Shanghai Lihua Hurstville Pty Ltd

108-124 Forest Road Hurstville

Traffic and Parking Impact Assessment

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July 2021

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1. Introduction

1.1 Overview

Shanghai Lihua Hurstville Pty Ltd have engaged GHD to prepare a Traffic and Parking Impact Assessment in support of a planning application to Georges River Council (formerly known as Hurstville City Council) for a proposed mixed-use development located at 108-124 Forest Road and 1-3 Wright Street in Hurstville, NSW. The proposed development comprises of ground floor specialist retail shops and residential apartments on the upper floors, with three levels of basement parking for retail patrons and residents.

This Traffic and Parking Impact Assessment examines the increase in traffic movements associated with the proposed mixed development, background traffic growth and parking associated with variation in commercial and residential uses. The report discusses the following:

- **Existing conditions** – a review of existing road features, adjacent developments, traffic volumes, and crash data.
- **Proposed modification** – a review of traffic generated as a result of the proposed mixed development.
- **Development impact** – assessment of the performance of existing intersections (delays, degree of saturation and level of service) in the vicinity of the site, resulting from the proposed mixed development.
- **Parking assessment** – a review of the parking provision and layout in relation to relevant Australian Standards (AS2890), Georges River Council DCP requirements and State Environmental Planning Policy No 65 – Design Quality of Residential Apartment Development (SEPP 65).

1.2 Site location and proposed development summary

The subject site is located at 108-124 Forest Road and 1-3 Wright Street, Hurstville. This site is situated at the intersection of Forest Road with Wright Street/Durham Street and Forest Road/Hudson Street, as shown in Figure 1-1. A layout of the existing site is illustrated in Figure 1-2.

The proposed mixed use development forms part of Lot 531 of DP 777334, Lot 1 of DP 75572 and Lot 1, 54 and 55 of DP 78322. The total area of the site is approximately 5,407 m^2 and is proposed to consist of the following:

- Residential units:
  - 1 bedroom: 54 units
  - 2 bedrooms: 128 units
  - 3 bedrooms: 31 units
  - **Total: 213 units** (403 bedrooms)
- Retail area: 2,701 m^2 Gross Floor Area (GFA)

Vehicular access to the site would be from Hudson Street for the residential and visitor parking area and Wright Street for the retail and additional visitor parking area. The existing site access on Forest Road is proposed to be removed.

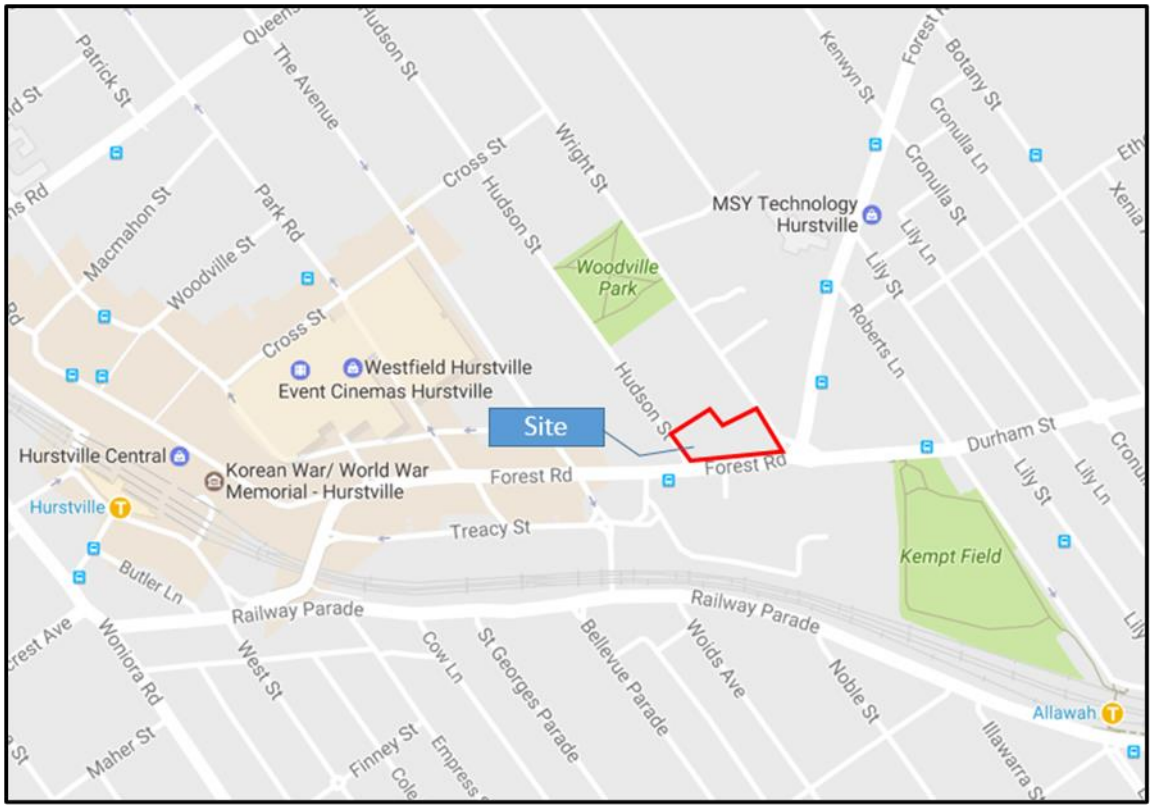


Figure 1-1 Site location

Source: Google Maps – Modified by GHD

Figure 1-2 Site aerial photo

Source: Google maps – Modified by GHD

1.3 Assumptions and limitations

The following assumptions have been made for this Traffic and Parking Impact Assessment:

- Traffic trip generation and distribution assumptions in relation to arrivals and departure profiles and routes through the network as outlined in section 2.5 (existing development) and section 3.2 (proposed development).
- Traffic survey as undertaken on Tuesday 1 June 2021 by Matrix Traffic and Transport Data Pty Ltd, used for assessment purposes.
- The existing site land use and building gross floor areas are based upon the information contained within the previous planning proposal Traffic Impact Assessment report for 108-112 & 124 Forest Road, Hurstville by GHD dated July 2014. Existing site conditions have not changed.

This study has been limited by the following:

- The analysis is a desktop study and no site visits have been undertaken.
- The conditions of the surrounding network are based on information either supplied by the traffic surveys and Google Maps / Street View.
- Trip generation rates for both the existing and future developments have been taken from the Transport for NSW Guide to Traffic Generating Developments, 2002 (the “guide”) or, where relevant, the amendment TDT 2013/04a. Where suitable rates are not available in the guide, the Institute of Transportation Engineers (ITE) publication Trip Generation, has been used.

This report and assessment for the proposed development is based on the following architectural drawings (refer to Table 1) produced by Dubbach Block Jaggers Architects and in conjunction with George El Khouri Architect Pty Ltd.

Table 1 Proposal drawing list

Drawing Number	Revision	Issue Date	Title
DA03	2	14/7/2021	Site Plan
DA06	2	14/7/2021	Floor Plan Level 01
DA14	2	14/7/2021	Floor Plan Basement 01
DA15	2	14/7/2021	Floor Plan Basement 02
DA16	2	14/7/2021	Floor Plan Basement 03
DA26	2	14/7/2021	GFA Area Table Sheet 2 of 2

2. Existing conditions

2.1 The site

The subject site is located at 108-124 Forest Road and 1-3 Wright Street, Hurstville. The site forms part of Lot 531 of DP 777334, Lot 1 of DP 75572 and Lot 1, 54 and 55 of DP 78322.

The Local Environmental Plan (LEP) indicates that the site is associated with Business Zones (B2 and B4) and Medium Density Residential Zones (R3), which extends to developments north-east and north-west of the site, respectively.

The existing land uses at the site comprise:

- A small shopping facility comprising of speciality shops on the ground floor, which mainly deals in electronics, and some office and commercial space on the first floor.
- Two independent buildings, one of which is a mechanics, with the other being a metal workshop.
- Two residential lots both providing off-street car parking for the dwellings.

Vehicular access to the shopping facilities is provided from Hudson Street, where there is an at-grade car park with 19 parking spaces and a basement car park with 63 parking spaces (82 spaces in total).

Vehicular access to the metal workshop is provided from Forest Road, with access to the mechanics from Wright Street where there is some informal courtyard parking. The residential lots are accessed via Wright Street.

2.2 Existing road characteristics

This section provides an understanding of the existing road network surrounding the site. The road network hierarchy within the vicinity of the proposed site is represented in Figure 2-1.

2.2.1 Road hierarchy

Roads within NSW are categorised in following two ways:

- By Classification (ownership); and
- By the function that they perform.

Road Classification

Roads are classified (as defined by the *Roads Act 1993*) based on their importance to the movement of people and goods within NSW (as a primary means of communication).

The classification of a road allows Transport for NSW to exercise authority of all or part of the road. Classified roads include Main Roads, State Highways, Tourist Roads, Secondary Roads, Tollways, Freeways and Transitways.

For management purposes, Transport for NSW has three administrative classes of roads. These are:

- **State Roads –** Major arterial links through NSW and within major urban areas. They are the principle traffic carrying roads and fully controlled by Transport for NSW with maintenance fully funded by Transport for NSW . State Roads include all Tollways, Freeways and Transitways; and all or part of a Main Road, Tourist Road or State Highway.
- **Regional Roads** – Roads of secondary importance between State Roads and Local Roads which, with State Roads provide the main connections to and between smaller towns and perform a sub arterial function in major urban areas. Regional roads are the responsibility of councils for maintenance funding, though Transport for NSW funds some maintenance based on traffic and infrastructure. Traffic management on Regional Roads is controlled under the delegations to local

government from Transport for NSW. Regional Roads may be all or part of a Main Road, Secondary Road, Tourist Road or State Highway; or other roads as determined by Transport for NSW.

- **Local Roads** – The remainder of the council controlled roads. Local Roads are the responsibility of councils for maintenance funding. Transport for NSW may fund some maintenance and improvements based on specific programs (e.g. urban bus routes, road safety programs). Traffic management on Local Roads is controlled under the delegations to local government from Transport for NSW.

Functional Hierarchy

Functional road classification involves the relative balance of the mobility and access functions. Transport for NSW define four levels in a typical functional road hierarchy, ranking from high mobility and low accessibility, to high accessibility and low mobility. These road classes are:

- **Arterial Roads** – generally controlled by Transport for NSW , typically no limit in flow and designed to carry vehicles long distance between regional centres.
- **Sub-Arterial Roads** – can be managed by either Transport for NSW or local council. Typically, their operating capacity ranges between 10,000 and 20,000 vehicles per day, and their aim is to carry through traffic between specific areas in a sub region, or provide connectivity from arterial road routes (regional links).
- **Collector Roads** – provide connectivity between local roads and the arterial road network and typically carry between 2,000 and 10,000 vehicles per day.
- **Local Roads** – provide direct access to properties and the collector road system and typically carry between 500 and 4,000 vehicles per day.

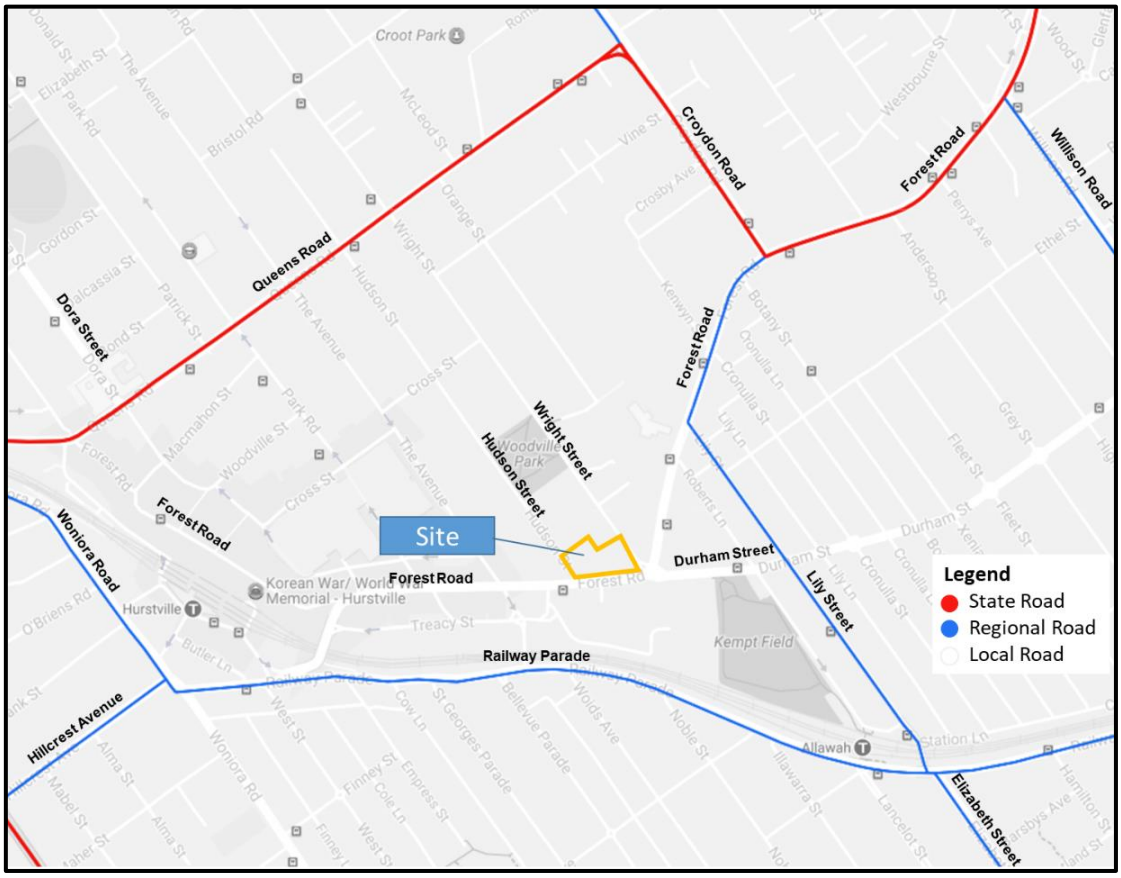


Figure 2-1 Surrounding road network

Source: Transport for NSW maps – Modified by GHD

2.2.2 Forest Road

Forest Road is a key east-west route in Hurstville and forms part of Sydney's regional road system.

Forrest Road (through Hurstville City Centre) has multiple functions, which are shown in Figure 2-2 and have other road classes along the route, including:

- A state road, west of Croydon Road.
- A regional road between Croydon Road and Lily Street.
- A collector road between Lily Street and Queens Road, which includes the proposal site frontage. The primary key features of Forest Road within proximity of the site are outlined in Table 2.

Traffic volumes of up to 1,973 vehicles per hour were reported during peak periods (based on 2020 intersection surveys undertaken by Matrix Traffic and Transport Data, between Hudson and Wright Streets) with Forest Road functioning as a collector road in the vicinity of the proposal site. A photo of Forest Road is shown in Figure 2-2.

Table 2 Forest Road key features

Feature	Description
Carriageway	Comprises of two traffic lanes in each direction, with a divided carriageway from Hudson Street to Durham Street and an undivided carriageway from Hudson Street towards the west.
Parking	On-street parking on both the northern and southern side of Forest Road is provided with the following restrictions: 1P (Mon – Fri 9:30 am – 6:00 pm & Sat 8:30 am – 12:30 pm)
Speed Limit	60 km/h
Pedestrian Facilities	Footpaths are provided on both sides of Forest Road
Bicycle Facilities	No dedicated facilities
Public Transport	Bus stops are located on both sides of Forest Road, approximately 30 m to the west of the proposal site.

Figure 2-2 Forest Road viewed westward from Durham Street

Source: Google maps Streetview

2.2.3 Hudson Street

Hudson Street is a local road that provides a connection between Forest Road to the south and Queens Road to the north. Hudson Street generally provides access to residential land uses, although some commercial and light industrial uses are located at its southern end, near Forest Road. A photo of Hudson Street is shown in Figure 2-3, with a summary of the key features of this street provided in Table 3.

Table 3 Hudson Street key features

Feature	Description
Carriageway	Comprises of an undivided carriageway with one traffic lane each in each direction
Parking	On-street parking on both sides of the street is provided with the following restrictions: 1P (Mon – Fri 8:30 am – 6:00 pm & Sat 8:30 am – 12:30 pm)
Speed Limit	50 km/h
Pedestrian Facilities	Footpaths are provided on both sides of Hudson Street. Raised pedestrian marked foot crossing is located approximately 50 m north of Forest Road
Bicycle Facilities	No dedicated facilities
Public Transport	No dedicated facilities

Figure 2-3 Hudson Street viewed northwards from Forest Road (west of the site)

Source: Google maps Streetview

2.2.4 Wright Street

Wright Street functions as a local road, with one traffic lane provided in each direction. Land uses along Wright Street are generally residential, with some commercial and light industrial land uses near the intersection with Forest Road.

Wright Street provides north-south access between Forest Road and Queens Road. A photo of Wright Street is shown in Figure 2-4, with a summary of the key features of this street provided in Table 4.

Table 4 Wright Street key features

Feature	Description
Carriageway	Undivided carriageway with one traffic lane in each direction
Parking	Unrestricted on-street parking provided on both sides of the street
Speed Limit	50 km/h (40 km/h School Speed Zone)
Pedestrian Facilities	Footpaths are provided on both sides of Wright Street
Bicycle Facilities	No dedicated facilities
Public Transport	No dedicated facilities

Figure 2-4 Wright Street looking north from Forest Road (east of the site)

Source: Google maps Streetview

2.3 Existing traffic volumes

2.3.1 Existing peak hour traffic volumes

GHD engaged Matrix Traffic and Transport Data to undertake intersection traffic turning counts on Tuesday 1 June 2021 between 6:30 am – 9:30 am to cover the AM peak and 2:30 pm – 6:30 pm to cover the PM peak. The times were adopted to capture the road network peak and school peak periods.

The traffic counts were undertaken at the following intersections, which are shown in Figure 2-5:

- Forest Road and Hudson Street.
- Forest Road, Wright Street and Durham Street.

Figure 2-5 Traffic survey locations

Source: Google maps – Modified by GHD

The intersection surveys indicated the following road network peak periods along Forest Road as follows:

- AM peak hour: 8:00 am to 9:00 am.
- PM peak hour 3:15 pm to 4:15 pm.

It should be noted that the AM road network peak includes the school peak period between 8:00 am and 9:00 pm. Additionally, the PM road network peak period coincides with the end of the likely school peak between 2:30 pm and 3:30 pm. The road network PM peak indicates higher traffic flows than the school peak period. Notwithstanding this, the peak has been adopted as follows:

- PM School peak hour: 2: 30 pm to 3:30 pm

A summary of the average peak hour traffic volumes along Forest Road between Hudson Street and Wright Street, based upon the intersection survey data, is provided in Table 5.

Table 5 Forest Road survey traffic volumes

Location	Direction	AM Peak Hour (veh/h)*	PM Peak Hour (veh/h)*	School PM Peak Hour (veh/h)*
Forest Road	Eastbound	1,067	901	898
	Westbound	786	1,106	912
	Total	**1,853**	**2,007**	**1,810**

Notes:
(*) veh/h = vehicles per hour

2.3.2 Heavy and light vehicle ratio

Based on the traffic survey data, the average heavy vehicle percentage for Forest Road is outlined below:

- AM Peak average: 3.1 percent heavy vehicles.
- PM Peak average: 2.6 percent heavy vehicles.

2.4 Existing intersection performance

2.4.1 Intersection capacity

The performance of the existing road network is largely dependent on the operating performance of key intersections, which are critical capacity control points on the road network. SIDRA intersection modelling software was used to assess the proposed peak hour operating performance of intersections on the surrounding road network.

The criteria for evaluating the operational performance of intersections, is provided by the Guide to Traffic Generating Developments (Transport for NSW, 2002) and reproduced in Table 6. The criteria for evaluating the operational performance of intersections is based on a qualitative measure (i.e. Level of Service), which is applied to each band of average vehicle delay.

