EG Funds Management

Summer Hill Flour Mill

Preferred Project Report - Traffic and Transport

220640/00

Issue | 12 March 2012

Arup
Arup Pty Ltd ABN 18 000 966 165

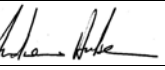
Arup
Level 10
201 Kent Street
Sydney
NSW 2000
Australia
arup.com.au

Job number 220640/00

ARUP

Document Verification

ARUP

Job title		Summer Hill Flour Mill			**Job number** 220640/00
Document title		Preferred Project Report - Traffic and Transport			**File reference**
Document ref		220640/00			
Revision	**Date**	**Filename**	0001PPR Report (Transport).docx		
Draft 1	1 Feb 2012	**Description**	First Draft		
			Prepared by	Checked by	Approved by
		Name	Joanna Lau / Andrew Hulse	Andrew Hulse	Andrew Hulse
		Signature			
Draft 2	2 Mar 2012	**Filename**	PPR Report (Transport) Draft 2.docx		
		Description	Second Draft		
			Prepared by	Checked by	Approved by
		Name	Joanna Lau / Andrew Hulse	Andrew Hulse	Andrew Hulse
		Signature			
Draft 3	8 Mar 2012	**Filename**	PPR Report (Transport) Draft 3.docx		
		Description	Third draft including staging		
			Prepared by	Checked by	Approved by
		Name	Joanna Lau / Andrew Hulse	Andrew Hulse	Andrew Hulse
		Signature			
Issue	12 Mar 2012	**Filename**	PPR Report (Transport).docx		
		Description	Issue		
			Prepared by	Checked by	Approved by
		Name	Joanna Lau / Andrew Hulse	Andrew Hulse	Andrew Hulse
		Signature			
				Issue Document Verification with Document	✓

Contents

Appendices

1 Introduction

The report is prepared as a response to the Department of Planning and Infrastructure's (DoPI) Preferred Project Report advice dated 16 September 2011.

The traffic, transport and car parking issues raised have been responded to as outlined below.

	DoPI Key Issues	Response Section
1	Traffic modelling in accordance with RTA correspondence dated 3 Aug 2011. Address the need for micro-simulation modelling on local street system.	2.1 and 2.2
2	Alternative options to the proposed local road link onto Old Canterbury Road adjacent to the railway corridor need to be considered.	2.3
3	Treatment of the local streets in the development needs to be considered to prevent through traffic and create a slow speed environment.	2.4
4	Light rail "kiss and drop" facility and disabled parking	2.5
5	Reduced car parking provision for non-residential uses to minimise traffic generation.	2.6
6	Additional car share spaces and any other innovative measures to discourage private vehicle use.	2.7
7	Further analysis of off-site linkages for walking and cycling which should include consideration of public domain upgrades to be included in the VPA.	2.8

2 Reponses to DoPI Key Issues

2.1 Additional traffic modelling in accordance with RMS (former RTA) correspondence dated 3 Aug 2011.

A Tranyst model has been built for the Old Canterbury Road intersections as required by the Roads and Maritime Services (RMS former RTA). The four intersections relevant are shown in Figure 1. The Parramatta Road intersection does not influence this system and is therefore not included. Note that the Edward Street intersection is currently priority controlled but is proposed to be signalised to facilitate access to the development and improve pedestrian crossing of Old Canterbury Road. A concept drawing of the proposed traffic signals at Edward Street has been prepared for input to the modelling and to assess land resumption issues. This model was independently audited by a third party (Aurecon) as requested.

The intersections modelled using Transyt are:

- Old Canterbury Road / Nowranie Street
- Old Canterbury Road / Edward Street (proposed traffic signals)
- Old Canterbury Road / Toothill Street
- Old Canterbury Road / Longport Street / Railway Terrace

Figure 1 Intersections included in Transyt model

2.1.1 Traffic Generation

The traffic generation for the proposed Summer Hill Flour Mill development has been updated based on the floor space changes that have resulted from the response to issues raised by the DOPI. The traffic updates for the latest McGill Street Precinct development proposals were received from Traffix, the traffic consultant for 78-90 Old Canterbury Road, on 13 January 2012.

2.1.1.1 Summer Hill Flour Mill

The traffic analysis has been based on the following development mix:

Total dwellings 267

Commercial GLA 3,752 m^2

Retail GLA 2,088 m^2

Using the same traffic generation methodology developed in the TMAP, May 2011, this results in the traffic generation as outlined in Table 1. The traffic has been distributed onto the road network as shown in Appendix A.

Table 1 Summer Hill Flour Mill Traffic Generation

Precint	Site Traffic Generation					
	Daily	Peak Hr	Morning Peak		Evening Peak	
			In	Out	In	Out
1	488	49	9	31	35	13
2	834	83	46	15	26	57
3	555	56	11	39	42	14
4	308	31	6	17	21	10
5	397	40	7	25	28	11
Total	**2581**	**258**	**79**	**127**	**153**	**105**

The precincts are shown in Figure 2.

Figure 2 Summer Hill Flour Mill precincts

2.1.1.2 McGill Street Precinct

The access arrangements and traffic generation for the McGill Street Precinct have been provided by Traffix, the traffic consultants for the 78-90 Old Canterbury Road development proposal. Stage 1 consists of the 78-90 Old Canterbury Road development site and Stage 2 refers to the remainder of the precinct.

Local traffic movements have been assumed at Brown, William and Hudson Streets which are to be retained. It has been assumed that McGill Street will be removed in the event that a new leg to the Toothill Street/Old Canterbury Road intersection is provided to avoid unnecessarily breaking up the site. Also, for the northern part of the Precinct, a basement will link both William St and the new road from Hudson Street along the western site boundary.

Some of the Stage 1 through movement from Toothill Street to the new leg may turn right and enter via William Street, however any delay to the right turn at this point would likely encourage these vehicles to continue through and enter the basement via the access from Hudson via the new leg. The later assumption has been taken for the traffic distribution.

The traffic generation for the entire McGill Street Precinct is shown in Table 2. The traffic has been distributed onto the road network as shown in Appendix A.

Table 2 McGill Street Precinct Traffic Generation

Precint	Site Traffic Generation					
	Daily	Peak Hr	Morning Peak		Evening Peak	
			In	Out	In	Out
Stage 1	1430	143	39	104	109	34
Stage 2	1890	189	102	87	103	86
Total	**3320**	**332**	**141**	**191**	**212**	**120**

2.1.2 Transyt Model Assumptions

Existing

- Phase times based on SIDRA outputs - calibrated on observed queue lengths (note different to site visit times however phase times likely to change depending on demand at particular times)
- Offsets - Based on transyt queue lengths

2021 Base (No Development)

- Demand uplifted based on 10 year traffic growth information provided by RTA.
- Phase times and offsets unchanged as demand proportions still same as existing

2021 Proposed (with Development)

- Added dedicated right turn short lane into Edward Street (40m length) and 2 through lanes in each direction - requires kerb widening.
- Right turn ban into Weston Street - traffic diverted to Windsor Rd
- Old Canterbury Rd / Toothill St intersection - 2 new 60m dedicated right turn lanes
- Offsets and green splits optimised.

Observations from site visit in PM period on Tuesday 15th November 2011 and AM period on Wednesday 16th November 2011:

- No significant linking of signals between the intersections.
- The timings on each intersection were variable.
- All the pedestrian crossings ran only when called.
- The Old Canterbury Road – Nowraine Street intersection had an irregular cycle based on vehicles on Nowraine Street and pedestrian arrivals.
- Pedestrians were pretty rare at the Nowraine Street intersection.
- Stopping Old Canterbury Road westbound traffic one in every three cycles.
- Parking restriction along the route were identified for input to the model.

2.1.3 Existing vehicle queuing observed on-site

Extensive vehicle queuing occurs in the morning peak period along the Old Canterbury Road corridor and along Railway Terrace as shown in Figure 3. These queues form due to the single lane constraints in the vicinity of the Old Canterbury Road/Railway Terrace intersection which occur on these two sub-arterial routes. Right turn movements have been banned at this intersection to maximise its throughput on each of these competing cross routes.

In comparison, the evening peak traffic queuing is relatively contained within each block as shown in Figure 4.

Figure 3 AM Peak Observed Queuing

Figure 4 PM Peak Observed Queuing

2.1.4 Edward Street / Old Canterbury Road Intersection Configuration

Two options have been considered for the Edward Street / Old Canterbury Road Intersection which is proposed to be signalised. These are shown in Appendix B and described below. The first option involves local widening to create a fifth lane on the westbound Old Canterbury Road approach to accommodate a right turn lane as shown in Figure 5. This involves considerable civil works and will impact on the local connection to houses to the south. The bridge structure and services running across the bridge restrict the length of the widening which creates a sharp deflection in the through traffic lanes. On the departure side of the intersection, car parking is permitted which requires traffic to merge back into a single lane.

An alternative which maintains the current 4 lanes and utilises the kerbside westbound lane for through traffic and the centre lane for right turn traffic is shown in Figure 6. This arrangement is possible because westbound traffic currently travels in a single lane across the bridge due to parking constraints in the kerbside lane. A more formal “No Stopping” arrangement would need to be installed. This layout achieves a long right turn bay with good visibility for westbound traffic and a more gradual deflection of through traffic. This type of treatment is not uncommon in the inner west with right turn traffic utilising the centre lane and through traffic moving into the kerb side lane.

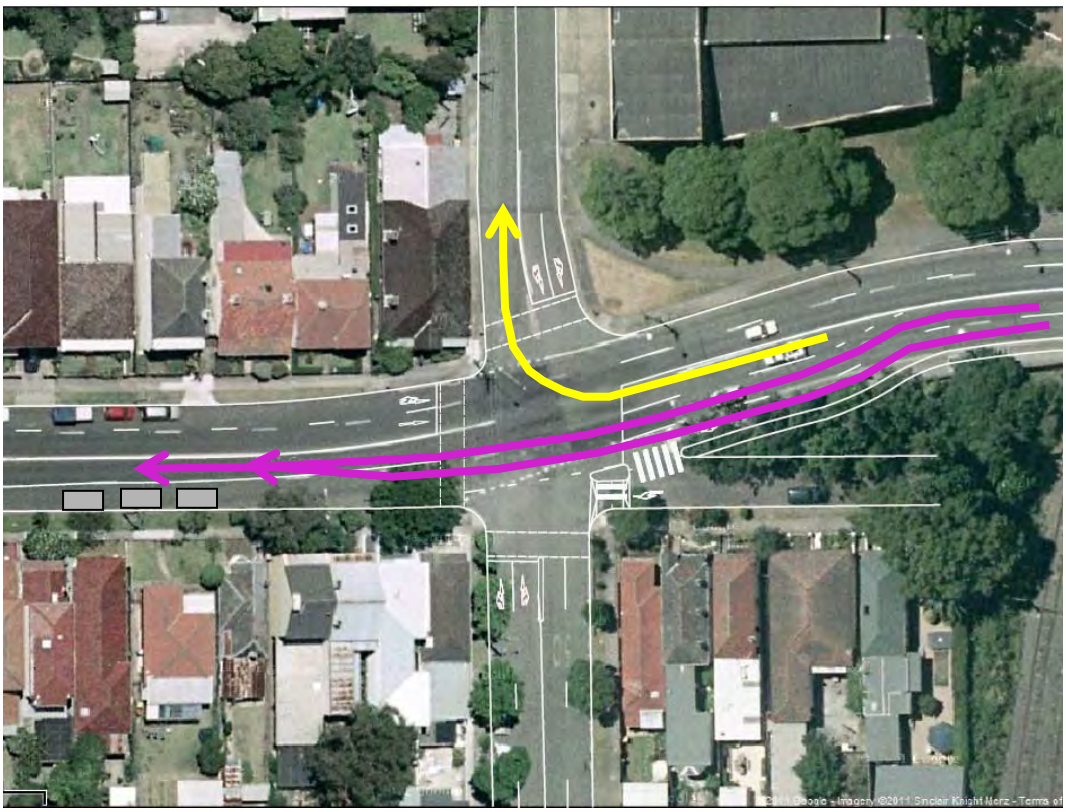


Figure 5 Edward Street / Old Canterbury Road 5 Lane treatment

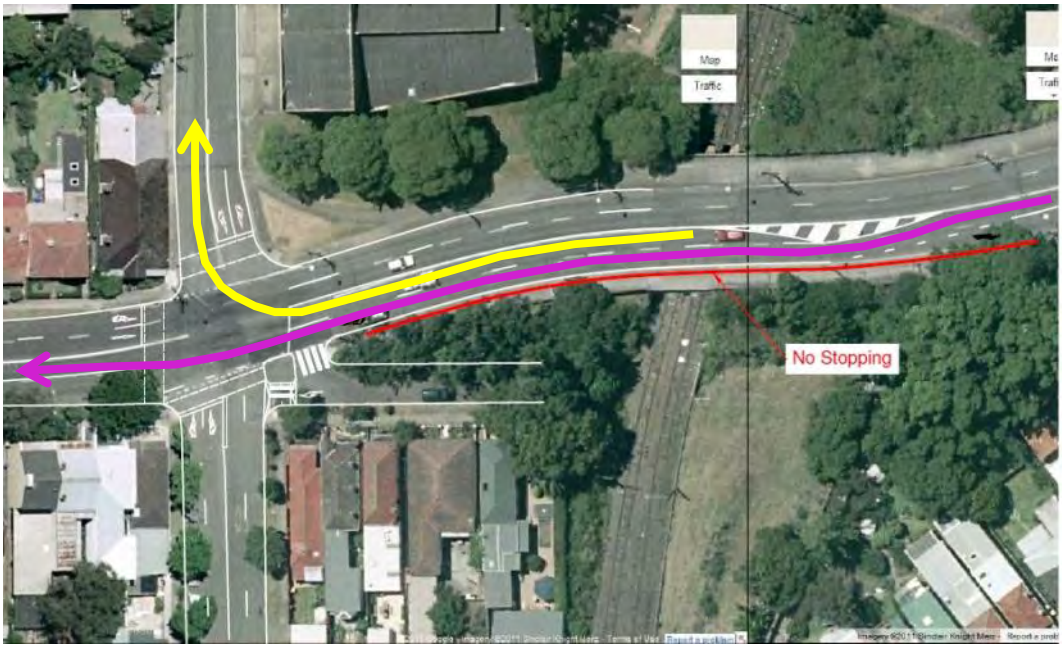


Figure 6 Edward Street / Old Canterbury Road 4 lane treatment

2.1.5 Transyt Model Results

The Transyt results for the AM Peak and PM peak periods are shown in Table 3 and Table 4 respectively. Results are included for the movement degree of saturation, average delay per vehicle and the mean maximum queue. The existing traffic flows have been modelled and then a 10 year background traffic growth to 2021 has been applied to Old Canterbury Rd (obtained from RMS) as follows:

West of Toothill Road - AM Peak 0.75% per annum /PM Peak 0.7% per annum

East of Toothill Road - AM Peak: 0.8% per annum /PM Peak 0.8% per annum

The development traffic for both Summer Hill Flour Mill and for the McGill Street precinct has been added to the 2021 background traffic. The traffic volumes used in the model are included in Appendix C. The Transyt queue length diagrams from the model are included in Appendix D.

