



TRAFFIC IMPACT ASSESSMENT (TIA)

**Proposed Mixed-Use Development
93 -145 Hoxton Park Road, Liverpool**

Reference: 22.076r01v03
Date: June 2022

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DOCUMENT VERIFICATION

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Project	93-145 Hoxton Park Road, Liverpool			
Client	ABA Estate Pty Ltd			
Revision	Date	Prepared By	Checked By	Signed
v03	10/06/22	Shenara Wanigasekera	Thomas Yang	

CONTENTS

1. Introduction	1
2. Location and Site	3
3. Existing Traffic Conditions	6
3.1 Road Network	6
3.2 Key Intersections	8
3.3 Public Transport	10
4. Description of Proposed Development	12
5. Parking Requirements	13
5.1 Car Parking	13
5.2 Accessible Parking	14
5.3 Bicycle Parking	14
5.4 Refuse Collection and Servicing	14
6. Traffic and Transport Impacts	15
6.1 Development Trip Generation	15
6.2 Traffic Distribution	16
6.3 Peak Period Intersection Performance	17
6.4 Sustainable Transport	19
7. Access and Internal Design Aspects	21
7.1 Site Vehicular Access	21
7.2 Internal Design	21
8. Conclusions	22

Appendices

- Appendix A: Reduced Plans
- Appendix B: SIDRA Outputs
- Appendix C: Green Travel Plan

1. INTRODUCTION

TRAFFIX has been commissioned by Tony Owen Partners to undertake a Planning Proposal (PP) relating to a mixed-use development at 93 - 145 Hoxton Park Road, Liverpool. For the purposes of the Planning proposal, an indicative development concept has been formulated, comprising of 312 residential apartments and a ground floor retail component with a total area 559m². The development is located within the Liverpool City Council Local Government Area (LGA) and has been assessed under that Council's controls.

This report documents the findings of our investigations and should be read in the context of the Planning Proposal Report prepared separately. The development contains more than 300 dwellings and therefore requires referral to TfNSW under the provisions of SEPP (Transport and Infrastructure) 2021.

In this regard, a pre-submission meeting was held with TfNSW on 16 March 2022 to provide TfNSW the opportunity to provide preliminary feedback, noting the following:

- A total of three (3) vehicular access options was presented to TfNSW as follows:
 - Option 1 comprised of two separate vehicular access driveways off Dale Avenue;
 - Option 2 comprised of one vehicular access driveway off Dale Avenue and another off Memorial Avenue; and
 - Option 3 comprised of one vehicular access driveway off Dale Avenue and another at the existing Hoxton Park Road / Webster Road signalised intersection by creating a fourth leg at the intersection.
- TfNSW raised concerns regarding any proposed vehicular access driveways at the existing signalised intersection of Hoxton Park Road / Webster Road, as well as Memorial Avenue given its close proximity (within 30 metres) to Hoxton Park Road.
- It was agreed with TfNSW that the best access strategy for the site would be via Dale Avenue (a local road), away from Hoxton Park Road, in accordance with Clause 101 of SEPP (Transport and Infrastructure) 2021.
- It was also agreed with TfNSW that Option 1 would not warrant any further assessment involving signal warrants nor accident history review, and driveways to Dale Avenue would not need to be restricted to left-in / left-out vehicle movements only.

Accordingly, the report is structured as follows:

- Section 2: Describes the site and its location
- Section 3: Documents existing traffic conditions
- Section 4: Describes the proposed development
- Section 5: Assesses the parking requirements
- Section 6: Assesses traffic impacts
- Section 7: Discusses access and internal design aspects
- Section 8: Presents the overall study conclusions

2. LOCATION AND SITE

The subject site is known as 93-145 Hoxton Park Road (Lot 53 to Lot 80 of DP1154816), 260 Memorial Avenue (Lot 2 of DP1050030), 20 Dale Avenue (Lot 126 of DP25952) and 48 Dale Avenue (Lot 140 of DP25952). It is located on the northern side of Hoxton Park Road, east of Memorial Avenue. In a regional context it is located approximately two (2) kilometres southwest of Liverpool Town Centre and approximately 2.3 kilometres southwest of Liverpool Railway Station.

The site is an irregular-shaped configuration and has a total site area of approximately 14,945.35m². It has a southern frontage to Hoxton Park Road measuring 460-metres and a western frontage to Memorial Avenue measuring 33 metres. It is bound to the east, and north by neighbouring residential dwelling houses.

The existing site on 93-145 Hoxton Park Road is currently vacant with 260 Memorial Avenue, 20 Dale Avenue, and 48 Dale Avenue each accommodates single-occupancy dwellings. Multiple vehicular accesses are currently provided at the subject site, comprising one (1) access on Hoxton Park Road at the south-eastern corner of the site, one (1) access on Memorial Avenue at the western side of the site, one (1) driveway access for 20 Dale Avenue and one (1) for 48 Dale Avenue, accommodating a total of four (4) existing driveway accesses.

A Location Plan is presented in **Figure 1** and a Site Plan is presented in **Figure 2** which provides an appreciation of the site in the context of neighbouring properties and surrounding streets.

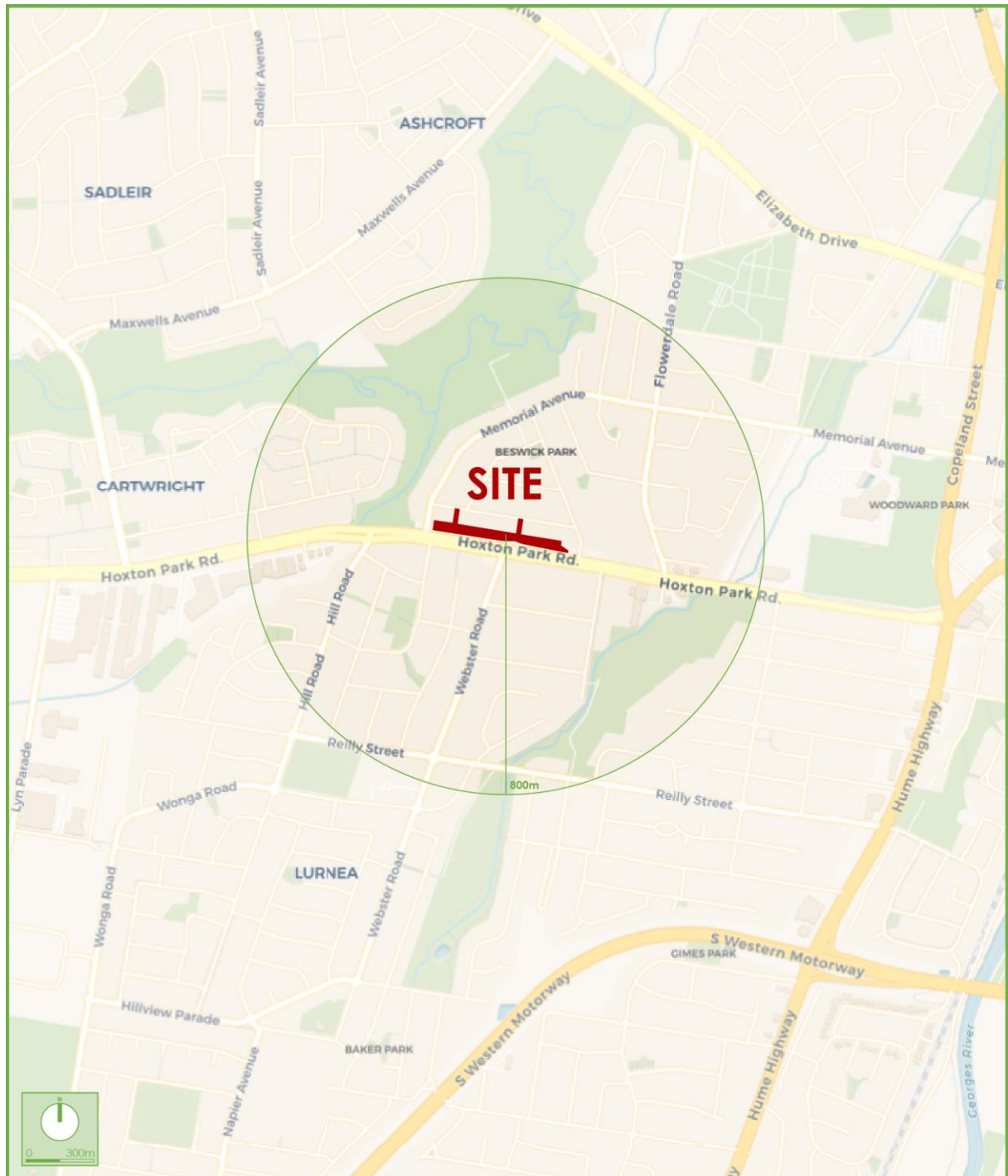


Figure 1: Location Plan



Figure 2: Site Plan

3. EXISTING TRAFFIC CONDITIONS

3.1 Road Network

The road hierarchy in the vicinity of the site is shown in **Figure 3** with the following roads of particular interest:

- **Hoxton Park Road:** a TfNSW Main Road (MR681) that generally runs in an east-west direction between Hume Highway in the east and Cowpasture Road in the west. In the vicinity of the site, Hoxton Park Road has a posted speed limit of 70km/hr and consists of two (2) traffic lanes in both directions separated by a bi-directional T-Way running along the centre of the road. Kerbside parking is not permitted on either side of Hoxton Park Road.
- **Memorial Avenue:** In the vicinity of the site Memorial Avenue is a local road that generally traverses in an east-west direction between Macquarie Street in the east and Hoxton Park Road in the west. Memorial Avenue is subject to a 50km/h speed limit. It allows for a single lane of traffic in either direction within an undivided carriageway. Unrestricted kerbside parking is permitted along both sides of Memorial Avenue.
- **Maryvale Avenue:** a local road that generally traverses in a north-south direction between Memorial Avenue in the north and Hoxton Park Road in the south. In the vicinity of the site, Maryvale Avenue is subject to a 50km/h speed limit. It allows for a single lane of traffic in either direction within an undivided carriageway. Unrestricted kerbside parking is permitted along both sides of Memorial Avenue.
- **Dale Avenue:** a local road that generally traverses in an east-west direction between Maryvale Avenue in the east and Memorial Avenue in the west. In the vicinity of the site, Dale Avenue is subject to a 50km/h speed limit. It allows for a single lane of traffic in either

direction within an undivided carriageway. Unrestricted kerbside parking is permitted along both sides of Memorial Avenue.

It can be seen from **Figure 3** that the site is conveniently located with respect to local and collector roads serving the region, with connectivity to the east and west using Hoxton Park Road.

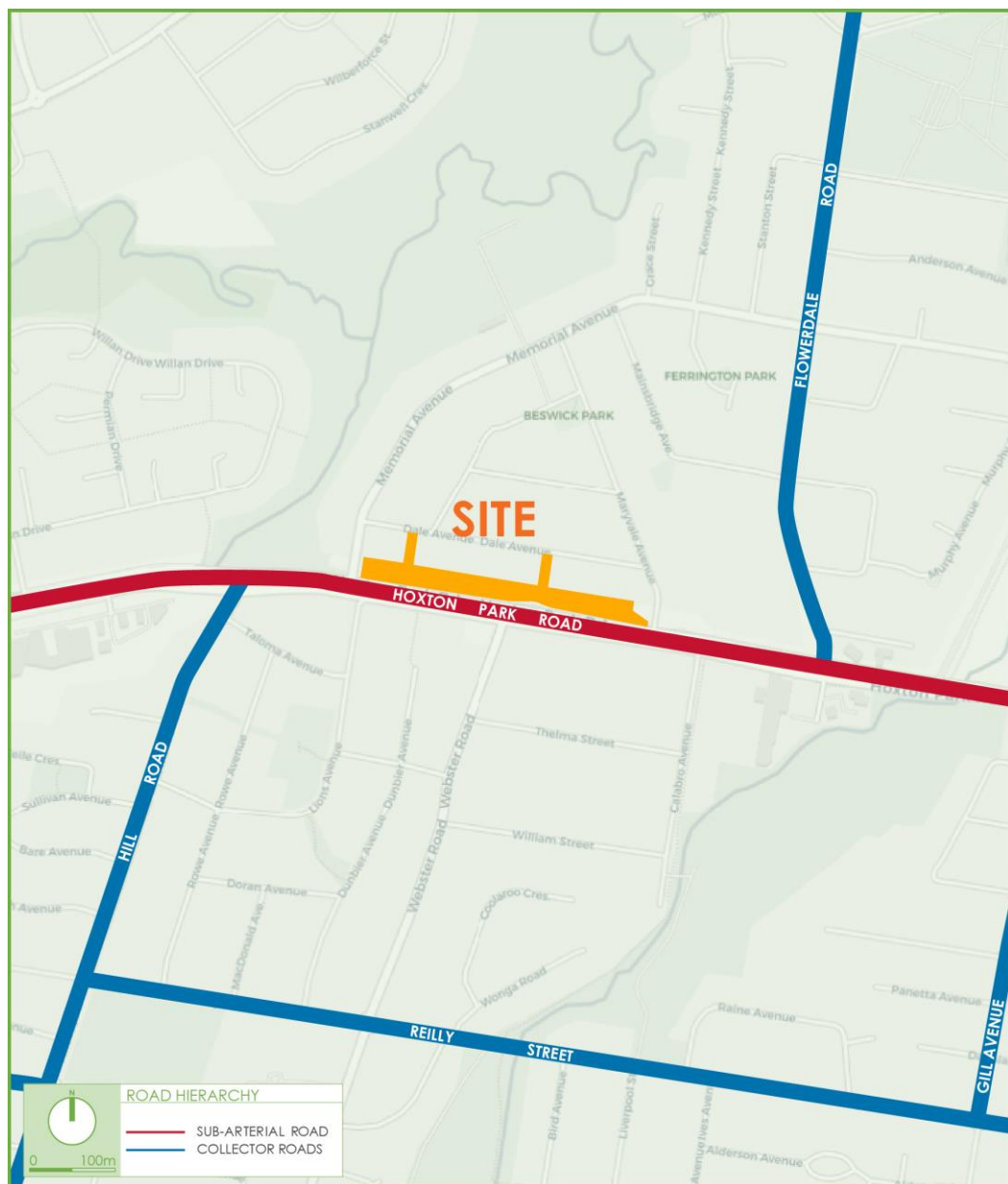


Figure 3: Road Hierarchy

3.2 Key Intersections

The key intersections in the vicinity of the site are shown below and provide an understanding of the existing road geometry and alignment in the locality.

