PROPOSED MIX-USED DEVELOPMENT

608-612 High Street in Penrith

Traffic and Parking Impact Report

Prepared for: NOR SIDE INVESTMENT PTY LTD

N1815755A (Version 1b)

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1. INTRODUCTION

Motion Traffic Engineers was commissioned by NOR SIDE INVESTMENT PTY LTD to undertake a traffic and parking impact assessment of proposed mix-used development at 608-612 High Street in Penrith. The site is located within the Penrith City Centre.

The site has frontage to High Street and Union Lane. The proposed vehicle access and egress to the car park is from Union Lane, except for service vehicles which will exit from the site onto High Street. Currently the site is a car lot.

The proposed development will consist of a commercial space in the ground floor with apartments occupying the higher levels. Car parking will be provided at the ground and basement levels.

This traffic report focuses on the proposed development and changes in car usage and car park utilisation and additional trips from the proposed 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 within the Penrith city centre.

The nearby land uses on High Street are retail and commercial business as well as residential homes. The Penrith Train Station and bus services are located nearby.

Figures 1 and 2 show the location of the mixed-use site from the aerial and street map perspective respectively.

Figures 3 shows the existing site. Currently the site is unoccupied.

Figure 1: Location of the Subject Site on Aerial

Figure 2: Street Map of the Location of the Development

Figure 3a: Site Photo from High Street

Figure 3b: Site Photo from Union Lane

2.2 Road Network

This section describes the roads near the proposed development.

High Street is a town centre road near the development with restricted on-street parking. High Street has two lanes in each direction adjacent to the site. The sign-posted speed limit is 50km/hr except where the high pedestrian speed limit applies near the Penrith Town Centre. Figure 4 shows a photograph of High Street near the development.

Union Lane is a service road with one lane each way with on street parking not permitted on both sides of the road. The default speed limit is 40km/hr. Figure 5 shows a photograph of Union Lane.

Worth Street is a town centre road with one lane each way with on street parking not permitted on both sides of the road. The default speed limit is 40km/hr. Figure 6 shows a photograph of Worth Street.

Figure 4: High Street looking East from Worth Street

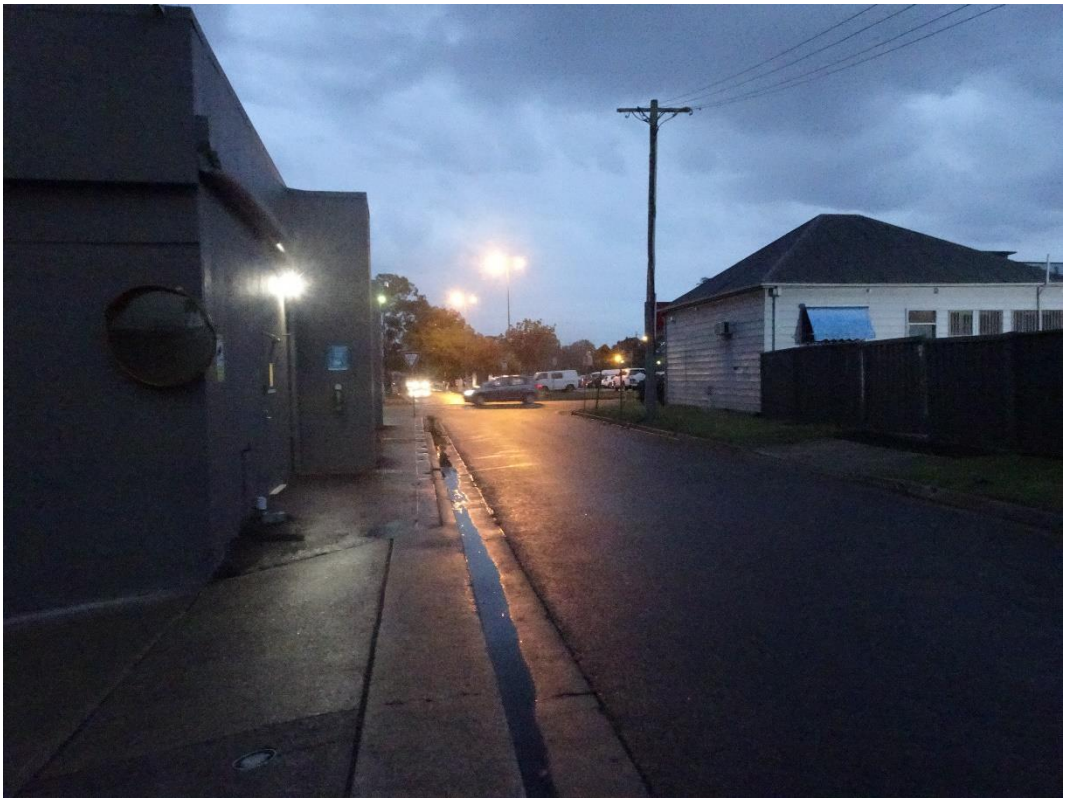

Figure 5: Union Lane looking north from adjacent the site

Figure 6: Worth Street looking South from High Street

2.3 Intersection Description

As part of the traffic impact assessment, the performance of two nearby intersections were surveyed and assessed:

- Signalised intersection of High Street with Worth Street
- Priority intersection of Worth Street with Union lane

External traffic travelling to and from the site will most likely need to travel through the above intersection.

The signalised intersection of High Street with Worth Street is a four-leg intersection with all turn movements permitted. The north leg of this intersection is a short leg which directly connects to the Penrith Plaza carpark. Left slip lanes are provided to and from Penrith Plaza Car Park. The number on the lanes represent the length of short lanes in metres. Pedestrian crossings are provided on all approaches. Figure 6 presents the layout of this intersection using SIDRA 7 (an industry standard intersection assessment program).

The priority intersection of Worth Street with Union Lane is a four-leg intersection. The eastern approach on Lane Street is an approach only. Drivers on Union lane needs to give way to traffic on Worth Street. Figure 7 presents the layout of this intersection using SIDRA 7.

