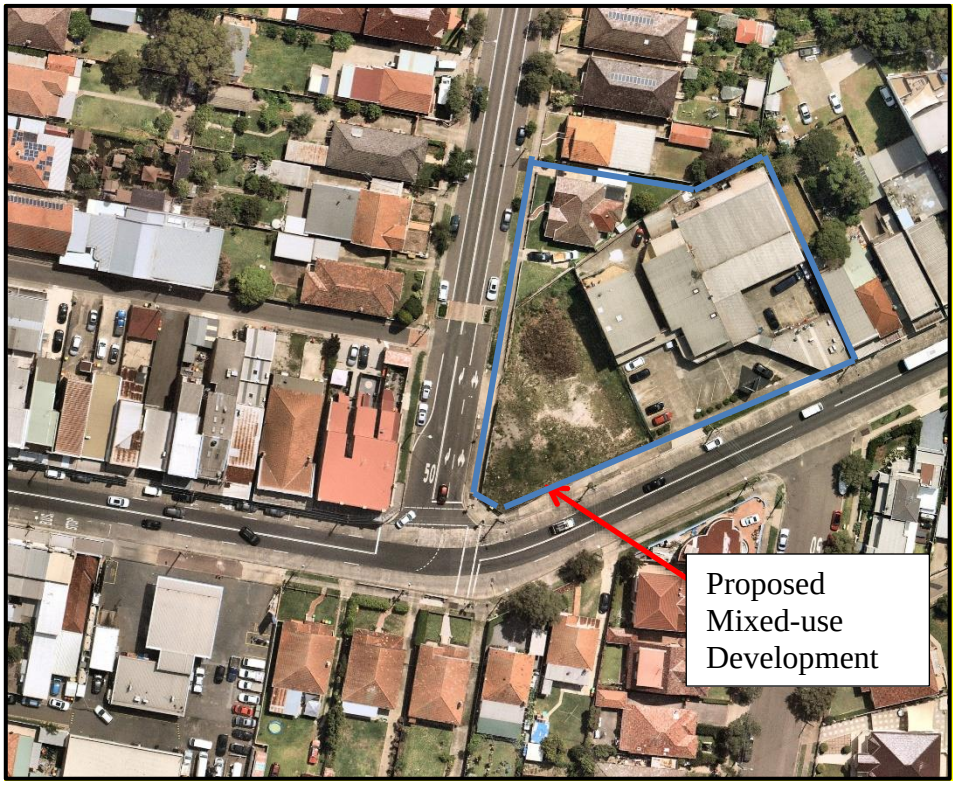


Figure 1: Location of the Subject Site on Aerial

Figure 2: Street Map of the Location of the mixed use site and assessed intersections

Figure 3a: Photograph of mixed-use site from Homer Street in Earlwood

Figure 3b: Photograph of mixed-use site from Wardell Road in Earlwood

2.2 Road Network

This section describes the roads near the mixed-use development.

Homer Street is a collector road with one lane each way and a sign posted speed limit of 50 km/hr. On street parking is not provided on the southbound of the Street and near the intersection of Homer Street with Wardell Road. Time-restricted on-street parking is provided on northbound of the road. Figure 4a shows a photograph of Homer Street.

Wardell Road is a collector road with one lane each way and a default speed limit of 50 km/hr. Time-unrestricted on-street parking is permitted on both sides of the road. Figure 4b shows a photograph of Wardell Road.

Earlwood Avenue is a local road with two-way traffic and a default speed limit of 50 km/hr. Traffic lanes are not line marked. Time-unrestricted on-street parking is available on both sides of the road. Earlwood Avenue merges with Clarke Street and connects with Homer Street from the south.

St. James Avenue is a local road with two-way traffic and a sign-posted speed limit of 50 km/hr. Traffic lanes are not line marked. Time-unrestricted on-street parking is available on both sides of the road. St. James Avenue connects with Homer Street from the north and connects with the City of Canterbury Free Public Parking from the south.

Watkin Avenue is a local road with two-way traffic and a sign-posted speed limit of 50 km/hr. Traffic lanes are not line marked. Time-unrestricted on-street parking is available on both sides of the road. Watkin Avenue connects with Homer Street from the south and Wardell Road from the north.

Hocking Avenue is a local road with two-way traffic and a sign-posted speed limit of 50 km/hr. Traffic lanes are not line marked. Time-unrestricted on-street parking is available on both sides of the road. Hocking Avenue connects with Homer Street from the north and merges with Minnamorra Avenue from the south.

Figure 4a: Homer Street looking east from the mixed-use site

Figure 4b: Wardell Road looking north from Homer Street

2.3 Public Parking Opportunities

The mixed-use development is located at the corner of Homer Street and Wardell Road. Time unrestricted on-street parking is available on the Wardell Road and time restricted on street parking is available on the northbound of the Homer Street. Site investigations show that there are vacant car spaces on Wardell Road during weekday peak hours. A driver may need to circulate to find a vacant car space.

Figure 5: On Street Parking Area in Wardell Road

2.4 Intersection Description

As part of the traffic assessment, five intersections are assessed:

- Signalised intersection of Homer Street with Wardell Road
- Signalised intersection of Homer Street with William Street and Hartill Law Avenue
- Signalised intersection of Homer Street with Earlwood Avenue
- Signalised intersection of Homer Street with St. James Avenue
- Signalised intersection of Homer Street with Watkin Avenue and Hocking Avenue

External traffic travelling to and from the mixed use will most likely need to travel through the above intersections.

The signalised intersection of Homer Street with Wardell Road is a three-leg intersection with all turn movements permitted. Pedestrian crossings are provided on all approaches except westbound approach on Homer Street. Figure 6 presents the layout of this intersection using SIDRA 9 – an industry standard intersection modelling software.

The signalised intersection of Homer Street with William Street and Hartill Law Avenue is a four-leg intersection with all turn movements permitted except the right

turn movement from William Street and Homer Street. Pedestrian crossings are provided on all approaches except the northeast approach on Homer Street. Figure 7 presents the layout of this intersection using SIDRA 9.

The signalised intersection of Homer Street with Earlwood Avenue is a three-leg intersection with all turn movements permitted. Pedestrian crossings are provided on the approach from Earlwood Avenue and east approach from Homer Street. Figure 8 presents the layout of this intersection using SIDRA 9.

The signalised intersection of Homer Street with St. James Avenue is a three-leg intersection with all turn movements permitted. Pedestrian crossings are provided on all approaches. Figure 9 presents the layout of this intersection using SIDRA 9.

The signalised intersection of Homer Street with Watkin Avenue and Hocking Avenue is a four-leg intersection. Vehicles approaching from Watkin Avenue are restricted by a 'left-only' movement, and vehicles approaching from east on Homer Street are not permitted to turn right onto Watkin Avenue, and therefore a 'left-only' and a 'No right-turn' signs have been posted. Pedestrian crossings have been provided on all approaches except for the east approach on Homer Street. Figure 10 presents the layout of this intersection using SIDRA 9.

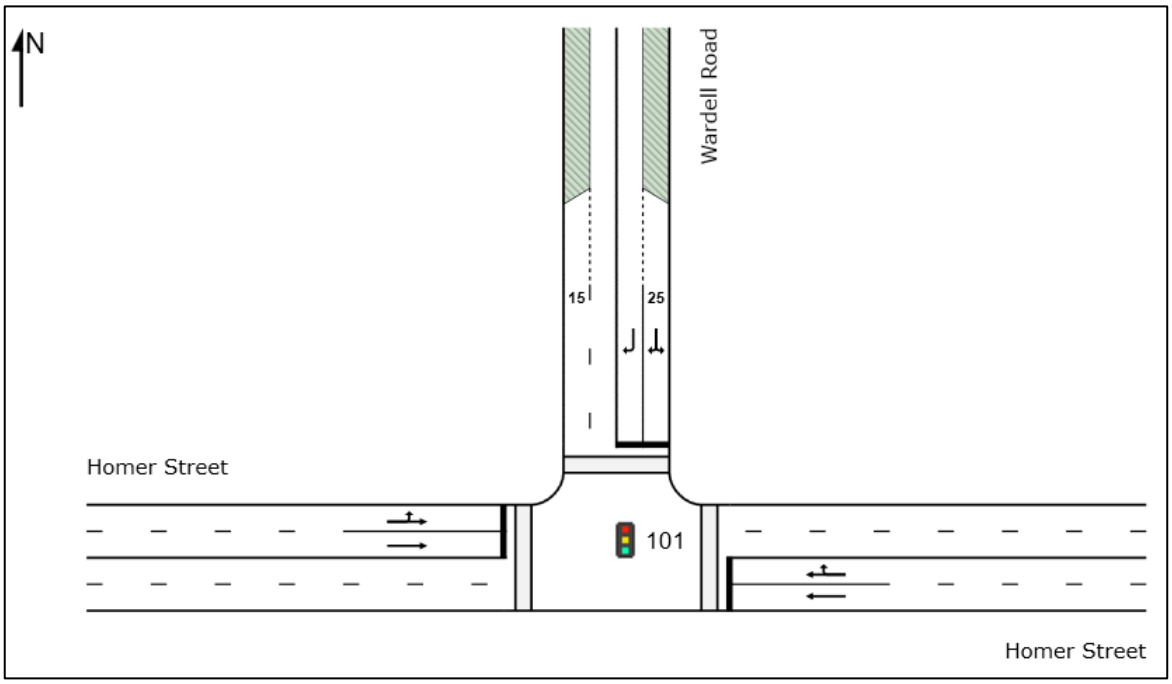


Figure 6: Signalised intersection of Homer Street with Wardell Road (SIDRA)

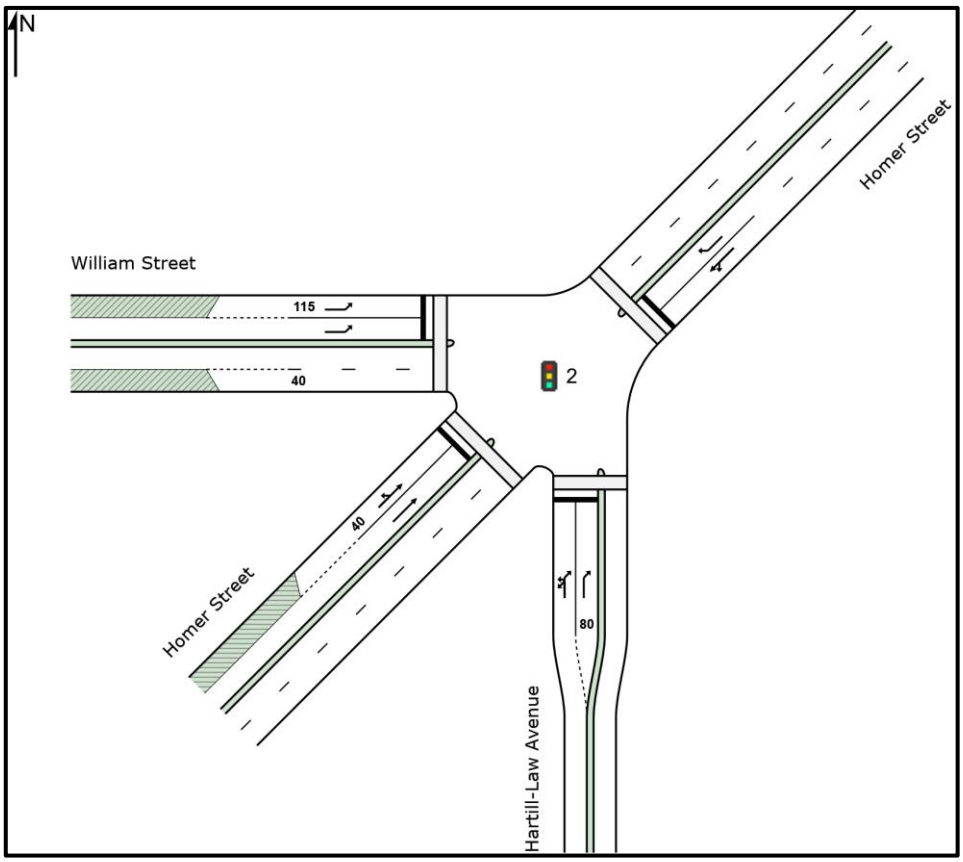


Figure 7: Signalised intersection of Homer Street with William Street and Hartill Law Avenue (SIDRA)