3.2.1 Hoxton Park Road and Memorial Avenue



Figure 4: Intersection of Hoxton Park Road and Memorial Avenue

It can be seen from **Figure 4** that the intersection of Hoxton Park Road and Memorial Avenue is a three-legged signalised intersection. The northern and western legs provide signalised pedestrian crossings. The main attributes of each approach are outlined below.

➤ Hoxton Park Road (eastern and western leg):

- The east bound approach provides two (2) through lanes. The kerbside lane does not allow for left turn movements between 6:00am-10:00am Monday to Friday with buses and taxis excepted. Additionally, a separated T-way approach lane is provided on this leg.

- The west bound approach provides two (2) through lanes with all right turns being banned. A separated T-way approach is provided on this leg.
- Memorial Avenue (northern leg):
 - The south bound approach provides one (1) left turn lane and one (1) short right turn lane which is restricted for use by buses only.

3.2.2 Hoxton Park Road and Maryvale Avenue



Figure 5: Intersection of Hoxton Park Road and Maryvale Avenue

- Hoxton Park Road (eastern and western leg):
 - The east bound approach provides two (2) through lanes. The kerbside lane allows for left turns. Additionally, a separated T-way approach lane is provided on this leg.
 - The west bound approach provides two (2) through lanes with a median preventing any right turns at this intersection. A separated T-way approach is provided on this leg.
- Maryvale Avenue (northern leg):
 - The south bound approach provides a single lane which permits left turns only.

3.3 Public Transport

Standard transport planning guidelines state that a development is advantageously located to benefit bus services if it is within 400 metres walking distance of a bus stop. As shown in **Figure 6**, there are 13 bus stops within a 400-metre walk of the site. The nearby bus stops are serviced by the following bus services:

- 802 – Liverpool to Parramatta
- 803 – Liverpool to Miller (Loop Service)
- 853 – Carnes Hill to Liverpool
- 854 – Carnes Hill to Liverpool
- 869 – Ingleburn to Liverpool

These services provide regular connections to Liverpool CBD and Liverpool Railway Station, Parramatta CBD and Fairfield Railway Station.

More information concerning all bus service information can be found on the Transport for NSW Info website: <https://www.transportnsw.info>.

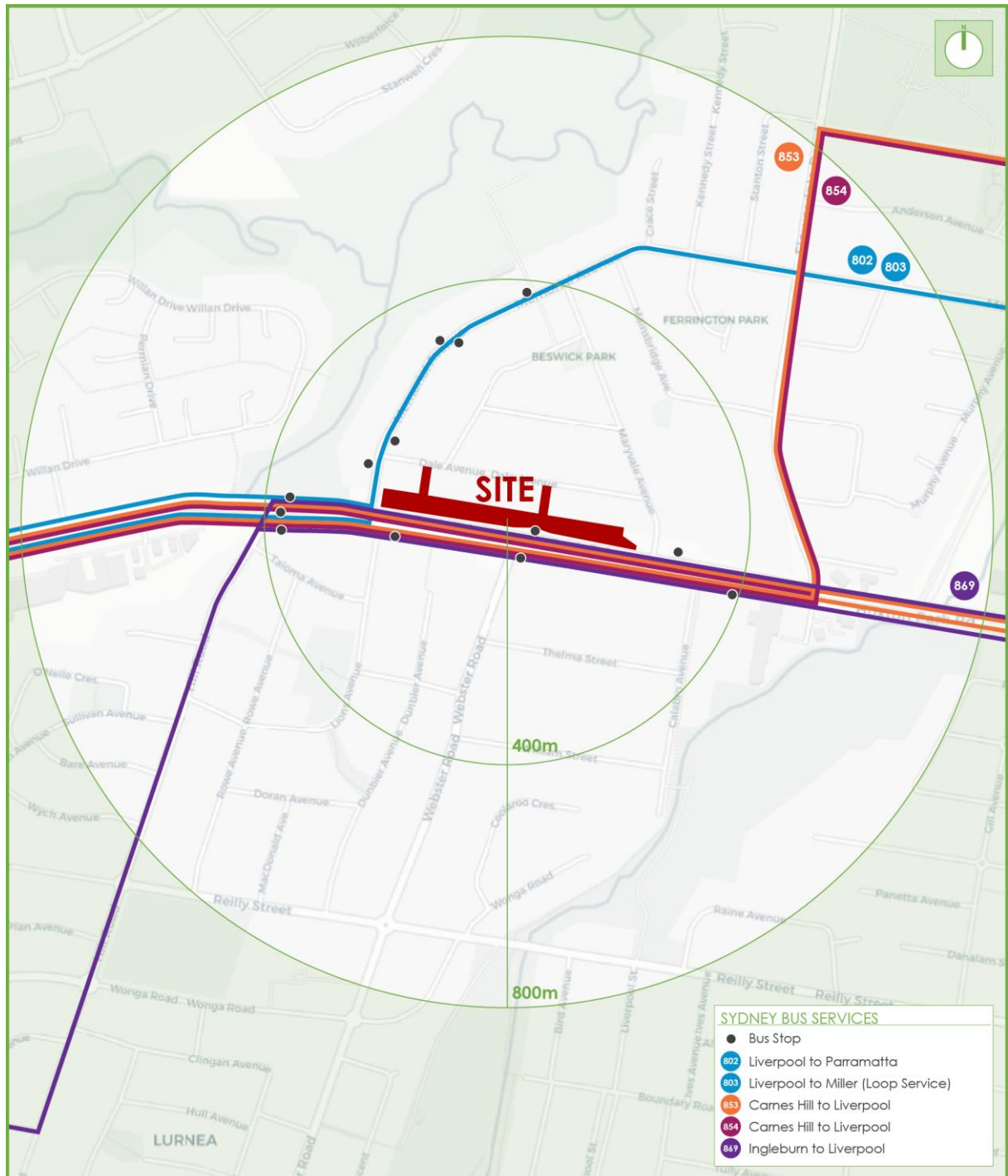


Figure 6: Public Transport

4. DESCRIPTION OF PROPOSED DEVELOPMENT

A detailed description of the concept development is provided in the Planning Proposal Report prepared separately. In summary, the concept development for which approval is now sought is a 6-storey mixed use development comprising of the following components:

- 312 residential apartments made up of the following:
 - 76 x one-bedroom apartments
 - 187 x two-bedroom apartments; and
 - 49 x three-bedroom apartments;
- A ground floor retail component with a total of 559m²; and
- A typical basement level providing parking for approximately 450 vehicles.

The parking and traffic impacts arising from the development are discussed in **Section 5** and **Section 6**. Reference should be made to the plans submitted separately to Council which are presented at reduced scale in **Appendix B**.

5. PARKING REQUIREMENTS

5.1 Car Parking

The Liverpool Development Control Plan 2008 (DCP) provides the minimum parking requirements for residential developments. These requirements are summarised below within

Table 1:

Table 1: Minimum Council Parking Rates and Provision

Type	LFA/Units	Minimum Parking Rate	Minimum Requirement*
Residential Flat Building			
1 Bed	76	1 space per 1-bedroom dwelling	454.5
2 Bed	187	1.5 spaces per 2-bedroom dwelling	
3+ Bed	49	2 spaces per 3+ bedroom dwelling	
Visitors	312	1 space per 4 dwellings	78.0
Sub-Total			533
Retail			
Retail	559m ²	1 space per 20m ² LFA	28.0
Sub-Total			28
Totals			561

It is evident from **Table 1** that the concept development requires a minimum of 561 spaces under Council's DCP comprised of 455 residential parking spaces, 78 visitor parking spaces and 28 retail parking spaces.

The total provision of parking on-site and design of parking spaces in accordance with AS 2890.1 (2004) will be assessed at DA stage.

5.2 Accessible Parking

Council's DCP specifies that accessible parking spaces are provided at the following rates:

- 1 accessible space per 100 spaces for retail uses
- 2 accessible spaces per 100 spaces for accommodation uses

The provision and compliance of accessible parking with regards to AS 2890.6 (2009) will be assessed at DA stage.

5.3 Bicycle Parking

Council's DCP specifies the following rates for bicycle parking:

- Residential Flat Buildings
 - Residents: 1 space per 2 units or 1 for every 4 bedrooms (whichever is greater)
 - Visitors: 1 per 10 units
- Retail Premises (> 500m² GFA)
 - Employee: 1 space per 10 staff or 1 per 200m² GFA (whichever is greater)
 - Customer: 2 plus 1 per 100m² GFA

The provision and design of bicycle parking will be assessed at DA Stage.

5.4 Refuse Collection and Servicing

Preliminary waste collection arrangements involve collection occurring within the basement and occurring entirely within the site. Service and waste collection arrangements are to be confirmed at DA Stage and all loading areas are to be designed in accordance with AS 2890.2 (2018).

6. TRAFFIC AND TRANSPORT IMPACTS

6.1 Development Trip Generation

The impacts of the proposed development on the external road network have been assessed having regard for the indicative yield scenarios as summarised in **Section 4** above. This assessment has been undertaken in accordance with the requirements of the *TfNSW Guide to Traffic Generating Developments (2002)* and most recently the *TfNSW Technical Direction (TDT 2013/04a)*.

6.1.1 Residential

The *TfNSW Technical Direction (TDT 2013/04a)* provides revised trip generation advice for a number of land uses based on survey data obtained since 2009. One of the land uses covered by TDT 2013/04a is high density residential development. The average Sydney weekday trip rates provided by TDT 2013/04a have been adopted for assessing the traffic generating potential of the subject development. The relevant trip rates are as follows:

- 0.19 vehicle trips per unit during the morning peak hour; and
- 0.15 vehicle trips per unit during the evening peak hour.

Application of these trip rates to the 312 residential units proposed, and adopting an 80:20 split, results in the following predicted trip generation volumes:

- 59 vehicle trips per hour during the morning peak period; (12 in, 47 out); and
- 47 vehicle trips per hour during the evening peak period; (37 in, 10 out)

6.1.2 Retail

The GTGD and TDT 2013/04a do not provide traffic generation rates in relation to small or local neighbourhood shop developments. Therefore, it is considered more appropriate in this circumstance to apply the commercial traffic generation rate derived from the TDT 2013/04a which is summarised as follows:

- 1.6 per 100m² GFA during the morning peak hour; and
- 1.2 per 100m² GFA during the evening peak hour.

Application of the above rates to the 559m² of retail floor area results in the following trip generation volumes:

- 9 vehicle trips per hour during the morning peak period; (7 in, 2 out); and
- 7 vehicle trips per hour during the evening peak period; (1 in, 6 out)

6.1.3 Combined Generation

The combined generation of the residential and retail components can be summarised as follows:

- 68 vehicle trips per hour during the morning peak period; (19 in, 49 out); and
- 54 vehicle trips per hour during the evening peak period; (38 in, 16 out)

6.2 Traffic Distribution

An analysis of the left/right turn restrictions at the two (2) key intersections as detailed within Section 3.2 has been used to determine the future distribution of traffic to and from the proposed development. In this regard the localised distribution of traffic at the two (2) key intersections in the vicinity of the site is summarised in **Figure 7** below.