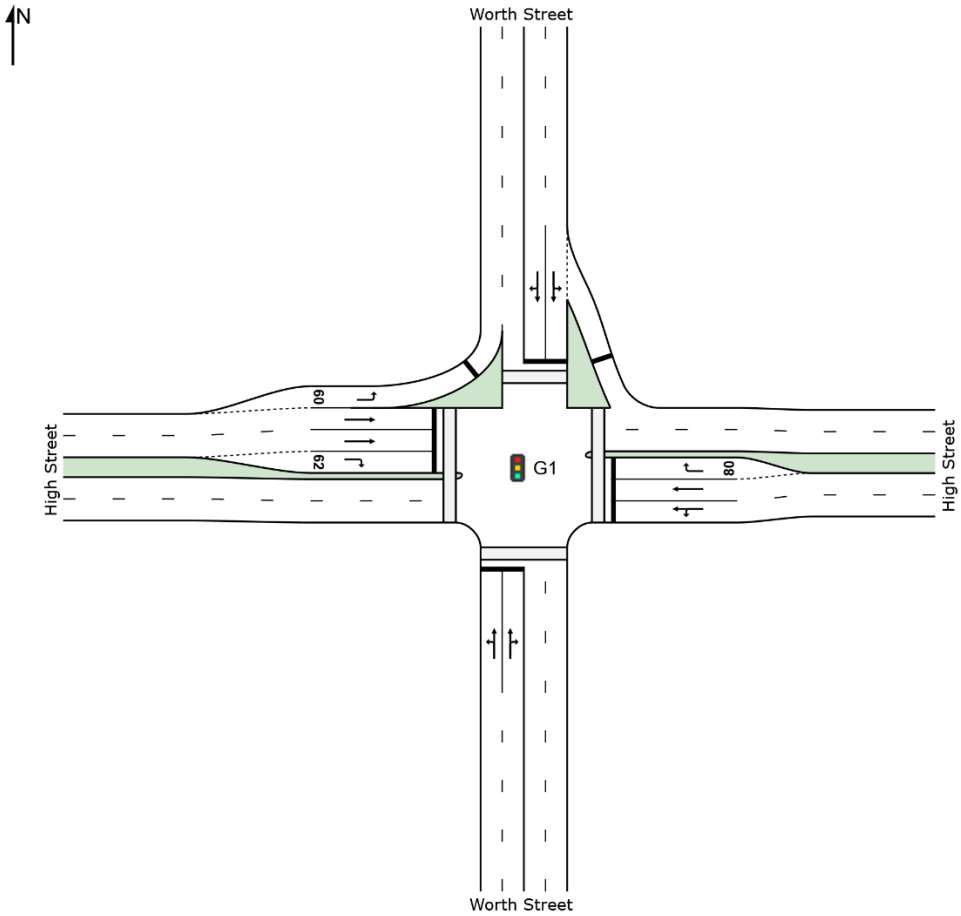

Figure 6: Signalized intersection of High Street with Worth Street

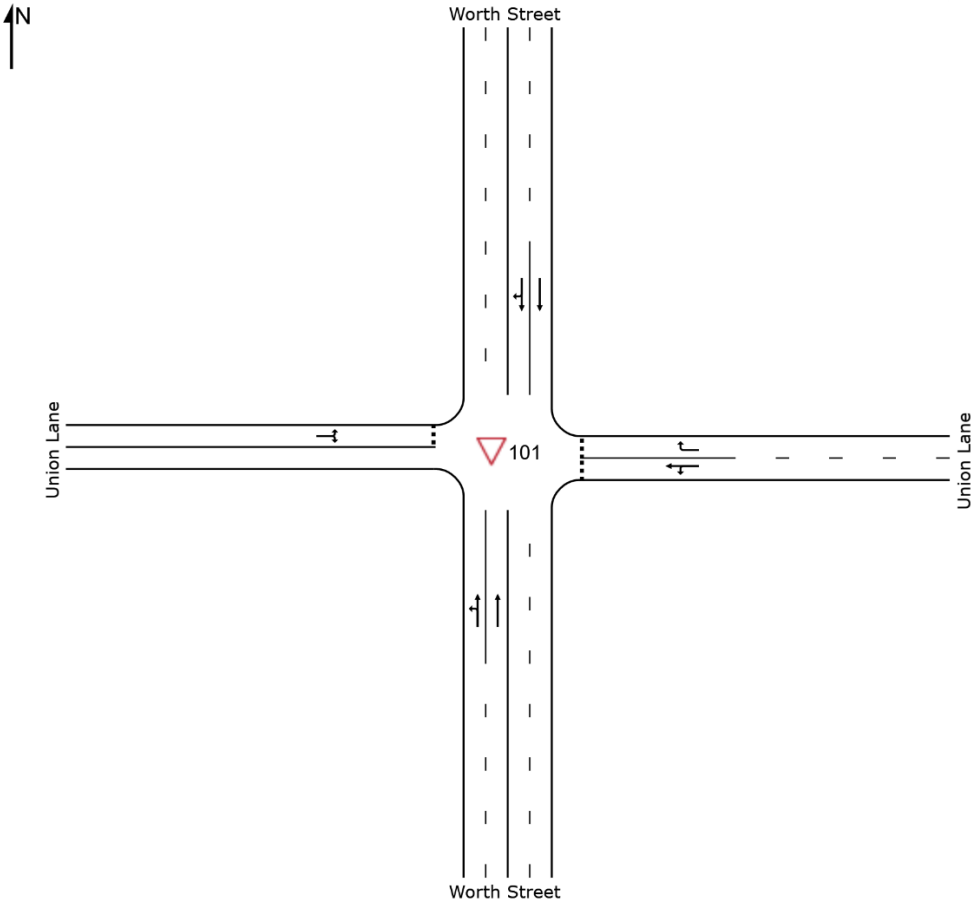

Figure 7: Priority intersection of Worth Street with Union Lane

2.4 Existing Traffic Volumes

As part of the traffic assessment, traffic counts have been undertaken at the intersections for the weekday AM and PM peak periods. The peak hour was 8-9 AM and 5-6 PM.

The survey hours are to capture the traffic movements when the retail and other businesses are most active in the Penrith City Centre as well as the proposed mixed-use development.

The following Figures present the traffic volumes in vehicles for the weekday peak hours.