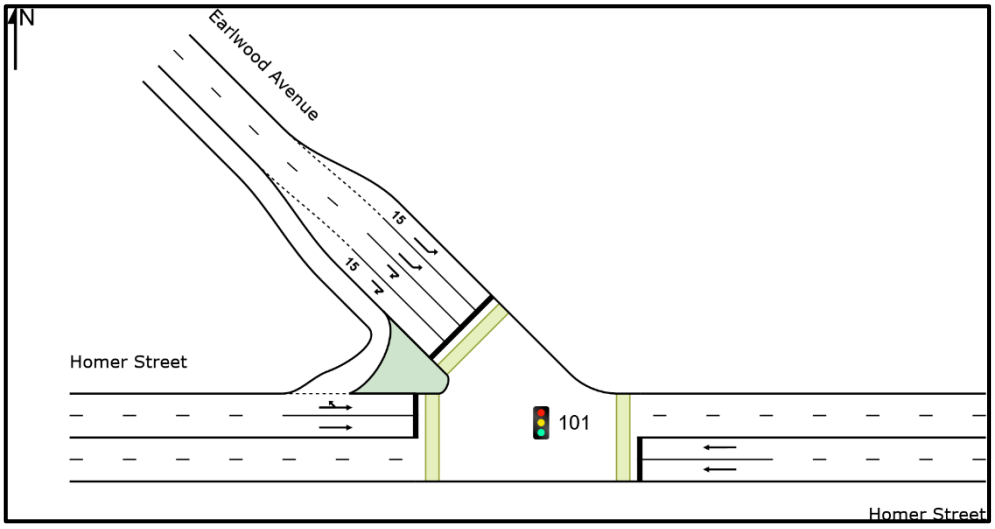


Figure 8: Signalised intersection of Homer Street with Earlwood Avenue (SIDRA)

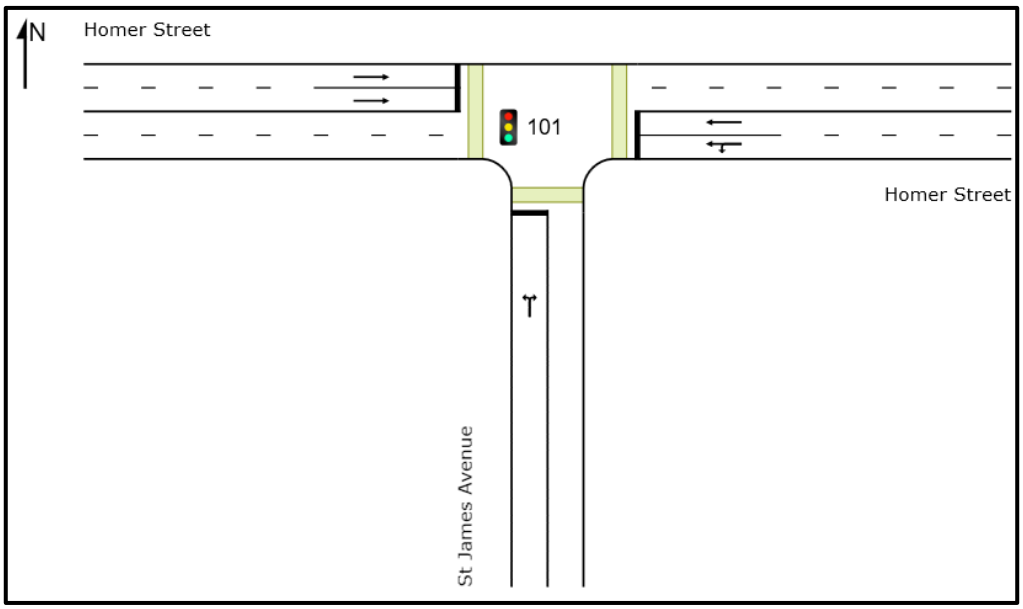


Figure 9: Signalised intersection of Homer Street with St. James Avenue (SIDRA)

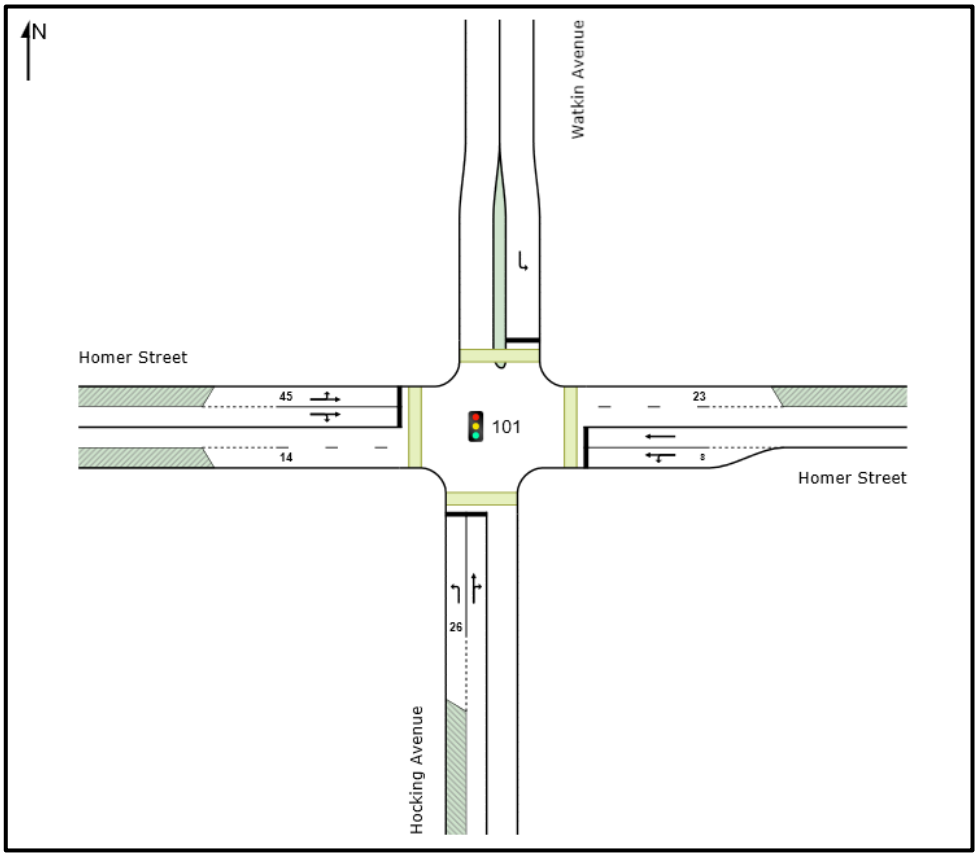
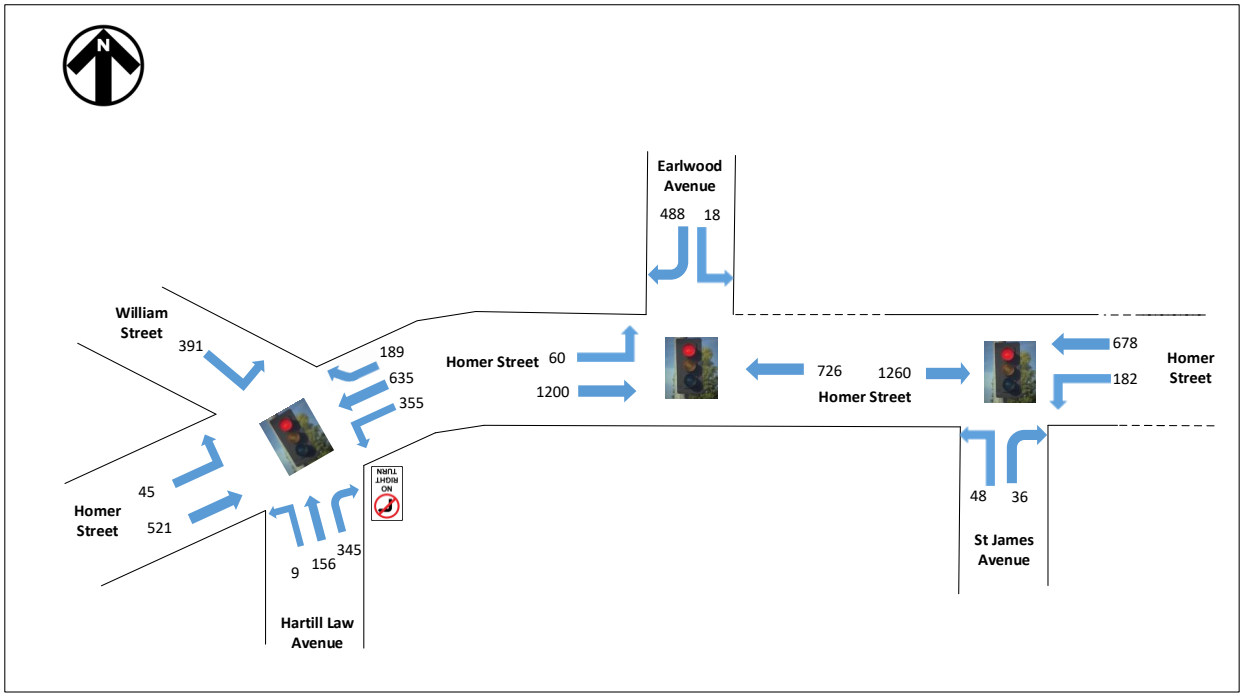


Figure 10: Signalised intersection of Homer Street with Watkin Avenue and Hocking Avenue (SIDRA)

2.5 Existing Traffic Volumes

As part of the traffic assessment, traffic counts have been undertaken at the intersections for the weekday AM and PM peak hours. The AM and PM peak hour were from 8:30am to 9:30am and 5pm to 6pm respectively. The traffic surveys were undertaken on a weekday in March 2020.

The following figures present the traffic volumes in vehicles for the weekday peak hours. The local road network with the traffic volumes has been shown in two parts as follows:



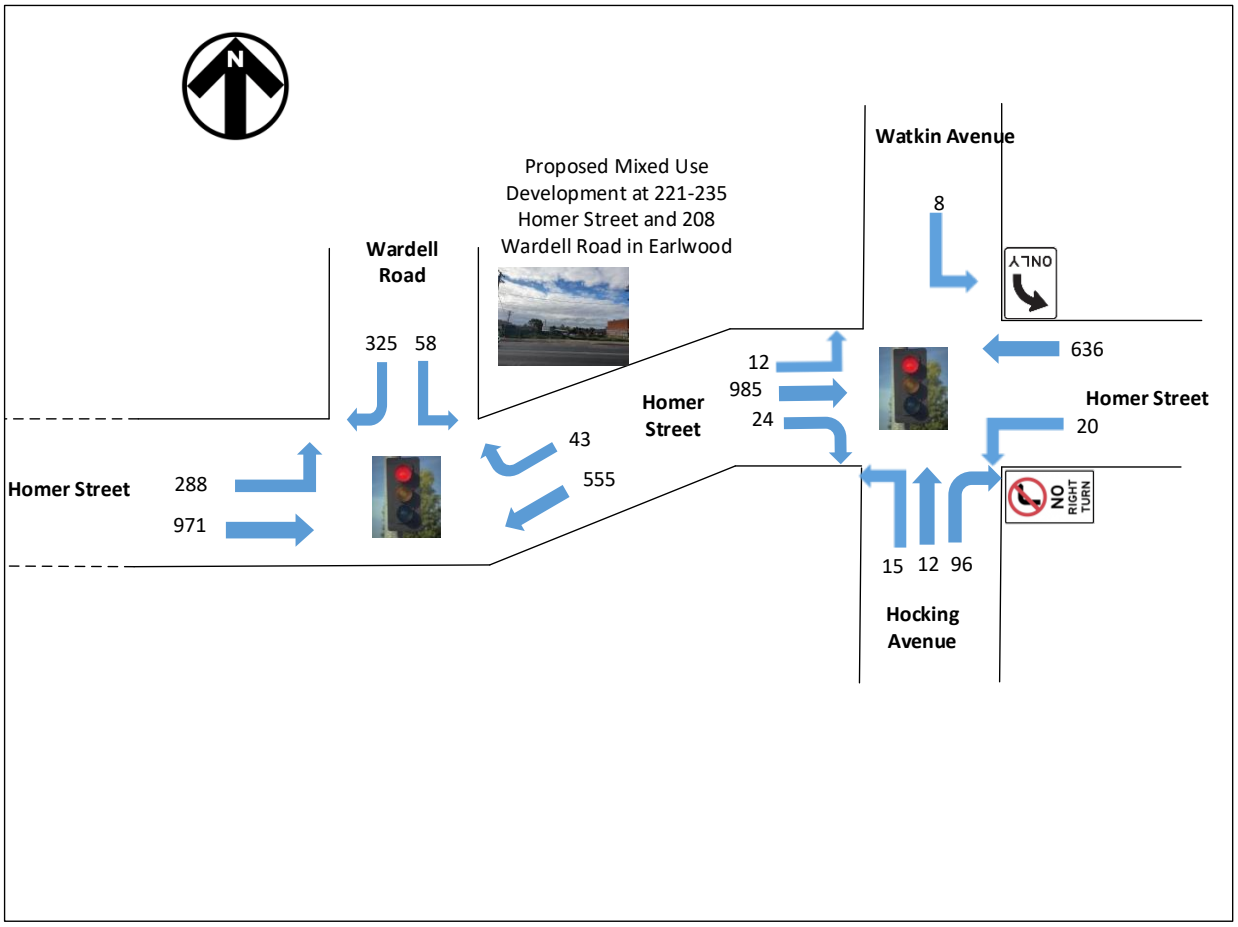
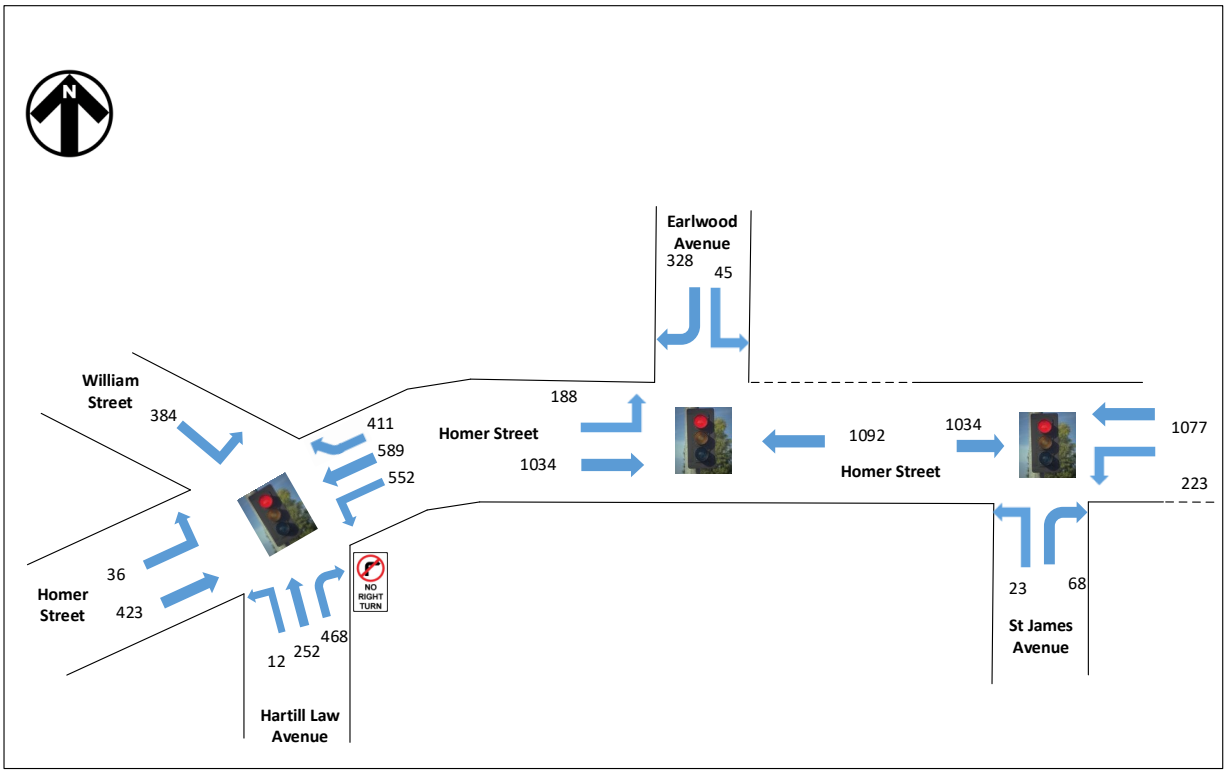