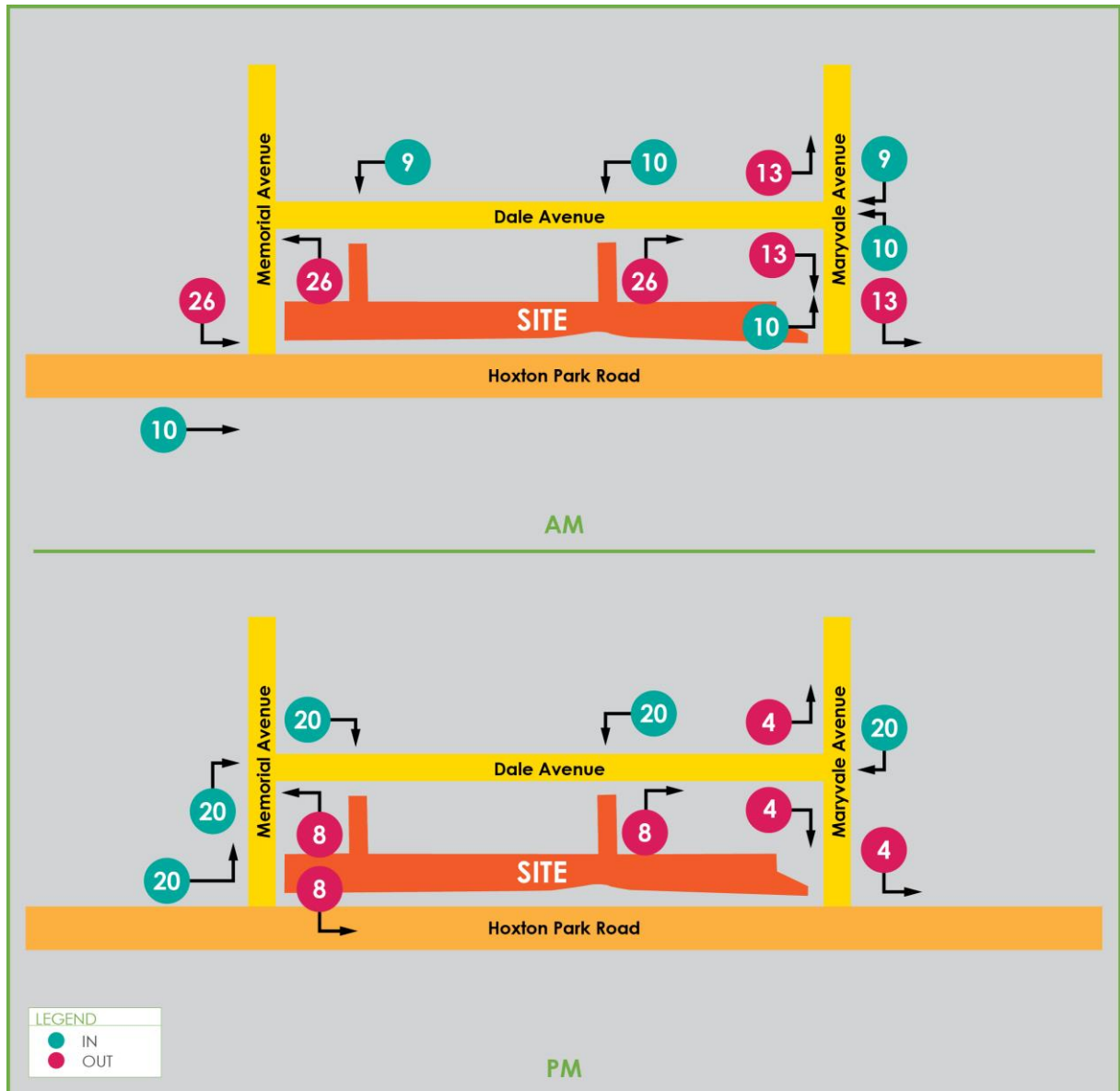


Figure 7: Traffic Distribution

6.3 Peak Period Intersection Performance

Traffic surveys were undertaken at the key intersections described in Section 3.2, which are considered to be most critical in relation to the site. These counts were undertaken on 6 April 2022 during the network peak periods between 7:00am and 9:00am (morning peak period) and 4:00pm and 6:00pm (evening peak period).

This data forms the base case volumes for software modelling undertaken to assess intersection performance characteristics under existing traffic conditions. The SIDRA Intersection 9 model produces a range of outputs, the most useful of which are the Degree of Saturation (DoS) and Average Vehicle Delay per vehicle (AVD). The AVD is in turn related to a level of service (LoS) criteria. These performance measures can be interpreted using the following explanations:

DoS - the DoS is a measure of the operational performance of individual intersections. As both queue length and delay increase rapidly as DoS approaches 1, it is usual to attempt to keep DoS to less than 0.9. When DoS exceeds 0.9 residual queues can be anticipated, as occurs at many major intersections throughout the metropolitan area during peak periods. In this regard, a practical limit at 1.1 can be assumed. For intersections controlled by roundabout or give way/stop control, satisfactory intersection operation is generally indicated by a DoS of 0.8 or less.

AVD - the AVD for individual intersections provides a measure of the operational performance of an intersection. In general, levels of acceptability of AVD for individual intersections depend on the time of day (motorists generally accept higher delays during peak commuter periods) and the road system being modelled (motorists are more likely to accept longer delays on side streets than on the main road system).

LoS - this is a comparative measure which provides an indication of the operating performance of an intersection.

A summary of the modelled results is provided below in **Table 2**. Reference should also be made to the SIDRA outputs provided in **Appendix C** which provide detailed results for individual lanes and approaches.

Table 2: Existing and Proposed Intersection Performance

Intersection	Control	Period	Scenario	Degree of Saturation (DoS)	Average Delay	Level of Service
Hoxton Park Road and Memorial Avenue	Signal	AM	Existing	0.519	6.4	A
			Existing + Development	0.523	6.5	A
		PM	Existing	0.450	6.6	A
			Existing + Development	0.450	6.6	A
Hoxton Park Road and Maryvale Avenue	Priority*	AM	Existing	0.450	7.1	A
			Existing + Development	0.453	7.2	A
		PM	Existing	0.380	7.2	A
			Existing + Development	0.380	7.2	A

* LoS for priority intersections based on the worst performing movement in accordance with TfNSW Guide to Traffic Generating Development.

It can be seen from Table 2 that the intersection of the Hoxton Park Road and Memorial Avenue operates at a LoS 'A' in the existing and development scenarios for the morning and evening peak hours. The intersection experiences an increase in the degree of saturation, the average delay only increases by 0.1 second and the intersection continues to operate with substantial spare capacity.

With regards to the intersection of Hoxton Park Road and Maryvale Avenue, this intersection also operates at a LoS 'A' in both the existing and development scenarios for the morning and evening peak hours. The largest change in average delay for the intersection is 0.1 seconds and it operates with substantial spare capacity in all scenarios.

Therefore, the additional traffic generation of the proposed development is expected to have minimal impacts on the surrounding road network, and as such, there are no road improvements or intersection upgrades required.

6.4 Sustainable Transport

Liverpool City Council places a high emphasis on the strategic importance of increasing sustainable transport and requested a Green Travel Plan (GTP) to accompany the application.

The encouragement of non-car based travel will assist in reducing private vehicle trips, thus decreasing congestion, time, money and environmental impacts. Due to this, the aim of the proposed development is to encourage and support the existing and future sustainable transport services available within the vicinity of the site.

Accordingly, a GTP accompanied by a Transport Access Guide (TAG) have been prepared for the planning proposal and is attached in **Appendix C**.

The GTP provides a site-specific set of measures and initiatives to promote sustainable transport options such as walking, cycling, car sharing and public transport. It will assist in encouraging future occupants of the building to use these options to replace all or part of their car-based journeys. The implementation of the GTP is expected to create a number of social, economic, environmental and health benefits. Specifically, the GTP will address the following:

- Documents existing transport conditions and mode choice.
- Discusses emerging trends that will impact on future transport mode choice.
- Identifies GTP objectives and sets travel mode targets.
- Set out actions that will help achieve the envisaged travel mode targets.
- Sets out a monitoring and review process.

7. ACCESS AND INTERNAL DESIGN ASPECTS

7.1 Site Vehicular Access

The proposed development will be accessed via two (2) access driveways via Dale Avenue. The intersections and new road are to be provided in accordance with requirements of AS 2890.1 (2004) which will be assessed at DA stage.

It is noted that the basement carpark will be connected internally and can be accessed via either driveway.

7.2 Internal Design

The basement carpark and servicing areas will be assessed in accordance with the requirements of AS 2890.1 (2004), AS 2890.2 (2018) and AS 2890.6 (2009) at DA Stage.

8. CONCLUSIONS

In summary:

- The planning proposal seeks approval for a mixed-use development at 93-145 Hoxton Park Road Liverpool. For the purposes of this assessment a concept development has been adopted comprised of 312 residential apartments and a ground floor retail component with a total area of 559m² with a shared basement carpark.
- The subject site is well connected to the public transport network with reliable access to regular bus services. These ensure the site is ideally situated for a residential development as it provides a good opportunity to encourage future tenants / visitors to use sustainable transport modes.
- The proposed concept development requires a minimum of 561 parking spaces in accordance with Council's DCP. The total provision of parking on-site and the design of parking spaces will be assessed at DA stage in accordance with AS 2890.1 (2004).
- The traffic generation arising from the development has been assessed as a net change over existing condition. SIDRA modelling shows a LoS 'A' in all scenarios for the two (2) key intersections. As such, there are no road improvements or intersection upgrades required.
- Access for the development is proposed via two (2) accessed onto Dale Avenue. A detailed design of the access arrangements, basement carpark and loading areas will be conducted at DA stage.

This traffic impact assessment therefore demonstrates that the subject application is supportable on traffic planning grounds. TRAFFIX anticipates an ongoing involvement during the approval process. It is further noted that a detailed assessment will occur at development application stage, based on final development yields and associated plans.