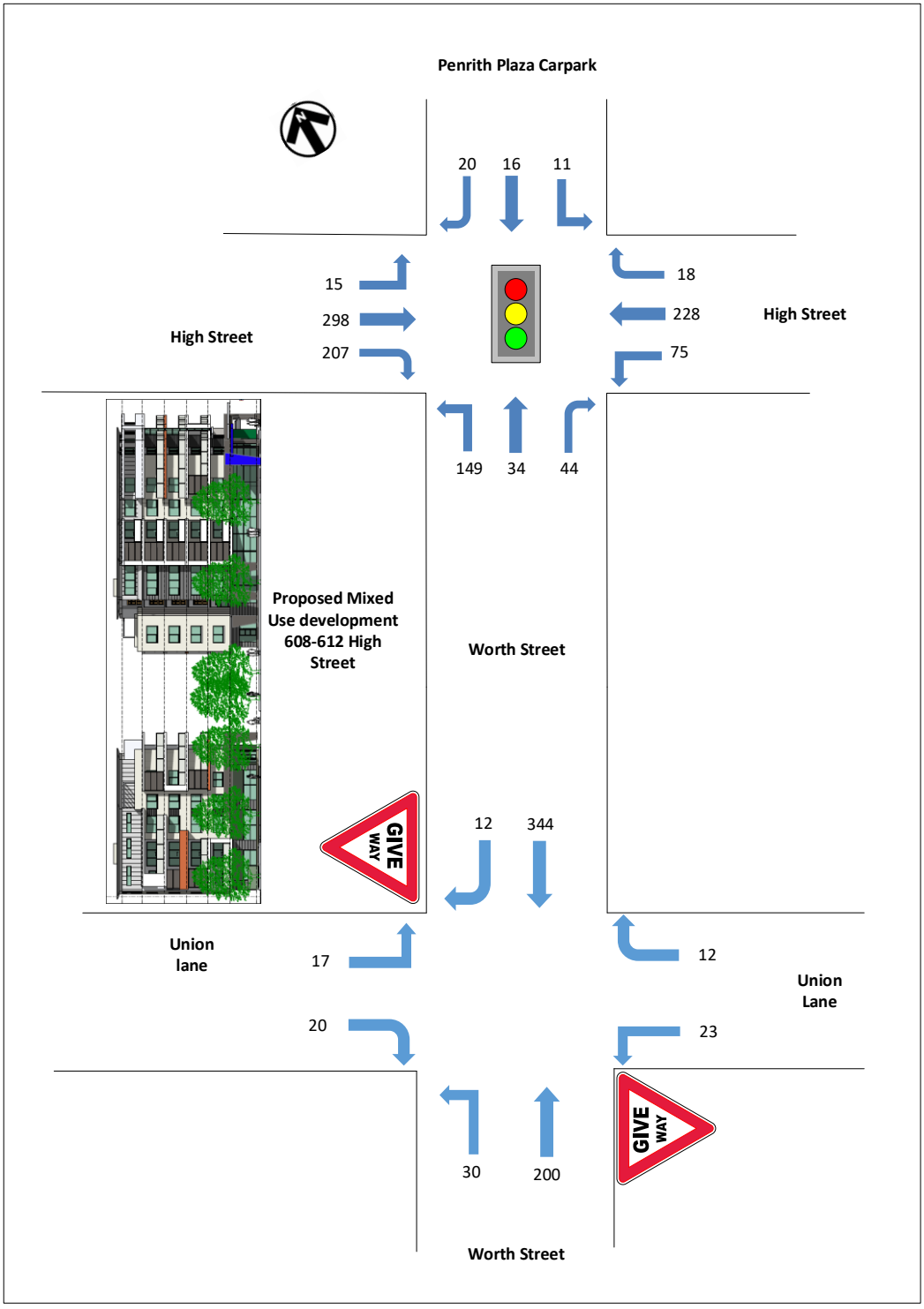

Figure 8: Existing Weekday Traffic Volumes AM Peak Hour

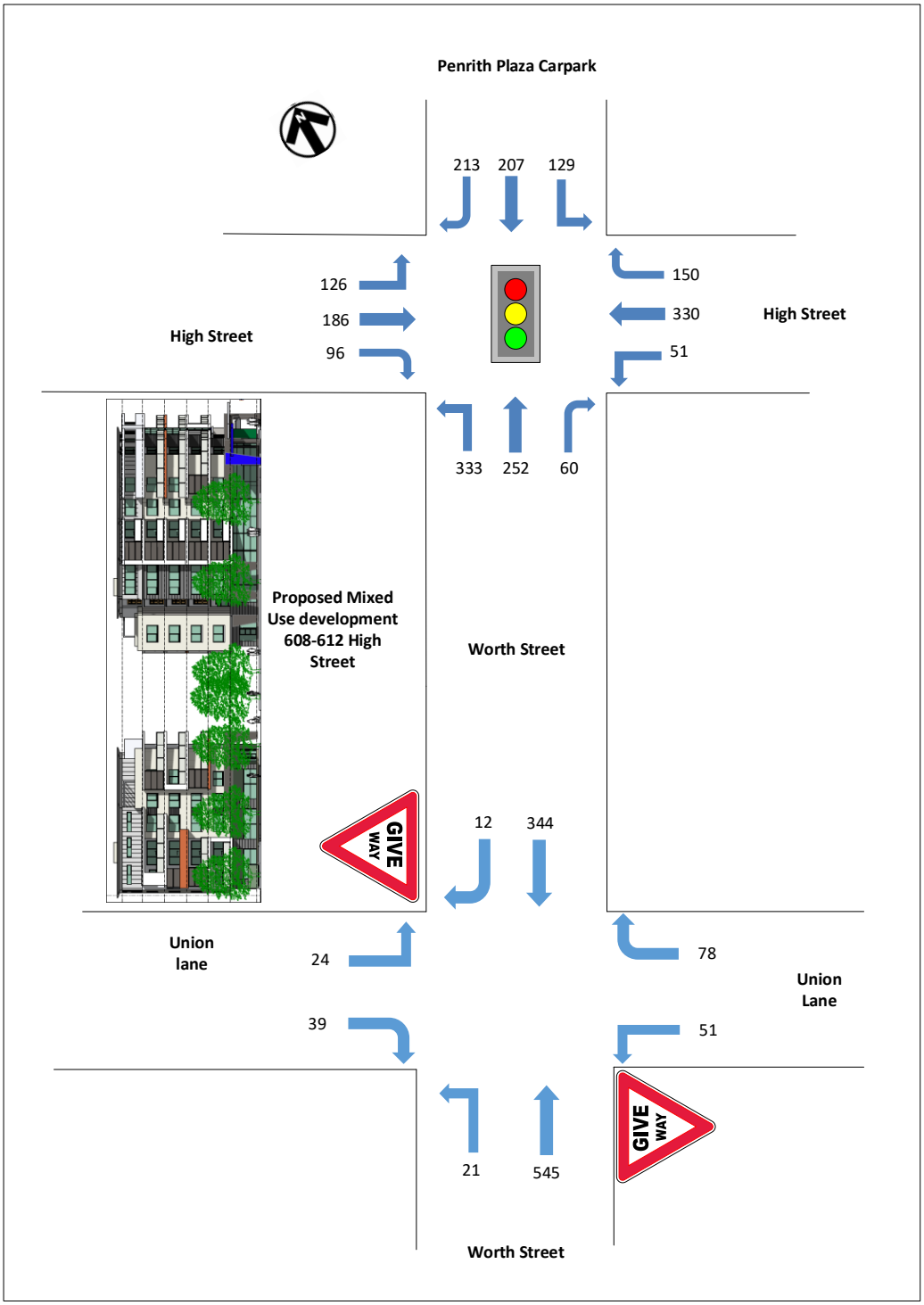

Figure 9: Existing Weekday Traffic Volumes PM Peak Hour

2.5 Intersection Assessment

As part of the traffic impact assessment, the performance of two nearby intersections were surveyed and assessed:

- Signalised intersection of High Street with Worth Street
- Priority intersection of Worth Street with Union lane

The existing intersection operating performance was assessed using the SIDRA software package (version 7) 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 below.

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 priority 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:

Signalised intersection of High Street with Worth Street

- The overall intersection has a LoS C for the AM and PM peak hours
- There is spare capacity at this intersection.