Figure 8: Existing Weekday Traffic Volumes AM Peak Hour


Earlwood
Avenue
328
45
William
Street
384
411
589
552
188
Homer Street
1034
1092
Homer Street
1034
1077
223
36
Homer
Street
423
NO
RIGHT
TURN
12
252
468
Hartill Law
Avenue
23
68
St James
Avenue

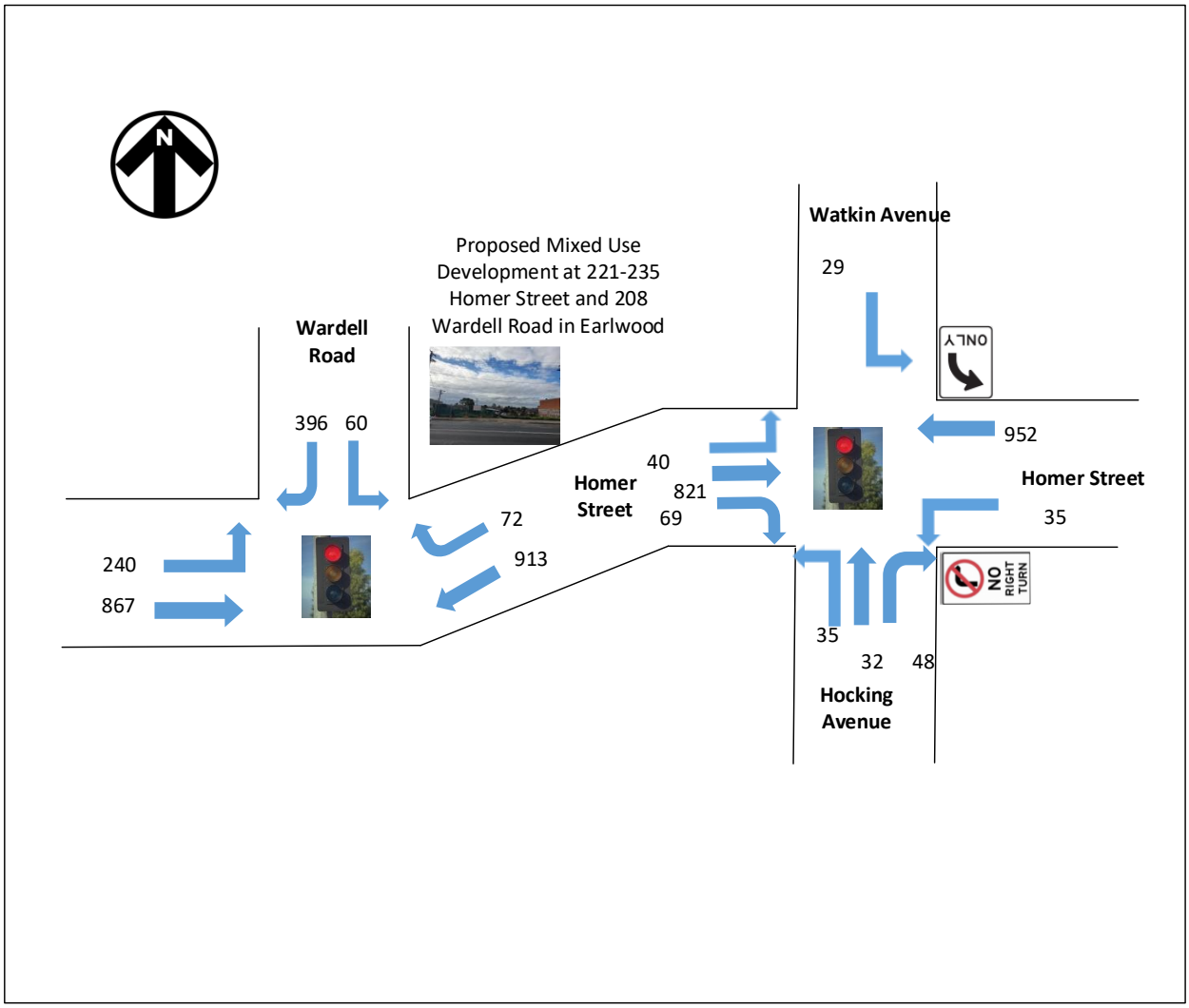


Figure 9: Existing Weekday Traffic Volumes PM Peak Hour

2.6 Intersection Assessment

An intersection assessment has been undertaken for the:

- Signalised intersection of Homer Street with Wardell Road
- Signalised intersection of Homer Street with William Street and Hartill Law Avenue
- Signalised intersection of Homer Street with Earlwood Avenue
- Signalised intersection of Homer Street with St. James Avenue
- Signalised intersection of Homer Street with Watkin Avenue and Hocking Avenue

The existing intersection operating performance was assessed using the SIDRA software package (version 8) to determine the Degree of Saturation (DS), Average Delay (AVD in seconds) and Level of Service (LoS) at each intersection. The SIDRA program provides Level of Service Criteria Tables for various intersection types. The key indicator of intersection performance is Level of Service, where results are placed on a continuum from 'A' to 'F', as shown in Table 1.

LoS	**Traffic Signal / Roundabout**	**Give Way / Stop Sign / T-Junction control**
A	Good operation	Good operation
B	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	Satisfactory	Satisfactory, but accident study required
D	Operating near capacity	Near capacity & accident study required
E	At capacity, at signals incidents will cause excessive delays.	At capacity, requires other control mode
F	Unsatisfactory and requires additional capacity, Roundabouts require other control mode	At capacity, requires other control mode

Table 1: Intersection Level of Service

The Average Vehicle Delay (AVD) provides a measure of the operational performance of an intersection as indicated below, which relates AVD to LOS. The AVD's should be taken as a guide only as longer delays could be tolerated in some locations (i.e., inner-city conditions) and on some roads (i.e. minor side street

intersecting with a major arterial route). For traffic signals, the average delay over all movements should be taken. For roundabouts and Signalised control intersections (sign control) the critical movement for level of service assessment should be that movement with the highest average delay.

LoS	Average Delay per Vehicles (seconds/vehicle)
A	Less than 14
B	15 to 28
C	29 to 42
D	43 to 56
E	57 to 70
F	>70

Table 2: Intersection Average Delay (AVD)

The degree of saturation (DS) is another measure of the operational performance of individual intersections. For intersections controlled by traffic signals both queue length and delay increase rapidly as DS approaches 1. It is usual to attempt to keep DS to less than 0.9. Degrees of Saturation in the order of 0.7 generally represent satisfactory intersection operation. When DS exceed 0.9 queues can be anticipated.

The results of the intersection analysis are as follows:

Intersection/ Performance criteria	AM Peak Hour Existing	PM Peak Hour Existing
Homer St/William St and Hartill Law Ave		
LoS	LoS C	LoS D
AVD	33.5	44.2
DS	0.872	0.872
Homer St /Earwood Ave		
LoS	LoS A	LoS A
AVD	14.5	13.0
DS	0.851	0.820
Homer St /St James Ave		
LoS	LoS B	LoS B
AVD	16.0	17.0
DS	0.810	0.824

Homer St /Wardell Rd		
LoS	LoS A	LoS B
AVD	14.1	15.4
DS	0.749	0.566
Homer St /Watkin Ave		
LoS	LoS B	LoS B
AVD	21.9	18.7
DS	0.822	0.775

Table 3: Existing Intersection Performances

As presented in Table 3, the above intersections are currently operating well with overall spare capacity to accommodate additional traffic both AM and PM peak hours.

The full SIDRA results are presented in Appendix A.

2.7 Public Transport

The nearest bus stop is next to the mixed-use development on Homer Street. This stop is serviced by bus routes 423 and L23 which provides access to nearby suburbs including Kingsgrove, Marrickville, Newtown and Martin Place

.

There is another bus stop on Wardell Road which is 150 metres away from the mixed-use site. This stop is serviced by bus route 412 which provides access to Campsie, Clemton Park, Earlwood and Dulwich Hill, Marrickville and Martin Place. Figure 10a and 10b shows the proximity of the site to public bus services.

The site is a 15-minute walk to Bardwell Park.

Overall, the site has excellent access to public transport.

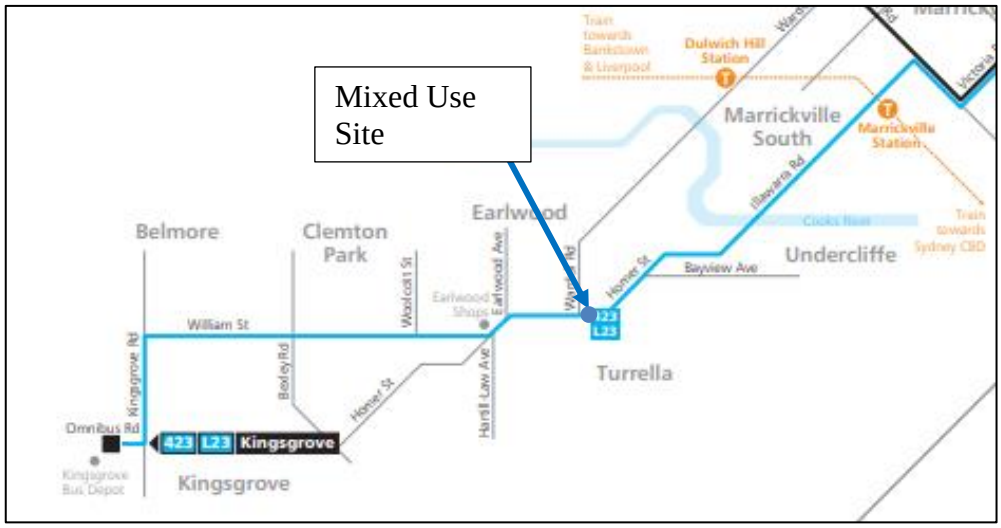


Figure 10a: Public Transport Network Map of Bus Route 423 and L23

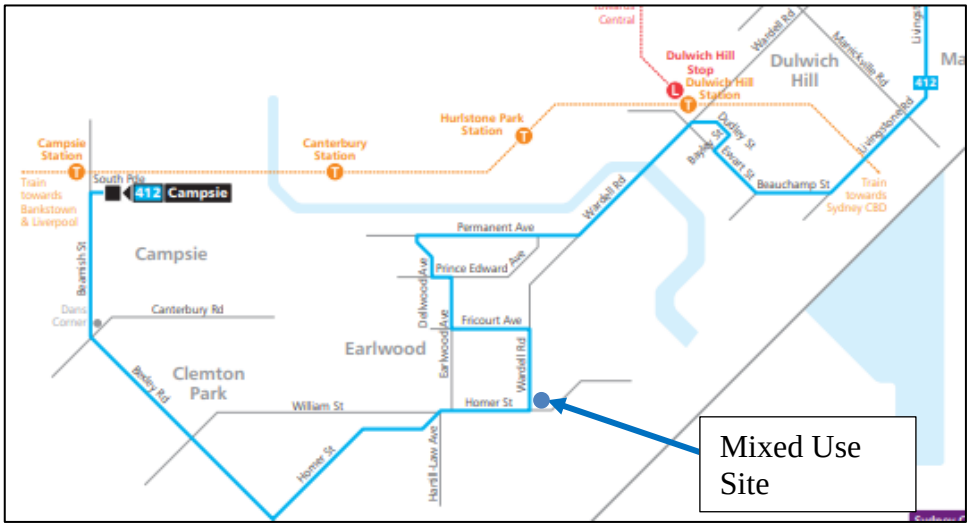


Figure 10b: Public Transport Network Map of Bus Route 412

2.8 Conclusions on the Existing Conditions

The mixed-use development is located at the corner of the Homer Street and Wardell Road with time unrestricted on-street parking opportunities nearby on the Homer Street and Wardell Road.