The modelling shows that the introduction of traffic lights at the Edward Street / Old Canterbury Road intersection will result in satisfactory operation of this intersection in both peak periods with the exception of the left turn from Edward Street into Old Canterbury Road in the morning peak where traffic is queued and impacts on the ability for vehicles to join this queue.

The operation of the Old Canterbury Road / Railway Terrace intersection continues to deteriorate in both peak periods if the RMS traffic growth projections are realised. In practice, the extent to which traffic will grow along this corridor is determined by the relative travel experience on parallel corridors. With the addition of development traffic, further deterioration occurs, particularly for east/west travel on Railway Terrace and Longport Street.

The purpose of the transyt model is to determine the implications of installing traffic lights at the Edward Street intersection. Given the spacing of intersections,

the introduction of signals assists with the coordination of the signals and creation of platoons of vehicles along this route.

The proposed intersection improvements to facilitate access into the Summer Hill Flour Mill site at Edward Street and the McGill Street precinct at Toothill Street can be coordinated into the Old Canterbury Road route. The existing constraints in the road network will continue to cause significant queuing on the north-south and east-west sub-arterial routes. These routes are heavily utilised due to constraints in the wider arterial road system. If these wider constraints can be addressed, then a balancing of traffic across the network would occur.

2.1.6 Independent audit of Transyt model by a third party

Aurecon has independently audited the Transyt model undertaking the following tasks:

- Full review of all model inputs and operation for the existing base conditions and one future scenario (each with two time periods)
- The completion of a preliminary audit report, which identified any issues and categorised these based on their significance
- Submission of the preliminary audit report to Arup
- Correspondence between Aurecon and Arup to clarify and discuss preliminary report findings
- Revision of audit report to include Arup responses to preliminary findings
- Finalisation of audit report, for submission to the RMS

This report is attached in Appendix E.

Table 3 AM PeakTransyt Model results

Link	Link Description	Traffic Volumes (PCUs / hr)			DOS			Average Delay (s)			Mean Max Queue (m)		
		Existing	2021 No Development	2021 with Development	Existing	2021 No Development	2021 with Development	Existing	2021 No Development	2021 with Development	Existing	2021 No Development	2021 with Development
Old Canterbury Rd / Junction Rd													
111	Old Canterbury Rd Eastbound	870	945	970	66%	78%	100%	19	27	150	112	161	399
121	Old Canterbury Rd Westbound Right	160	174	189	27%	29%	27%	19	14	9	21	21	14
122	Old Canterbury Rd Westbound Through	401	435	475	26%	27%	30%	3	1	1	14	0	14
131	Nowraine Street Southbound	24	26	26	25%	27%	27%	61	61	61	14	14	14
141	Junction Rd Eastbound	258	280	288	93%	83%	51%	108	70	37	84	70	56
Old Canterbury Rd / Edward St													
211	Weston St Left / Through	10	12	12	2%	2%	5%	0	0	44	0	0	14
211b	Weston St Right/Through	10	10	10	4%	3%	6%	1	0	41	0	0	0
221	Old Canterbury Rd Westbound	618	670	720	17%	19%	46%	0	1	6	0	0	28
231b	Edward St Left/Through	88	96	195	20%	23%	106%	1	1	322	0	0	42
231	Edward St Right/Through	10	10	46	4%	4%	14%	1	3	44	0	7	7
241	Old Canterbury Rd Eastbound	1215	1319	1352	33%	36%	84%	0	0	74	0	0	301
Old Canterbury Rd / Toothill St													
311	Toothill Street Left/Through	180	196	249	23%	20%	22%	19	310	19	84	336	91
312	Toothill Street Right	273	298	298	77%	94%	76%	50	390	47	84	336	91
321	Old Canterbury Rd Westbound	667	728	790	43%	54%	60%	10	56	20	28	84	56
331	McGill Precinct Left/Through	-	-	76	-	-	39%	-	-	55	-	-	14
332	McGill Precinct Right	-	-	19	-	-	32%	-	-	67	-	-	14
341	Old Canterbury Rd Eastbound Through/Left	889	965	1049	100%	99%	100%	125	221	275	175	294	294
342	Old Canterbury Rd Eastbound Right	383	415	447	63%	102%	69%	59	300	199	175	294	294
Old Canterbury Rd / Railway Tce													
411	Railway Tce Westbound	772	844	885	95%	107%	117%	70	208	375	196	392	623
421	Old Canterbury Rd Southbound	782	854	901	47%	50%	51%	24	24	22	56	63	63
432	Longport St Eastbound	1061	1158	1176	100%	100%	100%	216	481	555	400	882	1015
441	Old Canterbury Rd Northbound Right Lane	700	790	840	86%	100%	95%	137	172	127	210	280	280
442	Old Canterbury Rd Northbound Left Lane	351	358	402	100%	102%	100%	470	301	373	238	273	273

Table 4 PM Peak Transyt Model results

Link	Link Description	Traffic Volumes (PCUs / hr)			DOS			Average Delay (s)			Mean Max Queue (m)		
		Existing	2021 No Development	2021 with Development	Existing	2021 No Development	2021 with Development	Existing	2021 No Development	2021 with Development	Existing	2021 No Development	2021 with Development
Old Canterbury Rd / Junction Rd													
111	Old Canterbury Rd Eastbound	503	542	587	37%	41%	38%	16	17	10	49	56	49
121	Old Canterbury Rd Westbound Right	183	197	202	25%	23%	25%	5	2	2	14	14	14
122	Old Canterbury Rd Westbound Through	1038	1120	1153	72%	71%	69%	6	4	3	49	28	42
131	Nowraine Street Southbound	15	16	16	8%	16%	16%	48	58	57	0	14	14
141	Junction Rd Eastbound	111	119	129	36%	28%	56%	48	28	59	21	21	28
Old Canterbury Rd / Edward St													
211	Weston St Left / Through	10	10	10	2%	3%	5%	1	1	48	0	0	14
211b	Weston St Right/Through	10	10	10	5%	6%	11%	3	4	45	0	7	14
221	Old Canterbury Rd Westbound	1365	1486	1551	48%	54%	92%	1	1	26	0	0	168
231b	Edward St Left/Through	84	90	194	15%	16%	87%	1	1	94	0	0	42
231	Edward St Right/Through	13	14	39	4%	4%	23%	2	3	48	0	7	7
241	Old Canterbury Rd Eastbound	688	741	786	19%	20%	28%	1	1	4	0	0	28
Old Canterbury Rd / Toothill St													
311	Toothill Street Left/Through	279	301	383	49%	47%	37%	39	37	30	91	98	154
312	Toothill Street Right	279	304	304	65%	64%	78%	49	47	64	91	98	154
321	Old Canterbury Rd Westbound	1301	1419	1511	64%	76%	95%	40	5	24	168	21	126
331	McGill Precinct Left/Through	-	-	51	-	-	75%	-	-	104	-	-	21
332	McGill Precinct Right	-	-	13	-	-	53%	-	-	131	-	-	14
341	Old Canterbury Rd Eastbound Through/Left	538	580	682	44%	49%	33%	10	24	16	56	84	42
342	Old Canterbury Rd Eastbound Right	201	216	242	61%	73%	96%	37	53	131	28	35	70
Old Canterbury Rd / Railway Tce													
411	Railway Tce Westbound	887	967	1043	93%	103%	110%	49	129	227	203	308	826
421	Old Canterbury Rd Southbound	1311	1430	1504	96%	102%	110%	59	115	227	154	224	732
432	Longport St Eastbound	772	842	851	66%	73%	72%	26	25	29	98	98	98
441	Old Canterbury Rd Northbound Right Lane	468	529	583	81%	95%	94%	47	54	91	133	105	189
442	Old Canterbury Rd Northbound Left Lane	319	329	350	49%	50%	57%	33	17	26	56	42	49

2.2 Address the need for micro-simulation modelling on local street system.

The traffic management plan for the development is shown in Figure 7. It shows that the primary access points to the site are located on Edward Street with secondary left turn in/left turn out access points to Smith Street. The proposal includes the installation of traffic signals at the Edward Street intersection with Old Canterbury Road to enable good access for precinct traffic onto the main road system for travel south and east. Smith Street provides access onto Longport Street for drivers wishing to travel west and north. A roundabout is proposed at the Smith Street / Edward Street intersection to provide local circulation for Smith Street traffic.

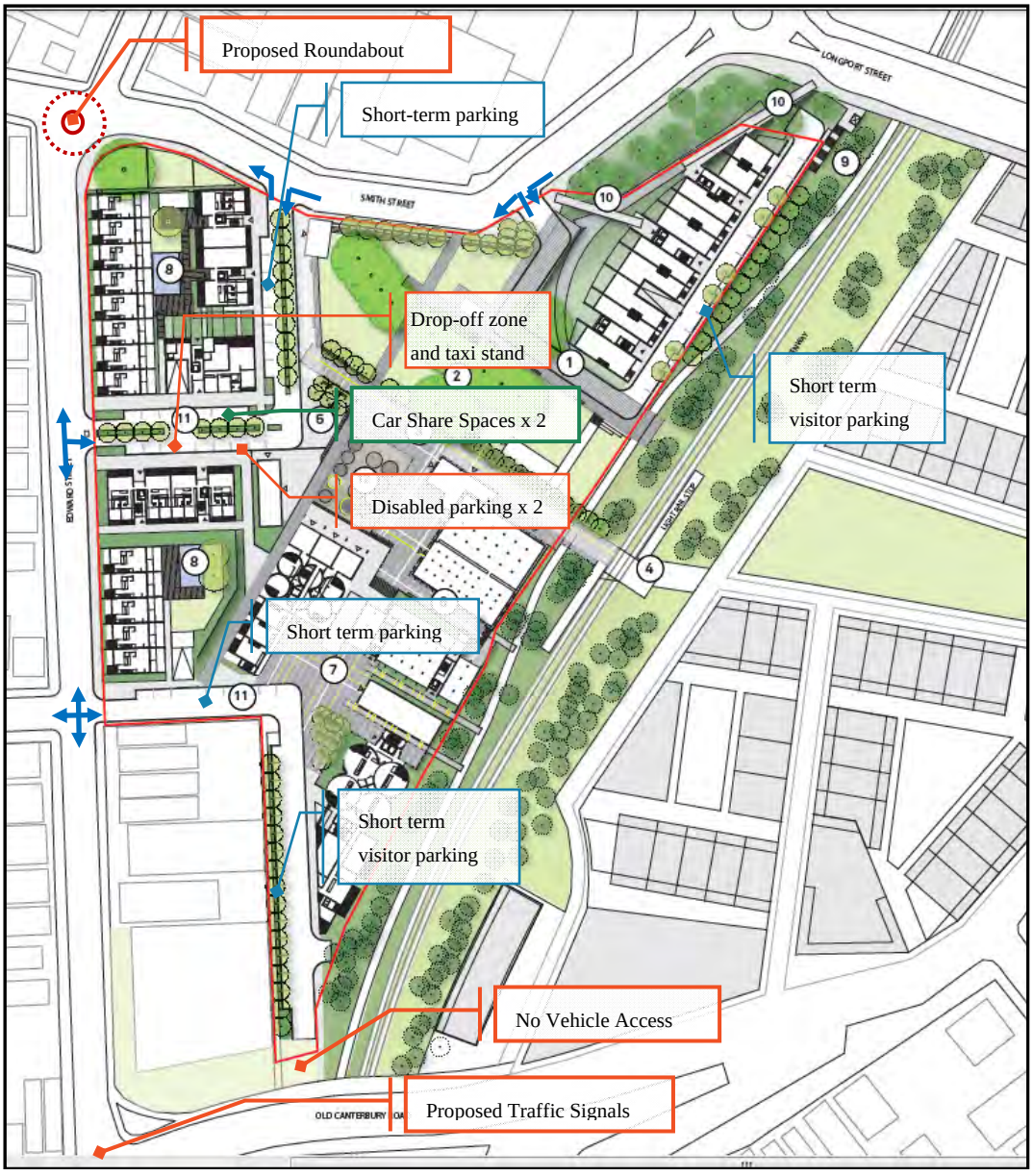


Figure 7 Traffic Management and Parking Plan

The only local street that is directly accessible from the development is Wellesley Street which connects between Edward Street and Nowranie Street as shown in Figure 8. We expect very little traffic would wish to use this route due to the more direct connections offered at each end of Edward Street to the main road system via new intersection controls. Monitoring of traffic flow in Wellesley Street should be undertaken as stages of the development progress to consider the amenity of this local street. If necessary, traffic management to restrict certain movements at the Edward Street intersection or traffic calming measures could be considered.

The proposed development should be viewed as an extension of the local precinct and the traffic management plan has been developed on this basis. We therefore see no benefit in undertaking micro-simulation on the local street system.

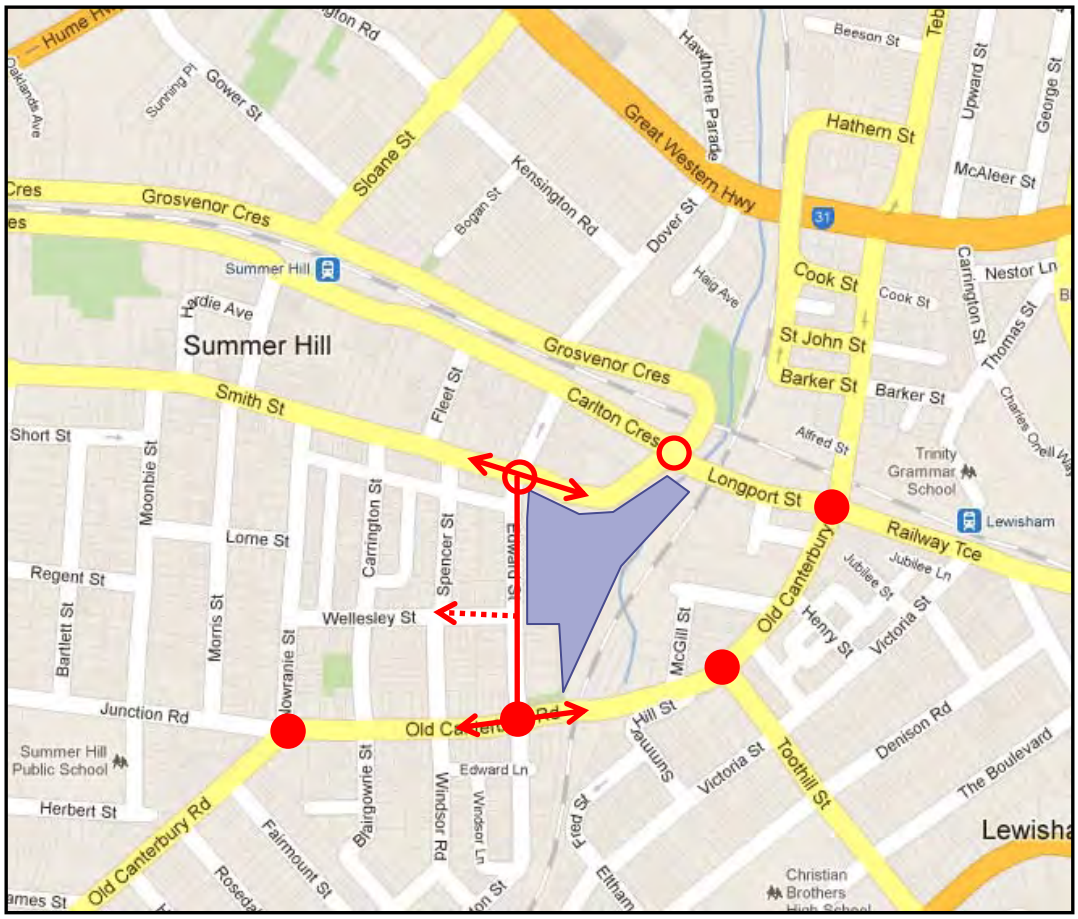


Figure 8 Local Street System

2.3 Alternative options to the proposed local road link onto Old Canterbury Road adjacent to the railway corridor need to be considered.