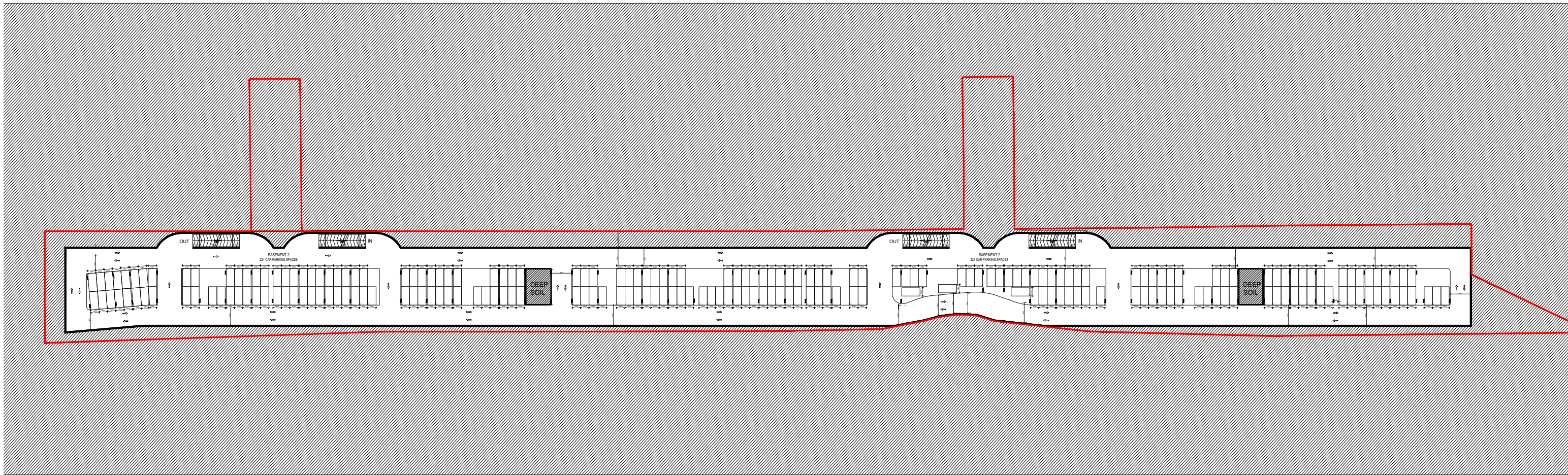
APPENDIX A

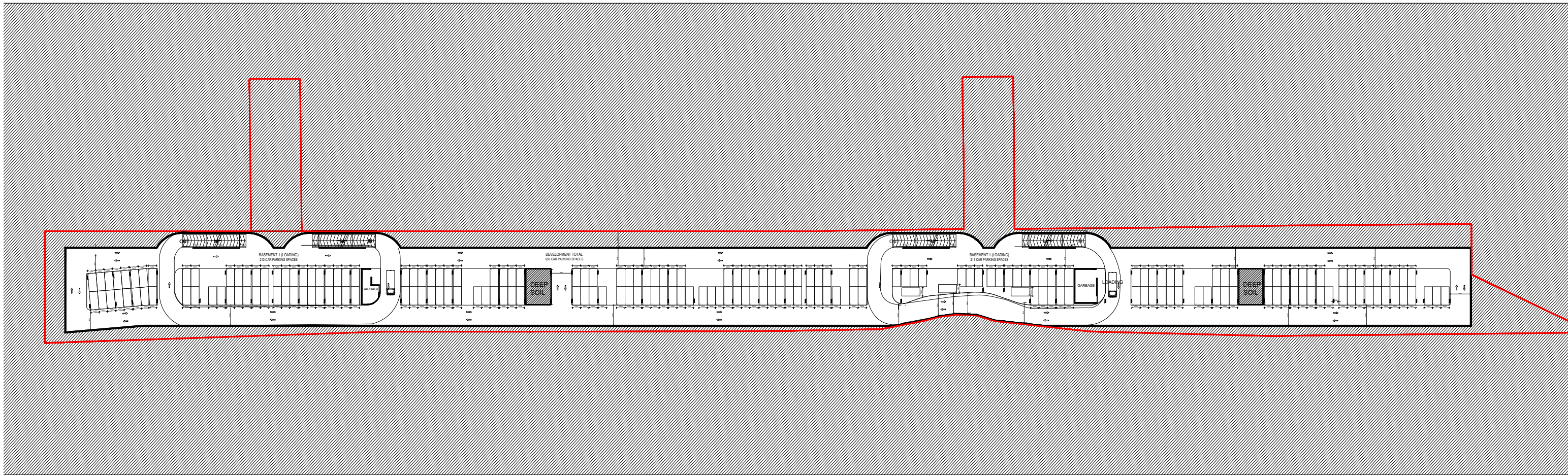
Reduced Plans





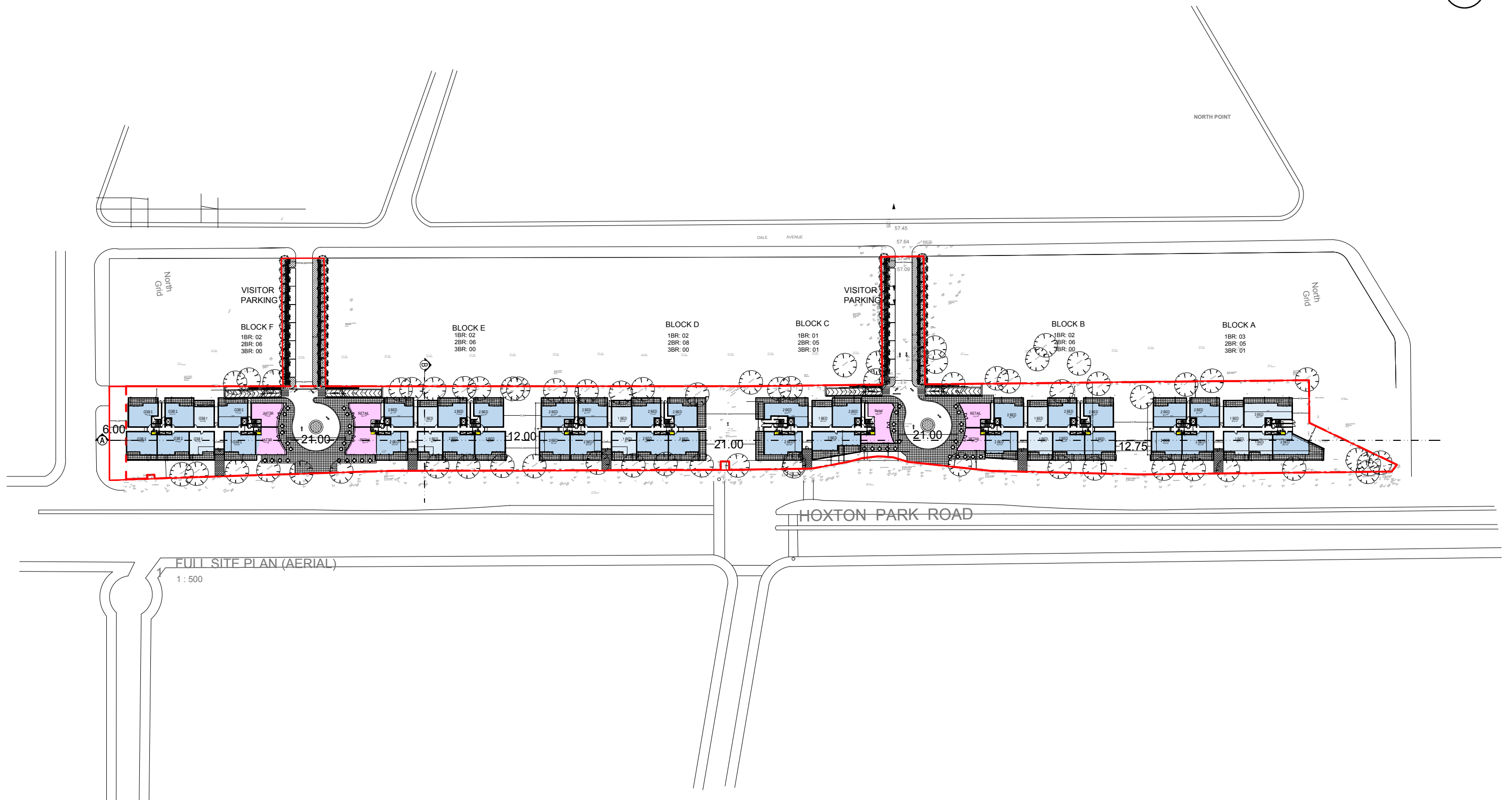
The architectural site plan depicts a long, narrow parking garage structure. The plan is symmetrical, divided into two main sections by a central vertical axis. Each section features a ramp system with 'OUT' and 'IN' directions, indicated by arrows. Storage areas are labeled 'STORAGE' and are located near the ramps. A central area is labeled 'DEEP SOIL'. The plan also shows various parking spaces, some of which are marked with 'P' and 'R'. The entire structure is enclosed within a red boundary line, which also highlights two rectangular areas above the main structure, possibly representing additional parking or storage areas. The plan is detailed with numerous lines and labels, providing a comprehensive view of the facility's layout.

Rev.		Description		By	Date	Disclaimer		Notes		Legend		DRAWING LABEL		Client		Architects		Project		Key plan		Scale 1:500 @ A1 1:1000 @ A3 Date MAR 2021				
A	FOR INFORMATION			MAR 2021	<p>THESE DRAWINGS ARE PRELIMINARY DRAWINGS AND ARE SUBJECT TO CHANGE WITHOUT NOTICE DURING THE COURSE OF THE PROPOSED DEVELOPMENT AND IN CONSULTATION WITH COOPER. SUBMISSION OF THE DRAWINGS DOES NOT CONSTITUTE A REPRESENTATION OR WARRANTY BY THE DRAWING OR ITS DESIGNER, MAKING OF CONTRACTS PRIOR TO THE DRAWING, THE FINAL NOR THAT THE PROPOSED DEVELOPMENT WILL TAKE PLACE IN ACCORDANCE WITH THESE DRAWINGS.</p> <p>BEFORE CARRYING OUT ANY WORK ENSURE THAT THE DRAWINGS USED CARRY THE LATEST AMENDMENT NO.</p>		<p>DRAWINGS MADE TO A LARGER SCALE AND THOSE SHOWING PARTICULAR DETAIL OF WORKS SHALL TAKE PRECEDENCE OVER DRAWINGS MADE TO A SMALLER SCALE AND FOR MORE GENERAL PURPOSES.</p> <p>WHERE ANY DISCREPANCY EXISTS BETWEEN FIGURED AND SCALED DIMENSIONS, THE FIGURED DIMENSIONS SHALL PREVAIL.</p> <p>BUILDER TO CHECK ALL SETT DIMENSIONS PRIOR TO FABRICATION OF ELEMENTS.</p>				BASEMENT LEVEL		<p>NATONWIDE BUILDERS Pty. Ltd.</p>		<p>tony owen ptnrs</p>		<p>ABA LIVERPOOL</p>		<p>Project address 83-145 Hoxton Park road & 20 Dale Avenue</p>		<p>Project no. Drawing no. A002</p>		<p>Drawing title Combined L 1-3 plan</p>		<p>Project no. Drawing no. A002</p>	
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Rev.	Description	By	Date	Disclaimer	Notes	Legend	DRAWING LABEL	Client	Archldts	Project	Key plan	Scale 1:500 @ A1 1:1000 @ A2	Date
A	FOR INFORMATION		MAR 2021	THESE DRAWINGS ARE PRELIMINARY DRAWINGS AND ARE SUBJECT TO CHANGE WITHOUT NOTICE DURING THE COURSE OF THE PROPOSED DEVELOPMENT AND IN CONNECTION WITH THE PROVISION OF SERVICES BY THE DEVELOPER OF ITS SERVICES, INSTEAD OF CONTRACTORS THAT THE DRAWINGS ARE FINAL, NOR THAT THE PROPOSED DEVELOPMENT WILL TAKE PLACE IN ACCORDANCE WITH THESE COMMENTS.	THESE DRAWINGS ARE TO A LARGER SCALE AND THOSE SHOWING PARTICULAR DETAIL OF WORKS SHALL TAKE PRECEDENCE OVER DRAWINGS MADE TO A SMALLER SCALE. PURPOSES WHERE AN DISCREPANCY EXISTS BETWEEN FIGURED AND SCALED DIMENSIONS, THE FIGURED DIMENSIONS SHALL PREVAIL.			NATONWIDE BUILDERS Pty. Ltd.		ABA LIVERPOOL			
B				BEFORE CARRYING OUT ANY WORK, ENSURE THAT THE DRAWINGS USED COVER THE LATEST AMENDMENT NO.	BUILDER TO CHECK ALL SITE DIMENSIONS PRIOR TO FABRICATION OF FINISHES					Project address 93-145 Weston Park road & 20 Dale Avenue	Project no. Drawing no.		
C											Drawn		
D											Drawing status		
E											FOR DESIGN DEVELOPMENT		

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APPENDIX B

SIDRA Outputs

USER REPORT FOR SITE

All Movement Classes

 **Project:** 22.076m01v04 TRAFFIX 93-145 Hoxton Park Road,
Liverpool

Template: Layouts

Site: 101 [101_EXAM_ Hoxton Park Rd and Memorial Ave (Site Folder: General)]

Hoxton Park Road & Memorial Avenue

Existing AM

7:45am-8:45am

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Phase Sequence: TCS

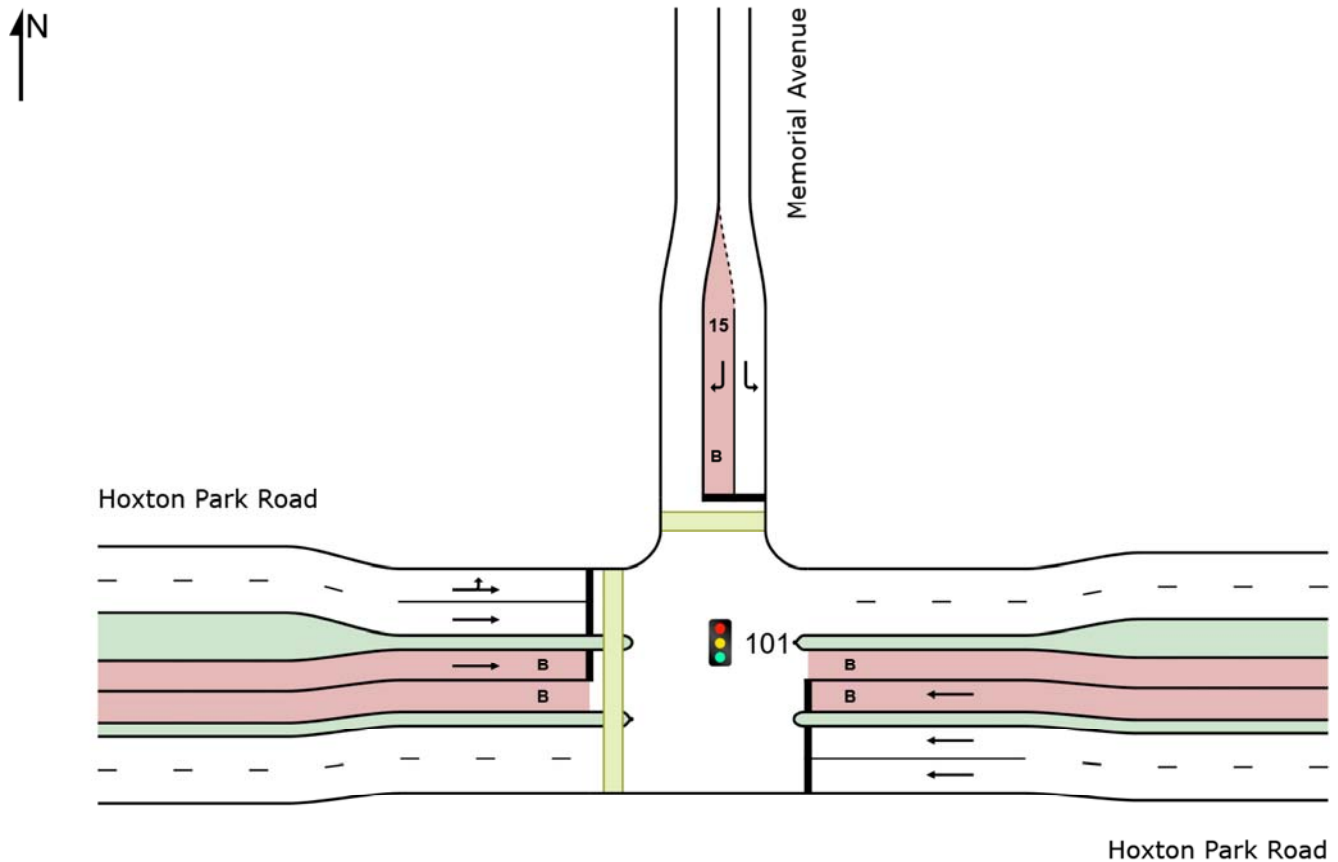
Reference Phase: Phase A

Input Phase Sequence: A, C

Output Phase Sequence: A, C

Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



USER REPORT FOR SITE

All Movement Classes

 **Project:** 22.076m01v04 TRAFFIX 93-145 Hoxton Park Road, **Template:** Movement Summaries
Liverpool

Site: 101 [101_EXAM_ Hoxton Park Rd and Memorial Ave (Site Folder: General)]