The nearby intersections have spare capacity to accommodate additional traffic.

The site has excellent access to public transport including the nearby Bardwell Park Train Station.

3. PROPOSED MIXED-USE DEVELOPMENT

The land uses of the proposed mixed-use development are as follows:

Residential

- Twenty one-bedroom apartments
- Forty-four two-bedroom apartments
- Twenty-one three-bedroom apartments

A total of Eighty-five apartments

Retail

Retail floor space with a combined gross floor area (GFA) of 1967 m^2 and with details as follows:

- Shop 1 (GFA) 308 m^2
- Shop 2 (GFA) 104 m^2
- Restaurant (GFA) 229 m^2
- Shop 3 (GFA) 40 m^2
- Supermarket (GFA) 1108m^2
    - A warehouse with a GFA of 402 m^2 is adjacent to the retail area, for extra stock storage.

The shops have frontage to either Homer Street or Wardell Road.

Car parking is provided on the two basement levels with vehicle access and egress is via Wardell Road and details as follows:

Ground Level

- A loading duck has been provided, with a turntable. This turntable is suitable for a truck up to 12.5 metres (Heavy Rigid Vehicle as described in Australian Standards) and a waste truck. The loading dock serves as a waste collection area and deliveries for the retail shops, Aldi supermarket and the residential tenants.

Basement 1

- Sixty-eight retail car spaces including;
    - Two retail accessible car spaces
    - Sixty-six retail car spaces
- Thirteen bicycle parking space

Basement 2

- Eighty-six car spaces including;
    - one visitor disabled car spaces
    - thirteen residential visitor car space
        - total of fourteen visit car spaces

- fourteen staff car spaces
- fifty-one residential tenant car spaces
- seven residential adaptable car space
- Twenty bicycle parking space

Basement 3

- Forty-six retail car spaces including;
  - Four residential adaptable car space
  - Forty-two residential car spaces

A total of two hundred (200) car spaces

The site is currently occupied by a gym, restaurant and clothing sales.

A full scaled plan of the mixed-use development is provided as part of the Development Application. Scaled measurements should use these plans.

4. CAR PARKING CONSIDERATIONS

4.1 Canterbury Development Control Plan

The car parking requirements for a mixed-use development are presented in *Canterbury Development Control Plan 2012* with the car parking rates as follows as it applies to the mixed-use development:

Shop Top Housing (Accessible Local Centres)

- Studio 0.5 spaces per dwelling
- 1 or more bedroom 1 space per dwelling
- Visitor parking 0.15 spaces per dwelling
- One car wash bay (may also be used as visitor parking)
- Bicycle parking:
    - One space per five dwellings for residents
    - One space per ten dwellings for visitors

Retail and Commercial Premises (Accessible Local Centres)

- 1 space per 50m^2 GFA (GFA<120m^2)
- 1 space per 40m^2 GFA (1000m^2>GFA>120m^2)
- 1 space per 27m^2 GFA (GFA>1000m^2)
- Bicycle parking:
    - One space per 300 m^2 GFA for staff
    - One space per 500 m^2 GFA for visitors

The warehouse parking rate is one car space per 300m2 or 1 space per 2 staff whichever is greater

Table 4 summarises the car parking requirements for the proposed mixed-use development. The proposed mixed-use development complies with Council's car parking requirements.

Land Use	Type	Number of Units	Car Parking Rate per Apartment	Car Spaces Required	Car Spaces Provided
Residential	1 bedroom apartments	20	1	20	104
	2 bedroom apartments	44		44	
	3 bedrooms apartments	21		21	
	Visitor	85	0.15	13	14
Total Residential				**98**	**118**

Land Use		GFA m^2	Car Parking Rate per GFA per 100m2	Car Spaces Required	Car Spaces Provided
Retail & warehouse	Retail 1 2 and 3	452	3.7	17	82
	Restaurant	229	3.3	8	
			3.7	0	
	Supermarket	1108	3.7	41	
	Warehouse	402	0.3	1	
	Total	**2191**		**67**	**82**

Table 4: Summary of Car Parking Requirements Versus Provisions (Council DCP)

Table 5 summarise the bicycle parking requirements for the proposed mixed-use development respectively.

Land Use	Number of Dwellings	Bicycle Parking Rate	Bicycle Spaces Required	Bicycle Spaces Provided
Residential	85	1 space per 5 dwellings for residents	17	24
		1 space per 10 dwellings for visitors	8.5	
Land Use	**GFA m^2**	**Bicycle Parking Rate**	**Bicycle Spaces Required**	**Bicycle Spaces Provided**
Retail (including restaurant)	2191	1 space per 300 m2 for staff	7.30	13
		1 space per 500m2 for patrons	4	
Total			37	37

Table 5: Summary of Bicycle Parking Requirements Versus Provisions

There are sufficient retail car spaces to ensure all car parking demand is met within the site. The residential apartments car space provision complies with Council's car park provision.

One car wash bay is provided for the residential tenants.

The mixed-use development complies with the council bicycle parking requirements.

5. VEHICLE TRAFFIC IMPACT CONSIDERATIONS

5.1 Traffic Generation

The NSW RTA Guide to Traffic Generating Development Updated Traffic Surveys 2013, and the RTA Guide to Traffic Generating Developments2002 publishes trip generation rates for the commercial component of the mixed-use development as follows:

Supermarket

- 155 vehicle trips per 100m^2 for weekday PM peak hour
    - For the purpose of this traffic assessment **only**, the AM trip generation rate is assumed as 20 percent of the PM rate.
    - Many retail businesses are not experiencing high customer activity in the AM peak hour

Retail (specialty shops)

- 46 vehicle trips per 100m^2 for weekday PM peak hour.
    - It is expected that the speciality shops will not operate during the commuter AM peak hour. Shops such as banks or restaurants open after 9:30am
- Restaurants: 5 trips per 100m^2 in PM peak hour

Warehouse is 1 trip per 100m2.

High Density Residential Building

- 0.5 vehicle trips per one- and two-bedroom apartments for the weekday peak hours
- 0.65 for a three-bedroom apartment for the

Table 6 present the weekday peak hour trip generation for the retail and residential component of the development respectively. The generated trips in the peak hour are modest.

Table 7 presents the weekday peak hour trips generation for the mixed-use development.

The site is currently occupied by a gym, restaurant and clothing sales. Table 8 presents the observed trip generation of the three businesses.

Table 9 presents the net trips to be assigned to the local road network.

	Land Use		GFA (m^2)	Trip Generation Rate per $100m^2$	Trips Generated
AM	Supermarket		1108	3.1	34
	Warehouse		402	1	4
PM	Supermarket		1108	15.5	172
	Warehouse		402	1	4
	Retail	Retail 1 2 and 3	452	4.6	21
		Restaurant	229	5	11
				Total AM peak Hour	38
				Total PM peak hour	208

Land Use	Units	Trip Generation Rate per Unit	Trip Generated
1 bedoom	20	0.5	10
2 bedrooms	44	0.65	28.6
3 bedrooms	21	0.65	13.65
		Total	53

Table 6: Trips Generated by the Proposed mixed-use Development during Weekday Peak Hours

Use	Peak Hour	Origin	Destination	Total
Retail/ Restaurant	AM	7	28	35
	PM	104	104	208
Residential	AM	48	5	53
	PM	5	48	53
Warehouse	AM	4	0	4
	PM	0	4	4
Total	AM	59	33	92
	PM	109	156	265

Table 7: Proposed trip distribution for the mixed-use development

	Peak Hour	Origin	Destination	Total
Existing	AM	10	18	28
	PM	19	23	42

Table 8: Existing trip distribution for the Current Businesses

	Peak Hour	Origin	Destination	Total
Net	AM	49	15	64
	PM	90	133	223

Table 9 : Net trip distribution

5.2 Traffic Volumes

The additional development trips are assigned onto the local traffic network. The following figures present the existing with the development trips (in red for origin trips and blue for destination trips) for the weekday AM and PM peak hours.

The additional development trips represent a small to medium proportion of the existing traffic volumes in the AM peak hour and a reasonable proportion in the PM peak hour.

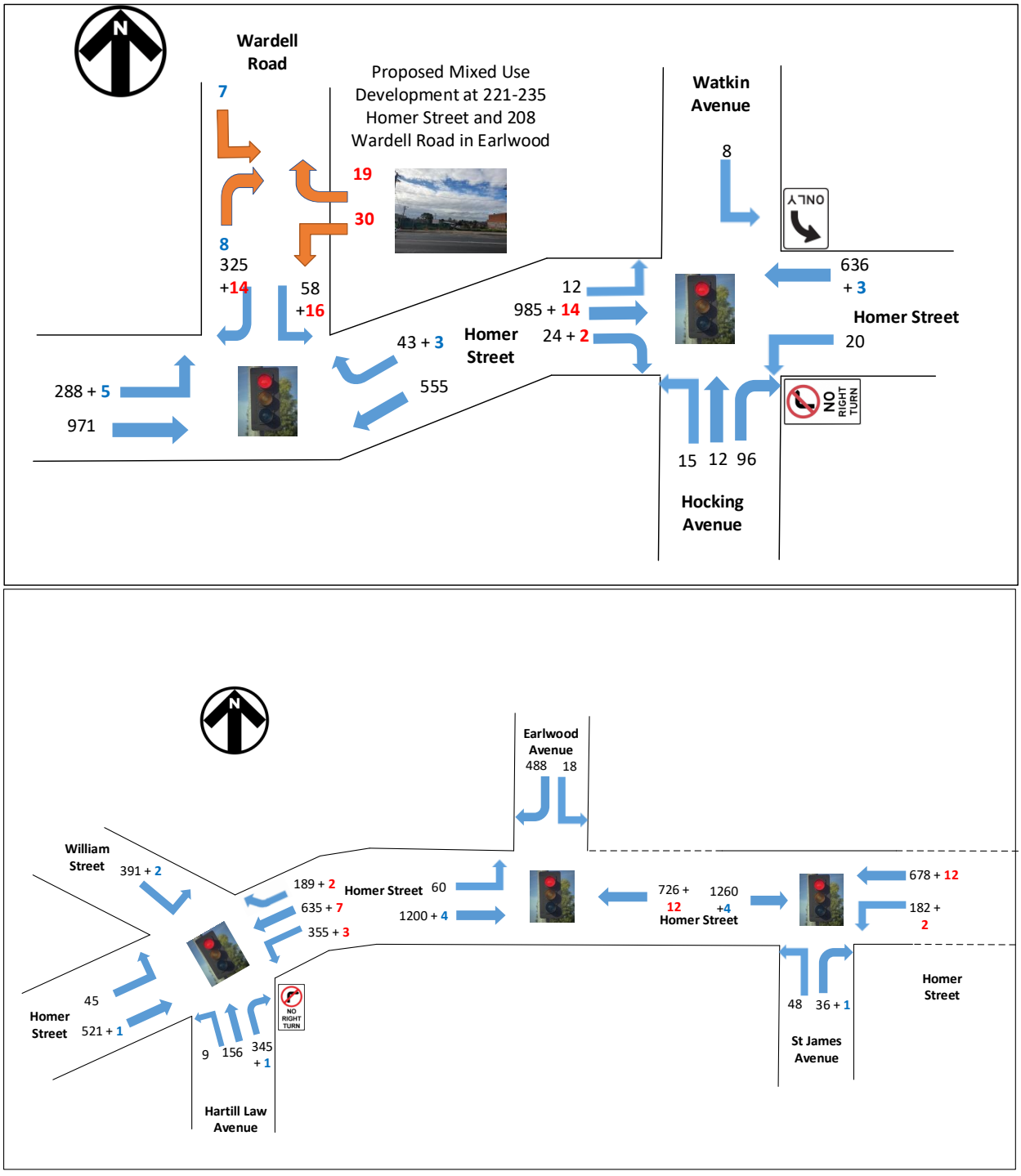


Figure 11: Weekday AM Peak Hour Traffic Volumes (Development Origin Trips in Red and Destination Trips in Blue)