Priority intersection of Worth Street with Union lane

- All the turn movements have an acceptable LoS for both peak hours
- There is spare capacity at this intersection.

The full SIDRA results are presented in Appendix A.

2.6 Public Transport

The nearest bus stop is 200 metres from the development on High Street. This bus stop is serviced by the 688, 689, 690P and 691 bus routes. These provide transport to a range of suburbs including Penrith, Emu Plains, Emu Heights and surrounding suburbs.

Penrith train station is 750 metres from the development. Trains regularly leave this station heading to major town centres including St Marys, Mount Druitt and Sydney CBD.

Overall, the site has excellent access to public transport.

Figure 10 shows a map of the local public transport services.

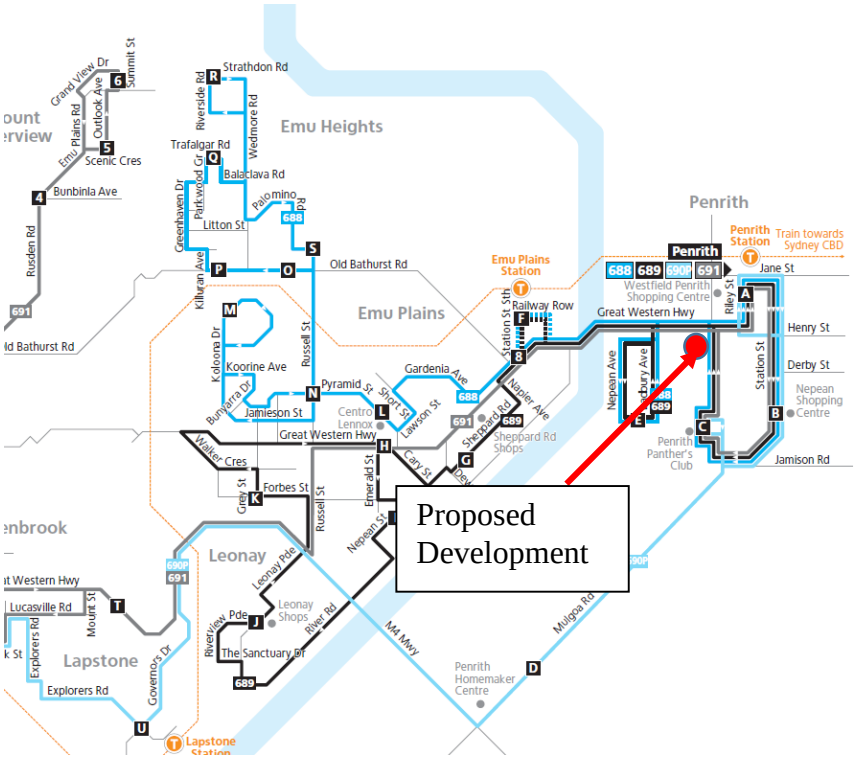

Figure 10: Local transport map

2.7 Conclusions on the Existing Conditions

The nearby intersection performs well with sufficient spare capacity to accommodate additional traffic.

The local area is well serviced by bus services and the Penrith Train Station.

3. PROPOSED MIXED-USE DEVELOPMENT

The details of the proposed development are as follows:

- 18 one-bedroom apartments (level one and above)
- 23 two-bedroom apartments (level one and above)
- 1493m^2 for commercial tenancy (ground level)

On-site parking will be provided at ground and one basement level.

The site has frontage to High Street and Union Lane. The proposed vehicle access and egress to the car park is from Union Lane.

A full scaled plan of the proposed residential development is provided as part of the Planning Application.

4. CAR PARKING CONSIDERATIONS

4.1 Penrith Council Planning Scheme

The car parking requirements for the proposed development are presented in *Penrith Development Control P*lan 2014 with the car parking rates as follows as it applies to the proposed development:

Residential Flat Buildings

- 1 car space per one or two-bedroom units
- 1 visitor parking space per 5 units
- 1 space per 40 units for service vehicles

Business and Office Premises

- Penrith City Centre – 1 space per 100m^2 GFA

Table 4a and 4b summarise the car parking requirements of the proposed mixed use development. The development complies with Council's residential tenant and visitor use; however, there is a shortage of eight car spaces for the commercial tenancy that can be met on-street.

There is provision of a waste-collection bay on the basement level that can be used a service bay for the mixed-use development.

Overall, the proposed mixed use complies with Council's parking requirements

Use	Number of Units	Parking Rate	Car spaces Required	Car Spaces Provided
One and Two-bedroom	41	1 car spaces per unit	41	43
Visitor Parking	41	1 car space per 5 units	8	7
		Total	**49**	**50**

Table 4a: Residential Parking Requirements and Provision

Use	GFA (m^2)	Parking Rate	Car spaces Required On-Site (*)	Car Spaces Provided
Commercial	1493	1 car space per 100m^2	15	7

Table 4b: Commercial Parking Requirements and Provision

Note*: The Penrith City Council DCP states:

"A maximum of 60% of the total number of commercial parking spaces required by a development, other than for service vehicles, car washing bays and parking spaces allocated to people with disability, are to be provided on-site."

4.2 State Environmental Planning Policy 65 for the Residential Apartments

The car parking requirements for Residential use apartments are presented in *State Environmental Planning Policy 65 (SEPP 65)* where reduced car parking rates for **residential** use can apply for sites within 800 metres of a railway station in the Sydney Metropolitan Area.

The proposed site is located within 750 (walking distance) of Penrith Train Station.

The car parking rates derived from the RMS *RTA Guide to Traffic Generating Developments 2002* are as follows:

High Density Residential Flat Building (Sub-Regional Centre):

- 0.6 car spaces per 1 bedroom unit
- 0.9 car spaces per 2 bedroom unit
- 1 visitor car space per 5 units

The car parking requirements and provision are presented in Table 5 using the RMS parking rate. The total parking requirements is car 90 spaces versus 109 car spaces provided. The proposed development complies with SEPP 65.

Type	Number of Units	Parking Rate	Car Spaces Required	Car Spaces Provided
One Bedroom	18	0.6 car spaces per unit	10.8	43
Two Bedroom	23	0.9 car spaces per unit	20.7	
Visitor	41	1 car space per 5 units	8	7
		Total Residential	40	50

Table 5: Summary of Car Parking Requirements and Provision for Residential Use (SEPP65)

4.3 Adequacy of Car Parking Provision

The site is located within walking distance to the Penrith Train Station and bus routes.

Overall, the residential component complies with Penrith City Council and SEPP65 car parking requirements. However, there is a shortage of eight car spaces for the commercial tenancy that can be met on-street.