As shown in Figure 7, the local road link in the southern portion of the site would operate as a cul-de-sac with access only onto Edward Street. There is no need to consider an alternative access option for this link. It serves the future development site in this southern portion of the site.

2.4 Treatment of the local streets in the development needs to be considered to prevent through traffic and create a slow speed environment.

The median tree planting and narrow street layout as shown in Figure 9 will create a slow speed environment and safe pedestrian access. Indented parking bays provide extended kerbs at crossing locations to improve pedestrian visibility and reduce the crossing distance. Restricted access to Smith Street and cul-de-sac treatment at the southern Edward Street access would prohibit the local streets being used by through traffic.

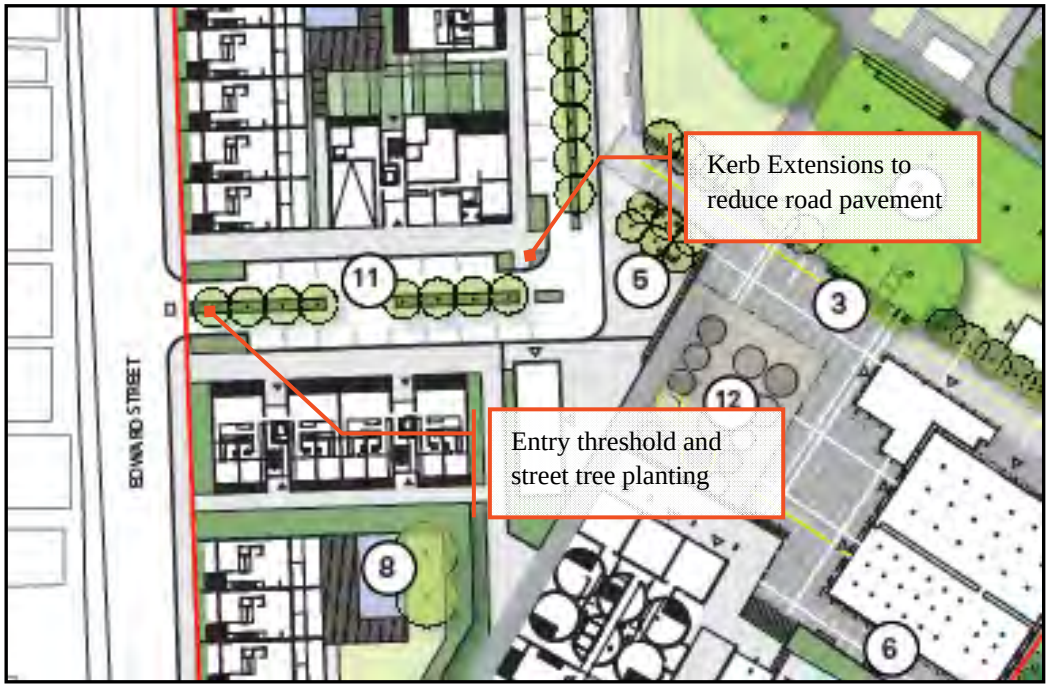


Figure 9 Internal Local Street Configuration

2.5 Light rail “kiss and drop” facility and disabled parking

Two disabled parking spaces are allocated at the southern kerb of the Smith Street access road. Kiss and drop zones are located as indicated in the traffic management and parking plan (Figure 7). The kiss and drop can be located on each side of the street to enable drivers to approach from either direction on the loop road through the site.

2.6 Reduced car parking provision for non-residential uses to minimise traffic generation.

A revised parking provision which reduces the provision of commercial and retail parking is considered appropriate for this site. The commercial and retail uses anticipated in this development will serve the local community and therefore have a local catchment allowing for walk and cycle trips including high public transport access for the commercial. The current Council DCP parking rates are shown in Table 5.

Table 5 Council DCP Parking Rates

Land Use	**Ashfield Parking Rate Precincts 2 to 5**	**Marrickville Parking Rates Precinct 1**
Multi-Unit Housing in Residential Zones	• 1 space per unit • Additional space for every five 2-bedroom units • Additional space for every two 3-bedroom units • 1 visitor space for every five units	• 1 space per 4 studio or 1 bedroom units • 1 space per 2 or 3 bedroom units • 1 visitor spaces per 10 units
Commercial Premises	1 space per 40m^2 GFA	1 per 80m2 GFA for staff & visitors
Retail Shops	1 space per 40m^2 GFA	Up to 500m2 1 per 80m2 GFA for customers & staff

Table 6 provides the parking provision in accordance with the Ashfield and Marrickville Council DCPs for the respective precinct parcels.

The DCP rates for residential and visitor parking are considered appropriate given the need for residents to garage a car which may not be used for journey to work and given the desire to allocate all on-street car parking to visitors and deliveries to the mixed uses in the precinct.

Table 6 Parking Requirement to comply with Ashfield and Marrickville Council's DCP

Dwelling Parking Requirements Precinct 1 (Marrickville)					
Precinct	**Revised Average Number of Units**				
	1 bed	**2 bed**	**3 bed**	**4 bed**	**TOTAL**
1	12	34	19	10	75
Council Parking Rate	0.25	1	1	1	
Total Spaces Required	**3**	**34**	**19**	**10**	**66**
Visitor Parking Requirements - 1 space per 10 dwellings					**8**

Dwelling Parking Requirements Precincts 2 to 5 (Ashfield)					
2	0	0	0	0	0
3	61	28	9	2	100
4	12	7	8	8	35
5	11	41	0	5	57
Sub-Total Dwellings	84	76	17	15	192
Council Parking Rate	1	1.2	1.5	1.5	
Total Spaces Required	**84**	**91**	**26**	**22**	**223**
Visitor Parking Requirements - 1 space per 5 dwellings					**38**
Total Dwelling Parking					**335**

Commercial Parking Requirement		
Precint	**Commercial GFA (m^2)**	**Total Parking Required**
1	205	3
2	3,037	76
3	400	10
4	0	0
5	110	3
Total	**3,750**	**92**
Retail Parking Requirement		
Precint	**Retail GFA (m^2)**	**Total Parking Required**
1	325	4
2	908	23
3	210	5
4	335	8
5	310	8
Total	**2,088**	**48**
Total Parking Required		**475**

For the commercial component, it is considered appropriate to reduce parking provision by 25% to represent the high public transport accessibility. For the retail component, a greater reduction of 50% is considered appropriate given the local catchment nature of the likely retail and the proximity to public transport.

Parking provision has been updated as shown in Table 7. This represents a reduction of 47 car parking spaces off Council's DCP requirement.

Table 7 Reduced Parking Provision

Use	Required	Provided Rate	Spaces
Residential	335	As per Council DCP	335
Commercial	92	75% Council DCP	69
Retail	48	50% Council DCP	24
Total	**475**		**428**

2.7 Additional car share spaces and any other innovative measures to discourage private vehicle use.

The Go Get company now extends its car share pods into the Summer Hill area as shown in Figure 10. Suitable car share spaces on the Summer Hill Flour Mill site have been identified on the traffic management and parking plan shown in Figure 7.

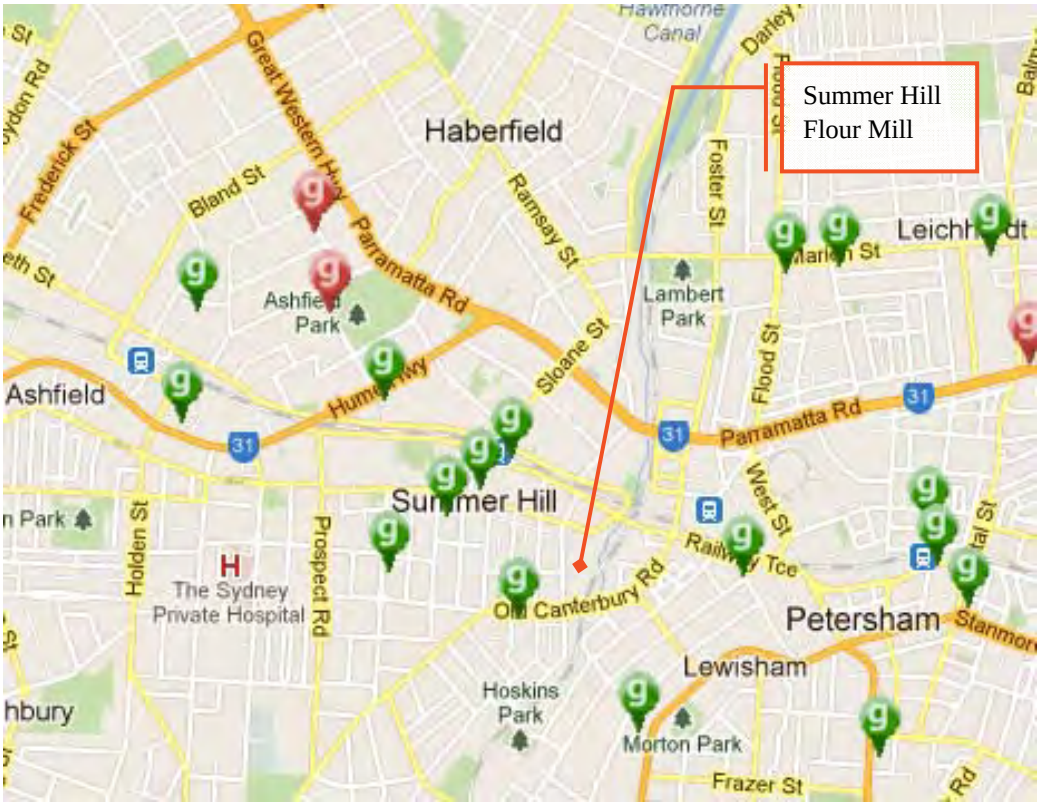


Figure 10 Go Get Car Share Pods

The proposed development is located at the heart of the future light rail hub and the Greenway. Access to the light rail stop will be facilitated along a pedestrian avenue through the Summer Hill Flour Mill site from Smith Street which also connects through to the McGill Street precinct.

Due to the high public transport accessibility and the bicycle and walking opportunities and facilities provided on site, car share is a viable option for many residents who choose to live here, thereby reducing car demand.

2.8 Further analysis of off-site linkages for walking and cycling which should include consideration of public domain upgrades to be included in the VPA.

Arup conducted a local precinct audit of pedestrian and cyclist facilities around the site. A field audit on pedestrian and bicycle linkages and facilities, within 800m (approx. 10 minutes walk) from the site, was conducted on 26 October 2011. A series of measures to improve the pedestrian and cyclist environment were identified through the audit, and summarised below.

2.8.1 Key Attractors in the Area

The key attractors within 800m from the site are identified and highlighted in Figure 11. Attractors include public transport stops (train, bus and light rail), retail area, schools and recreational uses.

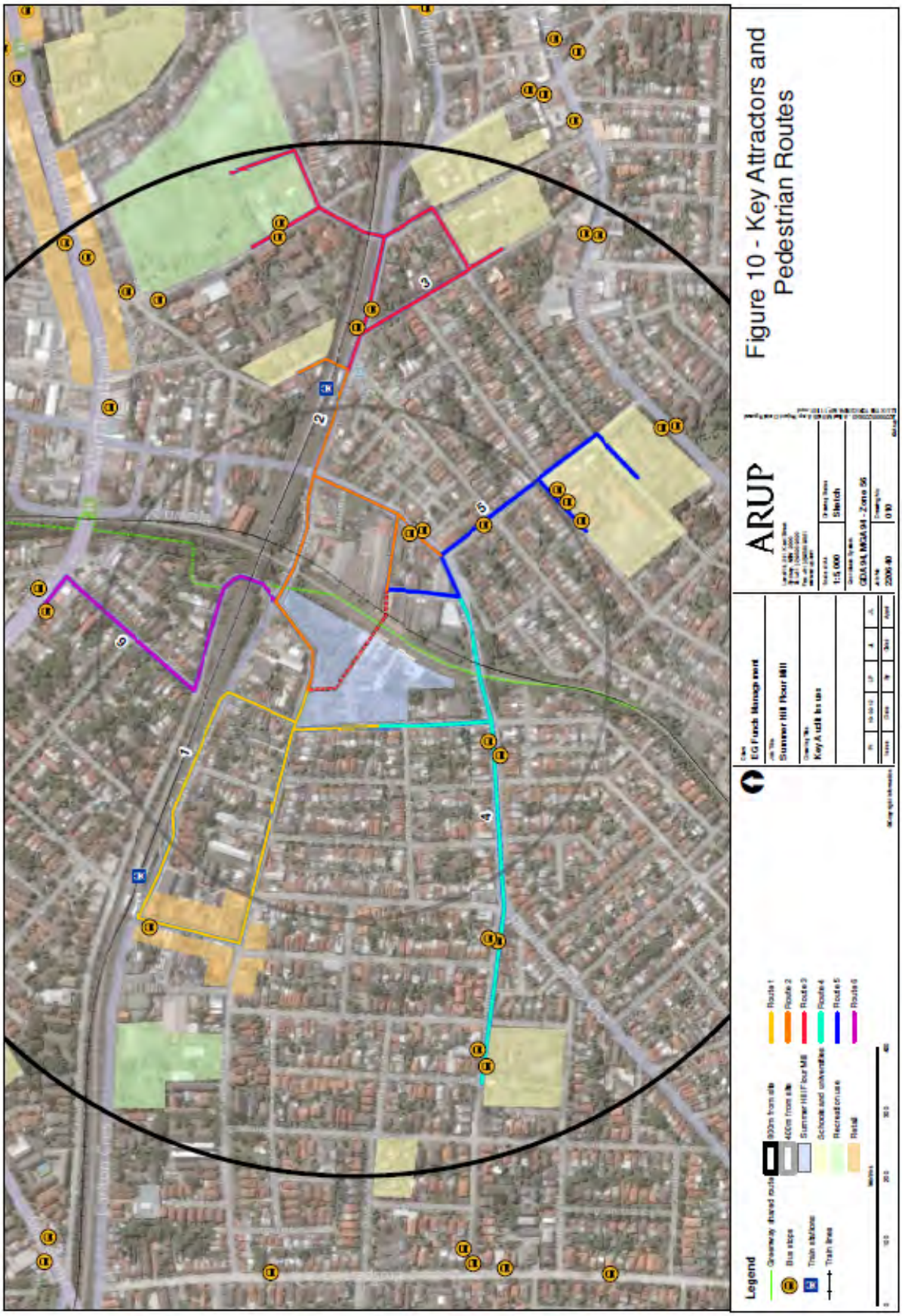


Figure 11 Key Attractors and Pedestrian Routes

2.8.2 Key Pedestrian and Cyclist Routes

The key routes linking from the site to the major attractors are highlighted in Table 8.