Table 6 Level of service criteria for intersections

Level of Service	Average Delay per Vehicle (seconds/veh)	Traffic Signals, Roundabouts	Give Way & Stop Signs
A	< 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays & spare capacity	Acceptable delays & spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity & accident study required
E	57 to 70	At capacity; at signals, incidents will cause excessive delays Roundabouts require other control modes	At capacity, requires other control mode
F	> 70	Over Capacity Unstable operation	Over Capacity Unstable operation

Source: Guide to Traffic Generating Developments (Transport for NSW 2002)

2.4.2 Existing intersection performance

The surveyed weekday AM, PM and PM School peak hour traffic flow (as shown in Figure 2-6, Figure 2-7 and Figure 2-8), were analysed using SIDRA 8 to assess the current intersection performance.

A summary of the SIDRA results is provided in Table 7, with the SIDRA outputs provided in Appendix A.

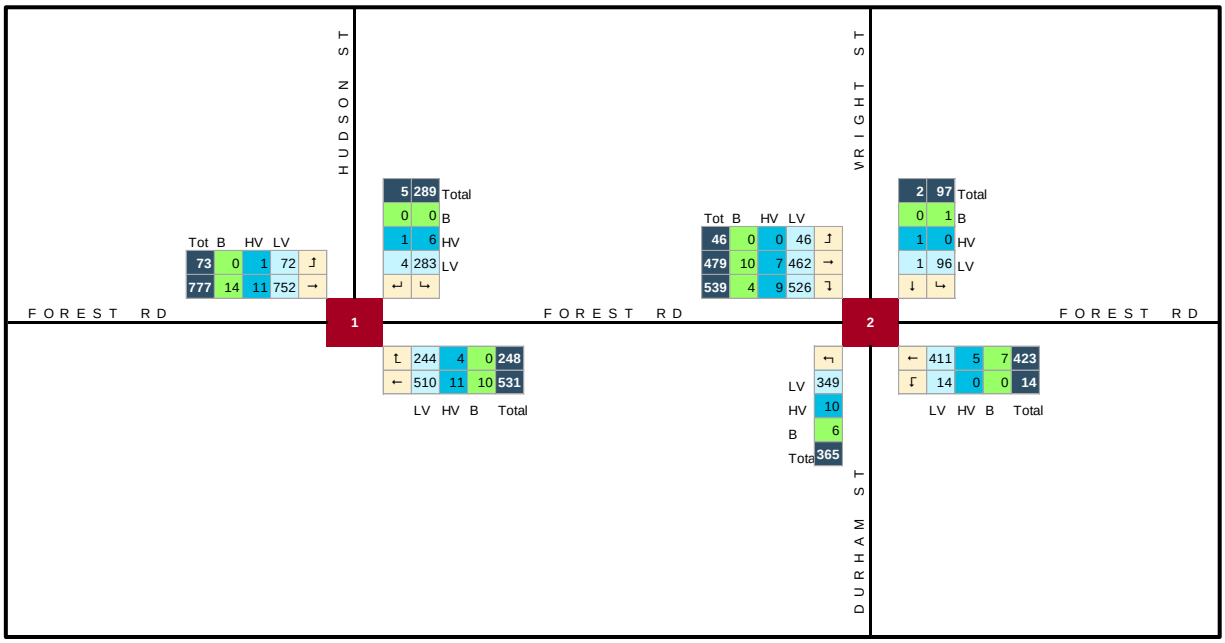


Figure 2-6 Existing (2021) AM peak hour traffic flows

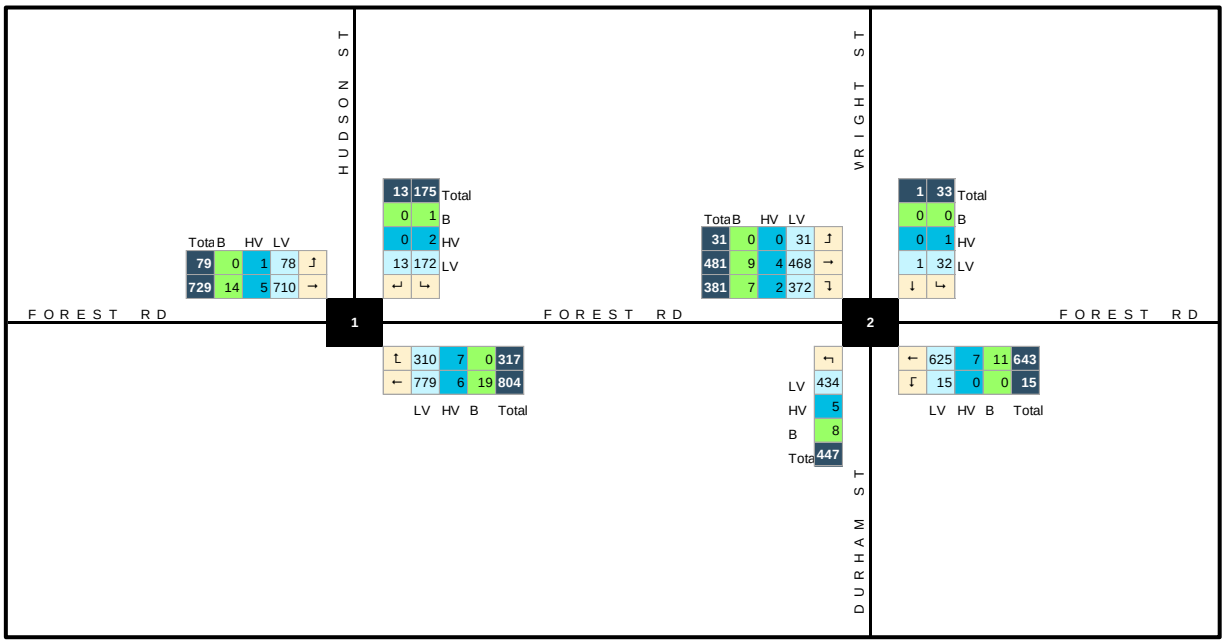


Figure 2-7 Existing (2021) PM peak hour traffic flows

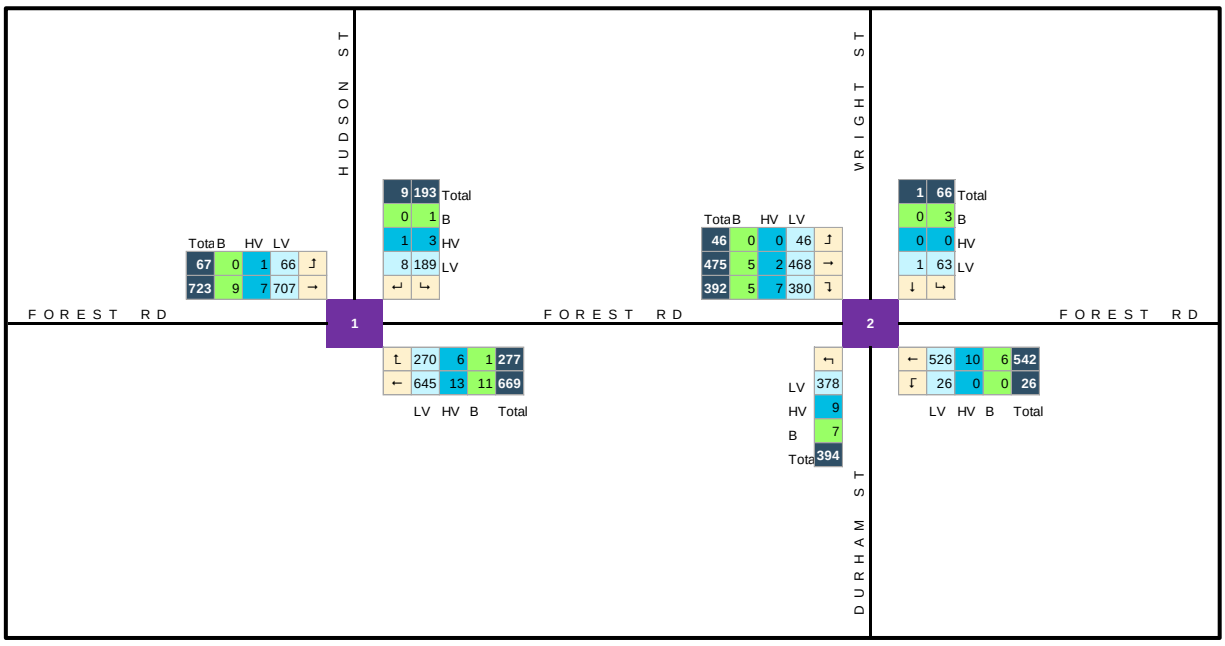


Figure 2-8 Existing (2021) School PM peak hour traffic flows

Table 7 Existing intersection operations (2021)

Intersection		AM Peak			PM Peak			School Peak		
	Control Type	Average Delay (s)	LoS	DoS	Average Delay (s)	LoS	DoS	Average Delay (s)	LoS	DoS
Forest Road / Hudson Street	Give Way	61.7	E	0.44	117.6	F	0.53	74.8	F	0.46
Forest Road / Wright Street / Durham Street	Give Way	9.4	A	0.58	11.1	A	0.53	9.8	A	0.49

Notes:

a) The average delay for priority-controlled intersections is selected from the movement on the approach with the highest average delay.

b) The level of service (LoS) for priority-controlled intersections is based on the highest average delay per vehicle for the most critical movement.

c) The degree of saturation(DoS) is defined as the ratio of the arrival flow (demand) to the capacity of each approach.

d) The average delay is given in seconds per vehicle.

The SIDRA modelling results indicate that the assessed intersections both currently operate with an acceptable Level of Service (i.e. better than Level of Service E). Noting however, The highest average delay identified for the Forest Road/Hudson Street intersection (117 seconds) is associated with the right turn from Hudson Street into Forest Road (worst delay movement) during the PM peak. This movement consisted of 13 vehicles of the 188 vehicles from Hudson Street and 2117 vehicles through the entire intersection, indicating that this delay is only for a minor quantity of vehicles, with all remaining turn movements operating at an acceptable level of service. Refer to Appendix A.

2.5 Existing development traffic generation

Traffic surveys have not been carried out at the existing site access points. In order to determine the amount of traffic currently generated by the side in the peak periods, a trip generation assessment has been undertaken using trip rates in published guidelines. This is shown in Table 8.

Trip rates have been based on the *Transport for NSW Guidelines to Traffic Generating Developments, 2002 (The Guide)* or, where relevant, the amendment *TDT 2013/04a Updated Traffic Surveys (2013)* and the reference is given in the table. Where suitable rates are not available in the guide, the ITE

publication *Trip Generation* has been used and the land use type used is given in the table. (Note that trip rates in the ITE guide are per 1,000 square feet. This has been converted to 100 square metres).

Generally, the Transport for NSW guide provides PM peak hour trip rates only. Therefore, the rates in Table 8 are PM peak trip rates.

Table 8 Existing development traffic generation

Land use	Unit Area	Trip Generation Rates	Trips generated	Source
Retail	1910 m^2	5.6 trips per 100 m^2	107	Transport for NSW Guide s3.6.1
Commercial	1976 m^2	2 trips per 100 m^2	40	Transport for NSW Guide s3.5
Mechanics	350 m^2	3.65 trips per 100 m^2	13	ITE 942
Metal workshop	550 m^2	1 trip per 100 m^2	6	Transport for NSW Guide s3.10.1
Residential	2 dwellings	0.99 trips per dwelling*	2	Transport for NSW Guide TDT 2013/04a
Total			**168**	

*Note: * Based on low density residential*

Figure 2-9 Existing site access points

Source: Google maps – Modified by GHD

Based on the trip rates in the referenced guides, the existing development generates approximately 168 trips in the PM peak hour.

It should be noted that the traffic analysis did not remove the trip generation of the existing land uses on the subject site. This is considered a conservative analysis approach as such, existing trip generation will no longer be within the future road network upcoming completion of the proposed development.

2.6 Existing on-site parking arrangement

As outline in Section 2.1, vehicle access to the shopping centre development at the site is currently provided from Hudson Street, where there is an at-grade car park with 19 parking spaces and a basement car park with 63 parking spaces (82 spaces in total). Access to the metal working shop is from Forest Road and access to the mechanics is from Wright Street, where there is some informal courtyard parking. The residential lots on Wright Street provide off-street car parking facilities for individual dwellings.

Figure 2-10 Current parking areas

Source: Google maps – Modified by GHD

2.7 Crash data review

A review of crash data provided from the Transport for NSW Centre for Road Safety website has been undertaken. This has been based on a five-year period (2015-2019) for roads within the vicinity of the development and is illustrated in Figure 2-11, resulting in minor, moderate, serious injuries or fatality.

A summary of the five-year crash data is summarised in Table 9.

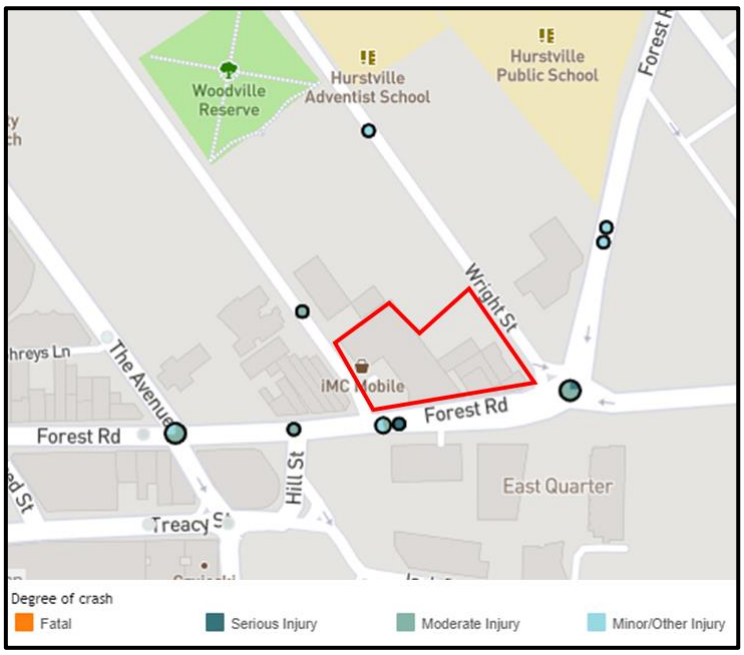


Figure 2-11 Crash locations

Source: Transport for NSW Centre for Road Safety website – *Modified by GHD*

Table 9 Summary of crash data (2015-2019)

Location	Number of crashes				
	Fatal	Serious Injury	Moderate Injury	Minor Injury	Total
Forest Road / The Avenue	0	4	0	0	4
Forest Road (between The Avenue and Hudson Street)	0	0	1	0	1
Hudson Street	0	0	1	0	1
Forest Road / Hudson Street intersection	0	1	1	1	3
Forest Road / Wright Street / Durham Street	0	3	1	0	4
Wright Street	0	0	0	1	1
Forest Road (east of Wright Street)	0	0	0	2	2
Total	**0**	**8**	**4**	**4**	**16**

A summary of the predominant crash types recorded on Forest Road at intersections in the vicinity of the site is shown in Table 10.

Table 10 Predominant crash types at intersections (2015-2019)

Intersection	Predominant crash type (number of crashes)
Forest Road / Durham Street / Wright Street intersection	Right through (2) Off right/right bend (1) Off left/right bend into an object (1)
Forest Road / Hudson Street intersection	Right through (1) Right near (1) Ped far side (1)
Forest Road / The Avenue intersection	Rear end (2) Left rear (1) Cross traffic (1)

2.8 Public transport and active transport

In reviewing the site and its accessibility to public transport opportunity, reference is made to the *NSW Planning Guidelines for Walking and Cycling (2004)*. This document outlines a recommended walkable distance of 400 m to 800 m to public transport and other local amenities or around 1.5 km bicycle riding distance.

Details of the accessibility to public transport, walking and bicycle riding access is provided in the following sections.

2.8.1 Walking access

The pedestrian network is reasonably well developed, with footpaths provided on both sides of all roads in the vicinity of the subject site. However, there are no formalised crossing facilities currently provided across Forest Road in the vicinity of the site, with the exception of at The Avenue and Lily Street (some 230 m west and north of the site. A pedestrian refuge island and kerb ramps are provided on the approach of Durham Street with the intersection of Forest Road. Kerb ramps are provided on the approach of Wright Street with the intersection of Forest Road. A central splitter island with kerb ramps is provided on the approach of Hudson Street with the intersection of Forest Road, which could provide short term refuge for pedestrians.

Additionally, a raised mark pedestrian foot crossing is located on Hudson Street, approximately 50 m north of Forest Road

2.8.2 Bus services

The nearest bus stops to the site are located approximately 30 m west of the site on Forest Road, west of the intersection with Hudson Street. An additional bus stop is located approximately 100 m to the northeast of the site. A summary of the bus services operating from these bus stops is provided in Table 11, with the location of the bus stops and routes shown in Figure 2-12 and Figure 2-13, respectively.

These bus stops are considered to be within a suitable walking distance (400 m) from the proposal site.

Table 11 Bus services

Route	Route description	Frequency
452	Beverly Hills – Rockdale	Weekday: Approx. 20 minute intervals Saturday: Approx. 30 minute intervals Sunday: Approx. 60 minute intervals
455	Kingsgrove – Kogarah	Weekday: Approx. 30 minute intervals Saturday: Approx. 40 minute intervals Sunday: Approx. 60 minute intervals
947	Hurstville – Kogarah	Weekday: Approx. 20-30 minute intervals Saturday: Approx. 40 minute intervals Sunday: Approx. 40 minute intervals

Figure 2-12 Location of bus stops

Source: Google maps – Modified by GHD

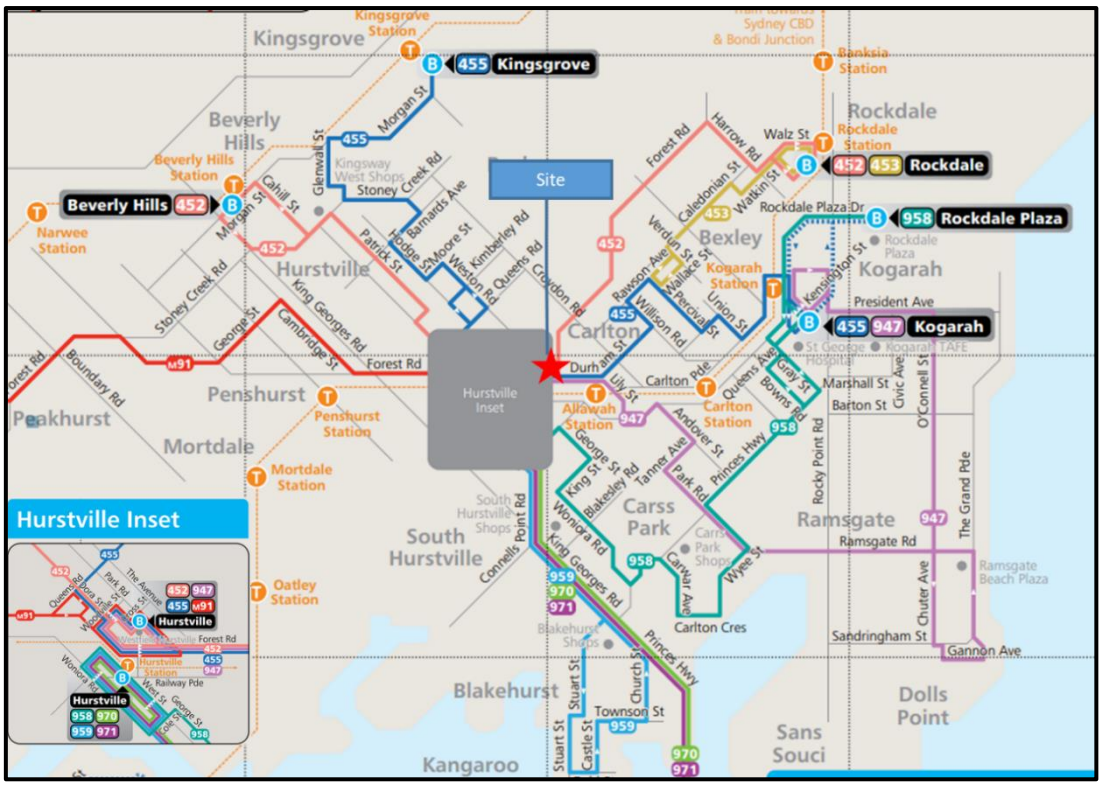


Figure 2-13 Bus routes

Source: Transport for New South Wales – Modified by GHD

2.8.3 Train services

There are two train stations within the vicinity of the proposal site. Hurstville Station is located approximately 650 m west of the site, while Allawah Station is located approximately 650 m southeast of the site (refer to Figure 2-14).