5. VEHICLE TRAFFIC IMPACT CONSIDERATIONS

5.1 Traffic Generation for the Proposed Development

The *RTA Guide to Traffic Generating Developments 2002 and RTA Guide to Traffic Generating Developments Updated Surveys 2013* provide average weekday AM and PM peak hour trip generation rates for commercial and high density residential developments respectively, the details are as follows:

High Density Residential

- 0.19 trips per car space for the AM peak hour
- 0.15 trips per car space for the PM peak hour

Commercial

- 2 per 100 m^2 GFA for the PM peak hour
    - The AM peak hour rate is assumed as the PM peak hour

Table 5a and 5b summarise the trip generation for each use of the proposed development.

Overall, the proposed development is a modest trip generator.

Peak Hour	Criteria	Number	Trip Generating Rate	Trips Generated
AM	Number of Units	41	0.19 per unit	8
PM	Number of Units	41	0.15 per unit	6

Table 5a: Summary of Trip Generation for the Proposed Residential Component for Weekday Peak Hours

Peak Hour	Criteria	Area	Trip Generating Rate	Trips Generated
AM and PM	GFA (m^2)	1493 (m^2)	2 trips per 100 m^2	30

Table 5b: Summary of Trip Generation for the Proposed Commercial Component for Weekday Peak Hours

Table 6 summarises the net trip generation and distribution of the existing and proposed developments.

Land Use	Peak Hour	Origin	Destination	Total
Residential	AM	6	2	8
	PM	1	5	6
Commercial	AM	15	15	30
	PM	15	15	30
Total	**AM**	**21**	**17**	**38**
	PM	**16**	**20**	**36**

Table 6: Weekday Total Trip Distribution for the Proposed Development

5.2 Traffic Volumes

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

The additional development trips represent a small proportion of the existing traffic volumes.