Table 8 Key Pedestrian and Cyclist Routes

Route	Key Attractors	Description
1	Summer Hill train station, Summer Hill shops on Lackey St & Smith St	This route has been upgraded in the town centre streetscape work. Summer Hill village centre is likely to be the main attractor to the Summer Hills Flour Mill development occupants. There are a variety of shops, restaurants, cafe, supermarket and services available there. The station is fully accessible with lifts.
2	Lewisham train station, Trinity Grammar School	Lewisham is located about same distance away from the development as Summer Hill station. However, the station has no easy access. The town centre itself is small with low pedestrian/ retail activity. This route would be secondary to the Summer Hill station.
3	Petersham Park and Pool, Petersham Public School, TAFE NSW Petersham	This route provides access to recreational and educational uses for the future occupants. It provides cycle linkages to local and regional routes.
4	Junction Rd/ Old Canterbury Rd bus stops, Summer Hill Public School	The site officially falls within the Summer Hill Public School catchment. It would be the primary choice of school for family enrolling their children into the local public school. The route is primarily used by school children and their carers.
5	Lewisham Public School, Christian Brothers High School	Lewisham public school is about the same distance away from the development as Summer Hill public school. Some families may chose to enrol their children here despite being out of the catchment area. Christian Brothers High School is the nearest high school to the site. The route is primarily used by school children and their carers.
6	Greenway shared route (off Grosvenor Circuit), Parramatta Road bus stops	This route provides access to bus stops and shops along Parramatta Road.

2.8.3 Facilities Check List

A check list on pedestrian and cyclist facilities was developed using the latest guidelines and best practices. The following documents were referenced:

- Australian Standard AS1428 Part 1, 2 and 4
- Austroads Guide to Road Design – Part 4, 6 and 6A
- Marrickville Pedestrian Access and Mobility Plan 2010
- Development and Active Living - Designing Projects for Active Living, Premier's Council for Active Living NSW, 2010
- Planning Guidelines for Walking and Cycling, Department of Planning, 2004

- How to prepare a Pedestrian Access and Mobility Plan – an easy three stage guide, RTA
- How to prepare a Bikeplan, RTA

A daytime field audit was conducted by Arup on Thursday 27 October 2011.

2.8.4 Audit Findings

Footpath and kerb ramps are generally provided within the study area. However, most of the kerb ramps do not comply with the Australian Standard AS1428. Typical issues are kerb ramps not aligned to the path of travel, kerb ramp too steep, only one kerb ramp (instead of two) is provided at the corner of the road. There is only a small section of footpath disconnection audited along Smith Street (outside of the BP workshop).

There is generally a lack of way finding signage along key pedestrian routes. Directions to local schools, shops, train station and parks are not provided to orient cyclists and pedestrians. On-road cycle route road marking logos at major intersections need to be refreshed with reflective paint.

Lewisham train station and the surrounding area needs to be upgraded and revitalised to improve the attractiveness and increase pedestrian and retail activity in the area. Easy access upgrade would be critical for the station to serve the wide spectrum of community users (school children, TAFE students, park patrons and local residents).

The intersections at the immediate vicinity of the site should be upgraded to improve pedestrian and cyclist safety. Edward Street/ Smith Street intersection is offset and wide and could be realigned or improved with a revised traffic management arrangement. This can reduce the crossing distance, improve pedestrian visibility and reduce traffic speed. Carlton Cr/ Grosvenor Cr intersection need to be upgraded to cater for pedestrian crossing. Refuges and kerb ramps should be provided at all four arms of the roundabout.

Detail of the audit is provided in Appendix A. Locations of the issues are provided in Figure 12.

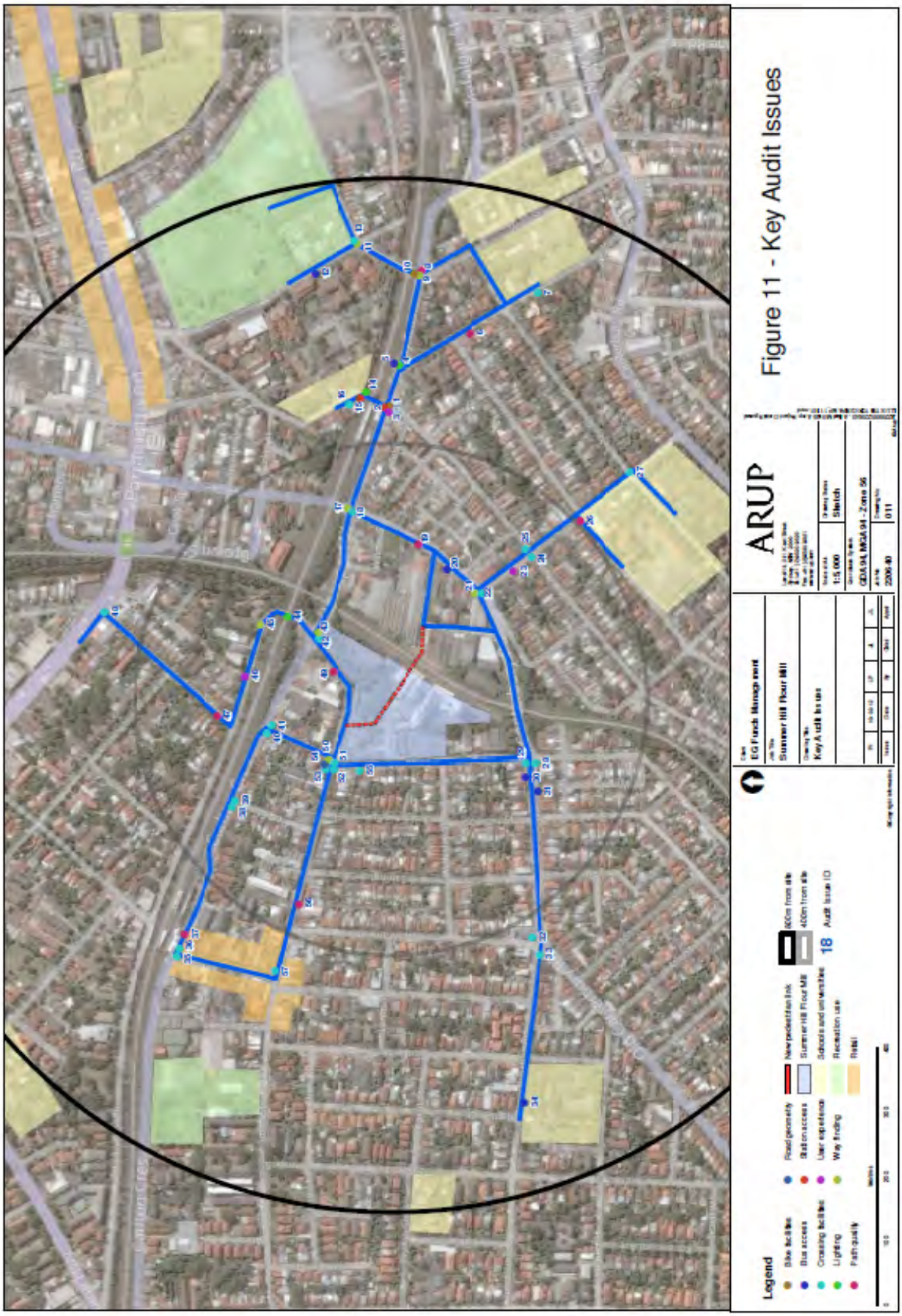


Figure 12 Key Audit Issues in the Extended Area

The key issues are also summarised in Table 9 below:

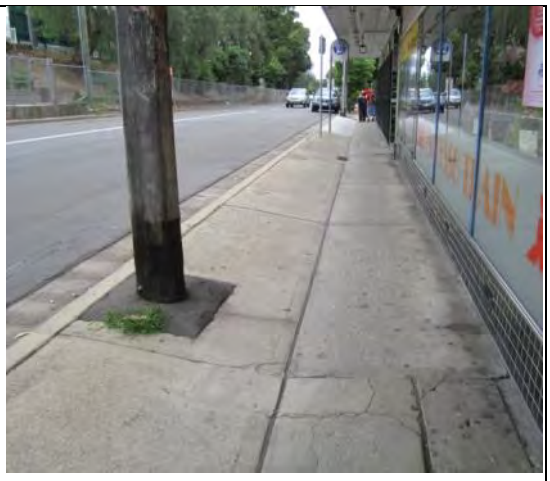
Table 9 Key Audited Issues

Key issues/ issues count	Issues
Bike facilities / 2	Steep crest. No bike holding rail provided No bike parking rail provided
Bus access / 6	No seating or shelter provided Narrow footpath Insufficient space for wheelchair manoeuvring Effective width >0.5m
Crossing facilities / 25	Crossing width too wide kerb ramp - poor drainage Kerb ramp lip >5mm Kerb ramp steeper than 1:8 Kerb ramps not aligned to the travel path Missing kerb ramp Missing kerb ramp - due to utility pits No crossing facilities provided No kerb ramps provide to connect to the school Speed hump slope < 1:20, too steep for easy access
Path quality / 8	Crossing obstructed by parked bus, reduced visibility of pedestrian Half side of the path is sloped, effective width <1.2m Missing footpath - section outside of BP workshop Path obstructed by overgrown shrub. Effective width < 1m Path obstructed by power pole. Effective reduced to <1m Tripping hazard - path lifted >5mm by tree root Uneven footpath, gap in path
Road geometry / 1	Wide intersection, long crossing distance
Station access / 2	Stair access to station only
User experience / 3	Steep uphill path, no seating, resting point provided Lack of active street frontage, poor public surveillance
Way finding / 7	No signage for Greenway entrance No signage for ped/bike No signage for entrance to Petersham Park No signage for schools along the road
Lighting / 3	No lighting for the night ride stop No lighting provided No lighting provided at the underpass
Total / 57	

2.8.5 Highlight of Issues by Route

Route1 - Summer Hill train station, Summer Hill shops on Lackey St

Photograph 1 No crossing facility on Lackey St



Photograph 2 Sloped path along Carlton Cr

Photograph 3 Kerb ramp not aligned to travel path – outside of Summer Hill station

Photograph 4 Kerb ramp not flush with path, lip >5mm

Route 2 - Lewisham train station, Trinity Grammar School

Photograph 5 Lewisham station has stair access only. No bike parking is provided

Photograph 6 Lewisham town centre has low activity

Photograph 7 Narrow footpath at night ride bus stop, no lighting provided, narrow kerb ramp with no landing area for pram/ wheelchair

Photograph 8 No kerb ramps for crossing to Trinity Grammar School

Route 3 - Petersham Park and Pool, Petersham Public School, TAFE NSW Petersham

Photograph 9 Power pole obstructed footpath – Railway Tce

Photograph 10 Kerb ramp & refuge not aligned to the path of travel (Brighton St)

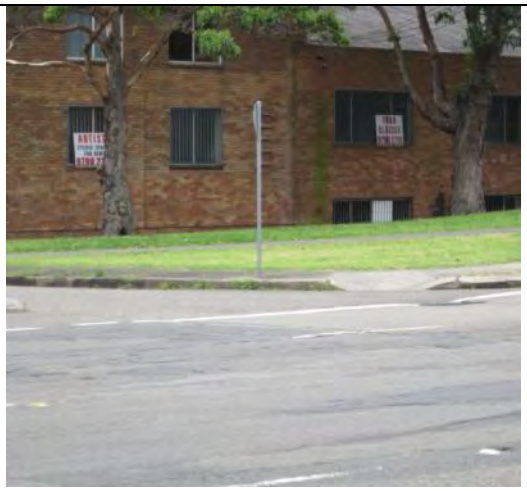
Photograph 11 Tripping hazard – gap in footpath along Hunter St

Photograph 12 Steep crest from Railway Tce to West St need bike holding rail

Route 4 - Junction Rd/ Old Canterbury Rd bus stops, Summer Hill Public School

Photograph 13 Wide crossing distance on Watson St – need to provide pedestrian refuge

Photograph 14 Steep kerb ramp on Nowraine St



Photograph 15 Kerb ramp not aligned to path of travel – Edward St

Photograph 16 Bus stop need seating and shelter – Old Canterbury Rd

Route 5 - Lewisham Public School, Christian Brothers High School

Photograph 17 Missing kerb ramp due to utility pit – Toothill St

Photograph 18 Uphill path need seating along path – Toothill St

Photograph 19 Missing kerb ramps – Victoria St

Photograph 20 Parked bus outside of Christian Brothers High School blocked pedestrian view and access

Route 6 - Greenway shared route, Parramatta Road bus stops

Photograph 21 No pedestrian crossing facilities nor way finding signage provided – Grosvenor Cr/Carlton Cr

Photograph 22 No lighting at the rail bridge underpass – Grosvenor Cr

Photograph 23 Greenway entrance has no information signage

Photograph 24 Kerb ramp not aligned to path of travel – Parramatta Rd

2.8.6 Actions Prioritisation and Recommendations

Summer Hill station has easy access facilities as well as a local mall with various types of shops. These are the key pedestrian attractors over Lewisham station despite the site being situated halfway between each station. The route in the immediate vicinity of the site and towards Summer Hill train station and shops, therefore, is identified as the priority route for the potential residents and users of the site.

If the actions identified by this audit are agreed as appropriate, it is recommended that the development contribute to some of the improvement works in the immediate vicinity of the site and along the route to Summer Hill station. Ashfield and Marrickville Councils can prioritise improvement works in the extended area through the Voluntary Planning Agreement process. The priority 1 recommended improvement works to be funded by the developer during the site development are summarised below in Table 10.