Both train stations are serviced by the T4 Eastern Suburbs and Illawarra Line and the South Coast Line, providing regular service to the Sydney CBD, Cronulla and the south coast, as illustrated in Figure 2-14. Access to the train services is considered to be within a suitable walking distance (800 m) from the proposal site.

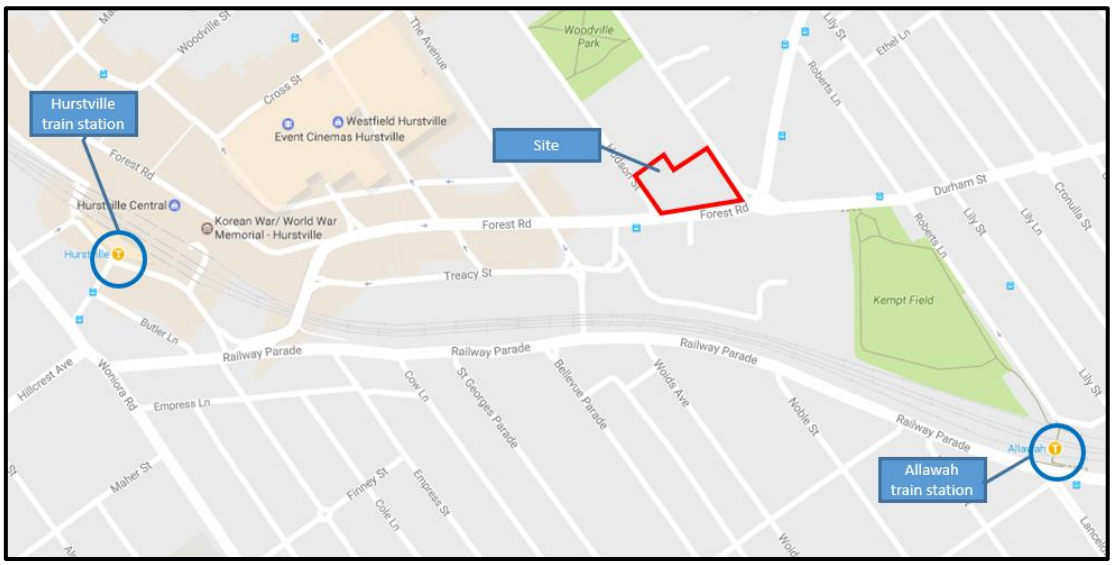


Figure 2-14 Location of Hurstville train station

Source: Google maps – Modified by GHD

Figure 2-15 Sydney rail network

Source: Transport for New South Wales – Modified by GHD

2.8.4 Bicycle access

The existing bicycle routes within the vicinity of the proposed development are shown in Figure 2-16, as identified from the Transport for NSW Cycleway Finder website.

As shown, there are currently limited off-road bicycle routes within close proximity to the site, with no designated bicycle paths or routes adjacent to the site.

There is no formal bicycle parking currently provided at the proposal site.

Figure 2-16 Existing cycle network

Source: Transport for NSW Centre Cycleway Finder – Modified by GHD

2.8.5 Car share

Georges River Council supports car sharing because it is sustainable by filling a “mobility gap” with city business owners and residents. Car sharing will support the following opportunities:

- Use street parking more efficiently.
- Reduce greenhouse emissions.
- Support the economy.
- Reduce congestion.
- Reduce the growth of private vehicle ownership.

It was noted that there are three existing car share pods (*Source: Go-Get.com.au*) located within 800 m radius from the site and an additional three pods just outside this walking distance adopted radius (as shown in Figure 2-17), providing an opportunity for residents and visitors of the proposed development to utilise this alternative transport option.

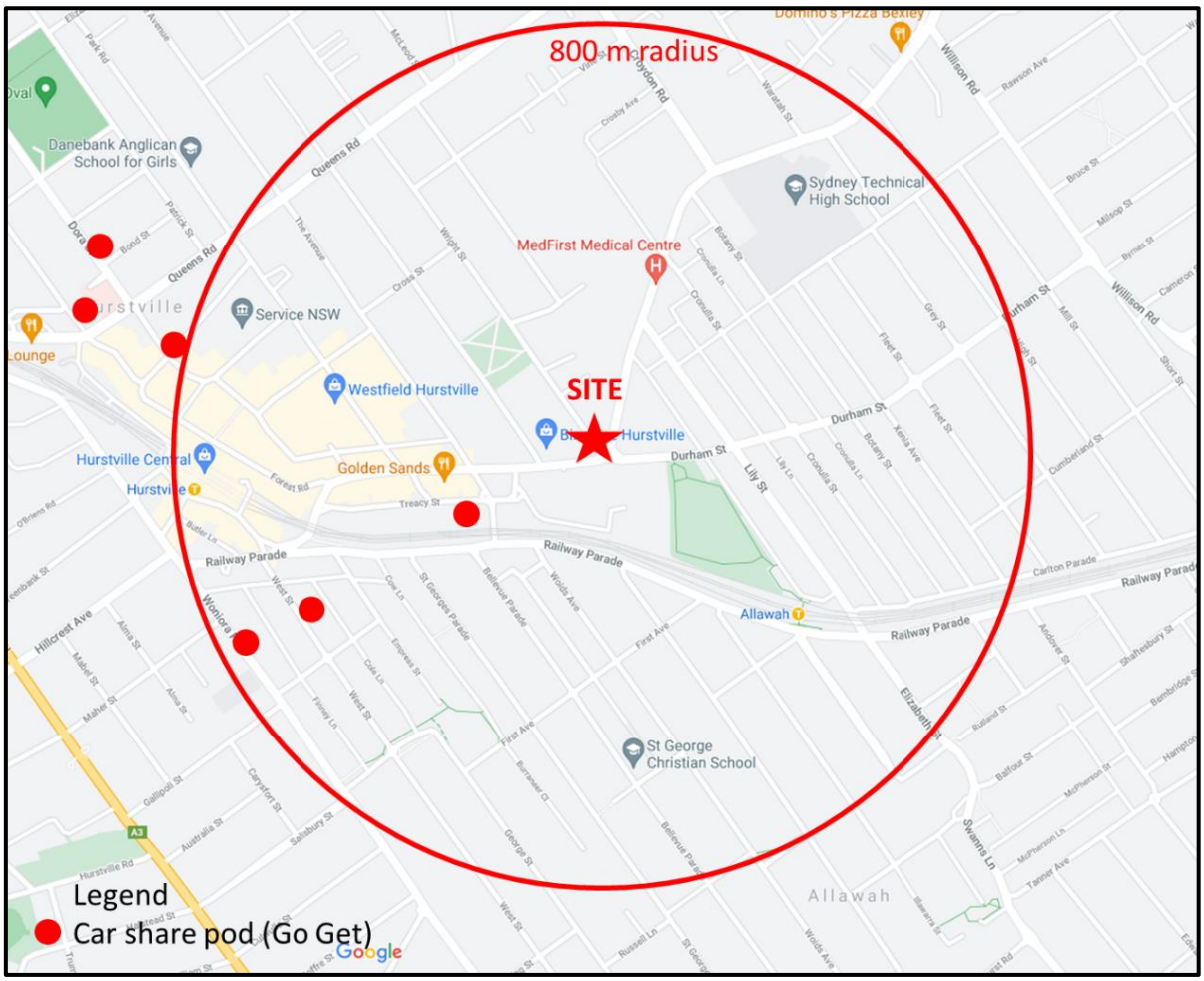


Figure 2-17 Car share locations

Source: Google maps – Modified by GHD (Car share pods source "Go Get")

3. Traffic impact assessment

This section outlines the proposed development and summarises the traffic and parking impact analysis of the development.

3.1 Overview of the proposed development

The proposal for the site would provide a mixed-use development, consisting of retail shops on the ground floor and 13 levels of residential apartments. Basement car parking is proposed for the use of residents with entry and exit via Hudson Street for basement level two and three and visitors and retail patrons on basement one via Wright Street.

A loading dock is proposed, which would accommodate vehicles up to 10.5 m in length (council waste collection vehicle), with the use of a mechanical turntable to provided access and egress in a forward direction on Hudson Street.

A summary of the proposed development is provided in Table 12.

Table 12 Land uses within the proposed development

Land use	Provision
Residential	213 apartments comprising of: 54 one-bed apartments 128 two-bed apartments 31 three-bed apartments (Total 403 bedrooms)
Retail	2,701 m2 GFA
Car parking	Residential: 198 spaces (including 21 accessible parking spaces) Residential Visitor: 31 spaces Retail: 54 spaces (including 2 accessible parking spaces)
Bicycle parking	28 spaces (racks) (publicly accessible area – Basement 1) 214 residential storage cages
Motorcycle parking	16 spaces (publicly accessible area – Basement 1) 6 spaces (residential parking area – Basement 2)

3.2 Proposal traffic generation

An indication of the potential traffic generation from the proposed development has been derived based on trip rates in the *Transport for NSW Guide to Traffic Generating Developments (2002) (the "guide").* As for the existing development, the guide generally provides PM peak trip rates. As such, this analysis identifies the PM peak trip generation for the proposed development, as shown in Table 13.

Table 13 Potential traffic generation

Land use	Area (m2)	Trip rate	Trips generated	Source
Residential	403 bedrooms	AM Peak: 0.09 trips per bedroom	36	Transport for NSW TDT 2013/04a
		PM Peak: 0.07 trips per bedroom	28	
Retail	2,701 m^2 GFA 2,025 m^2 GLFA*	AM Peak: No rate available	N/A	Transport for NSW TDT 2013/04a
		PM Peak 12.3 per 100 m^2 GLFA	249	

(*) GLFA = 0.75 x GFA (Guide to Traffic Generating Developments, Section 3.6.1)

This analysis indicates that the proposed development will generate up to 277 trips in the PM peak period based on the reference documentation. For the AM peak, trip generation will primarily be as a result of residential traffic with minimal traffic movement associated with the proposed retail component, which will predominately be associated with staff arrivals. For assessment purposes, an assumption of 25 percent of the PM retail peak has been adopted for the AM period to account for staff movements and lower arrival/departure rates for visitors to the retail component.

The trip generation guidelines do not provide advice on the trip generation of residential and retail development during school periods. For this assessment, it has been assumed that during PM school peak period, the trip generation of for the residential component of the proposed development will align with typical PM peak trip generation, and the retail component will align with 50 percent of the typical PM peak trip generation.

The arrival and departure of the patterns will vary during the AM, PM and PM School peak periods. Therefore, the assumed distribution of trip generation associated with the development during these peak periods is summarised in Table 14.

It should also be noted that the adopted rate for trip generation of the retail component is considered conservative, as the rates are based on Transport for *NSW TDT 2013/04a Guide to Traffic Generating Developments Updated Surveys* for “Shopping Centres”. Such developments will produce higher trip generation that “street front” retail of a mixed use development, which typically supports the residents within the subject development or nearby local area, when compared to shopping centres that typically contain high trade stores such as supermarkets or larger fast trade specialty stores.

3.2.1 Development traffic distribution

Traffic to and from the proposed development has been distributed on the surrounding road network using the following assumptions for the weekday AM, PM and PM School peak periods, as summarised in Table 14.

Trip generation for the residential component will access the site via Hudson Street, aligning with the development’s residential parking access. Trip generation for the retail component will access the site via Wright Street, aligning with the development’s retail parking access.

With consideration given that access from Forest Road is restricted by the existing no right turn westbound into and out of Wright Street (which retail the development’s retail access) and the retail component would also service other developments within the general proximity of the site from various directions, the bi-direction flow from Forest Road (determined by the 2021 traffic surveys) was used as a guide to estimate the potential percentage of retail development’s trip generation arrival and departure directly from Forest Road. Review of the AM, PM and PM School peak through traffic flow ratio along Forest Road ranged between 40 percent to 60 percent during these peak periods. Based on this and an estimated worst case perspective, the ratio of 60 percent of the retail trip generation was adopted to utilise the Forest Road/Wright Street intersection to access the site, for assessment purposes.

The residential trip generation was applied to Hudson Street to align with the site access conditions.

A summary of the development trip generation traffic volumes on the surrounding road network traffic for weekday AM, PM and School PM peak periods are summarised in

Table 15, while the development trip generation traffic volumes utilising the Forest Road access and egress is summarised in Table 16. Post development road network trip volumes (based on 2021 traffic surveys and distributed development trip generation) are shown in Figure 3-1, Figure 3-2 and Figure 3-3, respectively.

It should be noted that the traffic analysis did not remove the trip generation of the existing land uses on the subject site as described in section 2.5. This is considered a conservative analysis approach as

such existing trip generation will no longer be within the future road network upcoming completion of the proposed development.

Table 14 Future development peak hour trip distribution factors (inbound and outbound)

Land use	AM peak		PM peak		School PM peak	
	In	Out	In	Out	In	Out
Residential	20%	80%	70%	30%	70%	30%
Retail	90%	10%	30%	70%	30%	70%

Table 15 Future development peak hour trip distribution volumes

Land use	AM peak			PM peak			School PM peak		
	In	Out	Total	In	Out	Total	In	Out	Total
Residential	7	29	**36**	20	8	**28**	20	8	**28**
Retail	56	6	**62**	75	174	**249**	37	87	**124**
	63	**35**	**98**	**95**	**182**	**277**	**57**	**95**	**152**

Table 16 Future development peak hour trip distribution volumes: (to/from Forest Road)

Land use	AM peak			PM peak			School PM peak		
	In	Out	Total	In	Out	Total	In	Out	Total
Residential	7	29	**36**	20	8	**28**	20	8	**28**
Retail *	34	4	**38**	45	104	**149**	22	52	**74**
	41	**23**	**74**	**65**	**112**	**253**	**42**	**60**	**102**

(*) 60 percent of the retail trip generation assumed to utilise Forest Road for access/egress to the site

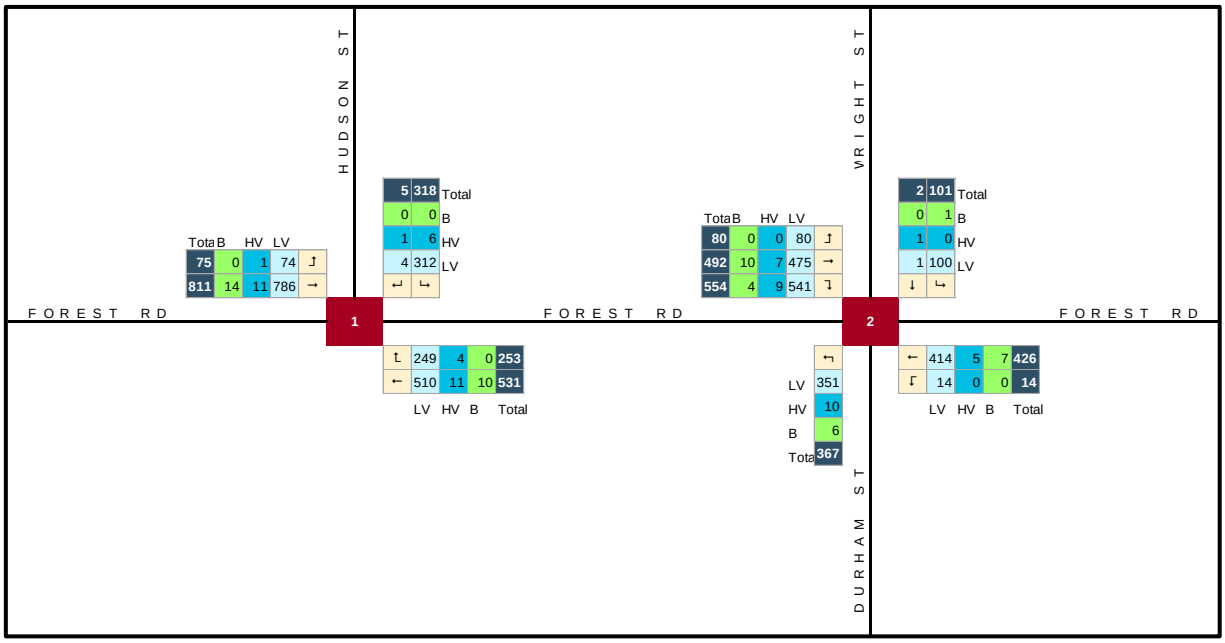


Figure 3-1 Post Development AM peak hour trip distribution

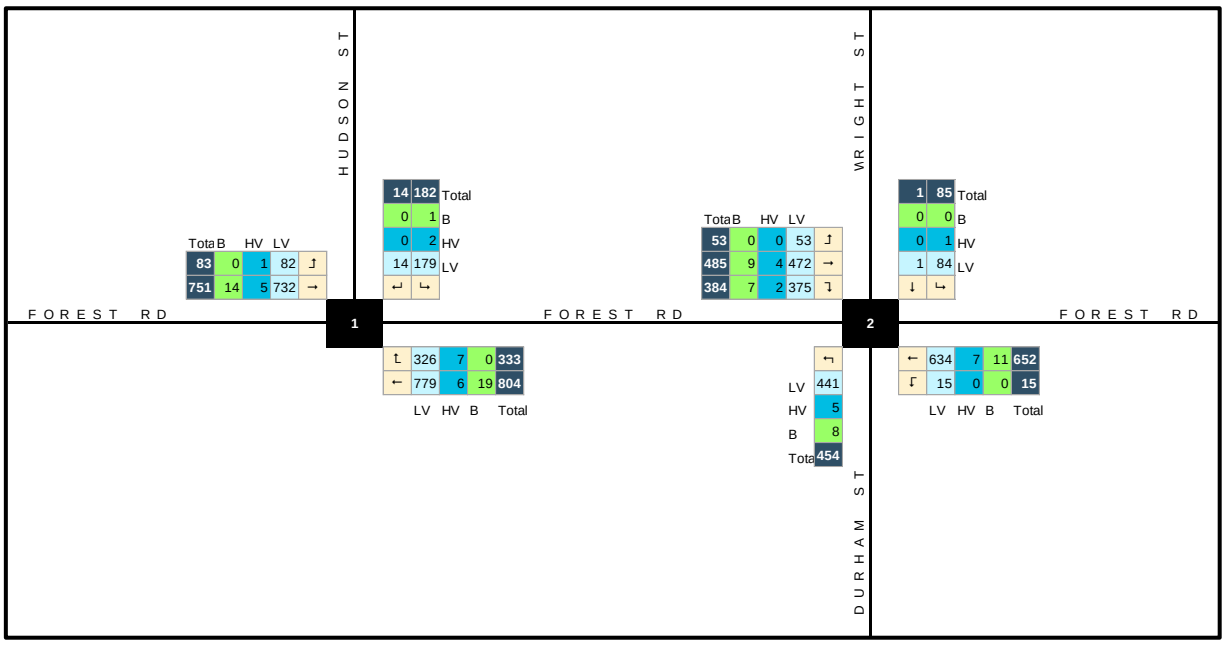


Figure 3-2 Post Development PM peak hour trip distribution

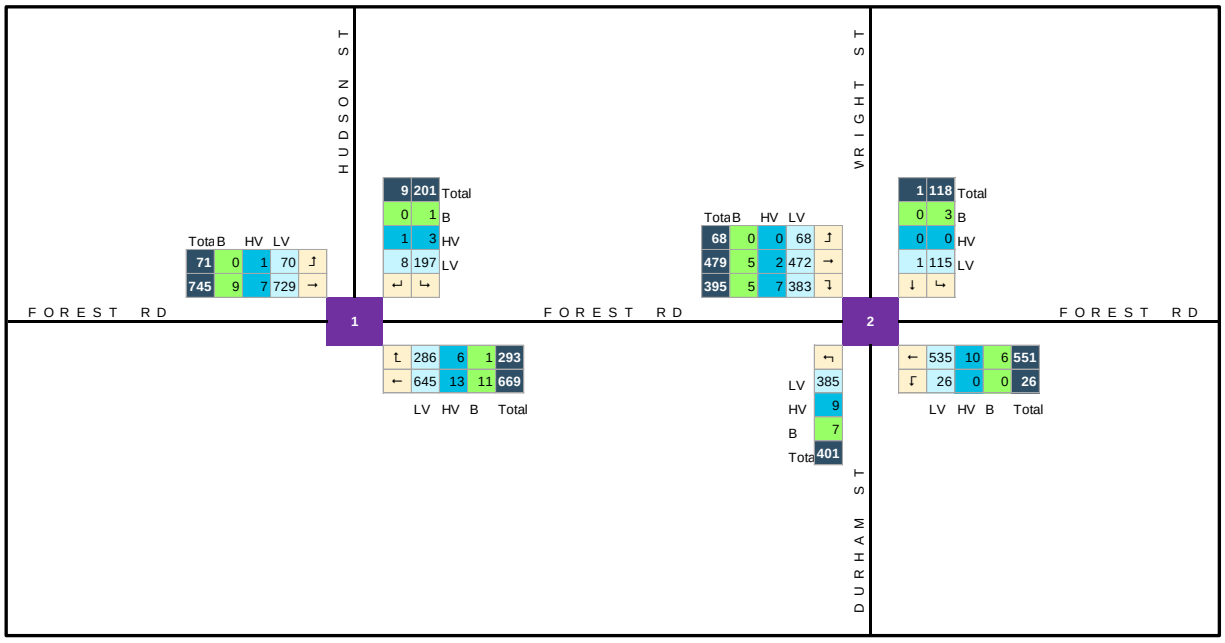


Figure 3-3 Post Development School PM peak hour trip distribution

3.3 Intersection performance

The performance of the road network is largely dependent on the operating performance of key intersections, which are critical capacity control points on the road network. SIDRA 8 intersection modelling software was used to assess the proposed peak hour operating performance of intersections on the surrounding road network. The criteria for evaluating the operational performance of intersections is provided by the Guide to Traffic Generating Developments (Transport for NSW, 2002) and reproduced in Table 6. The criteria for evaluating the operational performance of intersections is based on a qualitative measure (i.e. Level of Service), which is applied to each band of average vehicle delay.