Hoxton Park Road & Memorial Avenue

Existing AM

7:45am-8:45am

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site Optimum Cycle Time - Minimum Delay)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Phase Sequence: TCS

Reference Phase: Phase A

Input Phase Sequence: A, C

Output Phase Sequence: A, C

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
East: Hoxton Park Road														
5	T1	926	82	975	8.9	0.338	5.5	LOS A	10.2	76.8	0.34	0.31	0.34	53.8
Approach		926	82	975	8.9	0.338	5.5	LOS A	10.2	76.8	0.34	0.31	0.34	53.8
North: Memorial Avenue														
7	L2	47	1	49	2.1	* 0.102	8.1	LOS A	0.8	5.6	0.28	0.61	0.28	44.3
9	R2	3	3	3	100.0	0.023	63.7	LOS E	0.2	2.5	0.90	0.64	0.90	20.7
Approach		50	4	53	8.0	0.102	11.5	LOS A	0.8	5.6	0.32	0.61	0.32	41.7
West: Hoxton Park Road														
10	L2	17	4	18	23.5	* 0.519	13.2	LOS A	19.6	144.6	0.42	0.40	0.42	44.9
11	T1	1417	94	1492	6.6	0.519	6.8	LOS A	19.6	144.6	0.42	0.40	0.42	51.0
Approach		1434	98	1509	6.8	0.519	6.8	LOS A	19.6	144.6	0.42	0.40	0.42	50.8
All Vehicles		2410	184	2537	7.6	0.519	6.4	LOS A	19.6	144.6	0.39	0.37	0.39	51.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Site: 102 [102_EXPM_ Hoxton Park Rd and Memorial Ave (Site Folder: General)]

Hoxton Park Road & Memorial Avenue

Existing PM

4:30pm-5:30pm

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site Optimum Cycle Time - Minimum Delay)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Phase Sequence: TCS

Reference Phase: Phase A

Input Phase Sequence: A, C

Output Phase Sequence: A, C

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
East: Hoxton Park Road														
5	T1	1264	61	1331	4.8	* 0.450	6.2	LOS A	15.9	115.0	0.39	0.36	0.39	52.2
Approach		1264	61	1331	4.8	0.450	6.2	LOS A	15.9	115.0	0.39	0.36	0.39	52.2
North: Memorial Avenue														
7	L2	96	3	101	3.1	* 0.152	6.6	LOS A	1.2	8.6	0.23	0.60	0.23	45.4
9	R2	1	1	1	100.0	0.008	63.0	LOS E	0.1	0.8	0.89	0.60	0.89	20.8
Approach		97	4	102	4.1	0.152	7.2	LOS A	1.2	8.6	0.24	0.60	0.24	44.9
West: Hoxton Park Road														
10	L2	160	3	168	1.9	0.399	12.6	LOS A	13.3	96.0	0.38	0.46	0.38	44.4
11	T1	946	51	996	5.4	0.399	6.0	LOS A	13.3	96.0	0.37	0.38	0.37	51.1
Approach		1106	54	1164	4.9	0.399	6.9	LOS A	13.3	96.0	0.37	0.39	0.37	49.3
All Vehicles		2467	119	2597	4.8	0.450	6.6	LOS A	15.9	115.0	0.38	0.38	0.38	50.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Site: 103 [103_PRAM_ Hoxton Park Rd and Memorial Ave (Site Folder: General)]

Hoxton Park Road & Memorial Avenue

Existing + Development AM

7:45am-8:45am

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site Optimum Cycle Time - Minimum Delay)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Phase Sequence: TCS

Reference Phase: Phase A

Input Phase Sequence: A, C

Output Phase Sequence: A, C

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
East: Hoxton Park Road														
5	T1	926	82	975	8.9	0.338	5.5	LOS A	10.2	76.8	0.34	0.31	0.34	53.8
Approach		926	82	975	8.9	0.338	5.5	LOS A	10.2	76.8	0.34	0.31	0.34	53.8
North: Memorial Avenue														
7	L2	73	1	77	1.4	* 0.158	8.5	LOS A	1.4	9.6	0.31	0.63	0.31	44.1
9	R2	3	3	3	100.0	0.023	63.7	LOS E	0.2	2.5	0.90	0.64	0.90	20.7
Approach		76	4	80	5.3	0.158	10.7	LOS A	1.4	9.6	0.33	0.63	0.33	42.4
West: Hoxton Park Road														
10	L2	17	4	18	23.5	* 0.523	13.2	LOS A	19.8	146.3	0.43	0.40	0.43	44.9
11	T1	1427	94	1502	6.6	0.523	6.8	LOS A	19.8	146.3	0.43	0.40	0.43	50.9
Approach		1444	98	1520	6.8	0.523	6.9	LOS A	19.8	146.3	0.43	0.40	0.43	50.8
All Vehicles		2446	184	2575	7.5	0.523	6.5	LOS A	19.8	146.3	0.39	0.37	0.39	51.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Site: 104 [104_PRPM_Hoxton Park Rd and Memorial Ave (Site Folder: General)]

Hoxton Park Road & Memorial Avenue

Existing + Development PM

4:30pm-5:30pm

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site Optimum Cycle Time - Minimum Delay)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Phase Sequence: TCS

Reference Phase: Phase A

Input Phase Sequence: A, C

Output Phase Sequence: A, C

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %	v/c	sec		[Veh. veh	Dist] m				km/h
East: Hoxton Park Road														
5	T1	1264	61	1331	4.8	* 0.450	6.2	LOS A	15.9	115.0	0.39	0.36	0.39	52.2
Approach		1264	61	1331	4.8	0.450	6.2	LOS A	15.9	115.0	0.39	0.36	0.39	52.2
North: Memorial Avenue														
7	L2	104	3	109	2.9	* 0.165	6.6	LOS A	1.3	9.5	0.24	0.60	0.24	45.4
9	R2	1	1	1	100.0	0.008	63.0	LOS E	0.1	0.8	0.89	0.60	0.89	20.8
Approach		105	4	111	3.8	0.165	7.2	LOS A	1.3	9.5	0.24	0.60	0.24	44.9
West: Hoxton Park Road														
10	L2	180	3	189	1.7	0.406	12.6	LOS A	13.6	98.4	0.38	0.47	0.38	44.2
11	T1	946	51	996	5.4	0.406	6.0	LOS A	13.6	98.4	0.37	0.39	0.37	50.9
Approach		1126	54	1185	4.8	0.406	7.1	LOS A	13.6	98.4	0.37	0.40	0.37	49.0
All Vehicles		2495	119	2626	4.8	0.450	6.6	LOS A	15.9	115.0	0.38	0.39	0.38	50.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

▽ Site: 201 [201_EXAM_Hoxton Park Rd and Maryvale Ave (Site Folder: General)]

Hoxton Park Road and Maryvale Avenue

Existing AM

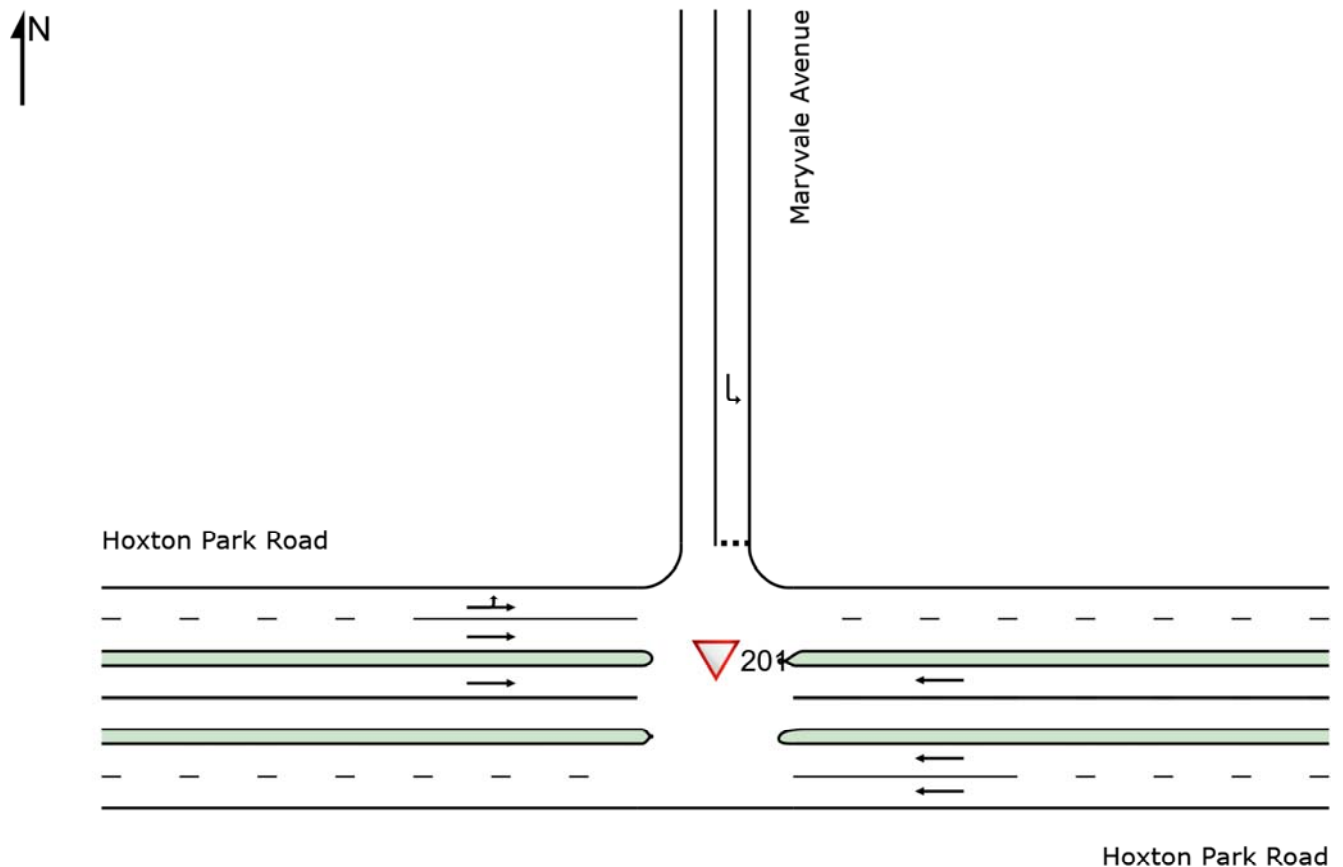
7:45am-8:45am

Site Category: (None)

Give-Way (Two-Way)

Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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Project: T:\Synergy\Projects\22\22.076\Modelling\22.076m01v04 TRAFFIX 93-145 Hoxton Park Road, Liverpool.sip9

Site: 201 [201_EXAM_Hoxton Park Rd and Maryvale Ave (Site Folder: General)]

Hoxton Park Road and Maryvale Avenue

Existing AM

7:45am-8:45am

Site Category: (None)

Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV veh/h	[Total veh/h	HV %				[Veh. veh	Dist] m				
East: Hoxton Park Road														
5	T1	893	79	940	8.8	0.252	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	69.9
Approach		893	79	940	8.8	0.252	0.0	NA	0.0	0.0	0.00	0.00	0.00	69.9
North: Maryvale Avenue														
7	L2	23	0	24	0.0	0.032	7.1	LOS A	0.1	0.8	0.48	0.66	0.48	45.8
Approach		23	0	24	0.0	0.032	7.1	LOS A	0.1	0.8	0.48	0.66	0.48	45.8
West: Hoxton Park Road														
10	L2	321	1	338	0.3	0.450	6.4	LOS A	0.0	0.0	0.00	0.25	0.00	60.5
11	T1	1278	93	1345	7.3	0.450	0.1	LOS A	0.0	0.0	0.00	0.09	0.00	67.0
Approach		1599	94	1683	5.9	0.450	1.3	NA	0.0	0.0	0.00	0.13	0.00	65.0
All Vehicles		2515	173	2647	6.9	0.450	0.9	NA	0.1	0.8	0.00	0.09	0.00	66.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: 202 [202_EXPM_Hoxton Park Rd and Maryvale Ave (Site Folder: General)]