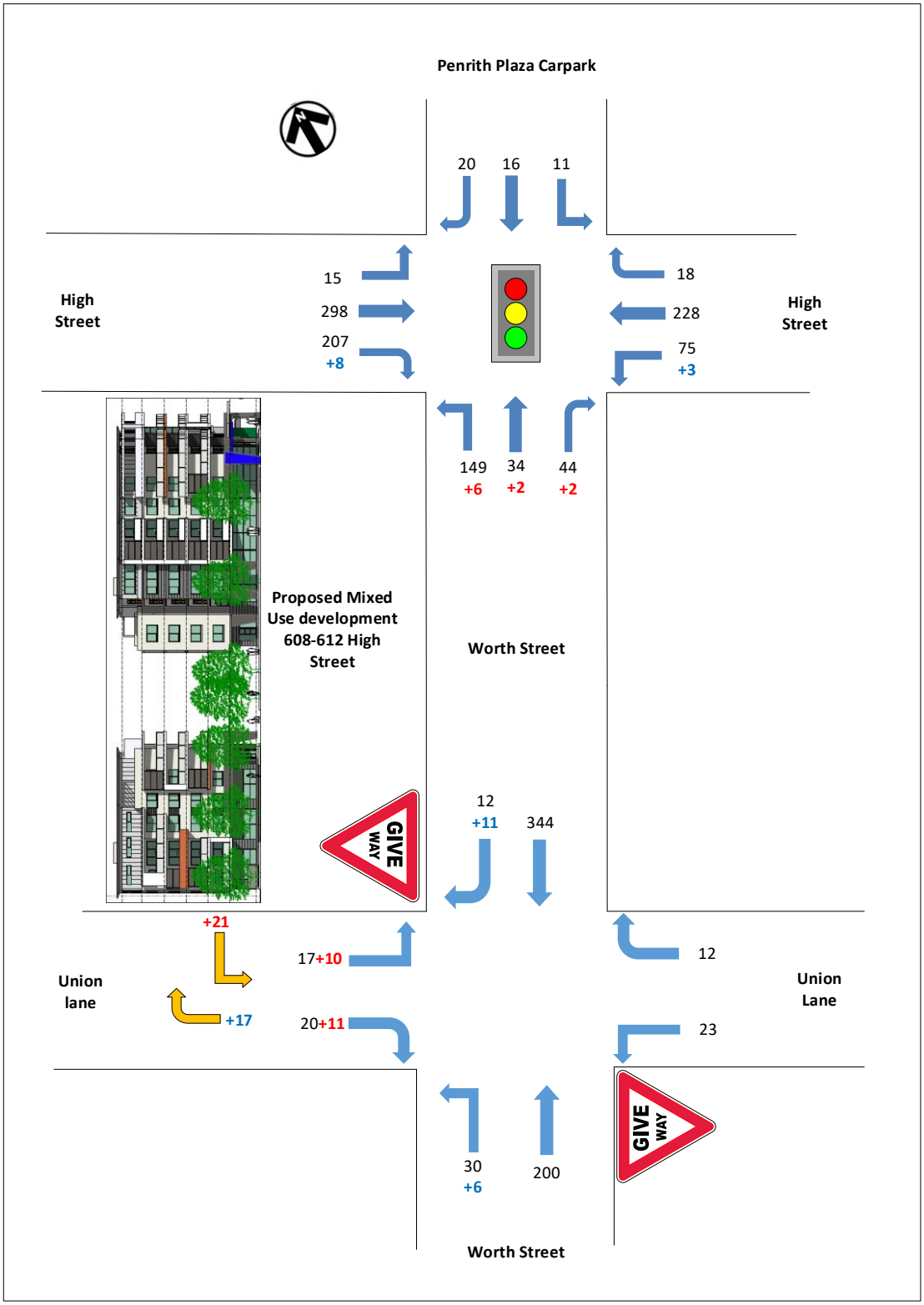

Figure 11: Weekday AM Peak Hour Traffic Volumes with Mixed Use Traffic

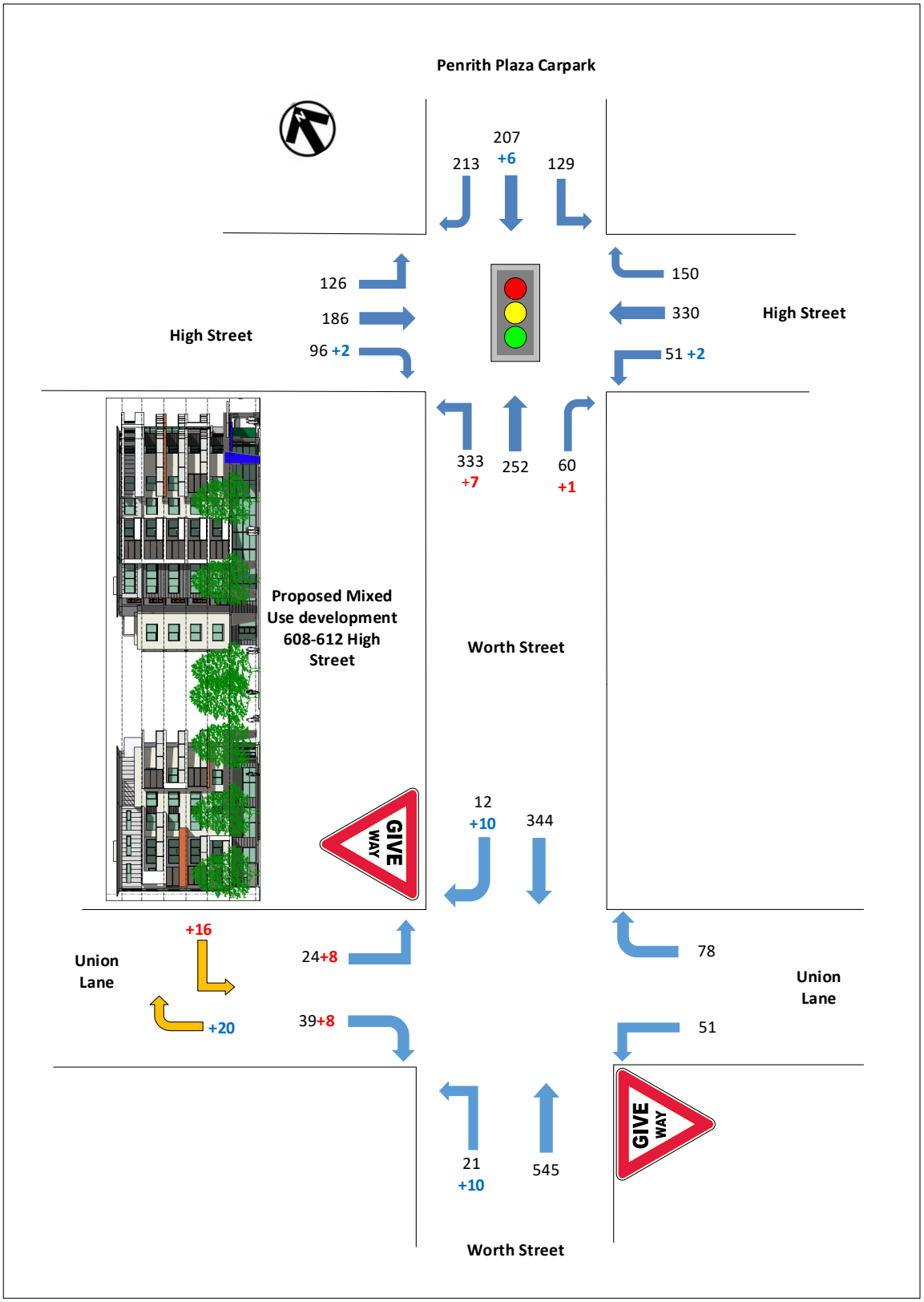

Figure 13: Weekday PM Peak Hour Traffic Volumes with Mixed Use Traffic

5.3 Intersection Assessment

An intersection assessment has been undertaken for the two surveyed intersections.

The results of the intersection analysis are as follows:

Signalised intersection of High Street with Worth Street

- The overall intersection has a LoS C for the AM and PM peak hours
- The additional mixed development trips do not change the overall intersection LoS

Priority intersection of Worth Street with Union lane

- All the turn movements have an acceptable LoS for both peak hours
- The additional mixed development trips do not change the LoS of any turn movements

The full SIDRA results with the development traffic are presented in Appendix B. The existing conditions are presented in Appendix A.

6. CONCLUSIONS

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

Car Parking Spaces

- The proposed mixed-use development overall complies with Penrith Council's Development Control Plan and SEPP65 for residential use.
- There is a shortage of eight car spaces for the commercial use, these spaces can be met on nearby roads.

Traffic

- The proposed development is a modest trip generator for the weekday AM and PM peak hours.
- The additional trips from the proposed development can be accommodated at the nearby intersections without noticeably affecting intersection performance, delays or queues.
- There are no traffic engineering reasons why a planning permit for the proposed mixed-use development at 608-612 High Street in Penrith should be refused.

APPENDIX A

SIDRA Intersection Results for Existing Traffic Conditions

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Worth Street												
4	L2	157	0.0	0.301	21.4	LOS B	4.3	30.0	0.81	0.74	0.81	22.0
5	T1	36	0.0	0.301	39.6	LOS C	4.3	30.0	0.89	0.74	0.89	7.3
6	R2	46	0.0	0.301	54.3	LOS D	3.8	26.3	0.94	0.75	0.94	16.0
Approach		239	0.0	0.301	30.5	LOS C	4.3	30.0	0.85	0.74	0.85	18.0
East: High Street												
7	L2	79	0.0	0.378	46.9	LOS D	7.9	55.5	0.90	0.76	0.90	17.4
8	T1	240	0.0	0.378	43.4	LOS D	8.1	56.8	0.90	0.74	0.90	20.2
9	R2	19	0.0	0.033	34.1	LOS C	0.8	5.3	0.72	0.65	0.72	18.0
Approach		338	0.0	0.378	43.7	LOS D	8.1	56.8	0.89	0.74	0.89	19.5
North: Worth Street												
10	L2	12	0.0	0.046	20.0	LOS B	0.9	6.3	0.70	0.51	0.70	19.9
11	T1	17	0.0	0.046	20.0	LOS B	0.9	6.3	0.70	0.51	0.70	10.0
12	R2	21	0.0	0.104	53.0	LOS D	1.1	7.9	0.93	0.67	0.93	9.8
Approach		49	0.0	0.104	34.1	LOS C	1.1	7.9	0.80	0.58	0.80	12.1
West: High Street												
1	L2	16	0.0	0.010	11.9	LOS A	0.1	0.5	0.13	0.82	0.13	23.5
2	T1	314	0.0	0.367	43.3	LOS D	7.9	55.0	0.90	0.73	0.90	20.3
3	R2	218	0.0	0.377	38.2	LOS C	10.0	69.7	0.83	0.77	0.83	16.1
Approach		547	0.0	0.377	40.4	LOS C	10.0	69.7	0.85	0.75	0.85	19.0
All Vehicles		1174	0.0	0.378	39.1	LOS C	10.0	69.7	0.86	0.74	0.86	18.8

Table A1: Weekday Intersection Performance of Worth Street with High Street AM Peak Hour

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Worth Street												
1	L2	32	0.0	0.062	3.4	LOS A	0.0	0.0	0.00	0.12	0.00	39.6
2	T1	211	0.0	0.062	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	38.9
Approach		242	0.0	0.062	0.4	NA	0.0	0.0	0.00	0.06	0.00	39.2
East: Union Lane												
4	L2	24	0.0	0.024	6.3	LOS A	0.1	0.6	0.29	0.56	0.29	45.0
5	T1	1	0.0	0.024	10.5	LOS A	0.1	0.6	0.29	0.56	0.29	52.4
6	R2	13	0.0	0.032	12.2	LOS A	0.1	0.8	0.60	0.77	0.60	39.0
Approach		38	0.0	0.032	8.4	LOS A	0.1	0.8	0.39	0.63	0.39	43.1
North: Worth Street												
8	T1	362	0.0	0.099	0.1	LOS A	0.1	0.8	0.03	0.02	0.03	39.3
9	R2	13	0.0	0.099	4.5	LOS A	0.1	0.8	0.06	0.03	0.06	39.6
Approach		375	0.0	0.099	0.2	NA	0.1	0.8	0.03	0.02	0.03	39.4
West: Union Lane												
10	L2	18	0.0	0.069	3.7	LOS A	0.2	1.7	0.31	0.54	0.31	35.2
12	R2	21	0.0	0.069	11.0	LOS A	0.2	1.7	0.31	0.54	0.31	34.9
Approach		39	0.0	0.069	7.6	LOS A	0.2	1.7	0.31	0.54	0.31	35.0
All Vehicles		694	0.0	0.099	1.2	NA	0.2	1.7	0.05	0.10	0.05	39.0