Table 10 Priority 1 Recommended Works

ID	Street	Side	Cross Street	Issues	Sub Issues	Action	length (m)/ Unit	Photo No.	Priority	Cost Est.
28	Old Canterbury Rd	s	Watson St	Crossing facilities	Crossing width too wide	Provide pedestrian crossing as part of the signal intersection improvement	1	51	1	-
29	Old Canterbury Rd	n	Edward St	Crossing facilities	Kerb ramps not aligned to the travel path	Realigned kerb ramp to the path of travel as part of the signal intersection improvement	1	52	1	-
30	Old Canterbury Rd	n	Edward St	Bus access	No seating or shelter provided	Install seating and shelter	1	53	1	$13,000
31	Old Canterbury Rd	s	Edward St	Bus access	No seating or shelter provided	Install seating and shelter	1		1	$13,000
35	Carlton Cr	s	Lackey St	Crossing facilities	Kerb ramps not aligned to the travel path	Realigned kerb ramp to the path of travel	1	58	1	$1,500
36	Lackey St	e	Carlton Cr	Crossing facilities	Kerb ramps not aligned to the travel path	Realigned kerb ramp to the path of travel	1	59	1	$1,500
37	Carlton Cr	s	Lackey St	Path quality	Half side of the path is sloped, effective width <1.2m	Fill and level footpath	20	60	1	$3,800
38	Fleet St	w	Carlton Cr	Crossing facilities	Kerb ramp lip >5mm	Remove lip, flush with path	1	62	1	$1,500
39	Fleet St	e	Carlton Cr	Crossing facilities	Kerb ramp lip >5mm	Remove lip, flush with path	1	63	1	$1,500
40	Chapman St	w	Carlton Cr	Crossing facilities	Kerb ramp lip >5mm	Remove lip, flush with path	1	64	1	$1,500
41	Chapman St	e	Carlton Cr	Crossing facilities	Kerb ramp lip >5mm	Remove lip, flush with path	1	64	1	$1,500
42	Carlton Cr		Grosvernor Cr	Crossing facilities	No crossing facilities provided	Install kerb ramps and cut open refuges at all four arms	4	66	1	$22,000

43	Carlton Cr		Grosvernor Cr	Way finding	No signage for ped/bike	Install way-finding signage, indicate directions to Summer Hill station, Lewisham station, Parramatta Rd	1	66	1	$1,200
49	Smith St	w	Carlton Cr	Path quality	Missing footpath - section outside of BP workshop	Provide new footpath	8	76	1	$1,520
50	Edward St	e	Smith St	Way finding	No signage for ped/bike	Install way-finding signage, indicate directions to Summer Hill station, Lewisham station, Parramatta Rd	1	78	1	$1,200
51	Edward St	e	Smith St	Crossing facilities	Kerb ramps not aligned to the travel path	Realigned kerb ramp to the path of travel	1	79	1	$1,500
52	Chapman St	e	Smith St	Crossing facilities	Kerb ramps not aligned to the travel path	Realigned kerb ramp to the path of travel	1		1	$1,500
53	Smith St		Edward St	Crossing facilities	Missing kerb ramp	Install standard kerb ramp	3	78	1	$4,500
54	Edward St		Smith St	Road geometry	Wide intersection, long crossing distance	Straighten Edward St geometry to reduce crossing distance and traffic turning speed as part of the rounabout improvement work	1		1	-
55	Edward St	w	Laneway south of Smith St	Crossing facilities	kerb ramp - poor drainage	Improve drainage to avoid water build-up at the ramp	1	81	1	$1,500
56	Smith St	s	Nowraine St	Path quality	Tripping hazard - path lifted >5mm by tree root	Provide even footpath	1	82	1	$190
57	Lackey St		Smith St	Crossing facilities	No crossing facilities provided	Provide zebra crossing*	1	84	1	$10,000
									Priority 1 Total:	**$83,910**

2.9 Staging of the Works

The intended staging of the development, shown in Figure 13, commences with the predominantly residential development on the corner of Edward Street and Smith Street. The Stage 1 boundary includes a public access route to the future light rail platforms and to the McGill Street Precinct beyond.

Figure 13 Indicative Development Staging Plan

The development mix for the four indicative stages is shown in Table 11. Stages 1 and 2 are small stages with 35 and 23 apartments/terrace houses respectively and minimal associated commercial and retail floor space. Stage 3 is the largest stage involving the reuse of the mill buildings and Stage 4 is the remaining new build in the north east corner of the site.

Table 11 Development Split for Indicative Staging

Stage	Residential Apartments					Commercial (GLA m^2)	Retail (GLA m^2)
	1bed	2bed	3bed	3/4 bed terrace	Total		
1	12	7	8	8	35	342	677
2	6	12	0	5	23	110	110
3	66	57	9	2	134	3300	1110
4	12	34	19	10	75	0	191
Total	**96**	**110**	**36**	**25**	**267**	**3752**	**2088**

Applying the traffic generation rates to the Stage 1 and Stage 2 development split results in traffic generation of 50 vehicles movements in and out in the peak hours. This low level of traffic generation can be accommodated on the local road system with existing arrangements.

The Stage 1 development includes the internal road connection between Edward Street and Smith Street with a left turn in and left turn out arrangement at Smith Street. The proposed roundabout at the intersection of Edward Street and Smith Street would therefore be installed in Stage 1 to allow for local vehicle circulation.

No further road works are required for completion of Stage 2.

It is recommended that the traffic signals at the intersection of Edward Street and Old Canterbury Road be operational prior to occupation of Stage 3 of the development.

Staging of the public domain upgrade works identified for pedestrians and cyclists is dependent on prioritisation by each Council and the precinct would benefit from their implementation during occupation of Stage 3 of the development.

3 Conclusions

All of the issues raised in the Department of Planning and Infrastructure's Preferred Project Report advice dated 16 September 2011 have been addressed in this Traffic and Transport response.

The site is well located to take advantage of public transport and non-motorised forms of transport or all journey types throughout the day. In particular, the morning peak traffic travelling through this precinct causes the roads to be heavily utilised. The journey to work for residents of the proposed developments have a range of alternatives modes to choose including the existing train and proposed light rail.

Arup conducted a local precinct audit of pedestrian and cyclist facilities around the site within 800m (approx. 10 minutes walk). A series of measures to improve the pedestrian and cyclist environment have been identified and can be implemented to encourage walking and cycling.

The sites are well located to feed traffic directly onto the main road system without impacting on the local street system. The internal road system for the site provides access to a series of car parks and on-street spaces which can be allocated for various uses such as kiss and ride for the light rail, car share spaces, short term parking, etc.

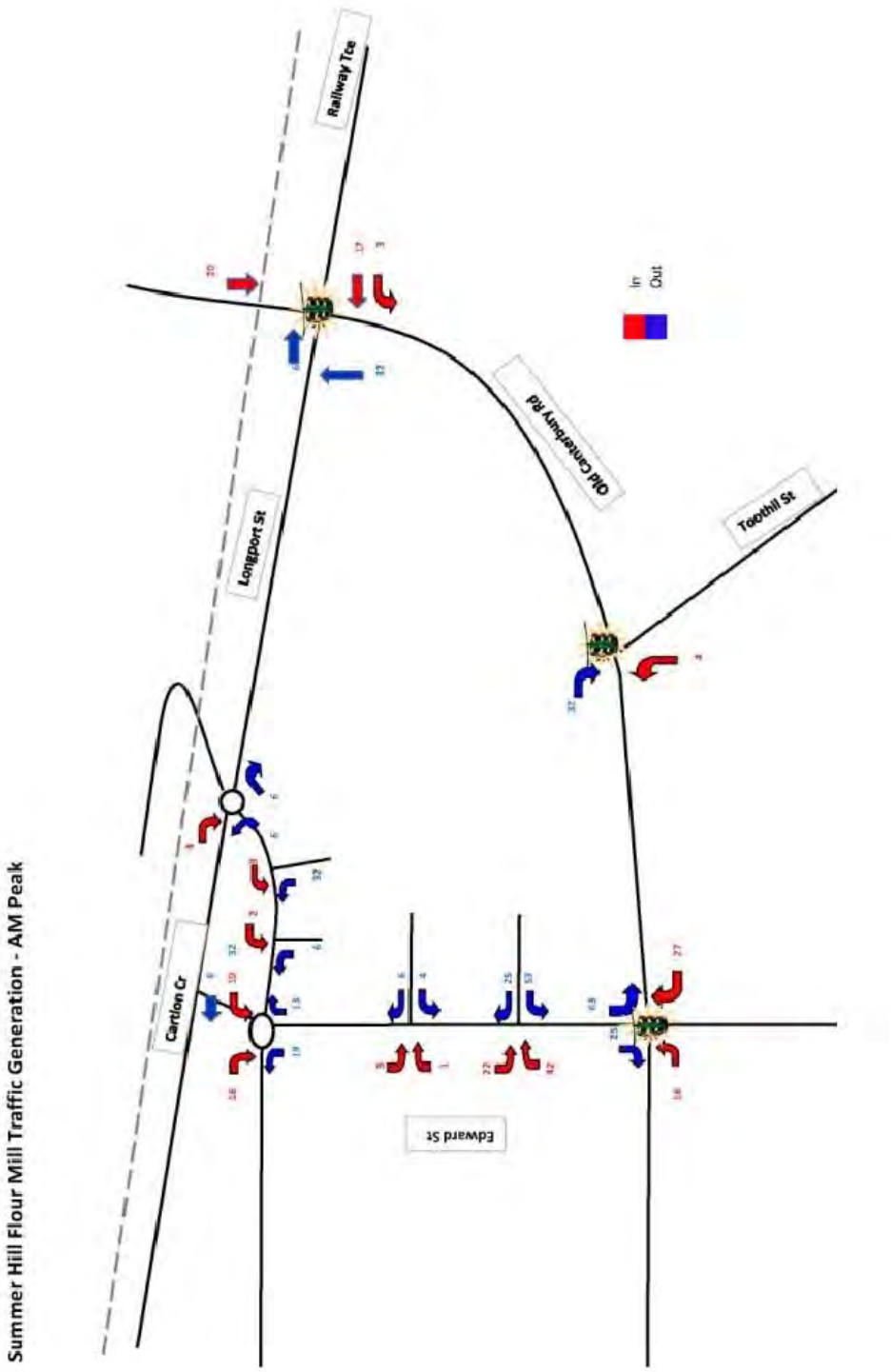
Staging of the road and public domain works has been considered based on the development mix. Stages 1 and 2 are small stages and will add minimal traffic to the road system. The roundabout would be installed at the intersection of Smith Street and Edward Street to facilitate local circulation. The remainder of the works are triggered by Stage 3 which is the largest stage of works.

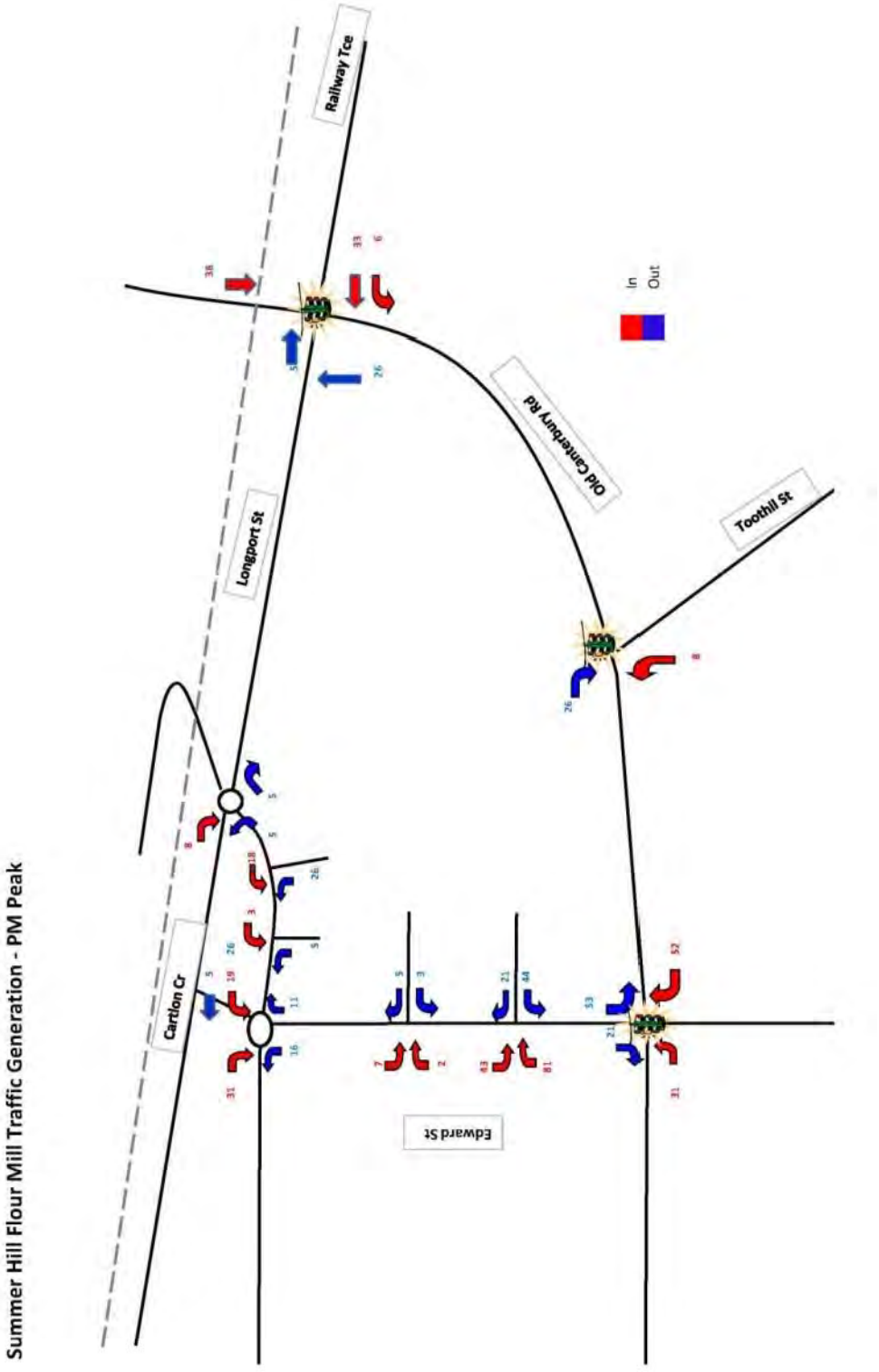
Consideration has been given to reduced parking provision for the commercial and retail floor space to support travel by alternative modes to the private car and to recognise that many trips will be from a walk in local catchment. It is considered appropriate to reduce parking provision by 25% for the commercial to represent the high public transport accessibility. For the retail component, a greater reduction of 50% is considered appropriate given the local catchment nature of the likely retail and the proximity to public transport. This represents a reduction of 47 car parking spaces off Council's DCP requirement.