3.3.1 2021 post-development scenario (existing intersection layout)

The post-development traffic volumes incorporating base 2021 traffic volumes at the existing intersections were analysed using SIDRA 8 to obtain the proposed operational performance as summarised in Table 17 with detailed results in Appendix A.

As previously noted, the traffic analysis did not remove the trip generation of the existing land uses on the subject site, as described in section 2.5. This is considered a conservative analysis approach as such, existing trip generation will no longer be within the future road network upcoming completion of the proposed development.

Table 17 Intersection operations (2021) – Post-development (existing intersection layout)

Intersection		AM Peak			PM Peak			School Peak		
	Control Type	Average Delay (s)	LoS	DoS	Average Delay (s)	LoS	DoS	Average Delay (s)	LoS	DoS
Forest Road / Hudson Street	Give Way	67.7	E	0.48	134.9	F	0.58	81.8	F	0.50
Forest Road / Wright Street / Durham Street	Give Way	9.7	A	0.60	11.4	A	0.54	10.0	A	0.50

Notes:
a) The average delay for priority-controlled intersections is selected from the movement on the approach with the highest average delay.
b) The level of service for priority-controlled intersections is based on the highest average delay per vehicle for the most critical movement.
c) The degree of saturation is defined as the ratio of the arrival flow (demand) to the capacity of each approach.
d) The average delay is given in seconds per vehicle.

The SIDRA modelling results indicate that the assessed intersections both currently operate with an acceptable Level of Service (i.e. better than Level of Service E). Noting however, the highest average delay identified for the Forest Road/Hudson Street intersection (135 seconds), is associated with the right turn from Hudson Street into Forest Road (worst delay movement) during the PM peak. This movement consisted of 14 vehicles of the 196 vehicles from Hudson Street and 2167 vehicles through the entire intersection, indicating that this delay is only for a minor quantity of vehicles, with all remaining turn movements operating at an acceptable level of service (Level of Service A). Refer to Appendix A.

When comparing post development intersection operations to the existing conditions intersection operations (refer to Table 7), the assessment indicates that the intersections remain at comparable operational level of service in existing and post development scenarios during the AM, PM and School peak periods. The primary turn movements of vehicles from Forest Road remain at an acceptable Level of Service (Level of Service A).

3.3.2 2021 post-development scenario (alternate geometric layout): Forest Road / Wright Street / Durham Street intersection)

Transport for NSW in conjunction with the council, propose to upgrade the intersection of Forest Road / Wrights Street / Durham Street to signalised arrangement as shown in Figure 3-4. This intersection upgrade is primarily to provide pedestrian crossing facilities across Forest Road, which is currently limited under the existing configuration, with closet crossing locations at The Avenue (approximately 230 m west) and Lily Street (approximately 230 m north).

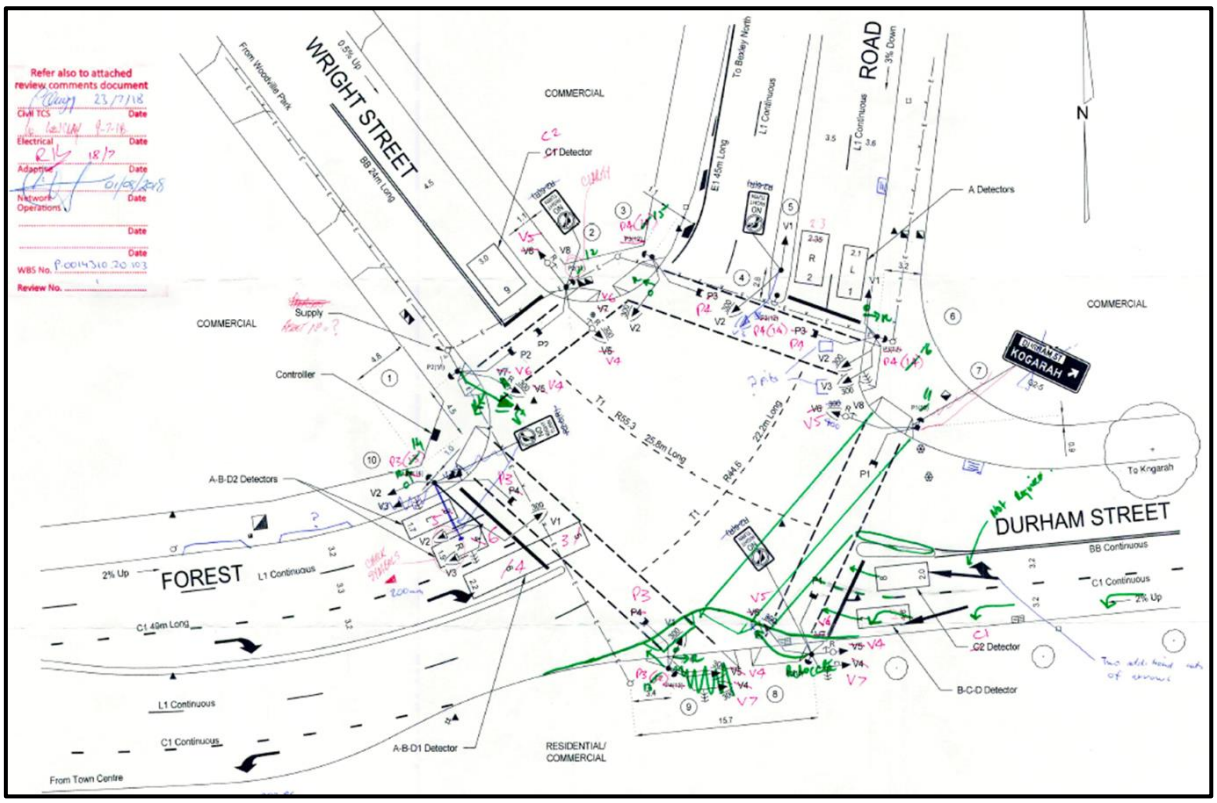


Figure 3-4 Forest Road / Wright Road /Durham Street: TCS Plan

Source: Transport for NSW

Under the signalised configuration, the existing right turn bans on Durham Street onto Forest Road will be removed and replaced with signal control filter turns. Wrights Street right turn ban onto Forest Road, along with the right turn ban from Forest Road into Wrights Street, remain unchanged under future conditions. Through traffic, movements will be permitted between Wright and Durham Street under the signal control layout.

Notwithstanding this, for a comparative assessment, the assumed distribution and turn movements at the intersection of Forest Road / Wrights Road / Durham Street has been based on the post development trip generation scenarios (refer to section 3.2) and distribution assumptions (refer to section 3.2.1).

The assessment was undertaken based on distributed 2021 traffic volumes and post-development traffic volumes at the intersections were analysed using SIDRA 8 to obtain the potential operational performance as summarised in Table 18 and detailed results in Appendix A.

As noted previously, the traffic analysis did not remove the trip generation of the existing land uses on the subject site as described in section 2.5. This is considered a conservative analysis approach as such, existing trip generation will no longer be within the future road network upcoming completion of the proposed development.

Table 18 Intersection operations (2021) – Post-development (alternate geometric layout: Forest Road / Wright Street / Durham Road intersection)

Intersection		AM Peak			PM Peak			School Peak		
	Control Type	Average Delay (s)	LoS	DoS	Average Delay (s)	LoS	DoS	Average Delay (s)	LoS	DoS
Forest Road / Hudson Street	Give Way	45.9	E	0.45	70.7	F	0.55	51.9	F	0.48
Forest Road / Wright Street / Durham Street	Signal	20.1	C	0.64	19.7	C	0.49	20.0	C	0.48

Notes:
a) The average delay for priority-controlled intersections is selected from the movement on the approach with the highest average delay.
b) The level of service for priority-controlled intersections is based on the highest average delay per vehicle for the most critical movement.
c) The degree of saturation is defined as the ratio of the arrival flow (demand) to the capacity of each approach.
d) The average delay is given in seconds per vehicle.

The SIDRA modelling results indicate that the assessed intersections both currently operate within an acceptable Level of Service (i.e. better than Level of Service E). Noting however, the highest average delay identified for the Forest Road/Hudson Street intersection (70 seconds), is associated with the right turn from Hudson Street into Forest Road (worst delay movement) during the PM peak. This movement consisted of 14 vehicles of the 196 vehicles from Hudson Street and 2167 vehicles through the entire intersection, indicating that this delay is only for a minor quantity of vehicles, with all remaining turn movements operating at an acceptable level of service (Level of Service A). Refer to Appendix A.

When comparing post development intersection operations between the existing priority control (give way) configuration and the signalised configuration of Forest Road / Wright Street / Durham Street intersection, it was identified that additional delays occurred under the signalised configuration. This is to be expected when considering that the major road (Forest Road) is free flowing under the existing configuration, and the minor roads (Wright Street and Durham Street) are left turn only into the adjacent lane. Implementation of signals would reduce the free flowing of vehicles, however, it has the positive attribute to provide pedestrian access across all approaches, including Forest Road, which is the key object of signalising the intersection. Notwithstanding this, Forest Road / Wright Street / Durham Street intersection performs within an acceptable level of service (Level of Service C).

Additionally, it is noted that the introduction of the signals at Forest Road / Wright Street / Durham Street, provided the opportunity for additional gaps in traffic flow at the Forest Road/Hudson Street intersection, as a result of phase transition periods. This reduced the delays from Hudson Street for the post development scenario.

3.4 Construction activity traffic management

3.4.1 Construction traffic management objective

A Construction Traffic Management Plan (CTMP) will need to be prepared prior to the commencement of works with site induction for construction personnel being undertaken to outline the requirements of the CTMP. The aim of the CTMP is to maintain the safety of all workers and road users within the vicinity site and the following are the primary objectives:

- To minimise the impact of the construction vehicle traffic on the overall operation of the road network.

- To provide continuous, safe and efficient movement of traffic for both the general public and construction workers.
- Installation of appropriate advance warning signs to inform users of the changed traffic condition.
- To provide a description of the construction vehicles and the volume of these construction vehicles accessing the construction site.
- To provide information regarding the changed access arrangement and also a description of the proposed external routes for vehicles, including the construction vehicles accessing the site.
- Establishment of a safe pedestrian environment in the vicinity of the site.

3.4.2 Construction vehicle types

The construction of the proposed expansion is expected to involve the use of a number of different vehicle types. The project involves the demolition of the existing building and construction of a mixed-use development which will require removal and delivery of various materials including spoil/waste, steel reinforcement, concrete and fit-out equipment. This will require the delivery of building materials that would typically involve medium rigid vehicles (i.e. concrete trucks), heavy rigid vehicles (i.e. spoil removal vehicles) and the use of up to an 'Articulated Vehicle" (19 m in length) for such activities as steel reinforcement deliveries.

3.4.3 Construction vehicle routes and access

Details of the site access and construction routes have not been finalised at this stage of the project, however, it is anticipated that access will be via Hudson Street. This would minimise access from Forest Road and removing the potential impact to through traffic along Forrest Road, as vehicles enter the site.

Access routes to and from the site should utilise the state and regional road network as much as possible such as Forest, Croydon, Woniora Roads and Railway Parade. If practical, consideration could be given to minimising the right turn from Forest Road into Hudson Street with an alternate access from the north along Hudson Street via Croydon and Queens Road.

Drivers are to be made aware of the various schools with the proximity of the site along Forest Road and Croydon Street, which will have increased pedestrian and vehicle activity during School Zone periods 8:00 am to 9: 30 am and 2:30 to 4:00 pm, Monday to Friday. Heavy vehicle transport should be avoided during these periods, where possible.

The potential site access road network and schools are shown in Figure 3-5.

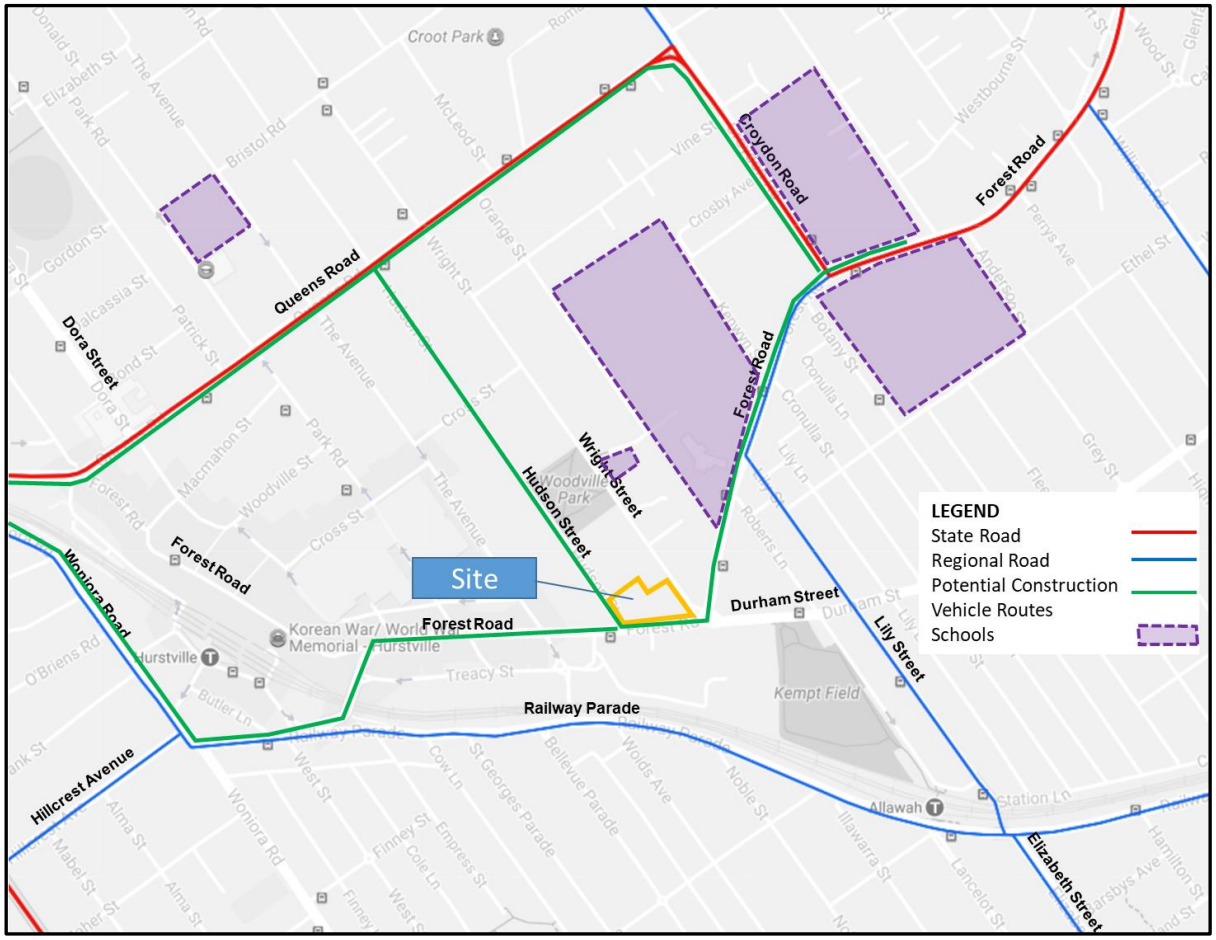


Figure 3-5 Potential construction vehicle access routes

Source: Transport for NSW maps – Modified by GHD

3.4.4 Traffic management

Public access of through vehicles past the site is to be maintained along Hudson Street, Wright Street and Forest Road. Vehicles will be permitted to travel past the work site on Byrnes Road with traffic signage in accordance with a Traffic Control Plan (TCP) to be developed in accordance with *RMS Traffic Control at Works Sites and AS1742.3 – Traffic Control for Works on Roads*. This is to advise motorists of changes in the road network or vehicle movements to/from the site, including "Truck turning" activity.

Should partial road closures be required as part of the works, the contractors would be required to ensure that both Transport for NSW and Council approvals are obtained prior to implementation and appropriate TCPs are developed and are implemented as part of the works.

Any TCP will need to be developed as part of the detailed CTMP prior to the commencement of construction activity on the site.

3.4.5 Traffic activity and parking provisions

Access and egress will primarily be prior to both the AM and PM peak hour periods as construction activity generally will commence at 7 am and finish by 4 pm on weekdays. Workers are to be made aware of the various schools with the proximity of the site along Forest Road and Croydon Street, which will have increased pedestrian and vehicle activity during School Zone periods and avoid large quantity deliveries during these periods.

There is limited opportunity to provide parking within the site, therefore contractors should encourage carpooling between workers, which will decrease traffic activity and parking demand. Furthermore, the

site is located within an acceptable walking distance (within 800 m) from both Hurstville Station and Allawah Stations, which provide regular train services.

The CTMP should include provisions for contractors to discourage the use of on street parking and encourage the use of alternate travel arrangements to decrease traffic movements and parking demand associated with construction workers.

3.4.6 Pedestrian management

Site access is be restricted to authorised personnel only. Pedestrian access to and around the site is to be maintained at all times.

The site is located on the boundary of the Hurstville town centre with Hurstville Westfield to the west and several schools to the east. Consequently, the nearby road network will contain pedestrian activity along the footpaths adjoining the site. Visibility from the site is to be maintained to allow visual engagement between the driver and pedestrians and signage to be erected to advise pedestrians of heavy vehicle movements to and from the site.

The pedestrian travel paths are to be maintained and be free from trip hazards.