Table A2: Weekday Intersection Performance of Worth Street with Union Lane AM Peak Hour

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Worth Street												
4	L2	351	0.0	0.597	21.3	LOS B	11.2	78.4	0.87	0.80	0.87	22.1
5	T1	265	0.0	0.597	36.6	LOS C	14.3	99.9	0.91	0.80	0.91	8.1
6	R2	63	0.0	0.597	44.2	LOS D	14.3	99.9	0.92	0.80	0.92	18.4
Approach		679	0.0	0.597	29.4	LOS C	14.3	99.9	0.89	0.80	0.89	16.3
East: High Street												
7	L2	54	0.0	0.615	54.3	LOS D	11.0	77.2	0.98	0.81	0.98	16.0
8	T1	347	0.0	0.615	50.9	LOS D	11.2	78.2	0.98	0.81	0.98	18.6
9	R2	158	0.0	0.594	56.7	LOS E	8.9	62.3	0.99	0.81	0.99	13.3
Approach		559	0.0	0.615	52.9	LOS D	11.2	78.2	0.98	0.81	0.98	17.0
North: Worth Street												
10	L2	136	0.0	0.351	13.7	LOS A	10.2	71.7	0.59	0.56	0.65	22.3
11	T1	218	0.0	0.351	13.7	LOS A	10.2	71.7	0.59	0.56	0.65	12.0
12	R2	224	0.0	0.623	48.7	LOS D	12.2	85.7	0.97	0.81	0.97	10.3
Approach		578	0.0	0.623	27.3	LOS B	12.2	85.7	0.74	0.66	0.77	13.4
West: High Street												
1	L2	133	0.0	0.081	12.0	LOS A	0.6	4.5	0.14	0.83	0.14	23.5
2	T1	196	0.0	0.298	47.8	LOS D	5.1	35.6	0.92	0.73	0.92	19.3
3	R2	101	0.0	0.380	54.8	LOS D	5.5	38.4	0.95	0.77	0.95	12.7
Approach		429	0.0	0.380	38.4	LOS C	5.5	38.4	0.69	0.77	0.69	18.2
All Vehicles		2245	0.0	0.623	36.4	LOS C	14.3	99.9	0.84	0.76	0.85	16.3

Table A3: Weekday Intersection Performance of Worth Street with High Street PM Peak Hour

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Worth Street												
1	L2	22	0.0	0.153	3.4	LOS A	0.0	0.0	0.00	0.03	0.00	40.1
2	T1	574	0.0	0.153	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	39.6
Approach		596	0.0	0.153	0.1	NA	0.0	0.0	0.00	0.02	0.00	39.7
East: Union Lane												
4	L2	54	0.0	0.052	6.3	LOS A	0.2	1.3	0.29	0.58	0.29	44.9
5	T1	1	0.0	0.052	18.3	LOS B	0.2	1.3	0.29	0.58	0.29	52.4
6	R2	82	0.0	0.401	28.0	LOS B	1.6	11.4	0.86	1.01	1.12	28.5
Approach		137	0.0	0.401	19.4	LOS B	1.6	11.4	0.63	0.84	0.79	33.5
North: Worth Street												
8	T1	362	0.0	0.101	0.2	LOS A	0.2	1.3	0.05	0.02	0.05	38.8
9	R2	13	0.0	0.101	6.8	LOS A	0.2	1.3	0.12	0.04	0.12	39.3
Approach		375	0.0	0.101	0.4	NA	0.2	1.3	0.05	0.02	0.05	38.8
West: Union Lane												
10	L2	25	0.0	0.241	5.3	LOS A	0.9	6.1	0.68	0.79	0.74	30.5
12	R2	41	0.0	0.241	23.8	LOS B	0.9	6.1	0.68	0.79	0.74	30.3
Approach		66	0.0	0.241	16.8	LOS B	0.9	6.1	0.68	0.79	0.74	30.4
All Vehicles		1174	0.0	0.401	3.4	NA	1.6	11.4	0.13	0.16	0.15	36.2

Table A4: Weekday Intersection Performance of Worth Street with Union Lane PM Peak Hour

APPENDIX B

SIDRA Intersection Results for Existing and Mixed-Use Traffic

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Worth Street														
4	L2	155	0	163	0.0	0.316	21.5	LOS B	4.5	31.4	0.82	0.74	0.82	21.9
5	T1	36	0	38	0.0	* 0.316	39.7	LOS C	4.5	31.4	0.90	0.75	0.90	7.3
6	R2	46	0	48	0.0	0.316	54.5	LOS D	4.0	27.7	0.94	0.75	0.94	15.9
Approach		237	0	249	0.0	0.316	30.7	LOS C	4.5	31.4	0.85	0.75	0.85	18.0
East: High Street														
7	L2	78	0	82	0.0	0.382	46.9	LOS D	8.0	56.0	0.90	0.76	0.90	17.3
8	T1	228	0	240	0.0	* 0.382	43.5	LOS D	8.2	57.4	0.90	0.74	0.90	20.2
9	R2	18	0	19	0.0	0.033	34.1	LOS C	0.8	5.3	0.72	0.65	0.72	18.0
Approach		324	0	341	0.0	0.382	43.8	LOS D	8.2	57.4	0.89	0.74	0.89	19.4
North: Worth Street														
10	L2	11	0	12	0.0	0.046	20.0	LOS B	0.9	6.3	0.70	0.51	0.70	19.9
11	T1	16	0	17	0.0	0.046	20.0	LOS B	0.9	6.3	0.70	0.51	0.70	10.0
12	R2	20	0	21	0.0	* 0.104	53.0	LOS D	1.1	7.9	0.93	0.67	0.93	9.8
Approach		47	0	49	0.0	0.104	34.1	LOS C	1.1	7.9	0.80	0.58	0.80	12.1
West: High Street														
1	L2	15	0	16	0.0	0.010	11.9	LOS A	0.1	0.5	0.13	0.82	0.13	23.5
2	T1	298	0	314	0.0	0.367	43.3	LOS D	7.9	55.0	0.90	0.73	0.90	20.3
3	R2	215	0	226	0.0	* 0.391	38.4	LOS C	10.4	72.8	0.84	0.78	0.84	16.0
Approach		528	0	556	0.0	0.391	40.4	LOS C	10.4	72.8	0.85	0.75	0.85	18.9
All Vehicles		1136	0	1196	0.0	0.391	39.1	LOS C	10.4	72.8	0.86	0.74	0.86	18.7