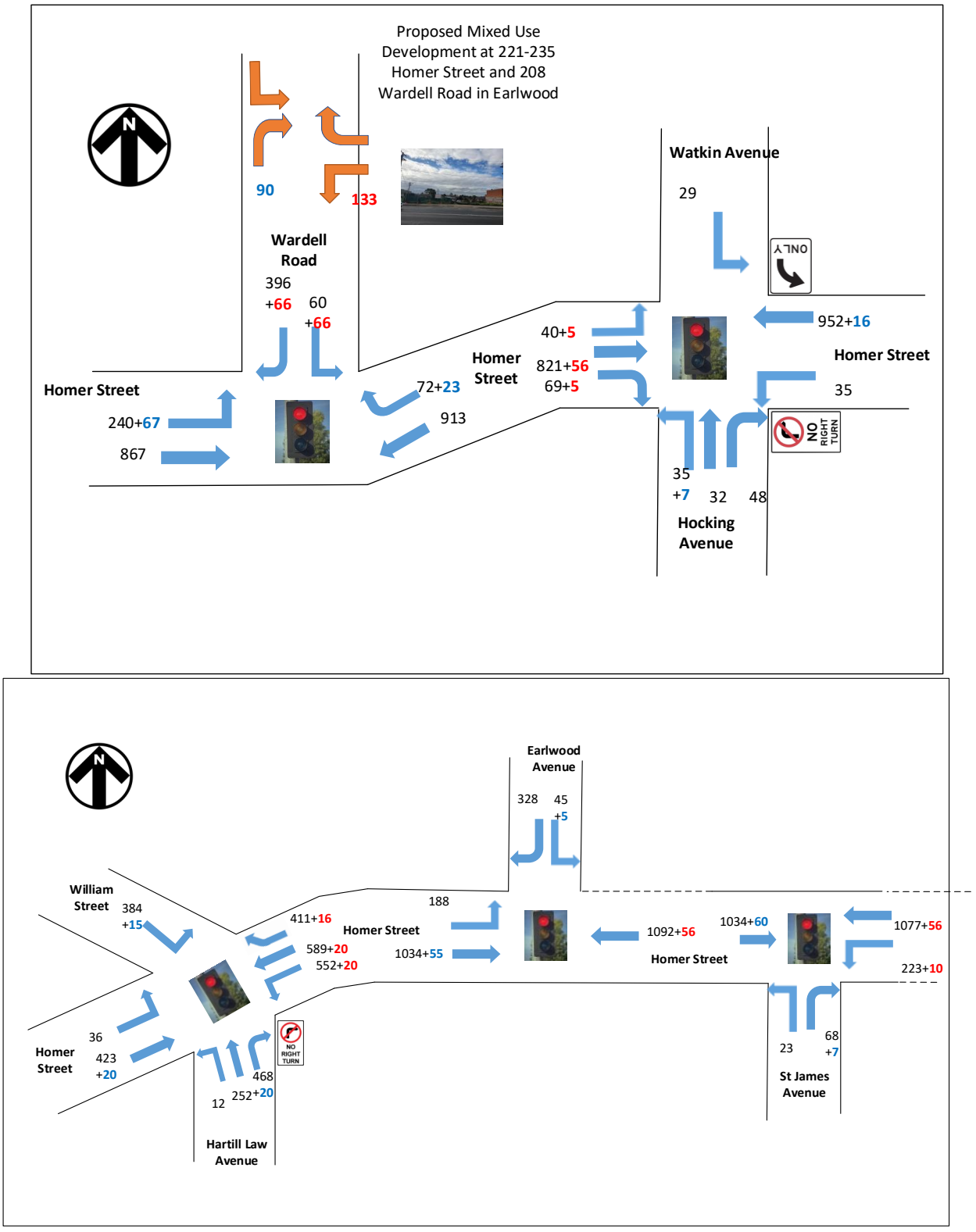


Figure 12: Weekday PM Peak Hour Traffic Volumes (Development Origin Trips in Red and Destination Trips in Blue)

5.3 Intersection Assessment

An intersection assessment has been undertaken for the five nearby intersections. However, as mentioned in section 2.6 of this report, some intersections are put into for assessment purpose.

The results of the intersection and network analysis are as follows for the AM and PM peak hours:

Intersection/ Performance criteria	Performance with Existing Traffic		Projected Performance with Existing and additional traffic	
	AM Peak Hour Existing	PM Peak Hour Existing	AM Peak Hour Projected	PM Peak Hour Projected
Homer St/William St and Hartill Law Ave				
LoS	LoS C	LoS D	LoS C	LoS D
AVD	33.5	44.2	38.3	49.6
DS	0.872	0.872	0.791	0.95
Homer St /Earwood Ave				
LoS	LoS A	LoS A	LoS B	LoS A
AVD	14.5	13.0	15.6	13.1
DS	0.851	0.820	0.745	0.727
Homer St /St James Ave				
LoS	LoS B	LoS B	LoS B	LoS B
AVD	16.0	17.0	20.2	23.3
DS	0.810	0.824	0.796	0.854
Homer St /Wardell Rd				
LoS	LoS A	LoS B	LoS B	LoS B
AVD	14.1	15.4	15.8	20.4
DS	0.749	0.566	0.764	0.69
Homer St /Watkin Ave				
LoS	LoS D	LoS B	LoS D	LoS C
AVD	50.6	18.7	51.6	39.2
DS	0.856	0.775	0.863	0.48

Table 9: Projected intersection performance with additional traffic

As presented in Table 9 above, the additional trips generated by the proposed depot have minimum impact on the intersection performances in both AM and PM peak hours. The LoS, AVD and DS of each intersection are not significantly affected by the addition of depot traffic.

The traffic impacts of the proposed depot are therefore considered acceptable. The full SIDRA results are presented in Appendix B for the future conditions with the depot traffic.

5.4 Scenario Assessment of the Signalised Intersection of Homer Street with Wardell Road

This section assesses two scenario assessments of the weekday PM peak hour of the signalised intersection of Homer Street with Wardell Road:

1) All outbound traffic travelling to Homer Street (assessed previously)
2) 60 percent of outbound traffic travelling to Homer Street and 40 percent turning right from the site to travel north on Wardell Road (see Figure 13)

The above scenario assessment is to assess the extent of the queue on Wardell Road (at the 95 percentile confidence interval) for the weekday PM peak hour.

The queue for scenario 1 on Wardell Road is 74.9 metres and falls to 67.9 metres in Scenario 2.

The SIDRA results for both scenarios are presented in Appendix C.

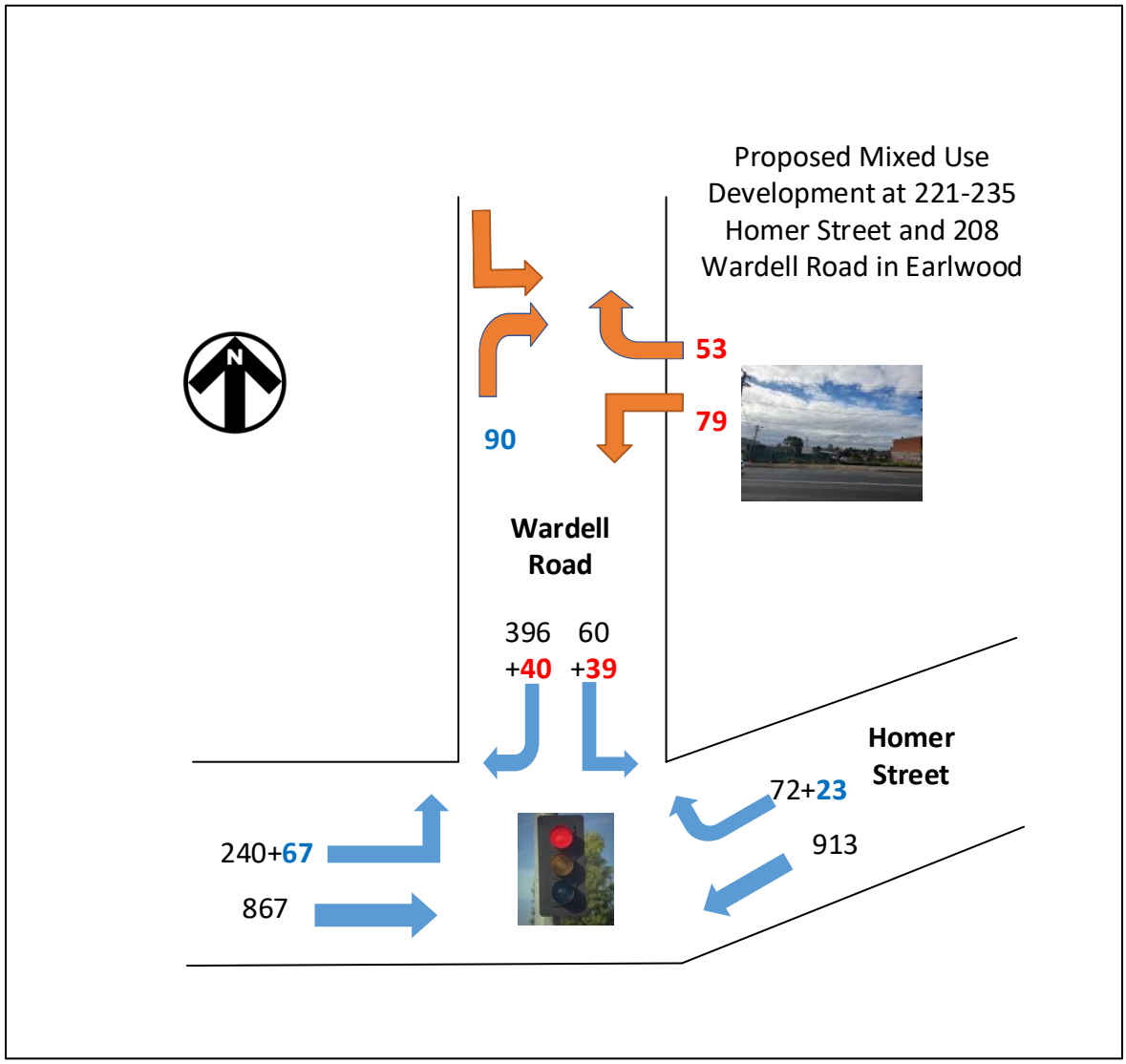


Figure 13: Weekday PM Peak Hour Traffic Volumes (Development Origin Trips in Red and Destination Trips in Blue) Scenario Assessment

6. CONCLUSIONS

Based on the considerations presented in this report, it is considered that:

Parking

- The proposed mixed-use development complies with Council's commercial and residential car parking requirements
- The mixed-use development complies with Council's bicycle parking requirements

Traffic

- The mixed-use development is a high trip generator for the weekday PM peak hours.
- The mixed-use development is moderate trip generator in the weekday AM peak hour
- The additional trips from the mixed-use development can be accommodated at the nearby intersections and road network without noticeably affecting intersection performance, delays or queues.
- There are no traffic engineering reasons why a development consent for the proposed mixed-use development at 221-235 and 241 Homer Street and 208 Wardell Road in Earlwood, should be refused.