4. Parking provision

4.1 Car parking provision

Statutory parking requirements are set out in Georges River Council's Development Control Plan (DCP). Georges River Council has two DCPs, being:

- DCP 1 provides planning controls for development within Hurstville local government area, except for developments within Hurstville City Centre; and
- DCP 2 (Amendment 12) contains the planning controls for development within the Hurstville City Centre.

Following recent planning changes, the Hurstville City Centre boundary now includes the entire proposal site within the Eastern Bookend Precinct. Therefore, the development has been assessed with the parking rate as outlined in DCP 2 (Amendment 12) with reference to State Environmental Planning Policy No 65 – Design Quality of Residential Apartment Development (SEPP 65) and the Apartment Design Guide.

The SEPP 65 can be applied to residential developments in the following locations:

- On sites that are within 800 m of a railway station or light rail stop in Sydney Metropolitan area; or
- On land zoned, as sites within 400 m of land zones B3 Commercial cores, B4 Mixed use or equivalent in a nominated regional centre

The SEPP 65, in association with the Apartment Design Guide, can be applied to the residential component of this development.

SEPP 65 and the Apartment Design Guide states that:

"*The minimum car parking requirement for residents and visitors is set out in the Guide to Traffic Generating Developments (GTTGD), or the car parking requirement prescribed by the relevant council,* ***whichever is less.****"*

The GTTGD prescribes car parking rates based on the centre's classification as a Metropolitan Regional Centre (CBD) or Metropolitan Subregional Centre. Although, not defining these terms in detail, SEPP 65 outlines that centres defined in 'A Plan for Growing Sydney as a CBD' as a Regional City Centre or Strategic Centre should apply the Metropolitan Regional Centre (CBD) rates of the GTTGD.

Therefore, 'A Plan for Growing Sydney as a CBD' classifies Hurstville City Centre as a Strategic Centre and as such, the development has been assessed with **the parking rate of a Metropolitan Regional (CBD) centre as outlined in GTTGD**.

The following Table 19 summarises the minimum parking rates and requirements outlined in Council DCP 2 and SEPP 65.

Table 19 Car parking requirements

Component	Use Type	Units/GFA	DCP 2 Requirements		SEPP 65 Requirements	
			Rate	Minimum Car Spaces required	Rate	Minimum Car Spaces required
Residential	1 bed unit	54	1 space per unit	54	0.4 spaces per unit	21.6
	2 bed unit	128	1 space per unit	128	0.7 spaces per unit	89.6
	3 bed unit	31	2 spaces per unit	62	1.20 spaces per unit	37.2
	Visitors	213	1 space per 4 units	54	1 space per 7 units	31
Residential Subtotal				***298***		***180***
Retail	Retail	2,702 m^2 *	1 space per 50 m^2	54	N/A	N/A
Retail Subtotal				***54***		***54***
Total minimum car spaces required				***352***		***234***

Note: Source: DCP requirements - Georges River Council DCP 2 (Amendment 12) Section 5.4.4.1
Source SEPP 65 requirements – Transport for NSW Guide to Traffic Generating Developments Section 5.4.3
(*) Retail area based on general retail leasable floor area as well as common back of house, corridors and water closets

The above analysis has determined that the statutory minimum parking requirement (SEPP 65 for the residential component and Council DCP 2 for the retail component) for the proposed development is 234 car spaces. The proposed development includes the following parking provisions:

- Residential: 198 spaces (including 21 accessible spaces) located on basements two and three.
- Visitors: 14 spaces located on basement one and 17 spaces located on basement two (total 31 spaces).
- Retail: 54 spaces (including 2 accessible spaces) located on basement one.

The proposal includes a total of **283 car spaces** to meet the relevant statutory minimum parking requirement in total for the development. A component of the residential visitor and all retail parking is located on the same level allowing flexibility in utilisation of visitors and retail parking provision.

4.2 Accessible parking

Georges River Council DCP 2 has the following requirement for accessible parking:

- Residential:
  - One space per each adaptable dwelling
  - Visitor parking: Two percent of the total spaces when greater than 50 spaces
- Retail
  - Retail parking: Two percent of the total spaces when greater than 50 spaces

A summary of the minimum and proposed accessible parking provision is outlined in Table 20.

Table 20 Accessible parking provision

Land use	Total parking provided	Required Accessible Parking Spaces	Accessible spaces provided
Residential	21 accessible units	21	21
Residential Visitor	31	0 *	1 *
Retail	54	1 *	1 *
Total		**22**	**23**

(*) While individually, the residential visitor provision is less than 50 spaces, therefore no accessible parking required. However, consideration was given that both uses were combined primarily in the basement one level and therefore for amenity such accessible parking provision was provided.

The proposed development is required to provide a total minimum of 22 accessible car spaces to meet the DCP requirement. The proposal includes a total of **23 accessible car spaces** with the individual land uses being accommodated to meet the DCP requirement.

4.3 Car wash bay

Georges River Council DCP 2 has the following requirement for a car wash bay:

- For residential developments containing four or more dwellings, a car wash bay is to be provided.

The proposal includes a provision of **one car wash bay** located on basement level two to meet the DCP requirement.

4.4 Bicycle parking facilities

Georges River Council DCP 2 Amendment 10 (within Hurstville City Centre) provides the minimum bicycle parking rates as outlined in Table 21. The provision of bicycle parking encourages alternate sustainable transport options and should be considered and incorporated into the development.

Table 21 Bicycle parking requirement

Component	Use Type	Units/GFA	DCP Rate	Source	Minimum bike spaces required
Residential	Units	213	1 space per 3 units	DCP 2 (Amendment No 12) Section 5.4.3.3	71
Retail	Retail	2,701 m^2	1 space per 300 m^2	DCP 2 (Amendment No 12) Section 5.4.3.3	9
TOTAL					**80**

The proposal includes the provision of publicly accessible bicycle parking facilities (racks on Basement level one) to accommodate **28 bicycles.** Additionally, there are **214 storage cages** that can be used for residential bicycle storage.

4.5 Motorcycle parking

The Georges River DCP does not outline a minimum motorcycle parking requirement. However, to promote an alternate transport option for use by visitors and residential of the development, the proposal includes 16 publicly accessible motorcycle parking spaces in Basement 1 and six motorcycle parking spaces in the residential parking area of Basement two for a total provision of **22 motorcycle parking** spaces.

4.6 Car share

As outlined in section 2.8.5, Council supports the provision of car share parking in residential, mixed use and commercial developments, however it does don't mandate such should be required.

The development does not propose the implementation of car share facilities, with three car share pods currently located within walking distance (800 m) of the site, which residents and visitors can utilise to access the development (refer to Figure 2-17).

4.7 Service vehicle parking

Georges River Council DCP does not outline a minimum service vehicle parking requirement.

The requirement for servicing and delivery to the residential and retail land uses is not defined. Therefore, the following assumptions have been made:

- Residential: aside from moving furniture in and out, which occurs infrequently and probably not during peak periods. There is expected to be no other heavy vehicle component associated with this land use (except for waste noted below).
- Retail: The proposed development incorporates three key street front tenancies and five smaller commercial tenancies. Service vehicle access can be managed with the implementation of a Loading Dock Management Plan. It is assumed that retail delivery could generate a minimum of one delivery for each key tenancy daily.

In addition to deliveries, there is also the requirement to collect waste. While the residential waste collection will probably occur twice a week, it is likely that there would be at least one trip per day for the other key tenancies uses.

The proposed loading dock will be located on the ground floor and will incorporate a turntable to enable forward entry and exit. The loading dock will be able to accommodate one medium rigid truck (council waste vehicle up to 10.5 m in length). The loading dock layout has been developed to allow the council waste collection vehicle to manoeuvre within the site with clearances and enter and exit the site in a forward direction (utilising the mechanical turntable). Council letter dated 14 May 2021 does not support the use of larger (Heavy Vehicles (12.5 m)).

Assuming that each truck occupies the loading dock for up to one hour within an eight hour period, and that loading activities take place at regular intervals throughout that period, the loading dock has the capacity to serve eight vehicles per day. Based on the assumptions above, this is adequate to satisfy the assumed demand.

Access to the loading dock should be via prior arrangement for both the retail and residential components. A Loading Dock Management Plan should be developed, which will outline permitted times of use and roles and responsibilities of residents, tenants and owners and alternate loading management during maintenance periods of the mechanical turntable.

5. Parking layout and access review

5.1 Car park arrangement

5.1.1 General Layout

An assessment of the car parking has been undertaken using *AS2890.1 – Off-Street Car Parking.* Table 1.1 of AS2890.1 which presents a number of car park classifications applicable to different land-uses. According to the table, the car park will comprise a Class 1 or 1A facility suitable for residential use and Class 2 facility, which is suitable for the use of generally medium-term parking and town centre parking. The parking space dimensions and associated aisle widths for each facility classification are presented in AS2890.1: Figure 2.2 include:

- Class 1A facility:
  - Spaces: 2.4 m x 5.4 m; and
  - Aisle Width: 5.8 m
- Class 1 facility:
  - Spaces: 2.4 m x 5.4 m; and
  - Aisle Width: 6.2 m
- Class 2 facility:
  - Spaces: 2.5 m x 5.4 m; and
  - Aisle Width: 5.8 m

A review of the parking layout has been completed within the proposed development. Basement level one is to be utilised by visitors to the development (including the retail parking) and assessed as a Class 2 facility. Basement level one provides parking spaces with dimensions of at least 2.5 m x 5.4 m and aisle widths of a minimum of 5.8 m. Basement levels two and three is for the use of residential parking and assessed as a Class 1 or 1A facility. Basement levels two and three provides parking spaces with dimensions of at least 2.4 m x 5.4 m and aisle widths of a minimum of 5.8 m. The parking space and aisle dimension for the residential parking align with the minimum Class 1A for residential use outlined AS2890.1.

5.1.2 Circulation

A combination of one-way and two-way circulation is proposed within the car park basement. Primarily the basement parking contains one way traffic flow through the parking modules and two-way on the ramps and circulation roadways

A swept path assessment of the access ramps has been undertaken with the use of Autoturn computer simulation package to review the access and circulation within the basement parking area. The review showed that adequate width has been provided to provide appropriate vehicle clearances where required in line with AS2890.1. Refer to Appendix B for the turning path review.

It is recommended that convex mirrors and designated waiting areas at key locations within the circulation areas be provided to assist in visibility to oncoming traffic (e.g. ramp areas). Additionally, consideration should be given to the provision of real-time parking availability system in the retail basement parking level (Basement 1) to advise motorists prior to entry the number car spaces available within the basement and direct motorists to such available spaces, whilst within the basement. This will assist in general circulation improvement and advise motorists of whether parking spaces are available (notably in the blind aisle at the southern end of the basement).

5.1.3 Accessible parking

Within the layout, there is provision for accessible car spaces. Section 2.2 of AS2890.6 requires parking space dimensions 2.4 m x 5.4 m with an access aisle width of 5.8 m and a shared area of 2.4 m x 5.4 m between spaces.

The proposed car park has been designed to provide compliant parking space with minimum dimensions of 2.5 m by 5.4 m, minimum aisle width of 5.8 m and a shared space of 5.4 m by 2.4 m, which exceeds the minimum requirement.

5.2 Loading dock

The proposal includes a loading dock located on the ground floor and will incorporate a turntable to enable forward entry and exit. The loading dock will be able to accommodate one rigid truck suitable for council waste collection vehicles up to 10.5 m in length. A mechanical turntable provides the ability for the vehicle to enter and exit in a forward direction.

It is recommended that convex mirrors be placed on the exit from the loading dock to improve visibility from the loading dock to the adjoining ramp. Additionally, an audible and visual notification system (i.e. flashing lights) should be activated when the loading dock activity is in operation, to advise approaching motorists of the loading dock activity to improve safety.

5.3 Site access review

5.3.1 Vehicle access/egress

The sight distance requirements are described in Section 3.2 of AS2890.1 and are prescribed on the basis of the signposted speed limit or 85th percentile vehicle speeds along the frontage road.

Egress from the site is on Hudson and Wright Streets that has a posted speed limit of 50 km/h (note: Wright Street north of the site has 40 km/h School Zone). Assuming an approach speed of 50 km/h to the driveways, the desirable visibility distance is 69 m, and a minimum distance is 45 m. Observations of the traffic movements along Hudson and Wright Streets indicate that 50 km/h speed limit would be adhered to, with the driveway on Hudson Street located approximately 40 m from the intersection of Forest Road towards the south and a raised pedestrian crossing towards the north, and the driveway on Wright Street located approximately 50 m from the intersection of Forest Road. Such infrastructure would slow and maintain such intended vehicle travel speeds. The proposed driveways are located on the straight sections of the road alignment with no permanent obstructions to the north to affect the visibility from the driver when exiting the site because of the No Stopping restriction applied to the pedestrian crossing (Hudson Street). Implementation of a No Stopping restriction north of the driveway for a short distance on Wright Street and south of both driveways to Forest Road will assist in providing increased visibility from the site egress and well as providing a clear approach and departure of the intersections from Forest Road to improve traffic flow through the intersection.

5.3.2 Driveway longsections

A review of the driveway longsections (as shown in Appendix B) indicated, in alignment with AS2890.1 and AS2890.6, that a minimum height clarence of 2.2 m has been provided on the ramps and ramp grade transitions do not exhibit scraping for a B99 vehicle. In line with AS2890.1 striker bars and low clearance height signage is to be provided on the entry ramps to the site to advise drivers on the maximum height clearance within the site.

5.3.3 Other site access facilities

Forest Road / Hudson Street intersection: Pedestrian Refuge

Georges River Council has requested that a pedestrian refuge be installed at the intersection of Forest Road / Hudson Street. The pedestrian refuge will provide an improved amenity and safety to pedestrians crossing Hudson Street adjacent to the site. This is achieved by narrowing the crossing distance and affording pedestrians the opportunity to observe one direction of traffic at a time, while crossing. A copy of the proposed design plans is included in Appendix D and is to be constructed as part of the development.

Forest Road: Land dedication

Georges River Council DCP 2 (Amendment 12) section 8.1.3.1 summaries required land dedication imposed on the subject site. The DCP stipulates that:

> *"Development of the site will include a dedication to Georges River Council a strip of land of approximately 196 m^2 and 2 m wide along the Forest Road boundary, including land at Hudson Street and Wright Street at the intersection of Forest Road, for the purpose of widening Forest Road as detailed in the Planning Agreement applying to the site"*

The objective of the land dedication is to provide the ability for road widening to address future traffic impacts. The increased road reserve can also facilitate improved pedestrian amenity along Forest Road in conjunction with the designated building setbacks

The land to be dedicated to Georges River Council is shown in Figure 5-1. Such area is to be free from permeant structures above and below the land.

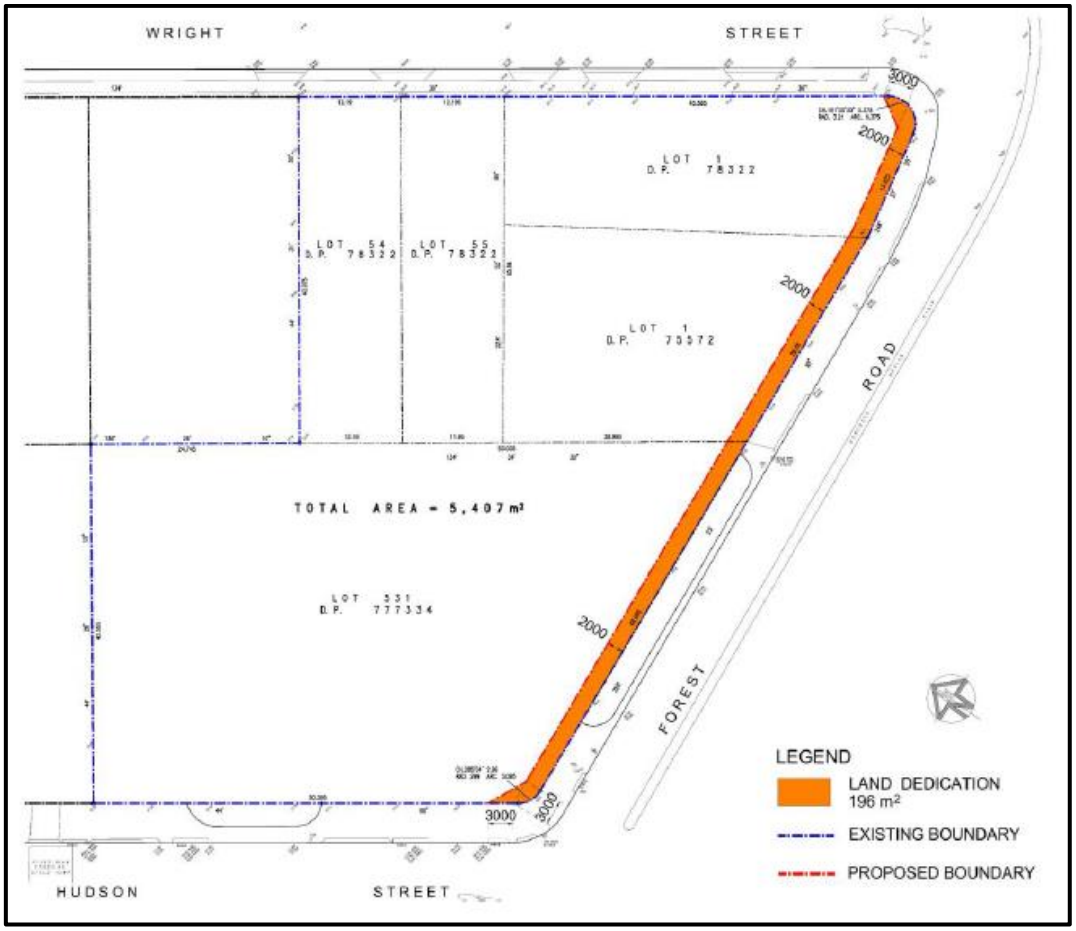


Figure 5-1 Forest Road: Land dedication

Source: Georges River Council DCP

6. Summary and conclusion

6.1 Proposed works

This Traffic and Parking Impact Assessment outlines the traffic, transport, parking and access impacts as a result of the proposed mixed-use development at 108-124 Forest Road and 1-3 Wright Street, Hurstville, which comprises of:

- 213 residential apartments.
- 2,701 m^2 GFA retail space over a maximum of nine tenancies on Level 1 (street level) and one tenancy on Level 2.
- 283 basement car spaces for the use of residents and visitors.
- Loading dock facility accommodating up to one 10.5 m medium rigid vehicle (equivalent to council waste vehicle).
- Bicycle parking for the use of residents and visitors, including 28 spaces via the use of racks (Basement 1) and 214 residential storage cages which could facilitate the storage of bicycles.

6.2 Traffic impact

The broad conclusions of the traffic impact assessment within the report are as follows:

- The proposal includes the provision of new accesses of Hudson and Wright Streets and removal of the existing access driveway on Forest Road and Wright Street.
- The Forest Road/Hudson Street and Forest Road/Wright Street intersections have an acceptable Level of Service (i.e. better than Level of Service E). Noting however, the highest average delay identified for the Forest Road/Hudson Street intersection, is associated with the right turn from Hudson Street into Forest Road. This movement consisted of a minor quantity of vehicles, with all remaining turn movements operating at an acceptable level of service (Level of Service A).
- An assessment of trip generation based on published rates indicates that the existing development generates 167 trips in the peak periods.
- An assessment of trip generation based on published rates indicates that the proposed development is assumed to generate up to 98 trips in the AM peak, 277 trips in the PM peak and 152 trips in the School PM peak.
- The existing configuration Forest Road/Hudson Street and Forest Road/Wright Street/Durham Street intersections are expected to provide acceptable Levels of Service (i.e. better than Level of Service E) post-development for the Forest Road corridor. Noting however the highest average delay identified for the Forest Road/Hudson Street intersection, is associated with the right turn from Hudson Street into Forest Road. This movement consisted of a minor quantity of vehicles, with all remaining turn movements operating at an acceptable level of service (Level of Service A).
- The post development intersection operations are comparable to the existing intersection operation.
- The intersection of Forest Road/Wright Street/Durham Street is proposed to be upgraded by TfNSW in conjunction with Council to a signalised intersection to assist in the movement of pedestrians across Forest Road. The Forest Road/Hudson Street and Forest Road/Wright Street/Durham Street intersections is expected to provide acceptable Levels of Service (i.e. better than Level of Service E) under the signalised configuration. Noting however, the highest average delay identified for the Forest Road/Hudson Street intersection, is associated with the right turn

from Hudson Street into Forest Road. This movement consisted of a minor quantity of vehicles, with all remaining turn movements operating at an acceptable level of service (Level of Service A).