Table B1: Weekday Intersection Performance of Worth Street with High Street AM Peak Hour with mixed use traffic

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Worth Street														
1	L2	36	0.0	38	0.0	0.064	3.4	LOS A	0.0	0.0	0.00	0.14	0.00	39.4
2	T1	200	0.0	211	0.0	0.064	0.0	LOS A	0.0	0.0	0.00	0.06	0.00	38.8
Approach		236	0.0	248	0.0	0.064	0.5	NA	0.0	0.0	0.00	0.07	0.00	39.0
East: Union Lane														
4	L2	23	0.0	24	0.0	0.024	6.3	LOS A	0.1	0.6	0.29	0.57	0.29	44.9
5	T1	1	0.0	1	0.0	0.024	10.8	LOS A	0.1	0.6	0.29	0.57	0.29	52.4
6	R2	12	0.0	13	0.0	0.033	12.6	LOS A	0.1	0.8	0.61	0.78	0.61	38.6
Approach		36	0.0	38	0.0	0.033	8.5	LOS A	0.1	0.8	0.40	0.64	0.40	43.0
North: Worth Street														
8	T1	344	0.0	362	0.0	0.104	0.1	LOS A	0.2	1.5	0.05	0.03	0.05	38.8
9	R2	23	0.0	24	0.0	0.104	4.5	LOS A	0.2	1.5	0.11	0.07	0.11	39.3
Approach		367	0.0	386	0.0	0.104	0.4	NA	0.2	1.5	0.05	0.03	0.05	38.9
West: Union Lane														
10	L2	27	0.0	28	0.0	0.110	3.7	LOS A	0.4	2.8	0.31	0.55	0.31	35.0
12	R2	31	0.0	33	0.0	0.110	11.6	LOS A	0.4	2.8	0.31	0.55	0.31	34.7
Approach		58	0.0	61	0.0	0.110	7.9	LOS A	0.4	2.8	0.31	0.55	0.31	34.9
All Vehicles		697	0.0	734	0.0	0.110	1.5	NA	0.4	2.8	0.07	0.12	0.07	38.4

Table B2: Weekday Intersection Performance of Worth Street with Union Lane AM Peak Hour with mixed use traffic

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Worth Street														
4	L2	340	0	358	0.0	* 0.603	21.3	LOS B	11.4	80.0	0.87	0.80	0.87	22.1
5	T1	252	0	265	0.0	* 0.603	36.8	LOS C	14.4	100.9	0.92	0.80	0.92	8.1
6	R2	61	0	64	0.0	0.603	44.3	LOS D	14.4	100.9	0.93	0.80	0.93	18.4
Approach		653	0	687	0.0	0.603	29.5	LOS C	14.4	100.9	0.89	0.80	0.89	16.3
East: High Street														
7	L2	53	0	56	0.0	0.618	54.4	LOS D	11.1	77.7	0.98	0.81	0.98	16.0
8	T1	330	0	347	0.0	* 0.618	50.9	LOS D	11.2	78.7	0.98	0.81	0.98	18.6
9	R2	150	0	158	0.0	0.594	56.7	LOS E	8.9	62.3	0.99	0.81	0.99	13.3
Approach		533	0	561	0.0	0.618	52.9	LOS D	11.2	78.7	0.98	0.81	0.98	17.0
North: Worth Street														
10	L2	129	0	136	0.0	0.357	13.9	LOS A	10.5	73.8	0.60	0.57	0.60	22.2
11	T1	213	0	224	0.0	0.357	13.9	LOS A	10.5	73.8	0.60	0.57	0.60	11.9
12	R2	213	0	224	0.0	* 0.623	48.7	LOS D	12.2	85.7	0.97	0.81	0.97	10.3
Approach		555	0	584	0.0	0.623	27.3	LOS B	12.2	85.7	0.74	0.66	0.74	13.3
West: High Street														
1	L2	126	0	133	0.0	0.081	12.0	LOS A	0.6	4.5	0.14	0.83	0.14	23.5
2	T1	186	0	196	0.0	0.298	47.8	LOS D	5.1	35.6	0.92	0.73	0.92	19.3
3	R2	98	0	103	0.0	0.388	54.9	LOS D	5.6	39.3	0.95	0.77	0.95	12.7
Approach		410	0	432	0.0	0.388	38.5	LOS C	5.6	39.3	0.69	0.77	0.69	18.2
All Vehicles		2151	0	2264	0.0	0.623	36.4	LOS C	14.4	100.9	0.84	0.76	0.84	16.3

Table B3: Weekday Intersection Performance of Worth Street with High Street PM Peak Hour with mixed use traffic

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Worth Street														
1	L2	31	0.0	33	0.0	0.156	3.4	LOS A	0.0	0.0	0.00	0.05	0.00	39.9
2	T1	545	0.0	574	0.0	0.156	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	39.5
Approach		576	0.0	606	0.0	0.156	0.2	NA	0.0	0.0	0.00	0.03	0.00	39.5
East: Union Lane														
4	L2	51	0.0	54	0.0	0.053	6.4	LOS A	0.2	1.3	0.31	0.58	0.31	44.9
5	T1	1	0.0	1	0.0	0.053	18.9	LOS B	0.2	1.3	0.31	0.58	0.31	52.3
6	R2	78	0.0	82	0.0	0.416	29.2	LOS C	1.7	11.8	0.87	1.02	1.15	28.0
Approach		130	0.0	137	0.0	0.416	20.2	LOS B	1.7	11.8	0.64	0.84	0.81	33.0
North: Worth Street														
8	T1	344	0.0	362	0.0	0.108	0.4	LOS A	0.3	2.4	0.09	0.03	0.09	38.0
9	R2	22	0.0	23	0.0	0.108	6.9	LOS A	0.3	2.4	0.21	0.08	0.21	38.7
Approach		366	0.0	385	0.0	0.108	0.8	NA	0.3	2.4	0.09	0.03	0.09	38.1
West: Union Lane														
10	L2	32	0.0	34	0.0	0.302	6.3	LOS A	1.2	8.2	0.68	0.82	0.81	30.0
12	R2	47	0.0	49	0.0	0.302	25.9	LOS B	1.2	8.2	0.68	0.82	0.81	29.7
Approach		79	0.0	83	0.0	0.302	17.9	LOS B	1.2	8.2	0.68	0.82	0.81	29.9
All Vehicles		1151	0.0	1212	0.0	0.416	3.9	NA	1.7	11.8	0.15	0.18	0.18	35.7

Table B4: Weekday Intersection Performance of Worth Street with Union Lane PM Peak Hour with mixed use traffic