Hoxton Park Road and Maryvale Avenue

Existing PM

4:30pm-5:30pm

Site Category: (None)

Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
East: Hoxton Park Road														
5	T1	1381	61	1454	4.4	0.380	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	69.8
Approach		1381	61	1454	4.4	0.380	0.1	NA	0.0	0.0	0.00	0.00	0.00	69.8
North: Maryvale Avenue														
7	L2	40	0	42	0.0	0.055	7.2	LOS A	0.2	1.3	0.49	0.68	0.49	45.7
Approach		40	0	42	0.0	0.055	7.2	LOS A	0.2	1.3	0.49	0.68	0.49	45.7
West: Hoxton Park Road														
10	L2	41	0	43	0.0	0.291	6.4	LOS A	0.0	0.0	0.00	0.05	0.00	64.1
11	T1	1013	51	1066	5.0	0.291	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	69.2
Approach		1054	51	1109	4.8	0.291	0.3	NA	0.0	0.0	0.00	0.02	0.00	68.9
All Vehicles		2475	112	2605	4.5	0.380	0.3	NA	0.2	1.3	0.01	0.02	0.01	68.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: 203 [203_PRAM_Hoxton Park Rd and Maryvale Ave (Site Folder: General)]

Hoxton Park Road and Maryvale Avenue

Existing + Development AM

7:45am-8:45am

Site Category: (None)

Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
East: Hoxton Park Road														
5	T1	893	79	940	8.8	0.252	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	69.9
Approach		893	79	940	8.8	0.252	0.0	NA	0.0	0.0	0.00	0.00	0.00	69.9
North: Maryvale Avenue														
7	L2	36	0	38	0.0	0.049	7.2	LOS A	0.2	1.2	0.48	0.67	0.48	45.8
Approach		36	0	38	0.0	0.049	7.2	LOS A	0.2	1.2	0.48	0.67	0.48	45.8
West: Hoxton Park Road														
10	L2	331	1	348	0.3	0.453	6.4	LOS A	0.0	0.0	0.00	0.26	0.00	60.4
11	T1	1278	93	1345	7.3	0.453	0.1	LOS A	0.0	0.0	0.00	0.10	0.00	66.9
Approach		1609	94	1694	5.8	0.453	1.4	NA	0.0	0.0	0.00	0.13	0.00	64.9
All Vehicles		2538	173	2672	6.8	0.453	1.0	NA	0.2	1.2	0.01	0.09	0.01	65.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: 204 [204_PRPM_Hoxton Park Rd and Maryvale Ave (Site Folder: General)]

Hoxton Park Road and Maryvale Avenue
 Existing + Development PM
 4:30pm-5:30pm
 Site Category: (None)
 Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
East: Hoxton Park Road														
5	T1	1381	61	1454	4.4	0.380	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	69.8
Approach		1381	61	1454	4.4	0.380	0.1	NA	0.0	0.0	0.00	0.00	0.00	69.8
North: Maryvale Avenue														
7	L2	44	0	46	0.0	0.061	7.2	LOS A	0.2	1.5	0.49	0.69	0.49	45.7
Approach		44	0	46	0.0	0.061	7.2	LOS A	0.2	1.5	0.49	0.69	0.49	45.7
West: Hoxton Park Road														
10	L2	41	0	43	0.0	0.291	6.4	LOS A	0.0	0.0	0.00	0.05	0.00	64.1
11	T1	1013	51	1066	5.0	0.291	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	69.2
Approach		1054	51	1109	4.8	0.291	0.3	NA	0.0	0.0	0.00	0.02	0.00	68.9
All Vehicles		2479	112	2609	4.5	0.380	0.3	NA	0.2	1.5	0.01	0.02	0.01	68.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: T:\Synergy\Projects\22\22.076\Modelling\22.076m01v04 TRAFFIX 93-145 Hoxton Park Road, Liverpool.sip9

APPENDIX C

Green Travel Plan



GREEN TRAVEL PLAN (GTP)


Proposed Mixed-Use Development
93-145 Hoxton Park Road, Liverpool NSW 2170

Reference: 22.076r02v01
Date: May 2022

Suite 2.08, 50 Holt St
Surry Hills, NSW 2010

t: (02) 8324 8700
w: www.traffix.com.au

DOCUMENT VERIFICATION

Job Number	22.076 – Green Travel Plan			
Project	93 – 145 Hoxton Park Road, Liverpool NSW 2170			
Client	ABA Estate Pty Ltd c/- Tony Owen Partners			
Revision	Date	Prepared By	Checked By	Signed
v01	05/05/2022	Timothy Le	Thomas Yang	

CONTENTS

1. Introduction	1
1.1 Background	1
1.2 Green Travel Plan Objectives	1
1.3 Green Travel Plan Benefits	1
1.4 Report Structure	2
2. Site Audit	3
2.1 Public Transport Infrastructure	3
2.2 Car Share Facilities	5
2.3 Cycling Infrastructure	5
2.4 Pedestrian Infrastructure	7
2.5 On-street Car Parking	7
2.6 Existing Mode Choice	8
3. Future of Transport	10
3.1 Emerging Trends	10
4. Objectives and Targets	11
4.1 Objectives	11
4.2 Target Mode Share	11
5. Actions and strategy	13
5.1 Site Specific Measures	13
5.2 Travel Access Guide	15
5.3 Transport Information	15
5.4 Actions	16
6. Monitoring and Maintenance	18
7. Conclusions	19

Appendices

Appendix A: Transport Access Guide

1. INTRODUCTION

1.1 Background

TRAFFIX has been commissioned by Tony Owen Partners to prepare a Green Travel Plan (GTP) for the proposed mixed-use development located at 93-145 Hoxton Park Road, Liverpool. The development is located within the Liverpool City Council Local Government Area (LGA) and has been assessed under that Council's controls.

The GTP aims to assist with the management of future travel demands being generated as a consequence of the development.

1.2 Green Travel Plan Objectives

The purpose of a Green Travel Plan is to set site-specific actions and incentives to manage travel demands and embrace the principles of sustainable transport to maximise the use of transport modes that have a lower environmental impact such as walking, cycling, public transport, or car share schemes etc.

New developments present an excellent opportunity to accommodate innovative ideas at an early stage into the designs so that transport demands arising from the future use of the development can be efficiently managed, and future occupants and visitors of the building would not need to depend on the usage of private vehicles.

1.3 Green Travel Plan Benefits

In addition to providing area-wide benefits such as reduction of congestion and pollution, Green Travel Plans can deliver a range of benefits to employers, employees, visitors or residents of a development that can:

- Reduce the need to provide parking within the development and on-street parking demands in the locality.
- Contribute to corporate social responsibility relating to the triple bottom line, and improve corporate image as an innovative and environmentally-aware organisation.
- Help to attract and retain staff.

- Create opportunities for healthier lifestyles and more vibrant, cohesive, and accessible communities.
- Provide staff, residents and visitors with potential travel cost savings.
- Help to appeal to a new generation of professionals who prioritise location and lifestyle over car ownership.
- Increase potential market for the development by improving accessibility.

1.4 Report Structure

Consistent with industry's 'best practice' to ensure the Green Travel Plan is robust, realistic, and achievable, the report has been structured as follows:

- Section 2: Documents existing transport conditions and mode choice.
- Section 3: Discusses emerging trends that will impact on future transport mode choice.
- Section 4: Identifies GTP objectives and sets travel mode targets.
- Section 5: Set out actions that will help achieve the envisaged travel mode targets.
- Section 6: Sets out a monitoring and review process.
- Section 7: Presents the overall study conclusions.

2. SITE AUDIT

2.1 Public Transport Infrastructure

The existing public transport services that operate in the locality are shown in **Figure 1**.

2.1.1 Bus Services

It is evident that the development benefits from good bus services with two (2) bus stops being situated within 400m of the subject site. These services provide regular connections to Liverpool CBD and Liverpool Railway Station, Parramatta CBD and Parramatta Railway Station, Fairfield Railway Station, Carnes Hill, Ingleburn, Miller and other key destinations.

Table 1: Bus Information

Bus No.	Route	Frequency		
		Weekday	Saturday	Sunday & Public Holidays
802	Liverpool to Parramatta	15-30mins	30mins	60mins
803	Liverpool to Miller (Loop Service)	30mins	N/A	N/A
853	Carnes Hill to Liverpool	15-60min	60mins	60mins
854	Carnes Hill to Liverpool	15-60mins	60mins	60mins
869	Ingleburn to Liverpool	30mins	30mins	30mins

2.1.2 Train Services

The subject development is also located approximately 2.2-kilometres southwest of Liverpool Railway Station servicing:

- T2 – Inner West & Leppington Line;
- T3 – Bankstown Line; and
- T5 – Cumberland Line.

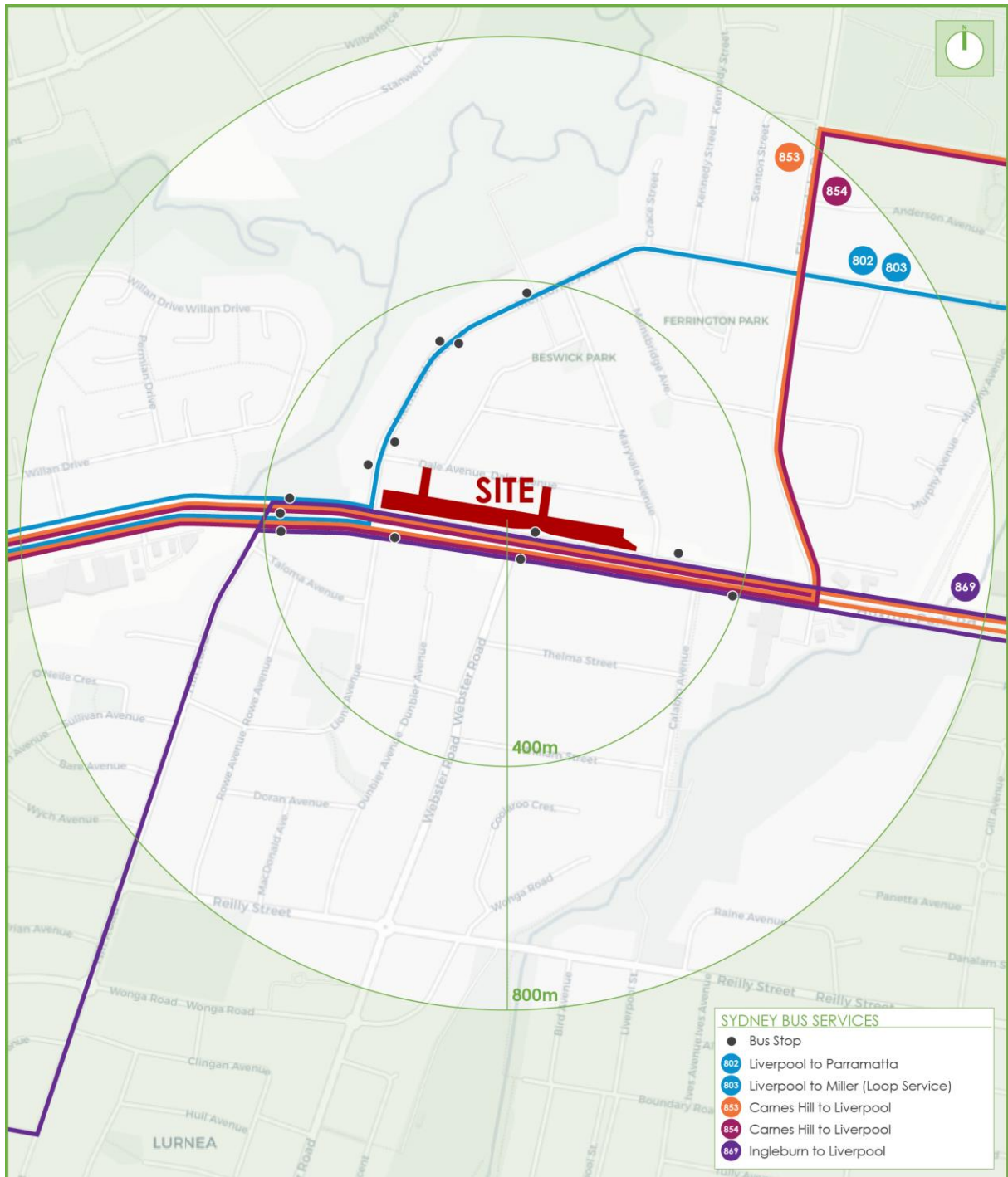


Figure 1: Existing Public Transport

2.2 Car Share Facilities

Car sharing offers a convenient, affordable and sustainable alternate transport option to owning / using private cars. Car sharing encourages more sustainable travel habits, and makes more efficient use of available parking by allowing a single vehicle to be used by a large number of people throughout the day. This reduces car ownership levels and the competition for parking spaces, which ultimately benefits everyone.

Car share generally involves signing up to a membership plan offered by car share operators. Plan fees vary depending on how frequent the user intends to use the service and affects hiring costs. Car share users are generally charged by time and distance, at a rate set by the operator.