Appendix A

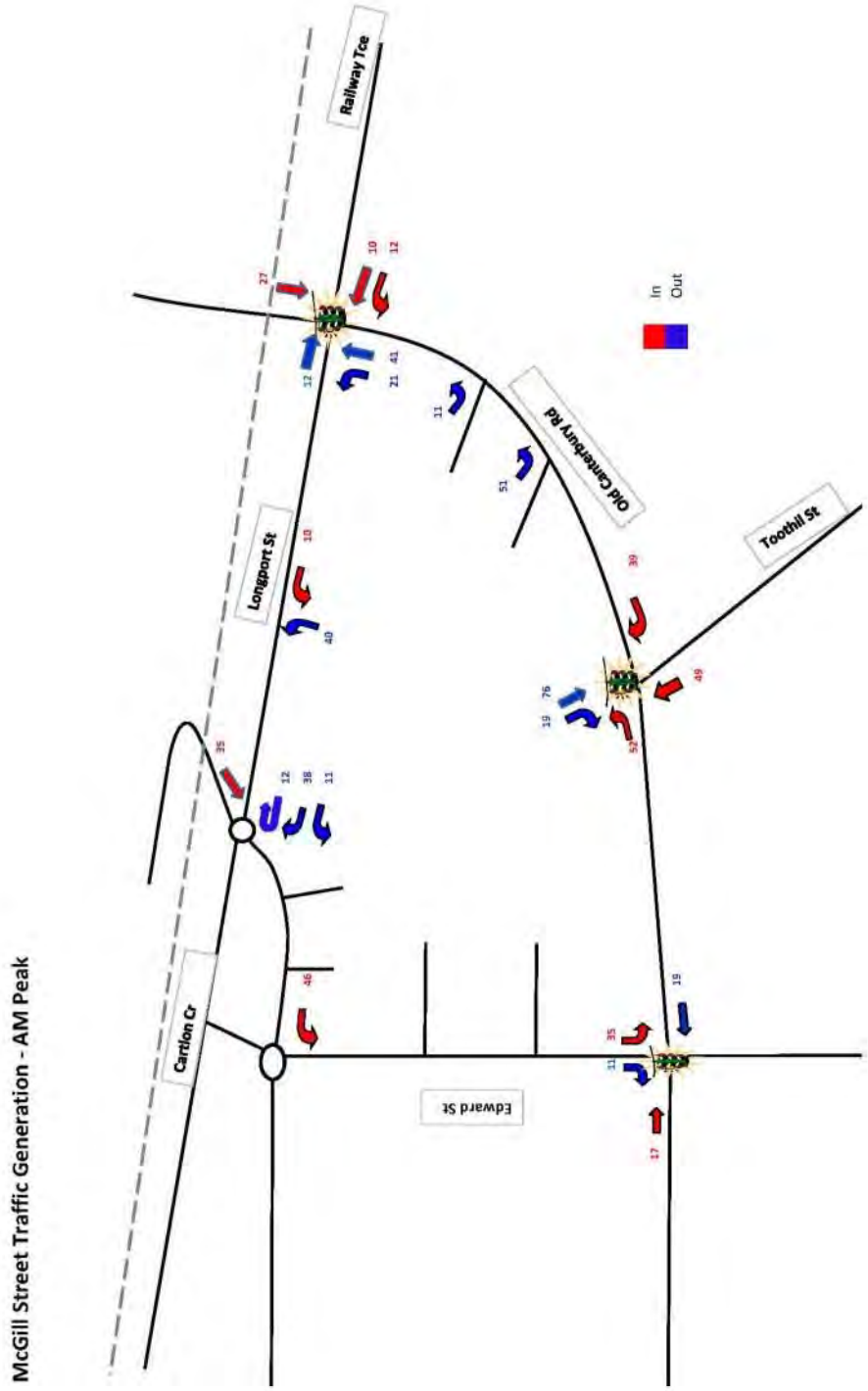
Traffic distribution

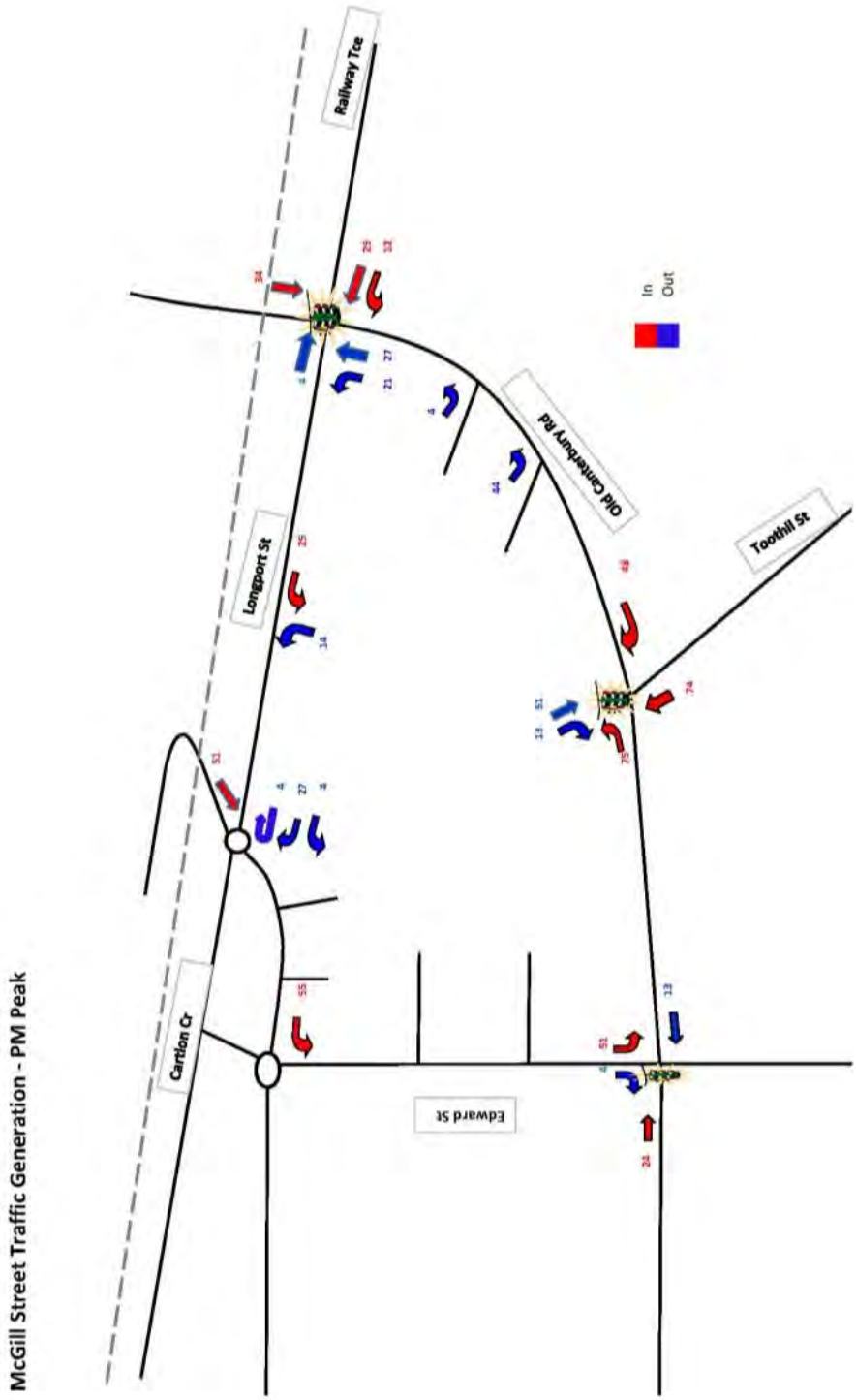
A1 Summer Hill Flour Mill traffic distribution




Summer Hill Flour Mill Traffic Generation - PM Peak
Railway Tce
Old Canterbury Rd
Toothill St
Longport St
Cartlon Cr
Edward St
In
Out

A2 McGill Street precinct traffic distribution

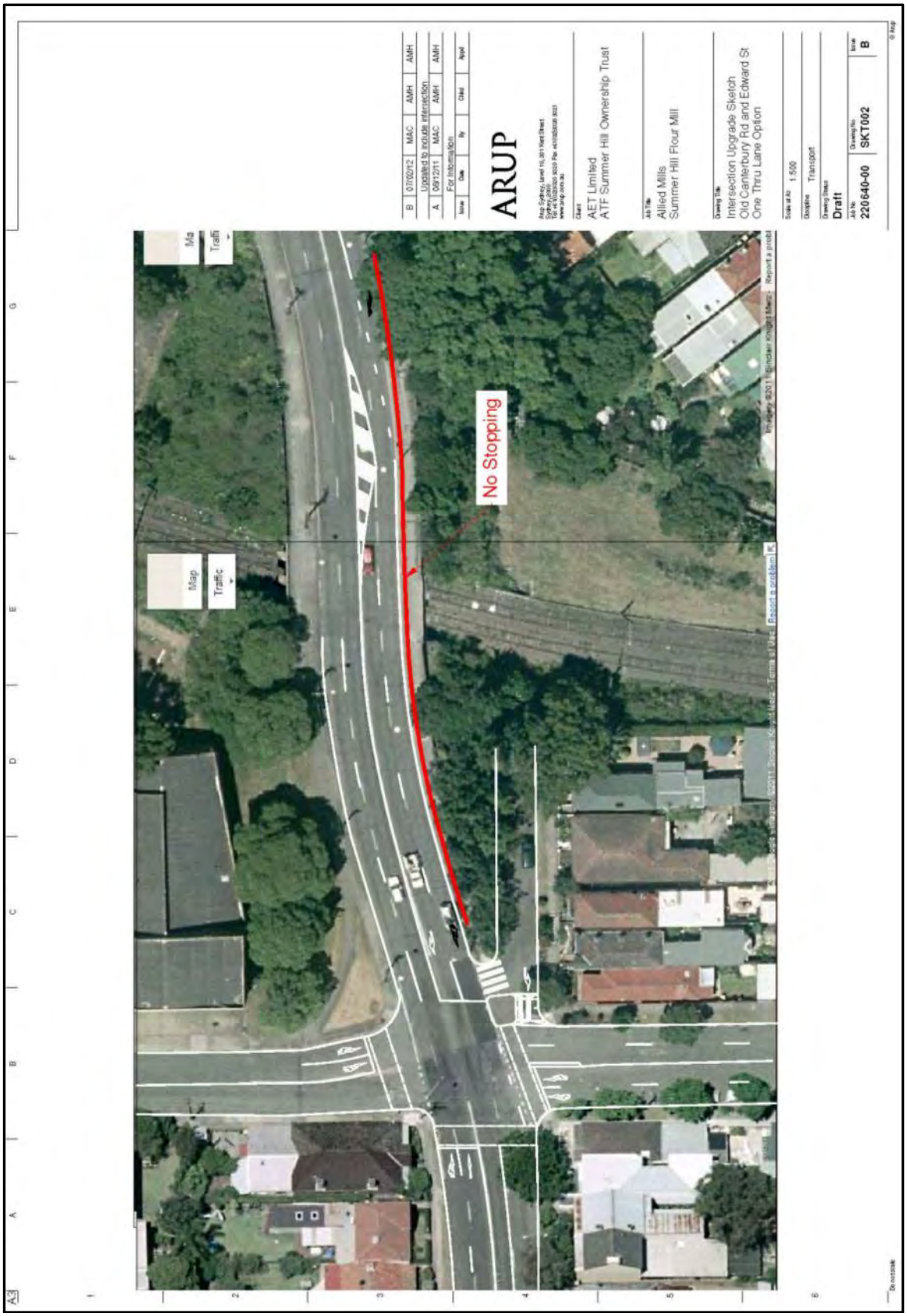



McGill Street Traffic Generation - PM Peak
Railway Tce
Longport St
Old Canterbury Rd
Toothill St
Carlton Cr
Edward St
In
Out