- It was identified that the introduction of the signals at Forest Road / Wright Street / Durham Street, provided the opportunity for additional gaps in traffic flow at the Forest Road/Hudson Street intersection, as a result of phase transition periods. This reduced the delays from Hudson Street for the post development scenario.
- A Construction Traffic Management Plan (CTMP) will need to be prepared prior to the commencement of works with site induction for construction personnel being undertaken to outline the requirements of the CTMP. The aim of the CTMP is to maintain the safety of all workers and road users within the vicinity site

6.3 Parking provision and layout

The broad conclusions of the parking assessment within the report are as follows:

- An assessment of the statutory parking requirement against the Georges River Council DCP and SEPP 65 indicates that the development is required to provide 234 parking spaces. The development will meet the statutory parking requirement with the provision of 283 spaces. Some of the residential visitor and retail parking areas are located on the same level allowing flexibility in the utilisation of visitors and retail parking provision. Furthermore, there is the provision of 22 motorcycle spaces to provide alternate transport opportunities for visitors to the development.
- The layout of the basement car park is in accordance with AS2890.1, and AS2890.6 and provides a combination of one way and two-way circulation to provide access to the individual parking spaces and ramped access. It is recommended for the provision of convex mirrors and waiting areas at key locations (e.g., ramps) to assist in visibility to opposing traffic movement.
- Consideration should be given to the provision of real-time parking availability system in the retail basement parking level (Basement 1) to advise motorists prior to entry the number of car spaces available within the basement and direct motorists to such available spaces, whilst within the basement to aid in circulation.
- An assessment of the site distance available at the proposed driveways indicates that visibility is likely to be adequate. The use of No Stopping restrictions on the southern side of the driveways to Forest Road is recommended in conjunction with a short “No Stopping” restriction north of the driveway on Wright Street and the existing “No Stopping” restriction north of the driveway on Hudson Street, to further aid in visibility from the site and general traffic flow to and from Forest Road.
- In line with AS2890.1 striker bars and low clearance height signage is to be provided on the entry ramps to the site to advise drivers on the maximum height clearance within the site.
- An assessment of the loading dock facility accommodating up to one service vehicle, indicate that it will be able to accommodate the expected design service vehicles of up to 10.5 m in length (equivalent to the council waste collection vehicle) and allow the vehicles to enter and exit the site in a forward direction with the use of a mechanical turntable. It is recommended that convex mirrors be placed on the exit from the loading dock to improve visibility and an audible and visual notification system (i.e. flashing lights) should be activated when the loading dock activity is in operation.
- Access to the loading dock should be via prior arrangement for both the retail and residential components. A Loading Dock Management Plan should be developed, which will outline permitted times of use and roles and responsibilities of residents, tenants and owners and alternate operations when maintenance is undarkened on the turntable.

- A pedestrian refuge in line with Council requirements is required at the intersection of Forest Road and Hudson Street to aid in the mobility of pedestrians.
- Land dedication to Council is required along the Forest Road frontage between Hudson Street and Wright Street to aid in the future road widening of Forest Road.

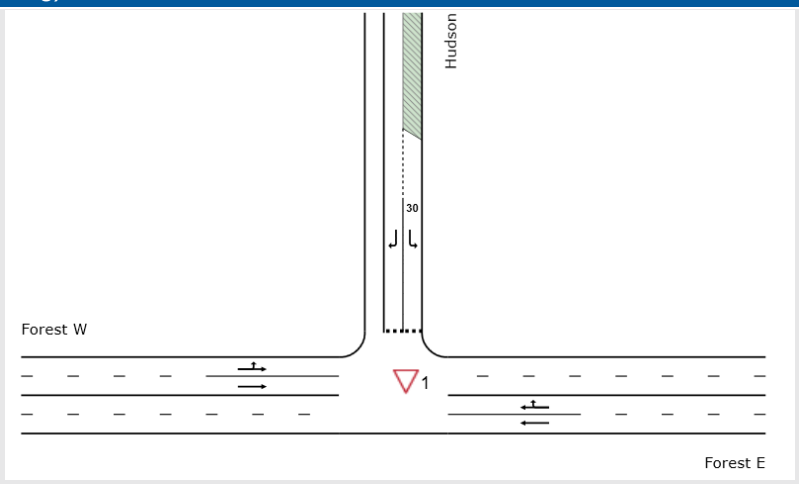
6.4 Conclusion

Based on the assumptions and investigations undertaken by GHD and the conclusions drawn above, it is considered that the proposed development satisfies the planning requirements on traffic engineering grounds.

Appendices

Appendix A– SIDRA Analysis Results

Site 1: Forest Road / Hudson Street (Existing)



AM Peak

MOVEMENT SUMMARY

Site: 1 [Hudson-Forest_Existing (2021)_AM Peak]

Network: N101 [2021_AM Peak_Existing]

8:00 - 9:00 am
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Forest Rd														
5	T1	531	4.0	531	4.0	0.279	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
6	R2	248	1.6	248	1.6	0.444	12.8	LOS A	1.0	6.9	0.74	0.99	1.06	38.5
Approach		779	3.2	779	3.2	0.444	4.1	NA	1.0	6.9	0.24	0.32	0.34	43.0
North: Hudson St														
7	L2	289	2.1	289	2.1	0.384	9.0	LOS A	0.8	5.9	0.60	0.88	0.76	40.3
9	R2	5	20.0	5	20.0	0.082	61.7	LOS E	0.1	0.8	0.94	0.97	0.94	20.7
Approach		294	2.4	294	2.4	0.384	9.9	LOS A	0.8	5.9	0.61	0.88	0.76	39.5
West: Forest Rd														
10	L2	73	1.4	73	1.4	0.319	4.6	LOS A	0.0	0.0	0.00	0.07	0.00	48.5
11	T1	777	3.2	777	3.2	0.319	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	48.0
Approach		850	3.1	850	3.1	0.319	0.4	NA	0.0	0.0	0.00	0.05	0.00	48.2
All Vehicles		1923	3.0	1923	3.0	0.444	3.3	NA	1.0	6.9	0.19	0.28	0.25	43.2

PM Peak

MOVEMENT SUMMARY

Site: 1 [Hudson-Forest_Existing (2021)_PM Peak]

Network: N101 [2021_PM Peak_Existing]

3:15 pm - 4:15 pm
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Forest Rd														
5	T1	804	3.1	804	3.1	0.421	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
6	R2	317	2.2	317	2.2	0.535	13.4	LOS A	1.4	9.8	0.75	1.06	1.23	38.2
Approach		1121	2.9	1121	2.9	0.535	3.8	NA	1.4	9.8	0.21	0.30	0.35	43.2
North: Hudson St														
7	L2	175	1.7	175	1.7	0.221	7.5	LOS A	0.4	2.6	0.53	0.73	0.53	41.6
9	R2	13	0.0	13	0.0	0.339	117.6	LOS F	0.4	2.7	0.98	1.01	1.07	13.8
Approach		188	1.6	188	1.6	0.339	15.1	LOS B	0.4	2.7	0.56	0.75	0.56	35.6
West: Forest Rd														
10	L2	79	1.3	79	1.3	0.303	4.6	LOS A	0.0	0.0	0.00	0.07	0.00	48.5
11	T1	729	2.6	729	2.6	0.303	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	47.7
Approach		808	2.5	808	2.5	0.303	0.5	NA	0.0	0.0	0.00	0.05	0.00	48.0
All Vehicles		2117	2.6	2117	2.6	0.535	3.5	NA	1.4	9.8	0.16	0.25	0.23	42.8

Site 1: Forest Road / Hudson Street (Existing)

School PM Peak

MOVEMENT SUMMARY

Site: 1 [Hudson-Forest_Existing (2021)_School PM Peak]

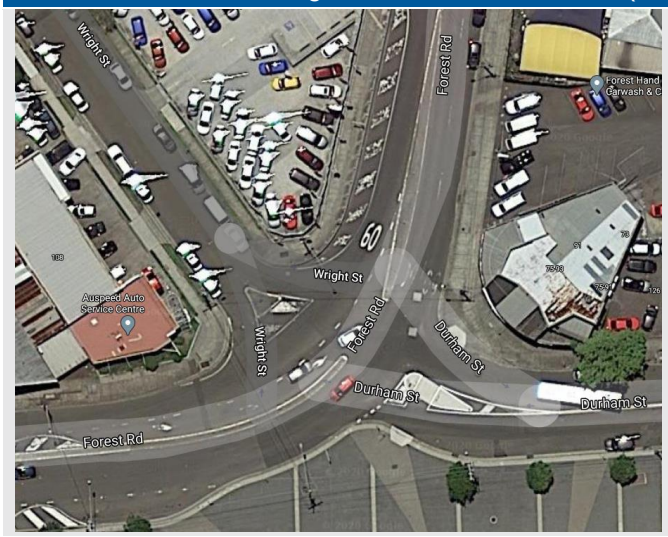
Network: N101 [2021_School PM Peak_Existing]

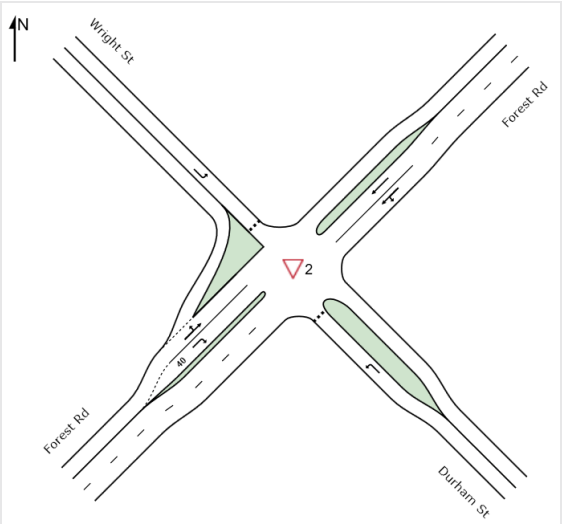
2:30 pm - 3:30 pm
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	Demand Flows HV %	Arrival Flows Total veh/h	Arrival Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Aver. Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Forest Rd														
5	T1	669	3.6	669	3.6	0.351	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
6	R2	277	2.5	277	2.5	0.457	12.2	LOS A	1.1	7.6	0.72	0.99	1.05	39.0
Approach		946	3.3	946	3.3	0.457	3.6	NA	1.1	7.6	0.21	0.29	0.31	43.6
North: Hudson St														
7	L2	193	2.1	193	2.1	0.244	7.6	LOS A	0.4	2.9	0.53	0.74	0.53	41.5
9	R2	9	11.1	9	11.1	0.173	74.8	LOS F	0.2	1.5	0.96	0.99	0.98	18.6
Approach		202	2.5	202	2.5	0.244	10.6	LOS A	0.4	2.9	0.55	0.75	0.55	39.0
West: Forest Rd														
10	L2	67	1.5	67	1.5	0.295	4.6	LOS A	0.0	0.0	0.00	0.06	0.00	48.6
11	T1	723	2.2	723	2.2	0.295	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	48.0
Approach		790	2.2	790	2.2	0.295	0.4	NA	0.0	0.0	0.00	0.05	0.00	48.2
All Vehicles		1938	2.7	1938	2.7	0.457	3.0	NA	1.1	7.6	0.16	0.24	0.21	43.6

Site 2: Forest Road / Wright Street / Durham Street (Existing)





AM Peak

MOVEMENT SUMMARY

Site: 2 [Forest-Wright-Durham_Existing (2021)_AM Peak]

Network: N101 [2021_AM Peak_Existing]

8:00 - 9:00 am
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Durham St														
4	L2	365	4.4	365	4.4	0.339	5.8	LOS A	0.7	4.8	0.38	0.59	0.38	36.6
Approach		365	4.4	365	4.4	0.339	5.8	LOS A	0.7	4.8	0.38	0.59	0.38	36.6
NorthEast: Forest Rd														
24	L2	14	0.0	14	0.0	0.114	4.6	LOS A	0.0	0.0	0.00	0.04	0.00	48.5
8	T1	423	2.8	423	2.8	0.114	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	49.6
Approach		437	2.7	437	2.7	0.114	0.2	NA	0.0	0.0	0.00	0.02	0.00	49.5
NorthWest: Wright St														
27	L2	97	1.0	97	1.0	0.124	7.2	LOS A	0.2	1.3	0.49	0.71	0.49	43.7
Approach		97	1.0	97	1.0	0.124	7.2	LOS A	0.2	1.3	0.49	0.71	0.49	43.7
SouthWest: Forest Rd														
1	L2	46	0.0	46	0.0	0.362	4.9	LOS A	0.8	5.6	0.40	0.03	0.40	48.9
2	T1	479	3.5	479	3.5	0.362	0.6	LOS A	0.8	5.6	0.40	0.03	0.40	46.4
3	R2	539	2.4	539	2.4	0.579	9.4	LOS A	2.1	15.0	0.66	0.95	1.01	35.2
Approach		1064	2.8	1064	2.8	0.579	5.2	NA	2.1	15.0	0.53	0.50	0.71	40.5
All Vehicles		1963	3.0	1963	3.0	0.579	4.3	NA	2.1	15.0	0.38	0.42	0.48	41.6

PM PEAK

MOVEMENT SUMMARY

Site: 2 [Forest-Wright-Durham_Existing (2021)_PM Peak]

Network: N101 [2021_PM Peak_Existing]

3:15 pm - 4:15 pm
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Durham St														
4	L2	447	2.9	447	2.9	0.463	7.4	LOS A	1.3	9.0	0.52	0.75	0.65	34.6
Approach		447	2.9	447	2.9	0.463	7.4	LOS A	1.3	9.0	0.52	0.75	0.65	34.6
NorthEast: Forest Rd														
24	L2	15	0.0	15	0.0	0.172	4.6	LOS A	0.0	0.0	0.00	0.02	0.00	48.7
8	T1	643	2.8	643	2.8	0.172	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	49.7
Approach		658	2.7	658	2.7	0.172	0.1	NA	0.0	0.0	0.00	0.01	0.00	49.7
NorthWest: Wright St														
27	L2	33	3.0	33	3.0	0.043	7.1	LOS A	0.1	0.4	0.47	0.66	0.47	43.8
Approach		33	3.0	33	3.0	0.043	7.1	LOS A	0.1	0.4	0.47	0.66	0.47	43.8
SouthWest: Forest Rd														
1	L2	31	0.0	31	0.0	0.269	4.4	LOS A	0.0	0.0	0.00	0.03	0.00	50.8
2	T1	481	2.7	481	2.7	0.269	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	49.5
3	R2	381	2.4	381	2.4	0.527	11.1	LOS A	1.5	10.4	0.70	1.02	1.10	33.6
Approach		893	2.5	893	2.5	0.527	4.9	NA	1.5	10.4	0.30	0.45	0.47	41.7
All Vehicles		2031	2.7	2031	2.7	0.527	3.9	NA	1.5	10.4	0.25	0.38	0.36	42.3

Site 2: Forest Road / Wright Street / Durham Street (Existing)

School PM Peak

MOVEMENT SUMMARY

Site: 2 [Forest-Wright-Durham_Existing (2021)_School PM Peak]

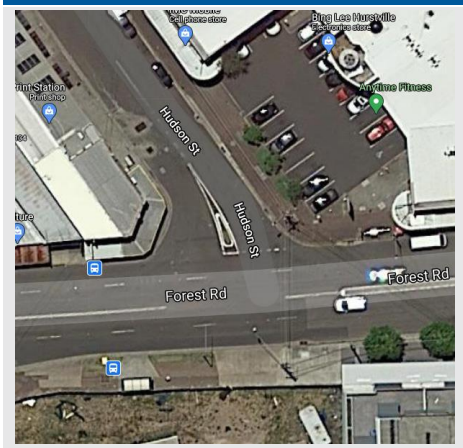
Network: N101 [2021_School PM Peak_Existing]

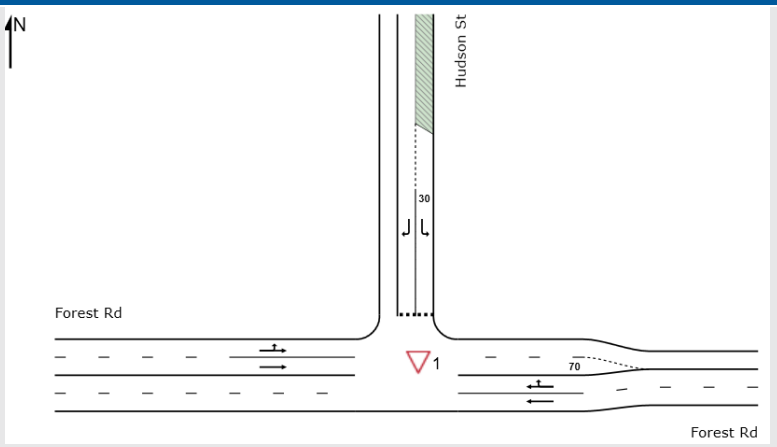
2:30 pm - 3:30 pm
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Durham St														
4	L2	394	4.1	394	4.1	0.387	6.4	LOS A	0.8	6.0	0.44	0.64	0.47	36.1
Approach		394	4.1	394	4.1	0.387	6.4	LOS A	0.8	6.0	0.44	0.64	0.47	36.1
NorthEast: Forest Rd														
24	L2	26	0.0	26	0.0	0.149	4.6	LOS A	0.0	0.0	0.00	0.05	0.00	48.4
8	T1	542	3.0	542	3.0	0.149	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	49.4
Approach		568	2.8	568	2.8	0.149	0.2	NA	0.0	0.0	0.00	0.02	0.00	49.4
NorthWest: Wright St														
27	L2	66	4.5	66	4.5	0.086	7.2	LOS A	0.1	0.9	0.48	0.69	0.48	43.7
Approach		66	4.5	66	4.5	0.086	7.2	LOS A	0.1	0.9	0.48	0.69	0.48	43.7
SouthWest: Forest Rd														
1	L2	46	0.0	46	0.0	0.273	4.4	LOS A	0.0	0.0	0.00	0.04	0.00	50.7
2	T1	475	1.5	475	1.5	0.273	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	49.3
3	R2	392	3.1	392	3.1	0.490	9.8	LOS A	1.4	9.7	0.66	0.97	0.96	34.8
Approach		913	2.1	913	2.1	0.490	4.4	NA	1.4	9.7	0.28	0.44	0.41	42.4
All Vehicles		1941	2.8	1941	2.8	0.490	3.7	NA	1.4	9.7	0.24	0.37	0.30	42.9

Site 1: Forest Road / Hudson Street (Post Development) – Existing intersection arrangement





AM Peak

MOVEMENT SUMMARY

Site: 1 [Hudson-Forest_Post Dev (2021)_AM Peak]

Network: N101 [2021_AM Peak_Post Dev]

8:00 - 9:00 am
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Forest Rd														
5	T1	531	4.0	531	4.0	0.279	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
6	R2	253	1.6	253	1.6	0.477	13.8	LOS A	1.1	7.5	0.77	1.02	1.15	37.9
Approach		784	3.2	784	3.2	0.477	4.5	NA	1.1	7.5	0.25	0.33	0.37	42.5
North: Hudson St														
7	L2	318	1.9	318	1.9	0.435	9.7	LOS A	1.0	7.3	0.63	0.92	0.86	39.7
9	R2	5	20.0	5	20.0	0.091	67.7	LOS E	0.1	0.8	0.95	0.98	0.95	19.7
Approach		323	2.2	323	2.2	0.435	10.6	LOS A	1.0	7.3	0.63	0.92	0.86	38.9
West: Forest Rd														
10	L2	75	1.3	75	1.3	0.333	4.6	LOS A	0.0	0.0	0.00	0.06	0.00	48.6
11	T1	811	3.1	811	3.1	0.333	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	48.0
Approach		886	2.9	886	2.9	0.333	0.4	NA	0.0	0.0	0.00	0.05	0.00	48.2
All Vehicles		1993	2.9	1993	2.9	0.477	3.6	NA	1.1	7.5	0.20	0.30	0.29	42.7