APPENDIX A

SIDRA Intersection Results for Existing Traffic Conditions

Vehicle Movement Performance																
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Homer Street																
5	T1	All MCs	584	0.0	584	0.0		0.373	6.6	LOS A	8.2	57.6	0.51	0.45	0.51	39.2
6	R2	All MCs	45	0.0	45	0.0		0.373	42.7	LOS D	4.0	27.7	0.75	0.67	0.75	34.5
Approach			629	0.0	629	0.0		0.373	9.2	LOS A	8.2	57.6	0.53	0.47	0.53	38.6
North: Wardell Road																
7	L2	All MCs	61	0.0	61	0.0		0.716	48.5	LOS D	8.0	56.0	0.99	0.87	1.11	26.7
9	R2	All MCs	342	0.0	342	0.0	*	0.716	45.4	LOS D	8.0	56.0	0.99	0.87	1.11	27.8
Approach			403	0.0	403	0.0		0.716	45.9	LOS D	8.0	56.0	0.99	0.87	1.11	27.6
West: Homer Street																
10	L2	All MCs	303	0.0	303	0.0		0.229	5.2	LOS A	2.0	14.0	0.26	0.57	0.26	44.1
11	T1	All MCs	1022	0.0	1022	0.0	*	0.749	9.1	LOS A	25.1	176.0	0.70	0.65	0.70	38.5
Approach			1325	0.0	1325	0.0		0.749	8.2	LOS A	25.1	176.0	0.60	0.64	0.60	40.2
All Vehicles			2358	0.0	2358	0.0		0.749	14.9	LOS B	25.1	176.0	0.65	0.63	0.67	35.9

Table A1: Signalised intersection of Homer Street with Wardell Road Weekday AM Peak Hour for Existing Conditions

Vehicle Movement Performance																
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Homer Street																
5	T1	All MCs	961	0.0	961	0.0		0.566	12.4	LOS A	15.5	108.5	0.71	0.64	0.71	34.7
6	R2	All MCs	76	0.0	76	0.0	*	0.566	26.1	LOS B	11.3	78.9	0.74	0.68	0.74	37.1
Approach			1037	0.0	1037	0.0		0.566	13.4	LOS A	15.5	108.5	0.71	0.64	0.71	34.9
North: Wardell Road																
7	L2	All MCs	63	0.0	63	0.0		0.542	35.3	LOS C	8.0	56.3	0.89	0.80	0.89	30.1
9	R2	All MCs	417	0.0	417	0.0		0.542	35.3	LOS C	8.0	56.3	0.89	0.80	0.89	31.1
Approach			480	0.0	480	0.0		0.542	35.3	LOS C	8.0	56.3	0.89	0.80	0.89	30.9
West: Homer Street																
10	L2	All MCs	253	0.0	253	0.0	*	0.398	5.5	LOS A	7.4	51.9	0.57	0.62	0.57	41.6
11	T1	All MCs	633	0.0	633	0.0		0.398	11.5	LOS A	9.6	66.9	0.59	0.56	0.59	37.4
Approach			885	0.0	885	0.0		0.398	9.8	LOS A	9.6	66.9	0.59	0.58	0.59	39.1
All Vehicles			2402	0.0	2402	0.0		0.566	16.4	LOS B	15.5	108.5	0.70	0.65	0.70	35.0

Table A2: Signalised intersection of Homer Street with Wardell Road Weekday PM Peak Hour for Existing Conditions

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Stop Rate	Eff.	Aver. No. of Cycles	Aver. Speed km/h
South: Hartill-Law Avenue																
1b	L3	All MCs	9	0.0	9	0.0	0.789	52.2	LOS D	12.1	84.7	1.00	0.90		1.15	24.6
1	L2	All MCs	164	0.0	164	0.0	0.789	50.6	LOS D	12.1	84.7	1.00	0.90		1.15	25.3
3a	R1	All MCs	363	0.0	363	0.0 *	0.789	49.2	LOS D	12.4	86.6	1.00	0.90		1.14	21.9
Approach			537	0.0	537	0.0	0.789	49.7	LOS D	12.4	86.6	1.00	0.90		1.14	23.1
NorthEast: Homer Street																
24a	L1	All MCs	374	0.0	374	0.0	0.769	28.2	LOS B	39.3	275.3	0.94	0.85		0.94	29.2
25	T1	All MCs	668	0.0	668	0.0 *	0.769	25.4	LOS B	39.3	275.3	0.94	0.85		0.94	18.5
26a	R1	All MCs	199	0.0	199	0.0	0.473	42.5	LOS D	8.3	57.8	0.98	0.79		0.98	15.7
Approach			1241	0.0	1241	0.0	0.769	29.0	LOS C	39.3	275.3	0.95	0.84		0.95	22.1
West: William Street																
10a	L1	All MCs	412	0.0	412	0.0 *	0.769	50.5	LOS D	9.4	66.0	1.00	0.89		1.15	13.6
Approach			412	0.0	412	0.0	0.769	50.5	LOS D	9.4	66.0	1.00	0.89		1.15	13.6
SouthWest: Homer Street																
30b	L3	All MCs	47	0.0	47	0.0	0.489	44.2	LOS D	11.5	80.6	0.94	0.78		0.94	21.8
31	T1	All MCs	548	0.0	548	0.0	0.489	38.4	LOS C	11.7	81.7	0.94	0.77		0.94	15.5
Approach			596	0.0	596	0.0	0.489	38.9	LOS C	11.7	81.7	0.94	0.77		0.94	16.2
All Vehicles			2785	0.0	2785	0.0	0.789	38.3	LOS C	39.3	275.3	0.96	0.85		1.01	19.9

Table A3: Signalised intersection of Homer Street with William Street and Hartill Law Avenue Weekday AM Peak Hour for Existing Conditions

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Stop Rate	Eff. No. of Cycles	Aver. Speed km/h
South: Hartill-Law Avenue															
1b	L3	All MCs	13	0.0	13	0.0		0.872	58.3	LOS E	19.9	139.5	1.00	0.97	1.21	23.2
1	L2	All MCs	265	0.0	265	0.0		0.872	57.4	LOS E	19.9	139.5	1.00	0.97	1.21	23.9
3a	R1	All MCs	493	0.0	493	0.0	*	0.872	55.3	LOS D	20.4	142.9	1.00	0.97	1.21	20.6
Approach			771	0.0	771	0.0		0.872	56.1	LOS D	20.4	142.9	1.00	0.97	1.21	21.9
NorthEast: Homer Street															
24a	L1	All MCs	581	0.0	581	0.0		0.864	33.7	LOS C	54.6	382.1	0.99	0.92	1.02	26.9
25	T1	All MCs	620	0.0	620	0.0	*	0.864	30.8	LOS C	54.6	382.1	0.99	0.92	1.02	16.4
26a	R1	All MCs	433	0.0	433	0.0		0.698	43.9	LOS D	19.8	138.9	1.00	0.84	1.00	15.5
Approach			1634	0.0	1634	0.0		0.864	35.3	LOS C	54.6	382.1	0.99	0.90	1.01	20.6
West: William Street															
10a	L1	All MCs	404	0.0	404	0.0	*	0.839	58.0	LOS E	10.5	73.8	1.00	0.94	1.24	12.4
Approach			404	0.0	404	0.0		0.839	58.0	LOS E	10.5	73.8	1.00	0.94	1.24	12.4
SouthWest: Homer Street															
30b	L3	All MCs	38	0.0	38	0.0		0.464	49.8	LOS D	10.6	74.5	0.96	0.78	0.96	19.8
31	T1	All MCs	445	0.0	445	0.0		0.464	43.3	LOS D	10.8	75.5	0.96	0.78	0.96	13.8
Approach			483	0.0	483	0.0		0.464	43.8	LOS D	10.8	75.5	0.96	0.78	0.96	14.4
All Vehicles			3292	0.0	3292	0.0		0.872	44.2	LOS D	54.6	382.1	0.99	0.90	1.08	19.2

Table A4: Signalised intersection of Homer Street with William Street and Hartill Law Avenue Weekday PM Peak Hour for Existing Conditions

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Stop Rate	Eff. No. of Cycles	Aver. Speed km/h
East: Homer Street															
5	T1	All MCs	764	0.0	764	0.0		0.445	10.7	LOS A	6.6	46.4	0.74	0.64	0.74	24.7
Approach			764	0.0	764	0.0		0.445	10.7	LOS A	6.6	46.4	0.74	0.64	0.74	24.7
NorthWest: Earlwood Avenue															
27a	L1	All MCs	19	0.0	19	0.0		0.015	16.2	LOS B	0.2	1.1	0.70	0.63	0.70	31.1
29b	R3	All MCs	514	0.0	514	0.0	*	0.641	26.1	LOS B	5.8	40.5	0.91	0.84	0.98	26.0
Approach			533	0.0	533	0.0		0.641	25.8	LOS B	5.8	40.5	0.90	0.84	0.97	26.1
West: Homer Street															
10b	L3	All MCs	63	0.0	63	0.0		0.777	7.3	LOS A	15.4	107.9	0.90	0.90	1.02	30.5
11	T1	All MCs	1263	0.0	1263	0.0	*	0.777	16.2	LOS B	15.6	109.5	0.91	0.90	1.03	20.1
Approach			1326	0.0	1326	0.0		0.777	15.8	LOS B	15.6	109.5	0.91	0.90	1.02	20.9
All Vehicles			2623	0.0	2623	0.0		0.777	16.3	LOS B	15.6	109.5	0.86	0.81	0.93	23.5

Table A5: Signalised intersection of Homer Street with Earlwood Avenue Weekday AM Peak Hour for Existing Conditions

Vehicle Movement Performance																
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Stop Rate	Eff. No. of Cycles	Aver. Speed km/h
South: St James Avenue																
1	L2	All MCs	51	0.0	51	0.0		0.366	23.6	LOS B	2.9	20.4	0.95	0.76	0.95	16.4
3	R2	All MCs	38	0.0	38	0.0	*	0.366	50.4	LOS D	2.9	20.4	0.95	0.76	0.95	20.5
Approach			88	0.0	88	0.0		0.366	35.1	LOS C	2.9	20.4	0.95	0.76	0.95	18.3
East: Homer Street																
4	L2	All MCs	192	0.0	192	0.0		0.535	12.6	LOS A	11.3	79.3	0.77	0.72	0.77	30.1
5	T1	All MCs	714	0.0	714	0.0		0.535	17.1	LOS B	11.4	80.0	0.78	0.70	0.78	29.4
Approach			905	0.0	905	0.0		0.535	16.2	LOS B	11.4	80.0	0.78	0.70	0.78	29.5
West: Homer Street																
11	T1	All MCs	1326	0.0	1326	0.0	*	0.794	21.7	LOS B	21.4	150.1	0.93	0.90	1.02	26.2
Approach			1326	0.0	1326	0.0		0.794	21.7	LOS B	21.4	150.1	0.93	0.90	1.02	26.2
All Vehicles			2320	0.0	2320	0.0		0.794	20.1	LOS B	21.4	150.1	0.87	0.82	0.92	27.0

Table A6: Signalised intersection of Homer Street with St James Avenue Weekday AM Peak Hour for Existing Conditions

Vehicle Movement Performance																
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Stop Rate	Eff. No. of Cycles	Aver. Speed km/h
South: Hocking Avenue																
1	L2	All MCs	16	0.0	16	0.0		0.017	19.8	LOS B	0.4	3.1	0.51	0.63	0.51	34.7
2	T1	All MCs	13	0.0	13	0.0	*	0.457	53.0	LOS D	6.3	44.1	0.97	0.78	0.97	23.9
3	R2	All MCs	101	0.0	101	0.0		0.457	57.6	LOS E	6.3	44.1	0.97	0.78	0.97	22.9
Approach			129	0.0	129	0.0		0.457	52.5	LOS D	6.3	44.1	0.91	0.76	0.91	24.0
East: Homer Street																
4	L2	All MCs	21	0.0	21	0.0		0.856	82.6	LOS F	21.5	150.3	0.98	0.98	1.17	26.9
5	T1	All MCs	669	0.0	669	0.0	*	0.856	77.0	LOS F	21.5	150.6	0.98	0.98	1.17	18.7
Approach			691	0.0	691	0.0		0.856	77.2	LOS F	21.5	150.6	0.98	0.98	1.17	19.0
North: Watkin Avenue																
7	L2	All MCs	8	0.0	8	0.0		0.013	37.4	LOS C	0.3	2.3	0.70	0.66	0.70	23.7
Approach			8	0.0	8	0.0		0.013	37.4	LOS C	0.3	2.3	0.70	0.66	0.70	23.7
West: Homer Street																
10	L2	All MCs	13	0.0	13	0.0		0.192	22.1	LOS B	4.5	31.2	0.29	0.27	0.29	46.5
11	T1	All MCs	1037	0.0	1037	0.0		0.854	30.4	LOS C	40.6	284.4	0.73	0.71	0.77	31.0
12	R2	All MCs	27	0.0	27	0.0	*	0.854	162.1	LOS F	40.6	284.4	0.89	0.86	0.94	35.4
Approach			1077	0.0	1077	0.0		0.854	33.6	LOS C	40.6	284.4	0.73	0.70	0.77	31.4
All Vehicles			1905	0.0	1905	0.0		0.856	50.7	LOS D	40.6	284.4	0.83	0.81	0.93	24.9

Table A7: Signalised intersection of Homer Street with Watkin Avenue and Hocking Avenue Weekday AM Peak Hour for Existing Conditions

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Homer Street															
5	T1	All MCs	1118	0.0	1118	0.0		0.651	12.1	LOS A	11.0	76.7	0.84	0.74	0.84	23.2
Approach			1118	0.0	1118	0.0		0.651	12.1	LOS A	11.0	76.7	0.84	0.74	0.84	23.2
NorthWest: Earlwood Avenue															
27a	L1	All MCs	36	0.0	36	0.0		0.029	16.3	LOS B	0.3	2.1	0.71	0.65	0.71	31.0
29b	R3	All MCs	345	0.0	345	0.0	*	0.332	19.7	LOS B	3.3	23.3	0.80	0.77	0.80	27.4
Approach			381	0.0	381	0.0		0.332	19.4	LOS B	3.3	23.3	0.79	0.76	0.79	27.7
West: Homer Street															
10b	L3	All MCs	198	0.0	198	0.0		0.757	6.6	LOS A	14.4	100.6	0.89	0.88	0.99	30.6
11	T1	All MCs	1088	0.0	1088	0.0	*	0.757	17.0	LOS B	14.8	103.3	0.90	0.87	0.99	20.6
Approach			1286	0.0	1286	0.0		0.757	15.4	LOS B	14.8	103.3	0.89	0.87	0.99	23.0
All Vehicles			2785	0.0	2785	0.0		0.757	14.6	LOS B	14.8	103.3	0.86	0.80	0.90	24.1