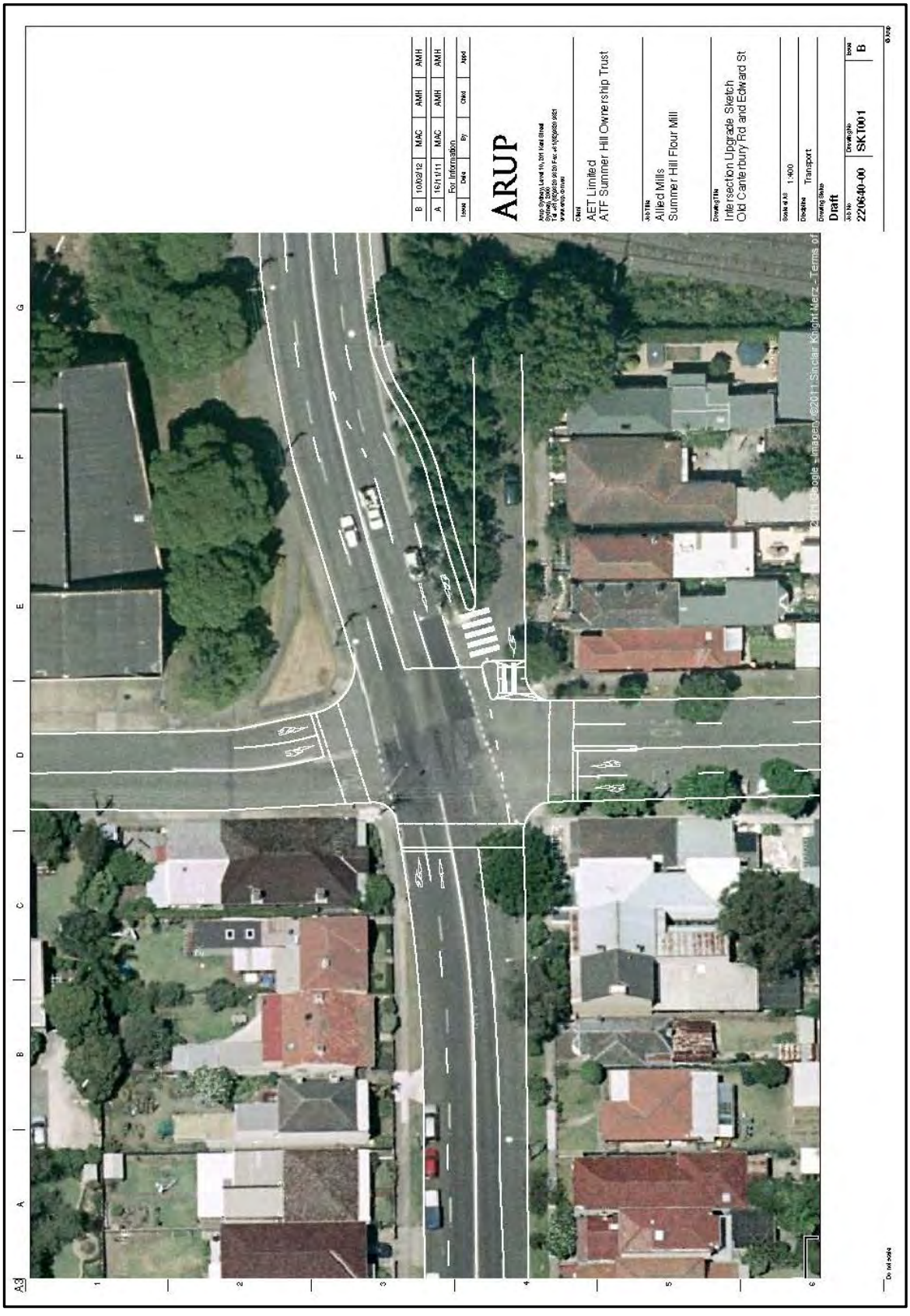
Appendix B

Edward Street / Old Canterbury Road Intersection

B1 4 Lane treatment option



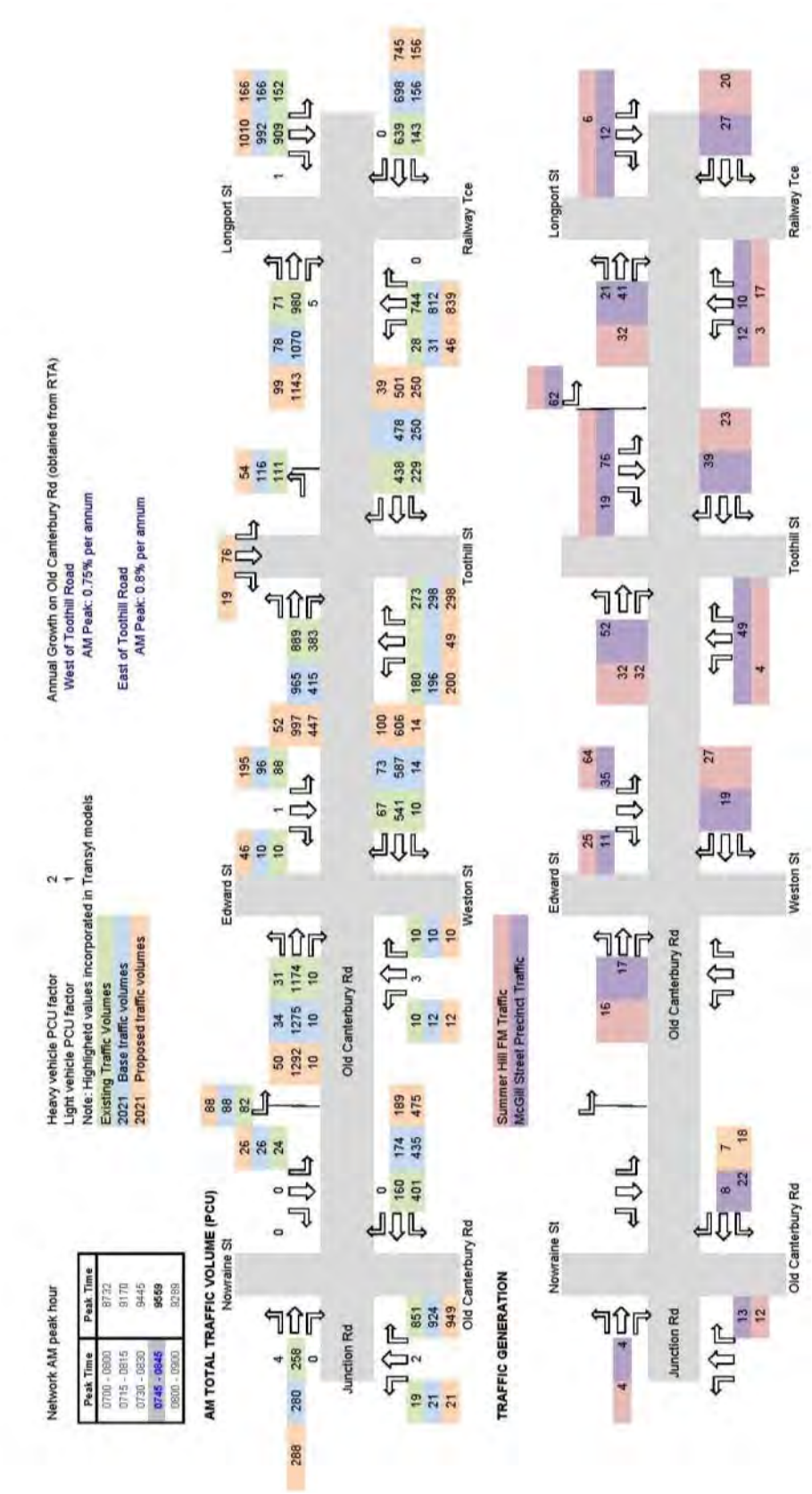
B2 5 Lane treatment option



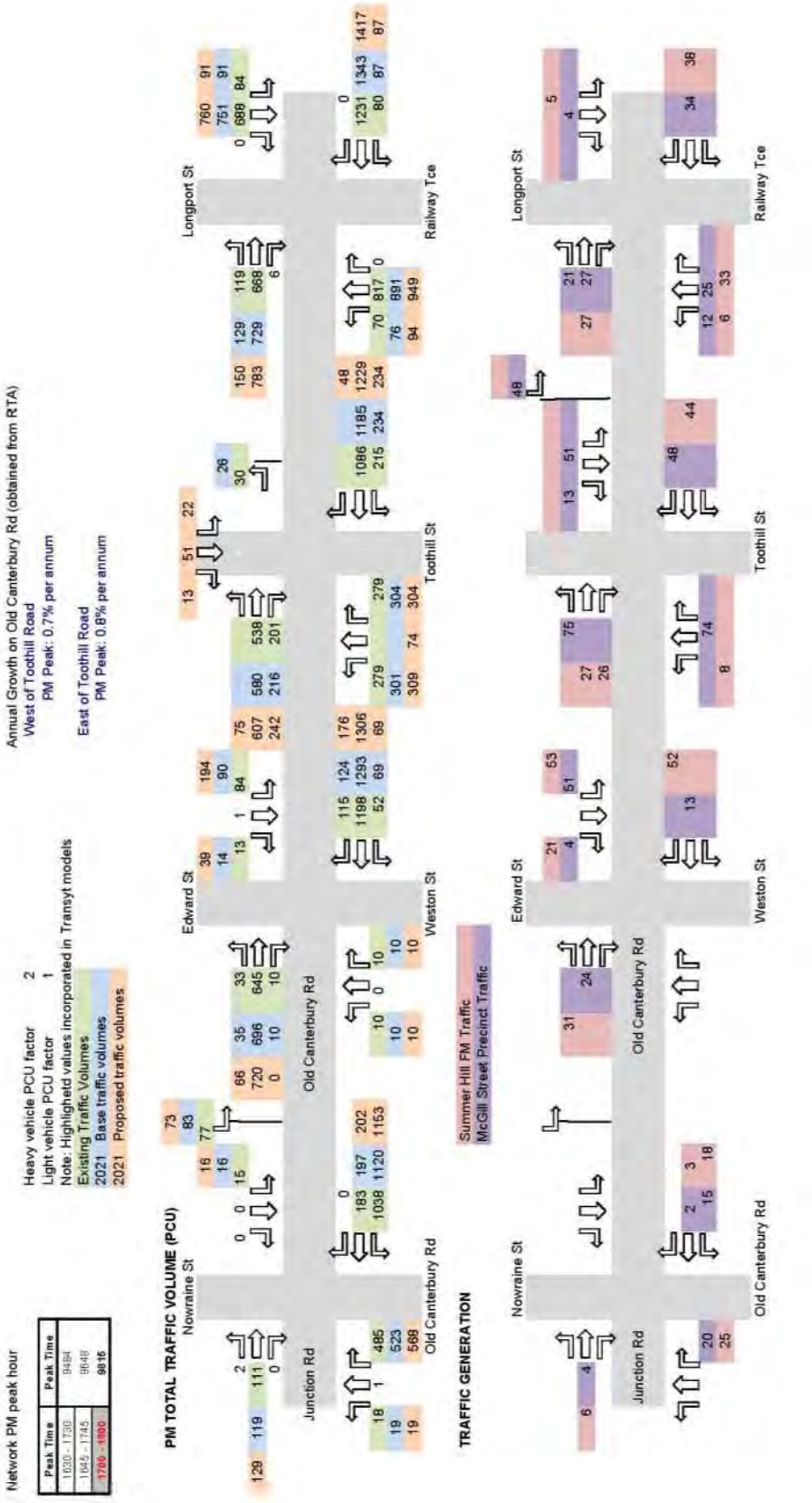
Appendix C

Traffic volumes used in model

C1 AM traffic volumes



C2 PM traffic volumes

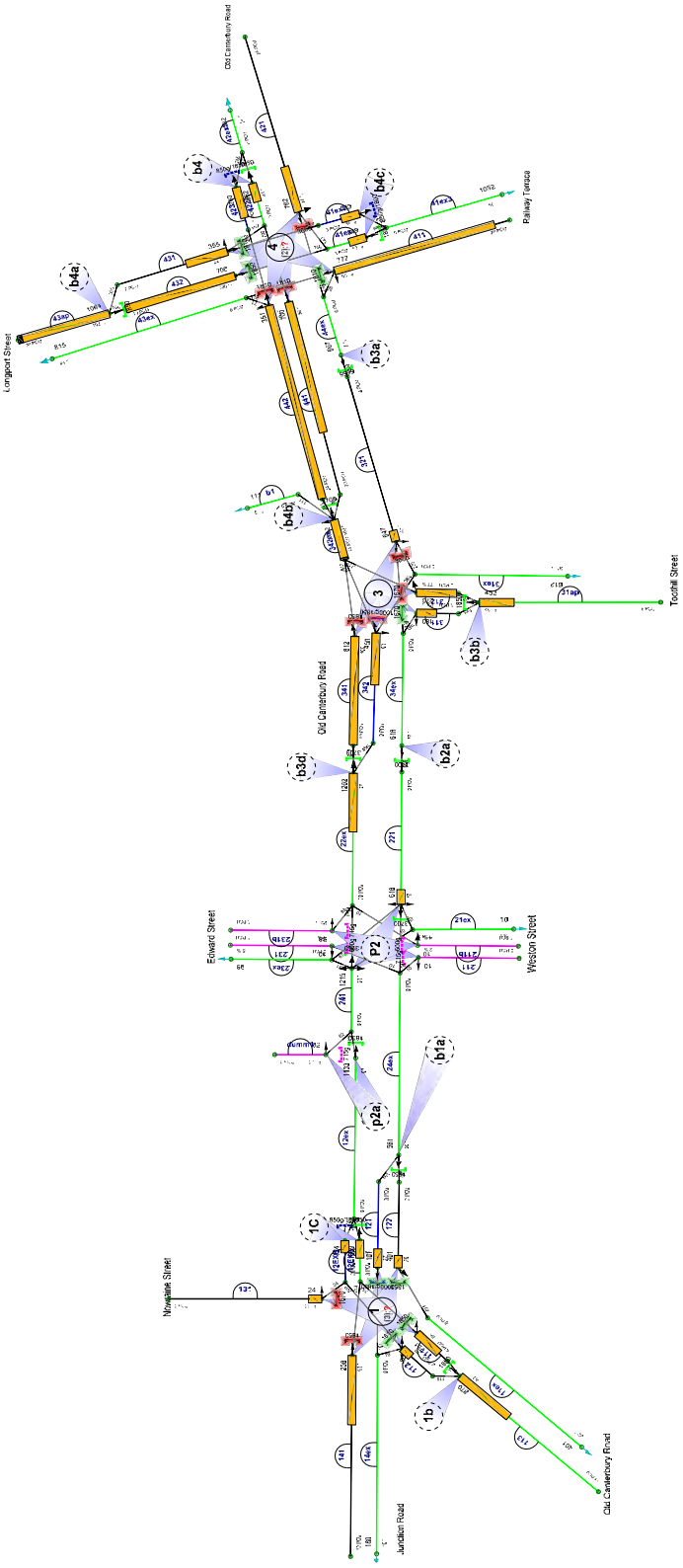


Appendix D

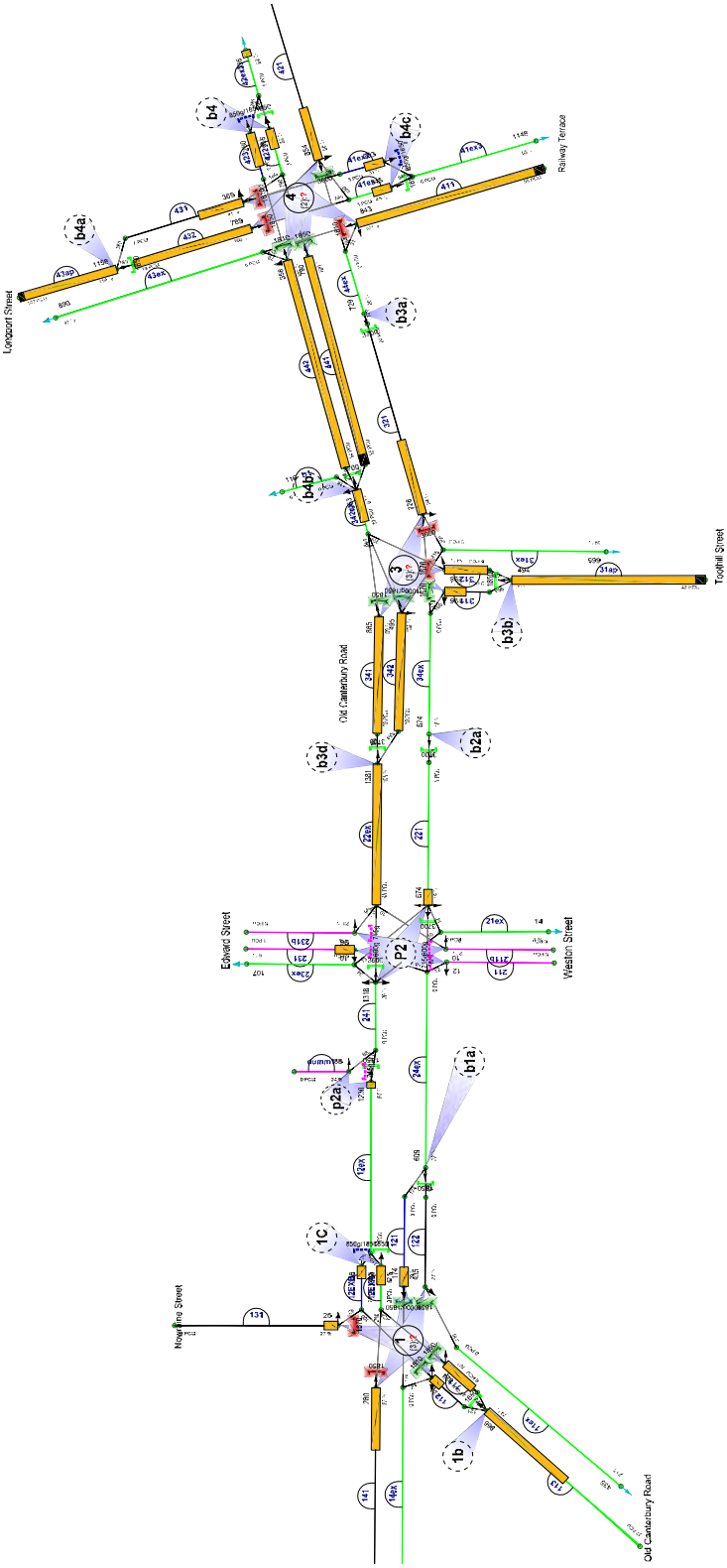
Transyt model queue length outputs

D1 AM peak

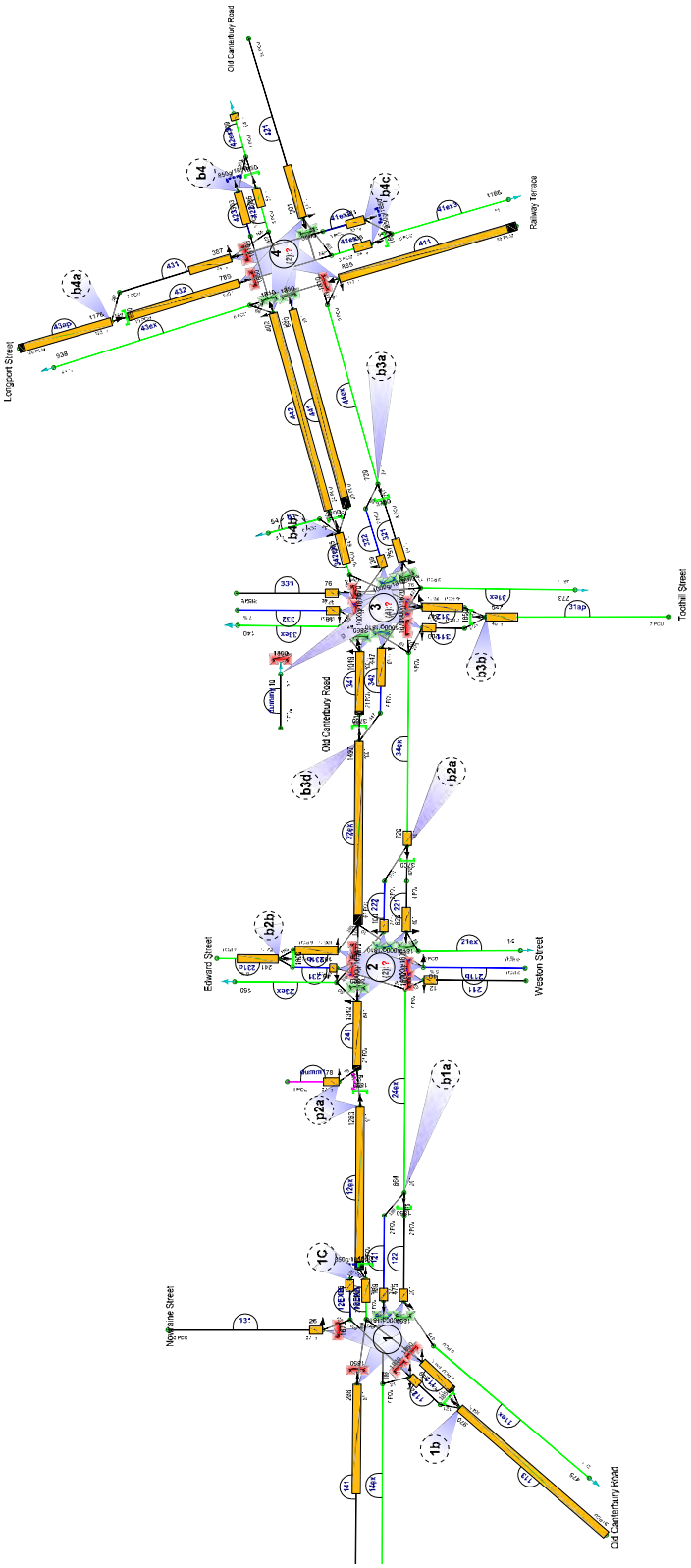
D1.1 Existing