PM Peak

MOVEMENT SUMMARY

Site: 1 [Hudson-Forest_Post Dev (2021)_PM Peak]

Network: N101 [2021_PM Peak_Post Dev]

3:15 pm - 4:15 pm
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Forest Rd														
5	T1	804	3.1	804	3.1	0.421	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
6	R2	333	2.1	333	2.1	0.583	14.6	LOS B	1.6	11.2	0.78	1.11	1.36	37.5
Approach		1137	2.8	1137	2.8	0.583	4.3	NA	1.6	11.2	0.23	0.32	0.40	42.6
North: Hudson St														
7	L2	182	1.6	182	1.6	0.234	7.7	LOS A	0.4	2.7	0.54	0.74	0.54	41.5
9	R2	14	0.0	14	0.0	0.397	134.9	LOS F	0.5	3.2	0.98	1.02	1.09	12.5
Approach		196	1.5	196	1.5	0.397	16.7	LOS B	0.5	3.2	0.57	0.76	0.58	34.6
West: Forest Rd														
10	L2	83	1.2	83	1.2	0.312	4.6	LOS A	0.0	0.0	0.00	0.08	0.00	48.5
11	T1	751	2.5	751	2.5	0.312	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	47.7
Approach		834	2.4	834	2.4	0.312	0.5	NA	0.0	0.0	0.00	0.05	0.00	48.0
All Vehicles		2167	2.5	2167	2.5	0.583	3.9	NA	1.6	11.2	0.17	0.26	0.26	42.2

Site 1: Forest Road / Hudson Street (Post Development) – Existing intersection arrangement

School PM Peak

MOVEMENT SUMMARY

Site: 1 [Hudson-Forest_Post Dev (2021)_School PM Peak]

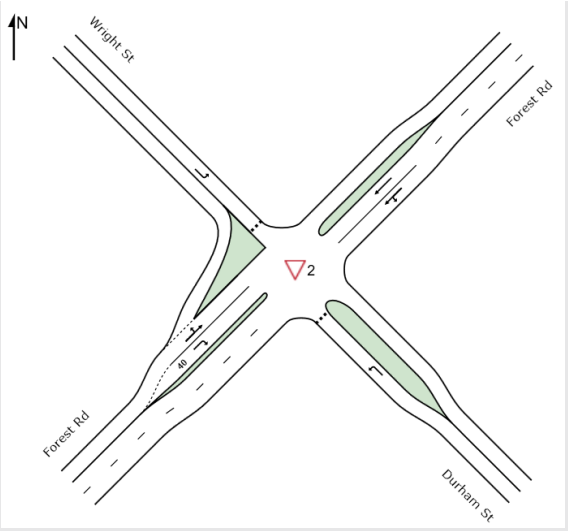
Network: N101 [2021_School PM Peak_Post Dev]

2:30 pm - 3:30 pm
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Forest Rd														
5	T1	669	3.6	669	3.6	0.351	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
6	R2	293	2.4	293	2.4	0.501	13.1	LOS A	1.2	8.6	0.74	1.03	1.15	38.4
Approach		962	3.2	962	3.2	0.501	4.0	NA	1.2	8.6	0.23	0.31	0.35	43.1
North: Hudson St														
7	L2	201	2.0	201	2.0	0.258	7.8	LOS A	0.4	3.1	0.54	0.76	0.55	41.4
9	R2	9	11.1	9	11.1	0.188	81.8	LOS F	0.2	1.6	0.96	0.99	0.99	17.6
Approach		210	2.4	210	2.4	0.258	10.9	LOS A	0.4	3.1	0.56	0.77	0.57	38.7
West: Forest Rd														
10	L2	71	1.4	71	1.4	0.305	4.6	LOS A	0.0	0.0	0.00	0.07	0.00	48.5
11	T1	745	2.1	745	2.1	0.305	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	48.0
Approach		816	2.1	816	2.1	0.305	0.4	NA	0.0	0.0	0.00	0.05	0.00	48.2
All Vehicles		1988	2.7	1988	2.7	0.501	3.2	NA	1.2	8.6	0.17	0.25	0.23	43.2

Site 2: Forest Road / Wright Street / Durham Street (Post Development) – Existing intersection arrangement



AM Peak

MOVEMENT SUMMARY

Site: 2 [Forest-Wright-Durham_Post Dev (2021)_AM Peak]

Network: N101 [2021_AM Peak_Post Dev]

8:00 - 9:00 am
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Aver. Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Durham St														
4	L2	367	4.4	367	4.4	0.342	5.8	LOS A	0.7	4.8	0.38	0.59	0.38	36.5
Approach		367	4.4	367	4.4	0.342	5.8	LOS A	0.7	4.8	0.38	0.59	0.38	36.5
NorthEast: Forest Rd														
24	L2	14	0.0	14	0.0	0.115	4.6	LOS A	0.0	0.0	0.00	0.03	0.00	48.5
8	T1	426	2.8	426	2.8	0.115	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	49.6
Approach		440	2.7	440	2.7	0.115	0.2	NA	0.0	0.0	0.00	0.02	0.00	49.5
NorthWest: Wright St														
27	L2	101	1.0	101	1.0	0.132	7.3	LOS A	0.2	1.3	0.50	0.72	0.50	43.6
Approach		101	1.0	101	1.0	0.132	7.3	LOS A	0.2	1.3	0.50	0.72	0.50	43.6
SouthWest: Forest Rd														
1	L2	80	0.0	80	0.0	0.393	5.0	LOS A	0.9	6.2	0.41	0.04	0.41	48.6
2	T1	492	3.5	492	3.5	0.393	0.6	LOS A	0.9	6.2	0.41	0.04	0.41	46.0
3	R2	554	2.3	554	2.3	0.597	9.7	LOS A	2.2	16.0	0.67	0.98	1.06	35.0
Approach		1126	2.7	1126	2.7	0.597	5.4	NA	2.2	16.0	0.54	0.50	0.73	40.6
All Vehicles		2034	2.9	2034	2.9	0.597	4.4	NA	2.2	16.0	0.39	0.42	0.50	41.6

PM PEAK

MOVEMENT SUMMARY

Site: 2 [Forest-Wright-Durham_Post Dev (2021)_PM Peak]

Network: N101 [2021_PM Peak_Post Dev]

3:15 pm - 4:15 pm
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Aver. Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Durham St														
4	L2	454	2.9	454	2.9	0.472	7.5	LOS A	1.3	9.4	0.53	0.76	0.67	34.5
Approach		454	2.9	454	2.9	0.472	7.5	LOS A	1.3	9.4	0.53	0.76	0.67	34.5
NorthEast: Forest Rd														
24	L2	15	0.0	15	0.0	0.174	4.6	LOS A	0.0	0.0	0.00	0.02	0.00	48.7
8	T1	652	2.8	652	2.8	0.174	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	49.7
Approach		667	2.7	667	2.7	0.174	0.1	NA	0.0	0.0	0.00	0.01	0.00	49.7
NorthWest: Wright St														
27	L2	85	1.2	85	1.2	0.110	7.2	LOS A	0.2	1.1	0.49	0.71	0.49	43.7
Approach		85	1.2	85	1.2	0.110	7.2	LOS A	0.2	1.1	0.49	0.71	0.49	43.7
SouthWest: Forest Rd														
1	L2	53	0.0	53	0.0	0.283	4.4	LOS A	0.0	0.0	0.00	0.05	0.00	50.6
2	T1	485	2.7	485	2.7	0.283	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	49.2
3	R2	384	2.3	384	2.3	0.537	11.4	LOS A	1.5	10.7	0.70	1.03	1.12	33.4
Approach		922	2.4	922	2.4	0.537	5.0	NA	1.5	10.7	0.29	0.46	0.47	41.8
All Vehicles		2128	2.5	2128	2.5	0.537	4.1	NA	1.5	10.7	0.26	0.39	0.36	42.3

Site 2: Forest Road / Wright Street / Durham Street (Post Development) – Existing intersection arrangement

School PM Peak

MOVEMENT SUMMARY

Site: 2 [Forest-Wright-Durham_Post Dev (2021)_School PM Peak]

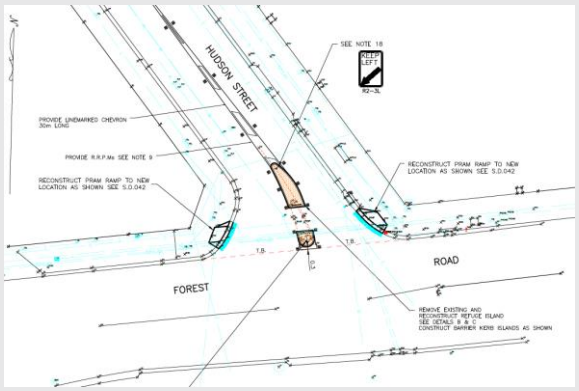
Network: N101 [2021_School PM Peak_Post Dev]

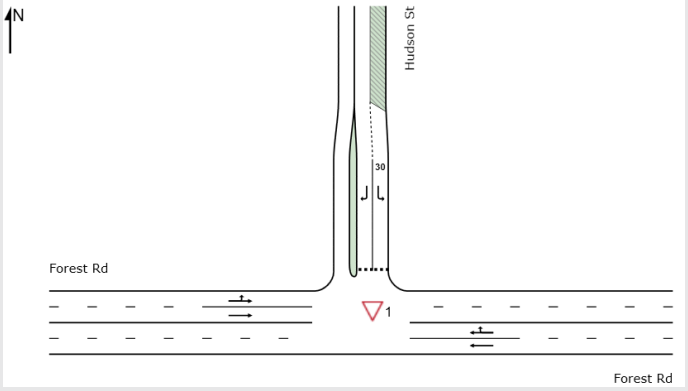
2:30 pm - 3:30 pm
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Durham St														
4	L2	401	4.0	401	4.0	0.395	6.5	LOS A	0.9	6.3	0.45	0.65	0.48	36.1
Approach		401	4.0	401	4.0	0.395	6.5	LOS A	0.9	6.3	0.45	0.65	0.48	36.1
NorthEast: Forest Rd														
24	L2	26	0.0	26	0.0	0.151	4.6	LOS A	0.0	0.0	0.00	0.05	0.00	48.4
8	T1	551	2.9	551	2.9	0.151	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	49.4
Approach		577	2.8	577	2.8	0.151	0.2	NA	0.0	0.0	0.00	0.02	0.00	49.4
NorthWest: Wright St														
27	L2	118	2.5	118	2.5	0.152	7.3	LOS A	0.2	1.6	0.50	0.72	0.50	43.6
Approach		118	2.5	118	2.5	0.152	7.3	LOS A	0.2	1.6	0.50	0.72	0.50	43.6
SouthWest: Forest Rd														
1	L2	68	0.0	68	0.0	0.287	4.4	LOS A	0.0	0.0	0.00	0.06	0.00	50.5
2	T1	479	1.5	479	1.5	0.287	0.0	LOS A	0.0	0.0	0.00	0.06	0.00	49.0
3	R2	395	3.0	395	3.0	0.499	10.0	LOS A	1.4	10.0	0.66	0.98	0.98	34.7
Approach		942	2.0	942	2.0	0.499	4.5	NA	1.4	10.0	0.28	0.45	0.41	42.5
All Vehicles		2038	2.6	2038	2.6	0.499	3.8	NA	1.4	10.0	0.25	0.38	0.31	42.9

Site 1: Forest Road / Hudson Street (Post Development) – Alternate intersection arrangement





AM Peak

MOVEMENT SUMMARY

Site: 1 [Hudson-Forest_Post Dev (2021)_AM Peak - Added departure lane to link to Wright St Signalised]

Network: N101 [2021_AM Peak_Post Dev_Signalise (Wright St)]

8:00 - 9:00 am
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Aver. Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Forest Rd														
5	T1	531	4.0	531	4.0	0.279	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
6	R2	253	1.6	253	1.6	0.446	12.4	LOS B	0.8	5.9	0.74	0.97	0.99	38.9
Approach		784	3.2	784	3.2	0.446	4.0	NA	0.8	5.9	0.24	0.31	0.32	43.2
North: Hudson St														
7	L2	318	1.9	318	1.9	0.344	7.0	LOS A	0.7	5.0	0.50	0.71	0.54	42.1
9	R2	5	20.0	5	20.0	0.059	45.9	LOS E	0.1	0.6	0.92	0.96	0.92	24.2
Approach		323	2.2	323	2.2	0.344	7.6	LOS A	0.7	5.0	0.51	0.71	0.55	41.5
West: Forest Rd														
10	L2	75	1.3	75	1.3	0.232	4.6	LOS A	0.0	0.0	0.00	0.09	0.00	48.3
11	T1	811	3.1	811	3.1	0.232	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	48.1
Approach		886	2.9	886	2.9	0.232	0.4	NA	0.0	0.0	0.00	0.05	0.00	48.2
All Vehicles		1993	2.9	1993	2.9	0.446	3.0	NA	0.8	5.9	0.18	0.26	0.21	43.8

PM Peak

MOVEMENT SUMMARY

Site: 1 [Hudson-Forest_Post Dev (2021)_PM Peak - Added departure lane to link to Wright St Signalised]

Network: N101 [2021_PM Peak_Post Dev_Signalise (Wright St)]

3:15 pm - 4:15 pm
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Aver. Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Forest Rd														
5	T1	804	3.1	804	3.1	0.421	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
6	R2	333	2.1	333	2.1	0.552	12.8	LOS B	1.2	8.6	0.76	1.02	1.13	38.5
Approach		1137	2.8	1137	2.8	0.552	3.8	NA	1.2	8.6	0.22	0.30	0.33	43.3
North: Hudson St														
7	L2	182	1.6	182	1.6	0.189	6.3	LOS A	0.3	2.2	0.42	0.63	0.42	42.8
9	R2	14	0.0	14	0.0	0.233	70.7	LOS F	0.3	1.9	0.96	1.00	1.01	19.3
Approach		196	1.5	196	1.5	0.233	10.9	LOS B	0.3	2.2	0.46	0.66	0.47	38.7
West: Forest Rd														
10	L2	83	1.2	83	1.2	0.218	4.6	LOS A	0.0	0.0	0.00	0.11	0.00	48.2
11	T1	751	2.5	751	2.5	0.218	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	47.9
Approach		834	2.4	834	2.4	0.218	0.5	NA	0.0	0.0	0.00	0.05	0.00	48.0
All Vehicles		2167	2.5	2167	2.5	0.552	3.1	NA	1.2	8.6	0.16	0.24	0.22	43.5

Site 1: Forest Road / Hudson Street (Post Development) – Alternate intersection arrangement

School PM Peak

MOVEMENT SUMMARY

Site: 1 [Hudson-Forest_Post Dev (2021)_School PM Peak - Added departure lane to link to Wright St Signalised]

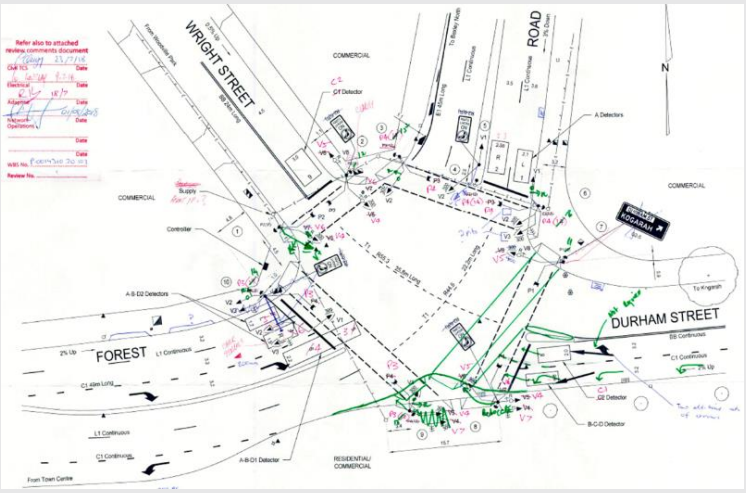
Network: N101 [2021_School PM Peak_Post Dev_Signalise (Wright St)]

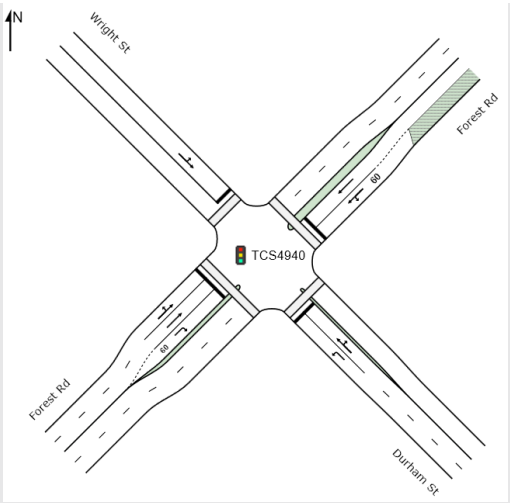
2:30 pm - 3:30 pm
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Forest Rd														
5	T1	669	3.6	669	3.6	0.351	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
6	R2	293	2.4	293	2.4	0.475	11.8	LOS B	0.9	6.8	0.72	0.97	0.99	39.2
Approach		962	3.2	962	3.2	0.475	3.6	NA	0.9	6.8	0.22	0.29	0.30	43.6
North: Hudson St														
7	L2	201	2.0	201	2.0	0.210	6.3	LOS A	0.4	2.5	0.43	0.64	0.43	42.7
9	R2	9	11.1	9	11.1	0.119	51.9	LOS F	0.1	1.1	0.94	0.97	0.94	22.9
Approach		210	2.4	210	2.4	0.210	8.3	LOS A	0.4	2.5	0.45	0.65	0.45	40.9
West: Forest Rd														
10	L2	71	1.4	71	1.4	0.213	4.6	LOS A	0.0	0.0	0.00	0.10	0.00	48.3
11	T1	745	2.1	745	2.1	0.213	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	48.1
Approach		816	2.1	816	2.1	0.213	0.4	NA	0.0	0.0	0.00	0.05	0.00	48.2
All Vehicles		1988	2.7	1988	2.7	0.475	2.8	NA	0.9	6.8	0.15	0.23	0.19	44.1

Site 2: Forest Road / Wright Street / Durham Street (Post Development) – Alternate intersection arrangement





AM Peak

MOVEMENT SUMMARY

Site: TCS4940 [Forest-Wright-Durham_Post Dev (2021)_AM Peak - Signalised (TCS4940)]

Network: N101 [2021_AM Peak_Post Dev_Signalise (Wright St)]

8:00 - 9:00 am
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 100 seconds (Site User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Durham St														
4	L2	367	4.4	367	4.4	0.296	10.6	LOS B	4.1	29.6	0.41	0.67	0.41	30.6
22	T1	1	0.0	1	0.0	0.011	43.2	LOS D	0.1	0.4	0.91	0.59	0.91	29.3
23	R2	1	0.0	1	0.0	0.011	48.8	LOS D	0.1	0.4	0.91	0.59	0.91	22.6
Approach		369	4.3	369	4.3	0.296	10.8	LOS B	4.1	29.6	0.41	0.67	0.41	30.5
NorthEast: Forest Rd														
24	L2	14	0.0	14	0.0	0.635	46.5	LOS D	6.2	44.5	0.98	0.81	0.98	22.3
8	T1	426	2.8	426	2.8	0.635	42.0	LOS D	6.3	45.0	0.98	0.81	0.98	15.6
Approach		440	2.7	440	2.7	0.635	42.1	LOS D	6.3	45.0	0.98	0.81	0.98	15.8
NorthWest: Wright St														
27	L2	101	1.0	101	1.0	0.473	50.7	LOS D	3.0	21.0	0.98	0.78	0.98	25.9
28	T1	1	0.0	1	0.0	0.473	47.1	LOS D	3.0	21.0	0.98	0.78	0.98	26.2
Approach		102	1.0	102	1.0	0.473	50.6	LOS D	3.0	21.0	0.98	0.78	0.98	25.9
SouthWest: Forest Rd														
1	L2	80	0.0	80	0.0	0.208	9.1	LOS A	2.6	18.8	0.34	0.40	0.34	43.7
2	T1	492	3.5	492	3.5	0.208	4.3	LOS A	2.6	18.8	0.33	0.33	0.33	42.5
3	R2	554	2.3	554	2.3	0.544	18.8	LOS B	8.1	58.0	0.67	0.87	0.90	28.3
Approach		1126	2.7	1126	2.7	0.544	11.8	LOS B	8.1	58.0	0.50	0.60	0.61	34.8
All Vehicles		2037	2.9	2037	2.9	0.635	20.1	LOS C	8.1	58.0	0.61	0.67	0.67	27.8