Table A8: Signalised intersection of Homer Street with Earlwood Avenue Weekday PM Peak Hour for Existing Conditions

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: St James Avenue															
1	L2	All MCs	24	0.0	24	0.0		0.502	20.7	LOS B	3.3	23.3	0.99	0.77	0.99	15.7
3	R2	All MCs	72	0.0	72	0.0	*	0.502	43.6	LOS D	3.3	23.3	0.99	0.77	0.99	19.7
Approach			96	0.0	96	0.0		0.502	37.9	LOS C	3.3	23.3	0.99	0.77	0.99	18.8
East: Homer Street															
4	L2	All MCs	235	0.0	235	0.0		0.813	18.2	LOS B	22.9	160.5	0.94	0.93	1.04	26.5
5	T1	All MCs	1134	0.0	1134	0.0	*	0.813	24.3	LOS B	22.9	160.5	0.94	0.93	1.05	25.1
Approach			1368	0.0	1368	0.0		0.813	23.2	LOS B	22.9	160.5	0.94	0.93	1.05	25.4
West: Homer Street															
11	T1	All MCs	1088	0.0	1088	0.0		0.651	17.2	LOS B	14.9	104.2	0.85	0.75	0.85	29.1
Approach			1088	0.0	1088	0.0		0.651	17.2	LOS B	14.9	104.2	0.85	0.75	0.85	29.1

Table A9: Signalised intersection of Homer Street with St James Avenue Weekday PM Peak Hour for Existing Conditions

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Hocking Avenue															
1	L2	All MCs	37	0.0	37	0.0		0.046	20.2	LOS B	0.9	6.4	0.60	0.67	0.60	34.6
2	T1	All MCs	34	0.0	34	0.0	*	0.250	35.1	LOS C	3.3	22.8	0.90	0.73	0.90	29.0
3	R2	All MCs	51	0.0	51	0.0		0.250	39.6	LOS C	3.3	22.8	0.90	0.73	0.90	27.9
Approach			121	0.0	121	0.0		0.250	32.4	LOS C	3.3	22.8	0.81	0.71	0.81	29.9
East: Homer Street															
4	L2	All MCs	34	0.0	34	0.0		0.833	56.2	LOS D	22.7	158.8	0.95	0.93	1.09	33.0
5	T1	All MCs	1002	0.0	1002	0.0	*	0.833	50.7	LOS D	22.7	159.1	0.95	0.93	1.09	24.7
Approach			1036	0.0	1036	0.0		0.833	50.9	LOS D	22.7	159.1	0.95	0.93	1.09	25.1
North: Watkin Avenue															
7	L2	All MCs	31	0.0	31	0.0		0.080	39.9	LOS C	1.1	7.8	0.85	0.71	0.85	22.4
Approach			31	0.0	31	0.0		0.080	39.9	LOS C	1.1	7.8	0.85	0.71	0.85	22.4
West: Homer Street															
10	L2	All MCs	42	0.0	42	0.0		0.177	10.7	LOS A	5.0	35.0	0.38	0.37	0.38	44.2
11	T1	All MCs	864	0.0	864	0.0		0.787	15.6	LOS B	26.8	187.6	0.78	0.72	0.80	28.8
12	R2	All MCs	73	0.0	73	0.0	*	0.787	132.4	LOS F	26.8	187.6	0.98	0.89	1.02	32.4
Approach			979	0.0	979	0.0		0.787	24.0	LOS B	26.8	187.6	0.78	0.72	0.80	29.7
All Vehicles			2166	0.0	2166	0.0		0.833	37.6	LOS C	26.8	187.6	0.86	0.82	0.94	27.4

Table A10: Signalised intersection of Homer Street with Watkin Avenue and Hocking Avenue Weekday PM Peak Hour for Existing Conditions

APPENDIX B

SIDRA Intersection Results for Existing Conditions with Mixed-Use Traffic

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Stop Eff. Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Homer Street																
5	T1	All MCs	961	0.0	961	0.0		0.692	16.5	LOS B	20.4	142.8	0.83	0.75	0.84	31.4
6	R2	All MCs	100	0.0	100	0.0	*	0.692	35.0	LOS C	12.3	86.2	0.87	0.80	0.90	33.4
Approach			1061	0.0	1061	0.0		0.692	18.2	LOS B	20.4	142.8	0.83	0.76	0.84	31.7
North: Wardell Road																
7	L2	All MCs	128	0.0	128	0.0		0.683	38.1	LOS C	10.7	74.9	0.92	0.84	0.95	30.3
9	R2	All MCs	486	0.0	486	0.0		0.683	38.1	LOS C	10.7	74.9	0.92	0.84	0.95	31.3
Approach			615	0.0	615	0.0		0.683	38.1	LOS C	10.7	74.9	0.92	0.84	0.95	28.5
West: Homer Street																
10	L2	All MCs	323	0.0	323	0.0	*	0.465	5.8	LOS A	9.4	65.6	0.64	0.68	0.64	40.3
11	T1	All MCs	633	0.0	633	0.0		0.465	15.6	LOS B	11.6	81.2	0.67	0.62	0.67	35.0
Approach			956	0.0	956	0.0		0.465	12.3	LOS A	11.6	81.2	0.66	0.64	0.66	37.4
All Vehicles			2632	0.0	2632	0.0		0.692	20.7	LOS B	20.4	142.8	0.79	0.74	0.80	32.3

Table B1: Signalised intersection of Homer Street with Wardell Road Weekday AM Peak Hour for Existing Conditions with mixed use traffic

Vehicle Movement Performance																
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Hartill-Law Avenue																
1b	L3	All MCs	9	0.0	9	0.0		0.791	52.2	LOS D	12.1	84.9	1.00	0.90	1.15	24.6
1	L2	All MCs	164	0.0	164	0.0		0.791	50.7	LOS D	12.1	84.9	1.00	0.90	1.15	25.3
3a	R1	All MCs	364	0.0	364	0.0	*	0.791	49.3	LOS D	12.4	86.8	1.00	0.90	1.14	21.9
Approach			538	0.0	538	0.0		0.791	49.7	LOS D	12.4	86.8	1.00	0.90	1.15	23.1
NorthEast: Homer Street																
24a	L1	All MCs	377	0.0	377	0.0		0.777	28.4	LOS B	39.9	279.3	0.94	0.86	0.94	29.1
25	T1	All MCs	676	0.0	676	0.0	*	0.777	25.5	LOS B	39.9	279.3	0.94	0.86	0.94	18.4
26a	R1	All MCs	201	0.0	201	0.0		0.478	42.5	LOS D	8.4	58.5	0.98	0.79	0.98	15.7
Approach			1254	0.0	1254	0.0		0.777	29.1	LOS C	39.9	279.3	0.95	0.85	0.95	22.0
West: William Street																
10a	L1	All MCs	414	0.0	414	0.0	*	0.773	50.6	LOS D	9.5	66.4	1.00	0.89	1.15	13.5
Approach			414	0.0	414	0.0		0.773	50.6	LOS D	9.5	66.4	1.00	0.89	1.15	13.5
SouthWest: Homer Street																
30b	L3	All MCs	47	0.0	47	0.0		0.491	44.3	LOS D	11.5	80.7	0.94	0.78	0.94	21.8
31	T1	All MCs	549	0.0	549	0.0		0.491	38.5	LOS C	11.7	81.9	0.94	0.77	0.94	15.5
Approach			597	0.0	597	0.0		0.491	39.0	LOS C	11.7	81.9	0.94	0.77	0.94	15.0
All Vehicles			2802	0.0	2802	0.0		0.791	38.3	LOS C	39.9	279.3	0.96	0.85	1.01	19.6

Table B2: Signalised intersection of Homer Street with William Street and Hartill Law Avenue Weekday AM Peak Hour for Existing Conditions with mixed use traffic

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Homer Street															
5	T1	All MCs	961	0.0	961	0.0		0.692	16.5	LOS B	20.4	142.8	0.83	0.75	0.84	31.4
6	R2	All MCs	100	0.0	100	0.0	*	0.692	35.0	LOS C	12.3	86.2	0.87	0.80	0.90	33.4
Approach			1061	0.0	1061	0.0		0.692	18.2	LOS B	20.4	142.8	0.83	0.76	0.84	31.7
North: Wardell Road															
7	L2	All MCs	128	0.0	128	0.0		0.683	38.1	LOS C	10.7	74.9	0.92	0.84	0.95	30.3
9	R2	All MCs	486	0.0	486	0.0		0.683	38.1	LOS C	10.7	74.9	0.92	0.84	0.95	31.3
Approach			615	0.0	615	0.0		0.683	38.1	LOS C	10.7	74.9	0.92	0.84	0.95	28.5
West: Homer Street															
10	L2	All MCs	323	0.0	323	0.0	*	0.465	5.8	LOS A	9.4	65.6	0.64	0.68	0.64	40.3
11	T1	All MCs	633	0.0	633	0.0		0.465	15.6	LOS B	11.6	81.2	0.67	0.62	0.67	35.0
Approach			956	0.0	956	0.0		0.465	12.3	LOS A	11.6	81.2	0.66	0.64	0.66	37.4
All Vehicles			2632	0.0	2632	0.0		0.692	20.7	LOS B	20.4	142.8	0.79	0.74	0.80	32.3

Table B3: Signalised intersection of Homer Street with Wardell Road Weekday PM Peak Hour for Existing Conditions with mixed use traffic

Vehicle Movement Performance																
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Hartill-Law Avenue																
1b	L3	All MCs	13	0.0	13	0.0		0.884	59.2	LOS E	20.4	143.1	1.00	0.98	1.24	23.0
1	L2	All MCs	265	0.0	265	0.0		0.884	58.4	LOS E	20.4	143.1	1.00	0.98	1.24	23.7
3a	R1	All MCs	503	0.0	503	0.0	*	0.884	56.2	LOS D	20.9	146.5	1.00	0.98	1.23	20.4
Approach			781	0.0	781	0.0		0.884	57.0	LOS E	20.9	146.5	1.00	0.98	1.23	21.7
NorthEast: Homer Street																
24a	L1	All MCs	592	0.0	592	0.0		0.917	40.8	LOS C	63.5	444.5	1.00	1.00	1.11	24.6
25	T1	All MCs	652	0.0	652	0.0	*	0.917	37.8	LOS C	63.5	444.5	1.00	1.00	1.11	14.3
26a	R1	All MCs	449	0.0	449	0.0		0.768	46.3	LOS D	21.4	150.1	1.00	0.88	1.05	14.9
Approach			1693	0.0	1693	0.0		0.917	41.1	LOS C	63.5	444.5	1.00	0.97	1.09	18.8
West: William Street																
10a	L1	All MCs	525	0.0	525	0.0	*	0.954	68.5	LOS E	15.4	107.6	1.00	1.10	1.50	10.9
Approach			525	0.0	525	0.0		0.954	68.5	LOS E	15.4	107.6	1.00	1.10	1.50	10.9
SouthWest: Homer Street																
30b	L3	All MCs	38	0.0	38	0.0		0.525	52.8	LOS D	11.5	80.3	0.97	0.79	0.97	19.7
31	T1	All MCs	477	0.0	477	0.0		0.525	46.3	LOS D	11.6	81.3	0.97	0.79	0.97	13.7
Approach			515	0.0	515	0.0		0.525	46.8	LOS D	11.6	81.3	0.97	0.79	0.97	13.2
All Vehicles			3514	0.0	3514	0.0		0.954	49.6	LOS D	63.5	444.5	1.00	0.97	1.17	17.6

Table B4: Signalised intersection of Homer Street with William Street and Hartill Law Avenue Weekday PM Peak Hour for Existing Conditions with mixed use traffic

Vehicle Movement Performance																
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Homer Street																
5	T1	All MCs	777	0.0	777	0.0		0.433	10.0	LOS A	6.5	45.6	0.72	0.62	0.72	25.6
Approach			777	0.0	777	0.0		0.433	10.0	LOS A	6.5	45.6	0.72	0.62	0.72	25.6
NorthWest: Earlwood Avenue																
27a	L1	All MCs	19	0.0	19	0.0		0.017	17.0	LOS B	0.2	1.1	0.72	0.63	0.72	30.6
29b	R3	All MCs	514	0.0	514	0.0	*	0.696	28.8	LOS C	6.2	43.3	0.94	0.88	1.08	24.9
Approach			533	0.0	533	0.0		0.696	28.3	LOS B	6.2	43.3	0.93	0.87	1.07	23.3
West: Homer Street																
10b	L3	All MCs	63	0.0	63	0.0		0.745	6.2	LOS A	14.4	100.6	0.87	0.84	0.94	32.0
11	T1	All MCs	1267	0.0	1267	0.0	*	0.745	14.2	LOS A	14.7	102.6	0.88	0.84	0.95	21.7
Approach			1331	0.0	1331	0.0		0.745	13.8	LOS A	14.7	102.6	0.88	0.84	0.95	22.5
All Vehicles			2640	0.0	2640	0.0		0.745	15.6	LOS B	14.7	102.6	0.84	0.78	0.91	23.4