At this current time, there are no GoGet pods located in the immediate vicinity of the site and the nearest GoGet pod is approximately 1.65-kilometres east of the site towards Liverpool CBD.

2.3 Cycling Infrastructure

Cycling provides substantial health benefits, is sustainable and can help reduce transportation costs associated with owning / using a private car.

The site is located in proximity to separated bicycle lanes, off-road shared paths and bicycle friendly roads available throughout the area. These cycleways can be used concurrently with other bicycle routes to provide connections to various areas. The existing cycle facilities are presented in **Figure 2**, with cycleways summarised as follows:

- **Off-Road Bicycle Routes:** The Hoxton Park Road shared-path provides an off-road cycle route that traverses between Cowpasture Road in the west and continues east to Hume Highway. The shared path spans approximately 6.5-kilometres and provides links to multiple cycle paths along the shared-path. It is noteworthy to mention Hoxton Park Road provides access to the popular bicycle route on the shared-path spanning the Westlink M7 Motorway. This cycle route can be accessed via Spire Crescent.

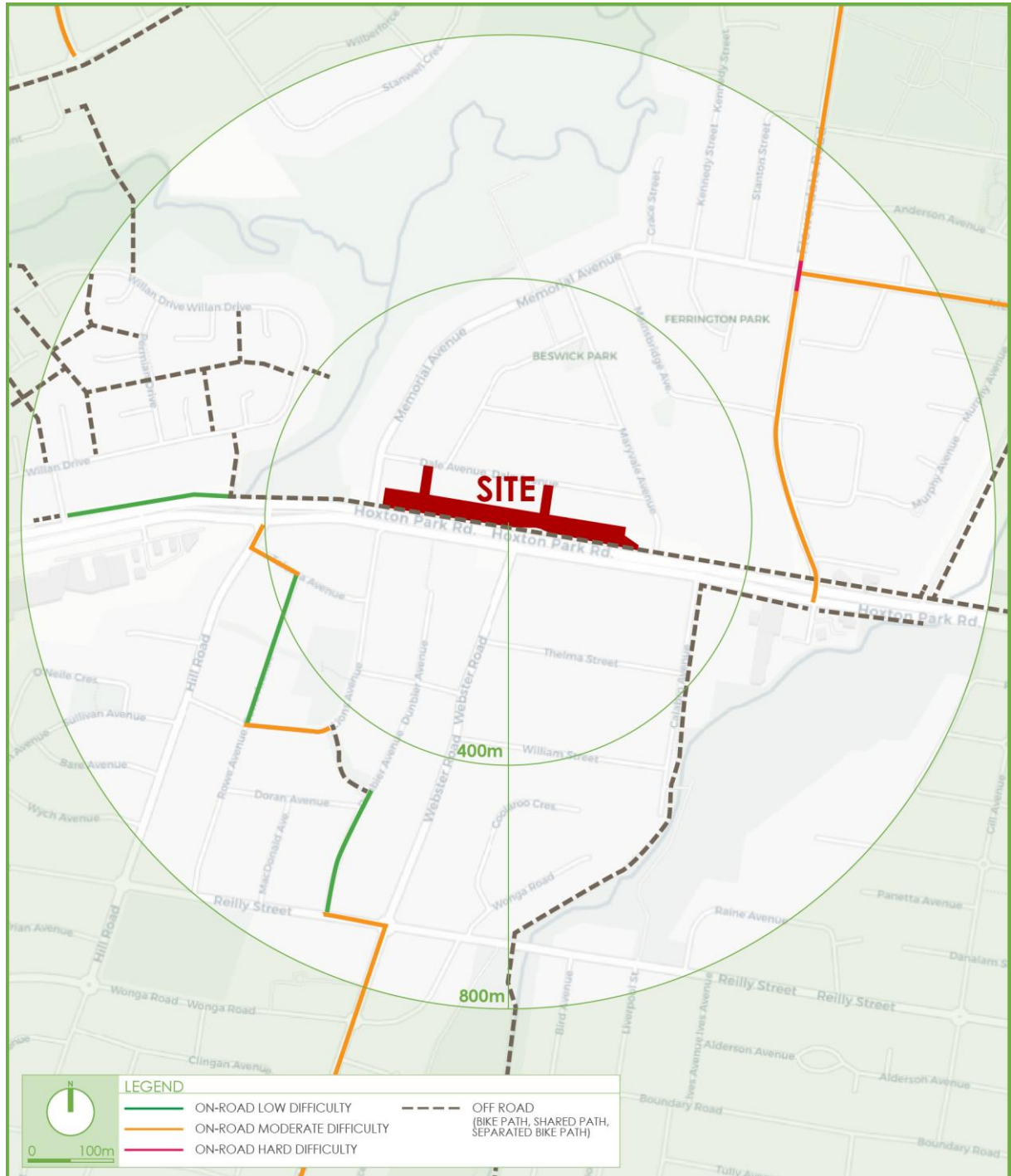


Figure 3: Existing Cycleways

(Source: https://roads-waterways.transport.nsw.gov.au/maps/cycleway_finder)

2.4 Pedestrian Infrastructure

Walking in daily transport routine helps maintain health and improves fitness. The development is located in proximity to a number of walking facilities including:

- Shared-path on the northern side of Hoxton Park Road providing access for pedestrians and cyclists;
- Pedestrian footpath on the southern side of Hoxton Park Road;
- Pedestrian footpath on the eastern side of Maryvale Avenue;
- Pedestrian footpath on the northern side of Dale Avenue;
- Pedestrian footpath on the eastern side of Memorial Avenue; and
- Signalised pedestrian crossings on all legs at each major intersection along Hoxton Park Road.

All nearby bus stops and train stations are accessible via paved footpaths.

There are also a full range of shops and services within the Hoxton Park Commercial and Industrial Area within walkable distance of the site, all of which are accessible via paved footpaths.

2.5 On-street Car Parking

Parking is generally prohibited on either side of Hoxton Park Road.

Unrestricted kerbside parking is however generally permitted on either side of Memorial Avenue, Dale Avenue and Maryland Avenue which are currently predominantly utilised by residents in the area.

2.6 Existing Mode Choice

2.6.1 Staff and Resident Travel Modes

The existing travel mode splits of people working, and living in Liverpool (Statistical Area Level 2 Region, Liverpool) have been obtained from the Australian Bureau of Statistics (ABS) 2016 Census Data and is summarised in **Table 2** and **Table 3** below.

It should be noted that data under the categories of “Did not go to work”, ‘Not stated’ and ‘Not applicable’ have been excluded from this analysis.

The 2016 Census Data identifies approximately 75% commuters drove to the area for work with only 13% commuters utilising public transport, and approximately 63% residents living in the area drives to work with only approximately 21% residents utilise public transport.

Comparatively, 2016 Census Data shows that 52% commuters in the Grater Sydney Region drives to work with 23% utilising public transport.

Table 2: Existing Staff Travel Mode Split (2016 Census Data)

Travel Mode	Mode Splits
Car, as driver	75.14%
Train	9.35%
Car, as passenger	5.99%
Walked only	3.79%
Bus	3.45%
Worked at home	1.14%
Truck	0.33%
Other	0.26%
Motorbike/Scooter	0.25%
Bicycle	0.21%
Taxi	0.09%
Total	100%

Table 3: Existing Resident Travel Mode Split (2016 Census Data)

Travel Mode	Mode Splits
Car, as driver	62.72%
Train	17.77%
Walked only	7.03%
Car, as passenger	5.52%
Bus	2.88%
Worked at home	1.90%
Truck	0.83%
Other	0.47%
Motorbike/Scooter	0.28%
Bicycle	0.22%
Ferry	0.06%
Total	100%

3. FUTURE OF TRANSPORT

3.1 Emerging Trends

The transport sector is currently undergoing its most rapid transformation in decades. Changing lifestyle choices and emerging transport technologies could significantly change land use and transport planning within the next 10-20 years.

During the pandemic, working from somewhere else than the office has become increasingly accepted due to generational change and the proliferation of reliable high-speed internet connections. At the same time, education also moved to online platforms, and primary school to university subjects were being taught over the internet.

Remote working and distance education will increasingly affect the transportation industry, putting less stress on all existing transport infrastructure.

There is also an increasing trend for business to share co-working spaces and hot desking reducing commercial footprint.

Transport technologies are also becoming increasingly efficient and user friendly, including car sharing services, ride sharing services, and potential emerging autonomous vehicle technologies.

These lifestyle changes and emerging transport technologies will have a profoundly transformative effect on our city, and can significantly reduce per capita travel demands in terms of trip frequency and distance, reducing per capita non-residential floor space requirements, improved access to information, and increased travel flexibility.

Accordingly, this Green Travel Plan takes into account of the abovementioned transport trends to maximise the use of transport modes that have a lower environmental impact such as walking, cycling, public transport, or car share schemes etc.

4. OBJECTIVES AND TARGETS

4.1 Objectives

The following objectives are set out to achieve the vision of this Green Travel Plan to maximise the use of transport modes that have a lower environmental impact such as walking, cycling, public transport, or car share schemes etc:

- **Accessibility:** improve access, safety amenity and convenience of sustainable transport modes for travel to and from the site.
- **Incentives:** incentivise the use of sustainable transport modes.
- **Restrict:** continue to limit the convenience of car parking to encourage other modes of transport.

4.2 Target Mode Share

The objective of this Green Travel Plan is to reduce potential private vehicle trips to and from the site to maximise the use of transport modes that have a lower environmental impact such as walking, cycling, public transport, or car share schemes etc.

To ensure the Green Travel Plan remains effective, its implementation will be monitored regularly with its success measured by setting mode share targets and identifying measures / actions that have had the greatest impacts.

It is understood that mode shift between 3-5 percent is generally considered to be a significant achievement, and given the emerging trends in travel behaviours due to the COVID-19 pandemic with a general decline in public transport usage, a shift of 3-5 percent is considered reasonable.

On the above basis, it is proposed to reduce commuter's and resident's private car usage by 5% as set out in **Table 4** and **Table 5**.

Table 4: Staff Target Modal Share

Travel Mode	Existing Modal Splits	Proposed Modal Split	Proposed Split
Car, as driver	75.14%	70.14%	-5%
Train	9.35%	9.35%	-
Car, as passenger	5.99%	6.99%	+1%
Walked only	3.79%	3.79%	-
Bus	3.45%	5.45%	+2%
Worked at home	1.14%	2.14%	+1%
Truck	0.33%	0.33%	-
Other	0.26%	0.26%	-
Motorbike/Scooter	0.25%	0.25%	-
Bicycle	0.21%	1.21%	+1%
Taxi	0.09%	0.09%	-
Total	100%		

Table 5: Residents Target Modal Share

Travel Mode	Mode Splits	Proposed Modal Split	Proposed Split
Car, as driver	62.72%	57.72%	-5%
Train	17.77%	17.77%	-
Walked only	7.03%	7.03%	-
Car, as passenger	5.52%	6.52%	+1%
Bus	2.88%	4.88%	+2%
Worked at home	1.90%	2.90%	+1%
Truck	0.83%	0.83%	-
Other	0.47%	0.47%	-
Motorbike/Scooter	0.28%	0.28%	-
Bicycle	0.22%	1.22%	+1%
Ferry	0.06%	0.06%	-
Total	100%		

5. ACTIONS AND STRATEGY

5.1 Site Specific Measures

This Green Travel Plan recommends the following measures to be implemented at the occupation stage to maximise the use of transport modes that have a lower environmental impact such as walking, cycling, public transport, or car share schemes etc.

5.1.1 Off-Street Car Parking

The subject development will provide off-street parking in a multi-level basement car park for residents, visitors as well as retail / commercial staff and customers.

Notwithstanding, parking supply will be restricted and accord with the minimum parking threshold set out in the Liverpool Development Control Plan (2008) to encourage non-car based travel. It is pertinent to note that resident parking is necessary to maintain reasonable marketability of residential apartments consistent with Australian lifestyle.

5.1.2 Walking

Commercial premises within the building is encouraged to implement a '10,000 steps per day' initiative to achieve health benefits for their staff.

The number of steps a person takes can be conveniently monitored by many every day electronic devices such as smart phones and smart watches.

Business could then incentivise walking by setting up monthly competitions and reward the staff with most steps of the month with a modest \$50 gift card.

5.1.3 Cycling

Bicycle parking and end-of-trip facilities including lockers and showers are recommended to be provided in the development to encourage residents, staff and visitors to travel to / from the site by bicycle.

Bicycle route maps are to be provided in the building foyer to promote awareness, and building occupants are to be regularly updated and informed as Council further improves the surrounding bicycle network.

Businesses could also promote cycling by setting up 'ride to work' days.

Building strata can also provide bicycle maintenance tool kits such as bike pump, puncture repair equipment that could be conveniently accessed when needed.

5.1.4 Public Transport

Public transport information is recommended to be prominently displayed at entrances and building foyers to make residents, staff and visitors aware of alternative transport options that are available.

Businesses can also provide their staff a pre-loaded Opal card as part of the welcome pack to influence their staff travel habits from Day One.