D1.2 2021 No Development

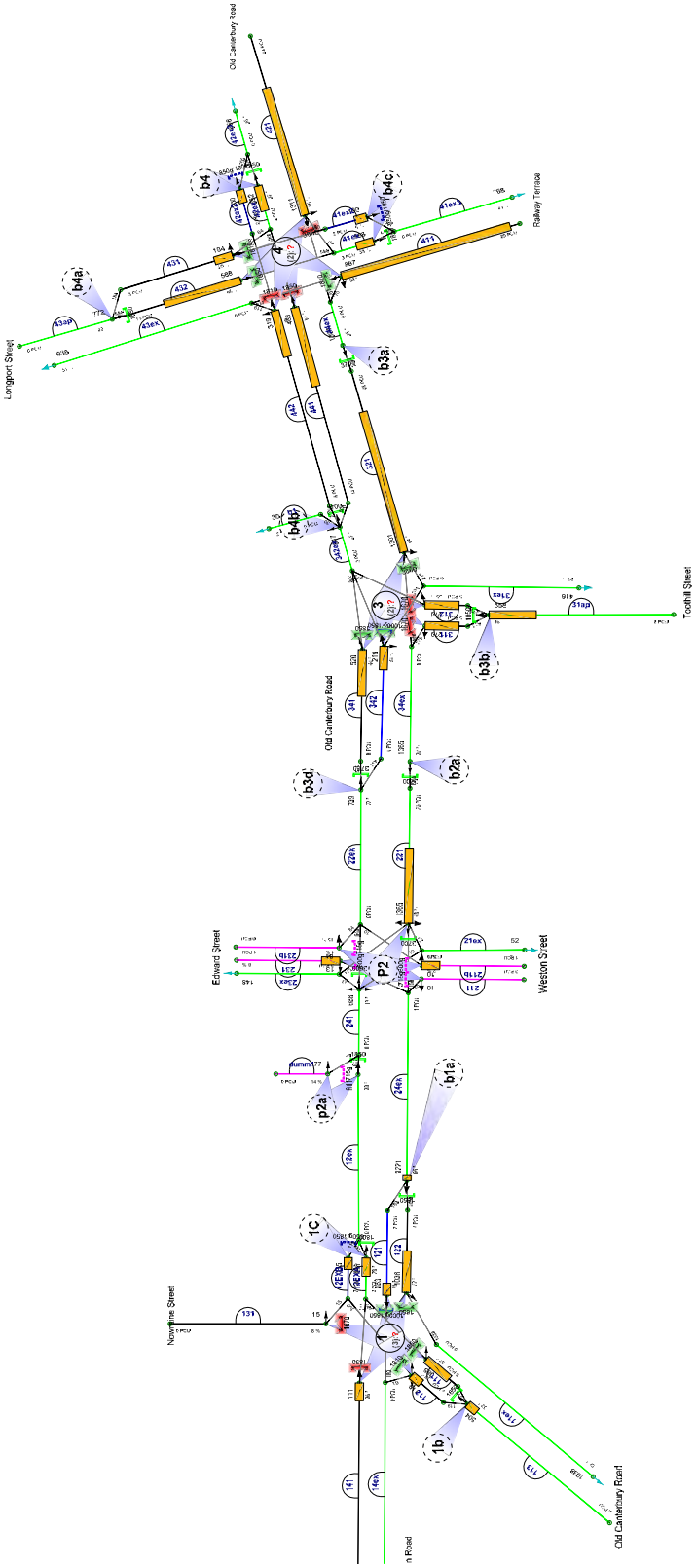


D1.3 2021 With Development



D2 PM peak

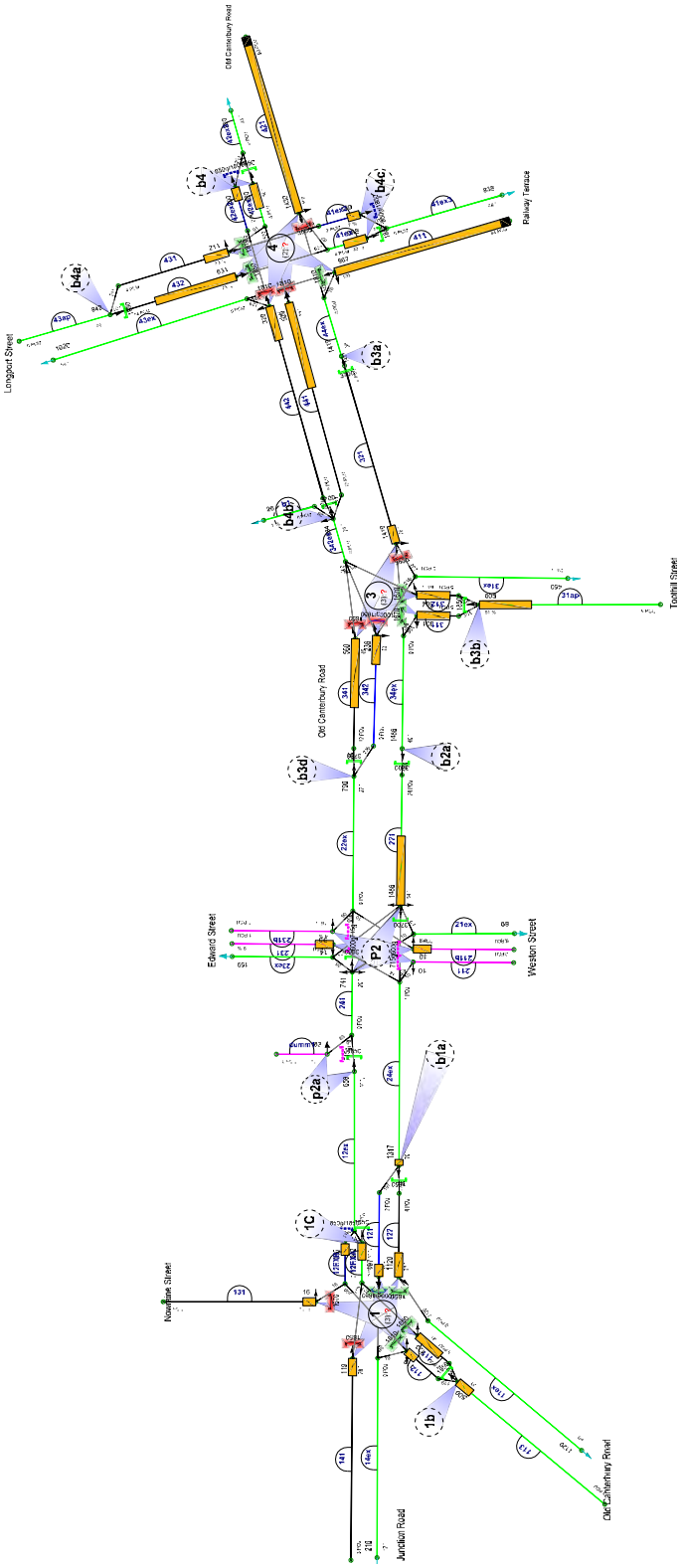
D2.1 Existing



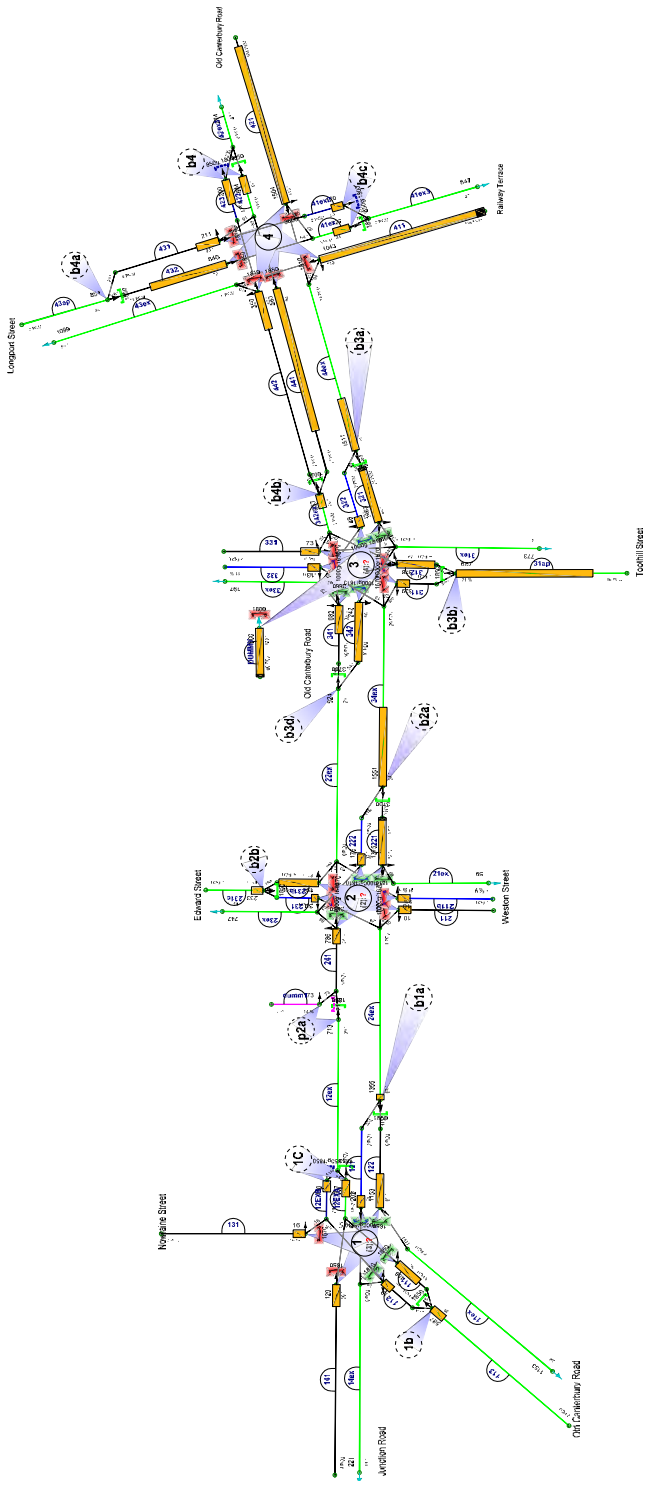
MMQ Queues Enabled
Node Traffic Cones Enabled
Stopline Signals States Enabled

Summer Hills Transyt Model
Cycletime 0s / 120s , Timesteps 0 / 120
Diagram produced using TRANSYT 13 Network Construction Editor

D2.2 2021 No Development



D2.3 2021 With Development



Appendix E

Independent audit report of Transyt model