Table B5: Signalised intersection of Homer Street with Earlwood Avenue Weekday AM Peak Hour for Existing Conditions with mixed use traffic

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: St James Avenue																
1	L2	All MCs	51	0.0	51	0.0		0.373	23.5	LOS B	3.0	20.7	0.96	0.76	0.96	16.4
3	R2	All MCs	39	0.0	39	0.0	*	0.373	50.2	LOS D	3.0	20.7	0.96	0.76	0.96	20.4
Approach			89	0.0	89	0.0		0.373	35.1	LOS C	3.0	20.7	0.96	0.76	0.96	18.3
East: Homer Street																
4	L2	All MCs	194	0.0	194	0.0		0.544	12.7	LOS A	11.6	81.1	0.77	0.72	0.77	30.1
5	T1	All MCs	726	0.0	726	0.0		0.544	17.2	LOS B	11.7	81.7	0.79	0.70	0.79	29.3
Approach			920	0.0	920	0.0		0.544	16.3	LOS B	11.7	81.7	0.78	0.71	0.78	29.5
West: Homer Street																
11	T1	All MCs	1331	0.0	1331	0.0	*	0.796	21.9	LOS B	21.6	151.3	0.93	0.90	1.02	26.1
Approach			1331	0.0	1331	0.0		0.796	21.9	LOS B	21.6	151.3	0.93	0.90	1.02	26.1
All Vehicles			2340	0.0	2340	0.0		0.796	20.2	LOS B	21.6	151.3	0.88	0.82	0.92	26.9

Table B6: Signalised intersection of Homer Street with St James Avenue Weekday AM Peak Hour for Existing Conditions with mixed use traffic

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Hocking Avenue															
1	L2	All MCs	16	0.0	16	0.0		0.012	19.7	LOS B	0.4	3.1	0.51	0.62	0.51	34.8
2	T1	All MCs	13	0.0	13	0.0	*	0.326	51.2	LOS D	6.1	42.6	0.95	0.77	0.95	24.3
3	R2	All MCs	101	0.0	101	0.0		0.326	55.7	LOS D	6.1	42.6	0.95	0.77	0.95	23.3
Approach			129	0.0	129	0.0		0.326	50.9	LOS D	6.1	42.6	0.90	0.75	0.90	24.4
East: Homer Street															
4	L2	All MCs	21	0.0	21	0.0		0.861	83.4	LOS F	21.8	152.3	0.98	0.99	1.18	26.7
5	T1	All MCs	673	0.0	673	0.0	*	0.861	77.9	LOS F	21.8	152.5	0.98	0.99	1.18	18.5
Approach			694	0.0	694	0.0		0.861	78.0	LOS F	21.8	152.5	0.98	0.99	1.18	13.4
North: Watkin Avenue															
7	L2	All MCs	8	0.0	8	0.0		0.013	37.5	LOS C	0.3	2.3	0.70	0.66	0.70	23.7
Approach			8	0.0	8	0.0		0.013	37.5	LOS C	0.3	2.3	0.70	0.66	0.70	23.7
West: Homer Street															
10	L2	All MCs	13	0.0	13	0.0		0.194	22.5	LOS B	4.5	31.6	0.29	0.27	0.29	46.5
11	T1	All MCs	1052	0.0	1052	0.0		0.863	31.8	LOS C	42.4	296.9	0.74	0.72	0.79	30.3
12	R2	All MCs	27	0.0	27	0.0	*	0.863	165.9	LOS F	42.4	296.9	0.90	0.88	0.97	34.7
Approach			1092	0.0	1092	0.0		0.863	35.0	LOS C	42.4	296.9	0.74	0.72	0.79	23.6
All Vehicles			1923	0.0	1923	0.0		0.863	51.6	LOS D	42.4	296.9	0.84	0.82	0.94	18.8

Table B7: Signalised intersection of Homer Street with Watkin Avenue and Hocking Avenue Weekday AM Peak Hour for Existing Conditions with mixed use traffic

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Homer Street															
5	T1	All MCs	1208	0.0	1208	0.0		0.646	10.8	LOS A	11.3	79.4	0.81	0.71	0.81	24.7
Approach			1208	0.0	1208	0.0		0.646	10.8	LOS A	11.3	79.4	0.81	0.71	0.81	24.7
NorthWest: Earlwood Avenue															
27a	L1	All MCs	52	0.0	52	0.0		0.048	18.1	LOS B	0.5	3.3	0.76	0.67	0.76	29.9
29b	R3	All MCs	345	0.0	345	0.0	*	0.379	21.6	LOS B	3.6	24.9	0.85	0.78	0.85	26.4
Approach			397	0.0	397	0.0		0.379	21.1	LOS B	3.6	24.9	0.84	0.77	0.84	26.8
West: Homer Street															
10b	L3	All MCs	198	0.0	198	0.0		0.727	5.7	LOS A	13.7	96.0	0.84	0.82	0.90	32.5
11	T1	All MCs	1146	0.0	1146	0.0	*	0.727	14.1	LOS A	14.2	99.3	0.85	0.81	0.90	22.8
Approach			1344	0.0	1344	0.0		0.727	12.9	LOS A	14.2	99.3	0.85	0.81	0.90	25.1
All Vehicles			2949	0.0	2949	0.0		0.727	13.1	LOS A	14.2	99.3	0.83	0.76	0.85	25.4

Table B8: Signalised intersection of Homer Street with Earlwood Avenue Weekday PM Peak Hour for Existing Conditions with mixed use traffic

Vehicle Movement Performance																
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: St James Avenue																
1	L2	All MCs	24	0.0	24	0.0		0.546	20.7	LOS B	3.6	25.3	0.99	0.79	1.02	15.6
3	R2	All MCs	79	0.0	79	0.0	*	0.546	43.5	LOS D	3.6	25.3	0.99	0.79	1.02	19.6
Approach			103	0.0	103	0.0		0.546	38.2	LOS C	3.6	25.3	0.99	0.79	1.02	18.8
East: Homer Street																
4	L2	All MCs	245	0.0	245	0.0		0.854	21.5	LOS B	26.3	183.8	0.96	1.00	1.13	24.9
5	T1	All MCs	1193	0.0	1193	0.0	*	0.854	27.8	LOS B	26.3	183.8	0.97	1.00	1.14	23.4
Approach			1438	0.0	1438	0.0		0.854	26.7	LOS B	26.3	183.8	0.97	1.00	1.14	23.7
West: Homer Street																
11	T1	All MCs	1152	0.0	1152	0.0		0.689	17.6	LOS B	16.1	112.8	0.87	0.77	0.87	28.8
Approach			1152	0.0	1152	0.0		0.689	17.6	LOS B	16.1	112.8	0.87	0.77	0.87	28.8
All Vehicles			2693	0.0	2693	0.0		0.854	23.3	LOS B	26.3	183.8	0.93	0.89	1.02	25.3

Table B9: Signalised intersection of Homer Street with St James Avenue Weekday PM Peak Hour for Existing Conditions with mixed use traffic

Vehicle Movement Performance																
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Hocking Avenue																
1	L2	All MCs	44	0.0	44	0.0		0.055	20.3	LOS B	1.1	7.8	0.61	0.67	0.61	34.5
2	T1	All MCs	34	0.0	34	0.0	*	0.250	35.1	LOS C	3.3	22.8	0.90	0.73	0.90	29.0
3	R2	All MCs	51	0.0	51	0.0		0.250	39.6	LOS C	3.3	22.8	0.90	0.73	0.90	27.9
Approach			128	0.0	128	0.0		0.250	31.8	LOS C	3.3	22.8	0.80	0.71	0.80	30.2
East: Homer Street																
4	L2	All MCs	34	0.0	34	0.0		0.848	58.2	LOS E	23.8	166.4	0.96	0.96	1.12	32.3
5	T1	All MCs	1019	0.0	1019	0.0	*	0.848	52.6	LOS D	23.8	166.7	0.96	0.96	1.12	24.0
Approach			1053	0.0	1053	0.0		0.848	52.8	LOS D	23.8	166.7	0.96	0.96	1.12	17.9
North: Watkin Avenue																
7	L2	All MCs	31	0.0	31	0.0		0.080	40.2	LOS C	1.1	7.8	0.85	0.71	0.85	22.4
Approach			31	0.0	31	0.0		0.080	40.2	LOS C	1.1	7.8	0.85	0.71	0.85	22.4
West: Homer Street																
10	L2	All MCs	47	0.0	47	0.0		0.189	10.8	LOS A	5.4	37.8	0.38	0.38	0.38	44.0
11	T1	All MCs	923	0.0	923	0.0		0.843	17.7	LOS B	30.8	215.5	0.80	0.77	0.86	27.4
12	R2	All MCs	78	0.0	78	0.0	*	0.843	138.0	LOS F	30.8	215.5	1.00	0.96	1.10	31.1
Approach			1048	0.0	1048	0.0		0.843	26.4	LOS B	30.8	215.5	0.79	0.76	0.86	28.3
All Vehicles			2260	0.0	2260	0.0		0.848	39.2	LOS C	30.8	215.5	0.87	0.85	0.98	22.6

Table B10: Signalised intersection of Homer Street with Watkin Avenue and Hocking Avenue Weekday PM Peak Hour for Existing Conditions with mixed use traffic

APPENDIX C

Scenario SIDRA Intersection Results for the Signalised

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Homer Street															
5	T1	All MCs	961	0.0	961	0.0		0.692	16.5	LOS B	20.4	142.8	0.83	0.75	0.84	31.4
6	R2	All MCs	100	0.0	100	0.0	*	0.692	35.0	LOS C	12.3	86.2	0.87	0.80	0.90	33.4
Approach			1061	0.0	1061	0.0		0.692	18.2	LOS B	20.4	142.8	0.83	0.76	0.84	31.7
North: Wardell Road															
7	L2	All MCs	128	0.0	128	0.0		0.683	38.1	LOS C	10.7	74.9	0.92	0.84	0.95	30.3
9	R2	All MCs	486	0.0	486	0.0		0.683	38.1	LOS C	10.7	74.9	0.92	0.84	0.95	31.3
Approach			615	0.0	615	0.0		0.683	38.1	LOS C	10.7	74.9	0.92	0.84	0.95	28.5
West: Homer Street															
10	L2	All MCs	323	0.0	323	0.0	*	0.465	5.8	LOS A	9.4	65.6	0.64	0.68	0.64	40.3
11	T1	All MCs	633	0.0	633	0.0		0.465	15.6	LOS B	11.6	81.2	0.67	0.62	0.67	35.0
Approach			956	0.0	956	0.0		0.465	12.3	LOS A	11.6	81.2	0.66	0.64	0.66	37.4
All Vehicles			2632	0.0	2632	0.0		0.692	20.7	LOS B	20.4	142.8	0.79	0.74	0.80	32.3

Table C1: Signalised intersection of Homer Street with Wardell Road Weekday PM Peak Hour for Existing Conditions with mixed use traffic (Scenario 1 all outbound traffic to Homer Street)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Homer Street															
5	T1	All MCs	961	0.0	961	0.0		0.655	14.5	LOS B	19.1	133.8	0.79	0.71	0.79	32.8
6	R2	All MCs	100	0.0	100	0.0	*	0.655	30.5	LOS C	11.5	80.6	0.83	0.75	0.83	34.9
Approach			1061	0.0	1061	0.0		0.655	16.0	LOS B	19.1	133.8	0.79	0.71	0.79	33.1
North: Wardell Road															
7	L2	All MCs	104	0.0	104	0.0		0.649	37.8	LOS C	9.7	67.9	0.92	0.83	0.93	30.1
9	R2	All MCs	459	0.0	459	0.0		0.649	37.8	LOS C	9.7	67.9	0.92	0.83	0.93	31.1
Approach			563	0.0	563	0.0		0.649	37.8	LOS C	9.7	67.9	0.92	0.83	0.93	28.6
West: Homer Street															
10	L2	All MCs	323	0.0	323	0.0	*	0.445	5.7	LOS A	8.7	60.8	0.60	0.66	0.60	40.9
11	T1	All MCs	633	0.0	633	0.0		0.445	13.8	LOS A	11.0	77.1	0.64	0.60	0.64	36.1
Approach			956	0.0	956	0.0		0.445	11.1	LOS A	11.0	77.1	0.62	0.62	0.62	38.3
All Vehicles			2580	0.0	2580	0.0		0.655	18.9	LOS B	19.1	133.8	0.76	0.70	0.76	33.2

Table C2: Signalised intersection of Homer Street with Wardell Road Weekday PM Peak Hour for Existing Conditions with mixed use traffic (Scenario 2 60 percent of outbound traffic to Homer Street)