5.1.5 Other Measures

Council also has a continual responsibility to implement measures in the public domain that can influence a positive shift towards non-car based travel, these include:

- Footpaths, cycleways and pedestrian crossing facilities to be maintained in good order.
- Continue to improve and maintain signage and way finding to / from key public transport hubs and destination.
- Maintain an open channel of communication with car share operators to expand car share networks.
- Provide community cycling programs to assist inexperienced riders and improve on-road awareness.
- Ensure telecommunication services are maintained in good order to enable staff to work from home.
- Continue to improve sustainable transport infrastructure in the locality and update community on a regular basis.

- Promote and advertise sustainable transport on public information boards.

5.2 Travel Access Guide

The information provided in this Green Travel Plan will be provided to residents, staff and visitors in a package of easy-to-understand information brochure often referred to as a Travel Access Guide (TAG).

The TAG will be provided to residents and staff on Day One, with additional copies available at all times in the building foyer.

The TAG will provide a visual representation of customised travel information for people travelling to and from the site using alternate, sustainable modes of transport to encourage the use of non-car based travel.

A copy of the recommended TAG is provided in **Appendix A**.

5.3 Transport Information

There are several channels with information regarding local transport options. Providing residents, staff and visitors with updated information will help facilitate journey planning and increase their awareness of convenient and potentially cost-saving transport options.

- **Transport for NSW info:** up-to-date public transport timetables, fare information, and journey planning are provided by Transport for NSW at <http://www.transportnsw.info>
- **Cycleway Finder:** Service NSW provides and maintains a map with detailed cycling route information to encourage people of all levels of experience to ride a bicycle, the finder can be accessed at https://roads-waterways.transport.nsw.gov.au/maps/cycleway_finder
- **Google Maps:** Google Maps provides up-to-date information regarding all transport options, it also has a cycling mode for cyclists to identify appropriate cycle routes.

5.4 Actions

A series of actions are recommended in **Table 6** which forms the strategies and initiatives that can be implemented to achieve the desired transport modal split targets.

It is pertinent that these actions are regularly monitored and updated to reflect current local transport conditions.

Table 6: Green Travel Plan Action Table

Strategy	Action	Target	When	Responsibility
Reduce car-based travel				
Restrict Car Parking	Not exceeding Council DCP minimum parking rates	All building occupants	DA	Council, Developer
Car Sharing	Consider car sharing facilities	All building occupants	DA, OC	Council, Developer, Car share operator
Car Pooling	Provide forum to form travel groups where possible	Staff and visitors	Post OC	Building strata
Promote Public Transport				
Provide public transport information	Provide and maintain an updated TAG with public transport information, and ensure copies of the TAG are easily accessible	All building occupants	Ongoing	Travel plan coordinator
Incentivise public transport usage	Provide a pre-loaded Opal card to staff on Day One	Staff	Ongoing	Commercial tenant
Promote Cycling and Walking				
Provide bicycle parking and end-of-trip facilities	Provide adequate bicycle parking facilities and consider showers, lockers and change rooms	All building occupants	DA	Council, Developer

Strategy	Action	Target	When	Responsibility
Maintain bicycle and end-of-trip facilities	Maintain bicycle and end-of-trip facilities in good order, set up a regime for regular inspection and forum to report improper use and damages	All building occupants	Ongoing	Building strata
10,000 steps initiative	Business to setup monthly competitions to reward staff with most logged steps	Staff	Ongoing	Commercial tenant
Provide up-to-date cycling information	Provide and maintain an updated TAG with cycling information, and ensure copies of the TAG are easily accessible	All building occupants	Ongoing	Travel plan coordinator
Keep Information Up-to-Date				
Green Travel Plan	Provide building occupants with updated GTP to encourage non-car based travel	All building occupants	Ongoing	Travel plan coordinator
Update and Review	Ongoing review of the GTP to reflect current local transport conditions	All building occupants	Ongoing	Travel plan coordinator
Other				
Remote Work	Business to facilitate staff to work remotely where appropriate	Staff	Ongoing	Commercial tenant
Flexible working hours	Business to facilitate flexible working hours to allow staff to travel outside of typical AM and PM peak periods	Staff	Ongoing	Commercial tenant

6. MONITORING AND MAINTENANCE

A monitoring and review process for this Green Travel Plan will be set out by the building manager to ensure that information contained within reflects any changes to the local transport conditions as well as building facilities.

A Travel Plan Coordinator (usually the building manager) will be designated with the responsibility of maintaining the Green Travel Plan and revisit the proposed travel mode targets to refine and update the proposed modal-split on a regular basis.

Regular review of the success measures outlined in this plan should be undertaken intermittently to determine whether alternative or supplementary measures are necessary. Travel mode data should be collected via an occupant travel survey within the first six (6) months of occupation to provide suitable baseline travel data. A travel survey should then be conducted annually to collect travel data in order to assess the performance targets set in the Green Travel Plan and update it if necessary and monitor these changes on an annual basis for further improvement.

This evaluation will provide a reliable overview of the areas in which the Green Travel Plan is operating effectively and which areas that require more attention. It is envisaged that the target travel modes be achievable in 5 years however, it is noted that these targets are aspirational and will require on-going evaluation and fine-tuning.

7. CONCLUSIONS

The proposed development at 93-145 Hoxton Park Road, Liverpool is conveniently located within close proximity to existing public transport services, noting T-Way bus services are located within a short walking distance from the site.

This travel plan has recommended a number of actions to manage future travel demands being generated as a consequence of the development, specifically, these actions seek to reduce reliance on private vehicle trips and comprise the following:

- Provision of bicycle parking and end-of-trip facilities.
- Develop forum to facilitate car pooling.
- Develop initiatives and incentives for the use of sustainable modes of transport.
- Maintain an open channel of communication with Council to maintain / improve existing sustainable infrastructure in the local area.
- Provide TAG at prominent locations on site.

It is pertinent to note that those actions recommended in this Green Travel Plan should be implemented together as a set of coordinated measures to achieve its maximum effect of influencing travel habits to increase non-car based travel to and from the site, as well as promoting a healthier and active lifestyle.

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APPENDIX A

Transport Access Guide

TRAVELLING TO 93-145 HOXTON PARK ROAD, LIVERPOOL NSW 2170



CAR

By Taxi: Taxi services are available by contacting the following company: 13 CABS by calling 13 22 27 or visiting their website <http://www.13cabs.com.au>.

By Uber: Offers car rideshare services available through the Uber app on your smartphone or tablet.

By GoGet: GoGet offers car rental services to promote ride sharing and reduce overall private car usage to lower carbon footprint.



BUS

By Bus: There are two (2) pairs of bus routes operating directly adjacent to the development, as shown on the Transport Map. These bus services provide regular connections between Liverpool CBD and Liverpool Railway Station, Parramatta CBD and Parramatta Railway Station, Carnes Hill, Ingleburn and Miller via the following services:

- **802** – Liverpool to Parramatta
- **803** – Liverpool to Miller (Loop Service)
- **853** – Carnes Hill to Liverpool
- **854** – Carnes Hill to Liverpool
- **869** – Ingleburn to Liverpool

For more information regarding service frequencies, please visit the Transport Info website at: <https://transportnsw.info/routes/bus>.



TRAIN

By Train: The development is situated approximately 2.2km southwest of Liverpool Railway Station. Liverpool Railway Station provides regular connections to other Sydney Metropolitan Regions via the following services:

- **T2** – Inner West & Leppington Line
- **T3** – Bankstown Line
- **T5** – Cumberland Line

For more information regarding service frequencies, please visit the Transport Info website at: <https://transportnsw.info/routes/train>.



BIKE AND WALKING

By Bicycle and Walking: Safe and accessible bicycle/ walking infrastructure is provided around the area of the subject development. The shared-path on the Hoxton Park Road frontage can be utilised to access cycle routes in the area.

For alternative cycle and walking routes please visit https://roads-waterways.transport.nsw.gov.au/customer-maps/cycleway_finder.html for more information.

TRANSPORT GOALS

This Travel Access Guide (TAG) provides information to residents, staff and visitors on how to get to and from the proposed mixed-use development located at 93-145 Hoxton Park Road, Liverpool by sustainable modes of transport, reducing reliance on private vehicles.

In addition to providing area-wide benefits such as reduction of congestion and pollution, travel plans can deliver a range of benefits to employers, employees, visitors or residents of a development that can:

- Reduce the need to provide parking.
- Contribute to corporate social responsibility relating to the triple bottom line, and improve corporate image as an innovative and environmentally-aware organisation.
- Help to attract and retain staff.
- Contribute to a healthier, happier and more active workplace.
- Create opportunities for healthier lifestyles and more vibrant, cohesive and accessible communities.
- Provide staff and residents with potential travel cost savings.
- Help to appeal to a new generation of professionals who prioritise location and lifestyle over car ownership.
- Increase potential market for the development by improving accessibility.

TRAFFIX
TRAFFIC AND TRANSPORT PLANNERS



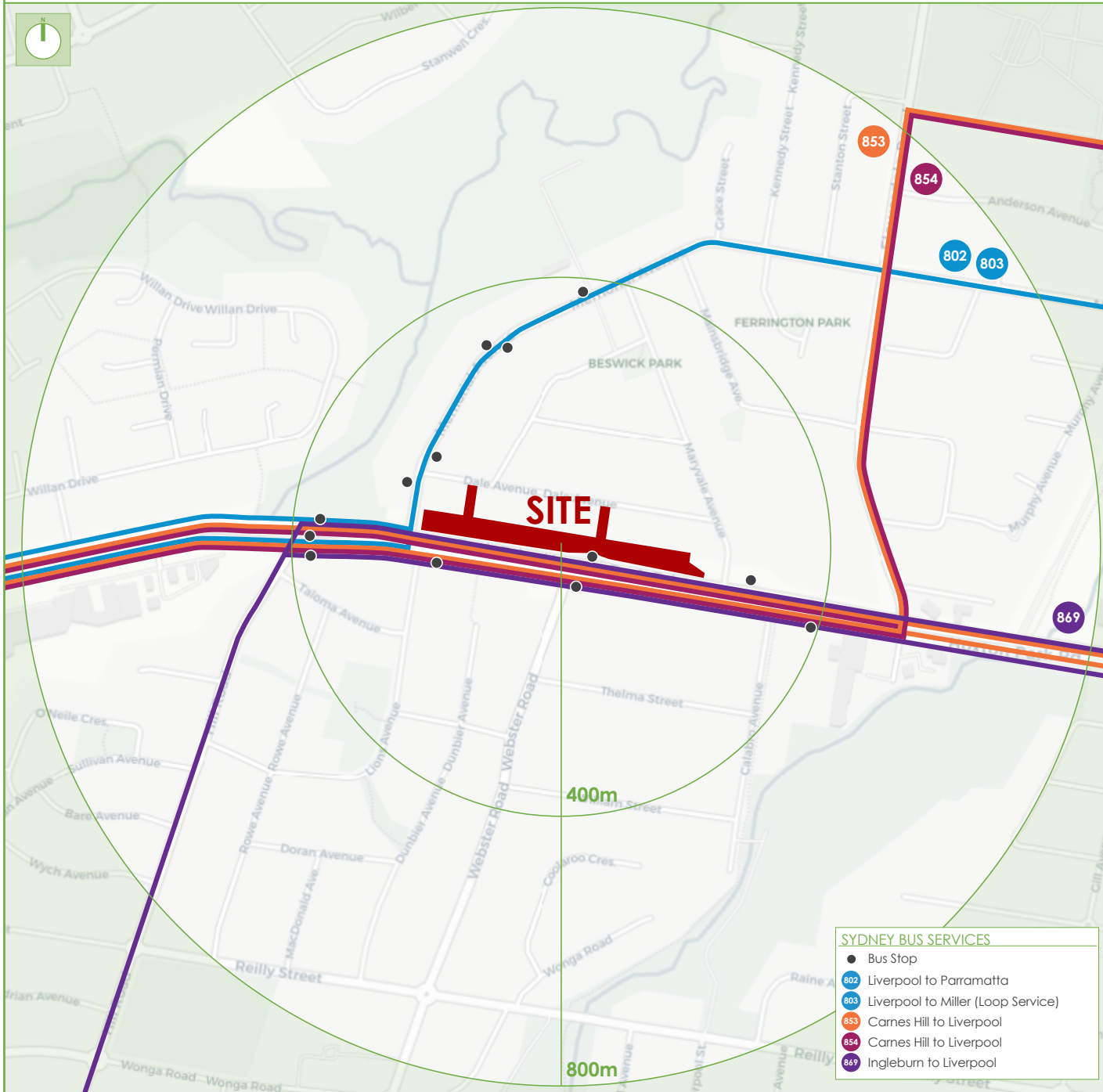
TRANSPORT ACCESS GUIDE

**93-145 Hoxton Park Road,
Liverpool NSW 2170**

For further public transport information
go to www.transportnsw.info or call 131 500

PUBLIC TRANSPORT MAP

The local bus routes located in walking distance of the site are presented in the figure below.



CYCLE NETWORK

The existing cycleways in the vicinity of the site are presented in the figure below.