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P5	SouthEast Full Crossing	50	41.5	LOS E	0.1	0.1	0.91	0.91
P6	NorthEast Full Crossing	50	44.3	LOS E	0.1	0.1	0.94	0.94
P7	NorthWest Full Crossing	50	5.5	LOS A	0.0	0.0	0.33	0.33
P1	SouthWest Full Crossing	50	44.3	LOS E	0.1	0.1	0.94	0.94
All Pedestrians		200	33.9	LOS D			0.78	0.78

PM PEAK

MOVEMENT SUMMARY

Site: TCS4940 [Forest-Wright-Durham_Post Dev (2021)_PM Peak - Signalised (TCS4940)]

Network: N101 [2021_PM Peak_Post Dev_Signalise (Wright St)]

3:15 pm - 4:15 pm
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 100 seconds (Site User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Durham St														
4	L2	454	2.9	454	2.9	0.487	21.1	LOS C	8.7	62.1	0.69	0.77	0.69	22.1
22	T1	1	0.0	1	0.0	0.010	42.2	LOS D	0.1	0.4	0.90	0.59	0.90	29.7
23	R2	1	0.0	1	0.0	0.010	47.7	LOS D	0.1	0.4	0.90	0.59	0.90	23.0
Approach		456	2.9	456	2.9	0.487	21.2	LOS C	8.7	62.1	0.69	0.77	0.69	22.1
NorthEast: Forest Rd														
24	L2	15	0.0	15	0.0	0.478	31.2	LOS C	7.7	55.2	0.82	0.71	0.82	27.8
8	T1	652	2.8	652	2.8	0.478	26.6	LOS C	7.7	55.2	0.82	0.71	0.82	20.8
Approach		667	2.7	667	2.7	0.478	26.7	LOS C	7.7	55.2	0.82	0.71	0.82	21.0
NorthWest: Wright St														
27	L2	85	1.2	85	1.2	0.400	50.2	LOS D	2.5	17.5	0.97	0.77	0.97	26.0
28	T1	1	0.0	1	0.0	0.400	46.6	LOS D	2.5	17.5	0.97	0.77	0.97	26.3
Approach		86	1.2	86	1.2	0.400	50.1	LOS D	2.5	17.5	0.97	0.77	0.97	26.0
SouthWest: Forest Rd														
1	L2	53	0.0	53	0.0	0.194	8.7	LOS A	2.4	16.9	0.32	0.35	0.32	44.4
2	T1	485	2.7	485	2.7	0.194	4.2	LOS A	2.4	17.2	0.32	0.31	0.32	42.9
3	R2	384	2.3	384	2.3	0.486	20.1	LOS C	7.6	54.3	0.76	0.82	0.82	27.6
Approach		922	2.4	922	2.4	0.486	11.0	LOS B	7.6	54.3	0.51	0.53	0.53	35.5
All Vehicles		2131	2.5	2131	2.5	0.487	19.7	LOS B	8.7	62.1	0.66	0.65	0.67	27.3

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P5	SouthEast Full Crossing	50	26.7	LOS C	0.1	0.1	0.73	0.73
P6	NorthEast Full Crossing	50	44.3	LOS E	0.1	0.1	0.94	0.94
P7	NorthWest Full Crossing	50	5.5	LOS A	0.0	0.0	0.33	0.33
P1	SouthWest Full Crossing	50	44.3	LOS E	0.1	0.1	0.94	0.94
All Pedestrians		200	30.2	LOS D			0.74	0.74

School PM Peak

MOVEMENT SUMMARY

Site: TCS4940 [Forest-Wright-Durham_Post Dev (2021)_School PM Peak - Signalised (TCS4940) - Copy]

Network: N101 [2021_School PM Peak_Post Dev_Signalise (Wright St)]

2:30 pm - 3:30 pm
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 100 seconds (Site User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Durham St														
4	L2	401	4.0	401	4.0	0.403	17.9	LOS B	6.7	48.8	0.61	0.74	0.61	24.1
22	T1	1	0.0	1	0.0	0.010	42.1	LOS D	0.1	0.4	0.90	0.59	0.90	29.7
23	R2	1	0.0	1	0.0	0.010	47.6	LOS D	0.1	0.4	0.90	0.59	0.90	23.0
Approach		403	4.0	403	4.0	0.403	18.0	LOS B	6.7	48.8	0.61	0.74	0.61	24.1
NorthEast: Forest Rd														
24	L2	26	0.0	26	0.0	0.468	33.9	LOS C	6.9	49.4	0.85	0.73	0.85	26.5
8	T1	551	2.9	551	2.9	0.468	29.4	LOS C	7.0	49.9	0.85	0.73	0.85	19.6
Approach		577	2.8	577	2.8	0.468	29.6	LOS C	7.0	49.9	0.85	0.73	0.85	20.0
NorthWest: Wright St														
27	L2	118	2.5	118	2.5	0.473	48.8	LOS D	3.4	24.3	0.97	0.79	0.97	26.4
28	T1	1	0.0	1	0.0	0.473	45.2	LOS D	3.4	24.3	0.97	0.79	0.97	26.7
Approach		119	2.5	119	2.5	0.473	48.7	LOS D	3.4	24.3	0.97	0.79	0.97	26.4
SouthWest: Forest Rd														
1	L2	68	0.0	68	0.0	0.202	9.4	LOS A	2.6	18.3	0.35	0.39	0.35	43.6
2	T1	479	1.5	479	1.5	0.202	4.8	LOS A	2.7	18.8	0.35	0.34	0.35	41.9
3	R2	395	3.0	395	3.0	0.483	19.8	LOS B	7.6	54.4	0.75	0.82	0.82	27.7
Approach		942	2.0	942	2.0	0.483	11.5	LOS B	7.6	54.4	0.52	0.55	0.55	35.2
All Vehicles		2041	2.6	2041	2.6	0.483	20.0	LOS C	7.6	54.4	0.66	0.65	0.67	27.6

Movement Performance - Pedestrians

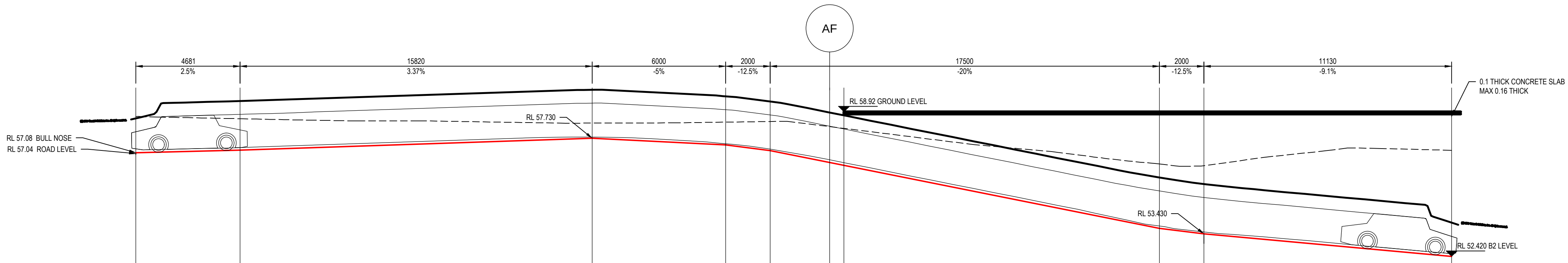
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P5	SouthEast Full Crossing	50	29.7	LOS C	0.1	0.1	0.77	0.77
P6	NorthEast Full Crossing	50	44.3	LOS E	0.1	0.1	0.94	0.94
P7	NorthWest Full Crossing	50	6.1	LOS A	0.0	0.0	0.35	0.35
P1	SouthWest Full Crossing	50	44.3	LOS E	0.1	0.1	0.94	0.94
All Pedestrians		200	31.1	LOS D			0.75	0.75

Appendix B – Driveway longsections

ENTERING CARPARK FROM HUDSON STREET

DESIGN BASIS & ASSUMPTIONS:

1. THE MINIMUM HEADROOM IS CHECKED FOR THE BASEMENT DRIVEWAYS WITH REFERENCE TO AS/NZS 2890.6 TO ACHIEVE A MINIMUM 2200 mm HEADROOM.
2. THE THICKNESS OF GROUND LEVEL SLAB IS ASSUMED AT 100 mm BUT CAN BE A MAXIMUM OF 160 mm TO ENABLE THE VERTICAL CLEARANCE FOR A B99 STANDARD VEHICLE.



SCALE: H 1:100 1:100

DATUM 50.000

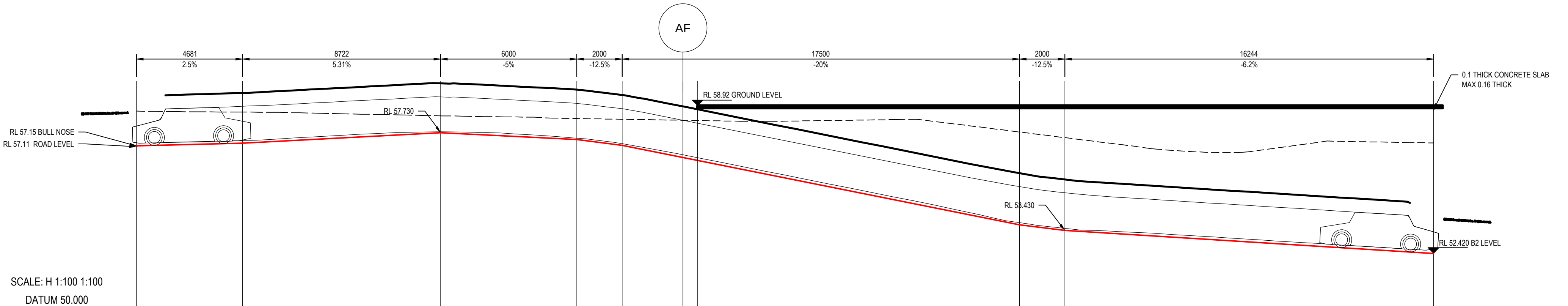
VERTICAL ALIGNMENT	L=4.681m G=2.50%	L=15.820m G=3.37%		L=6.00m G=-5.00%	L=2.00m G=-12.50%	L=12.96m G=-20.00%			L=2.00m G=-12.50%	L=11.13m G=-9.08%	
DESIGN SURFACE LEVEL	57.080	57.197	57.713	57.730	57.430	57.180	56.516	54.880	53.680	53.430	52.420
EXISTING SURFACE LEVEL	58.706	58.611	58.413	58.414	58.458	58.485	58.178	57.238	56.577	56.499	57.192
CHAINAGE	0.000	4.681	20.000	20.501	26.501	28.501	31.823	40.000	46.001	48.001	59.131

LONGITUDINAL SECTION - RAMP 01 ENTRY

EXITING CARPARK TO HUDSON STREET

DESIGN BASIS & ASSUMPTIONS:

1. THE MINIMUM HEADROOM IS CHECKED FOR THE BASEMENT DRIVEWAYS WITH REFERENCE TO AS/NZS 2890.6 TO ACHIEVE A MINIMUM 2200 mm HEADROOM.
2. THE THICKNESS OF GROUND LEVEL SLAB IS ASSUMED AT 100 mm BUT CAN BE A MAXIMUM OF 160 mm TO ENABLE THE VERTICAL CLEARANCE FOR A B99 STANDARD VEHICLE.



SCALE: H 1:100 1:100

DATUM 50.000

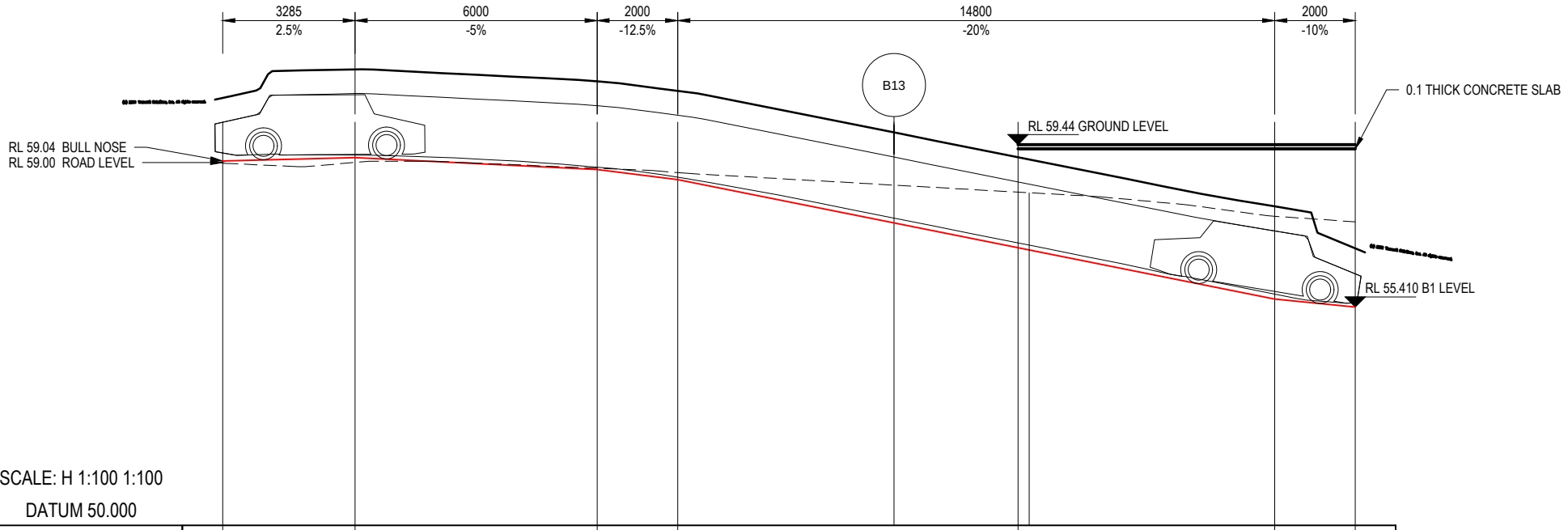
VERTICAL ALIGNMENT	L=4.681m G=2.50%	L=8.722m G=5.31%	L=6.000m G=-5%	L=2.000m G=-12.5%	L=17.500m G=-20%	L=2.000m G=-12.5%	L=11.13m G=-9.08%

DESIGN SURFACE LEVEL	57.150	57.713	57.730	57.730	57.355	57.730	56.516	57.730	54.880	53.430	52.420
EXISTING SURFACE LEVEL	58.682	58.637	58.476	58.355	58.345	58.323	58.269	57.763	57.627	57.515	57.284
CHAINAGE	0.000	4.681	13.403	19.403	20.000	21.403	24.725	38.903	40.000	40.903	57.147

LONGITUDINAL SECTION - RAMP 01 EXIT

ENTERING CARPARK FROM WRIGHT STREET

DESIGN BASIS & ASSUMPTIONS:
1. THE MINIMUM HEADROOM IS CHECKED FOR THE BASEMENT DRIVEWAYS WITH REFERENCE TO AS/NZS 2890.6 TO ACHIEVE A MINIMUM 2200 mm HEADROOM.
2. THE THICKNESS OF GROUND LEVEL SLAB IS ASSUMED AT 100 mm BUT CAN BE A MAXIMUM OF 160 mm TO ENABLE THE VERTICAL CLEARANCE FOR A B99 STANDARD VEHICLE.



SCALE: H 1:100 1:100

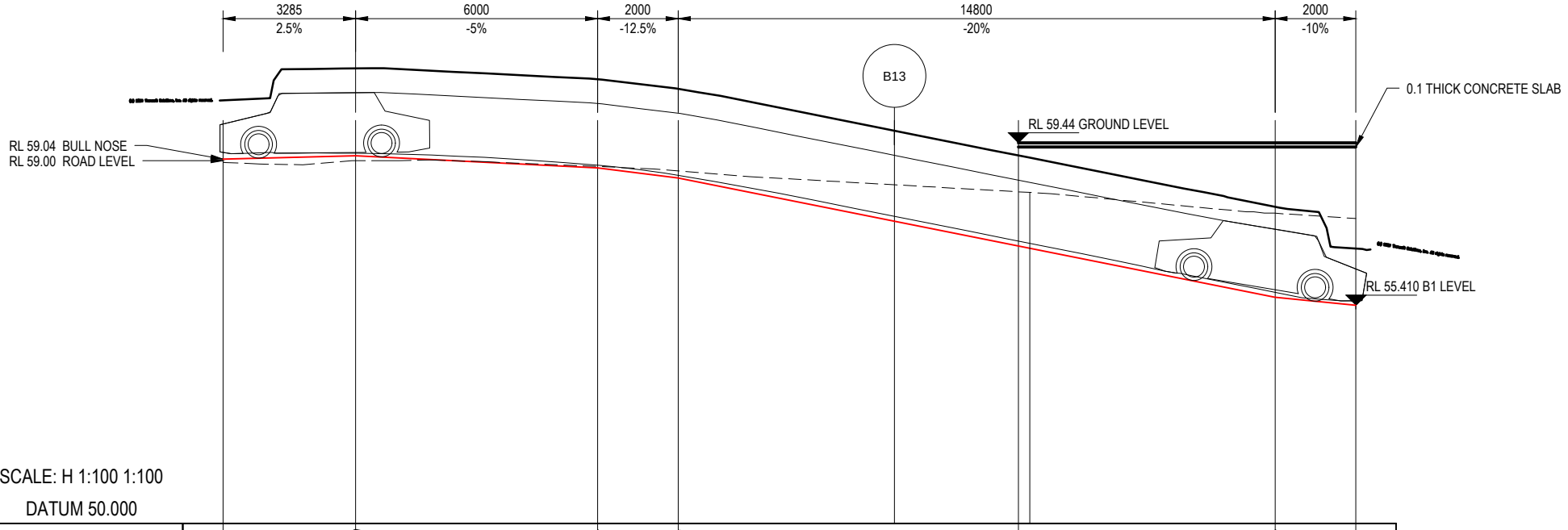
DATUM 50.000

VERTICAL ALIGNMENT		L=3.285m G=2.50%		L=6.00m G=-5%		L=2.00m G=-12.5%	L=14.800m G=-20%		L=2.00m G=-10%
DESIGN SURFACE LEVEL	59.04	59.122		58.822	58.572		56.884	56.829	55.612	55.410
EXISTING SURFACE LEVEL	58.981	59.002		58.883	58.750		58.265	58.249	57.667	57.529
CHAINAGE	0.000	3.285		9.285	11.285		19.723	20.000	26.085	28.085

LONGITUDINAL SECTION - RAMP 02 ENTRY

EXITING CARPARK TO WRIGHT STREET

DESIGN BASIS & ASSUMPTIONS:
1. THE MINIMUM HEADROOM IS CHECKED FOR THE BASEMENT DRIVEWAYS WITH REFERENCE TO AS/NZS 2890.6 TO ACHIEVE A MINIMUM 2200 mm HEADROOM.
2. THE THICKNESS OF GROUND LEVEL SLAB IS ASSUMED AT 100 mm BUT CAN BE A MAXIMUM OF 160 mm TO ENABLE THE VERTICAL CLEARANCE FOR A B99 STANDARD VEHICLE.



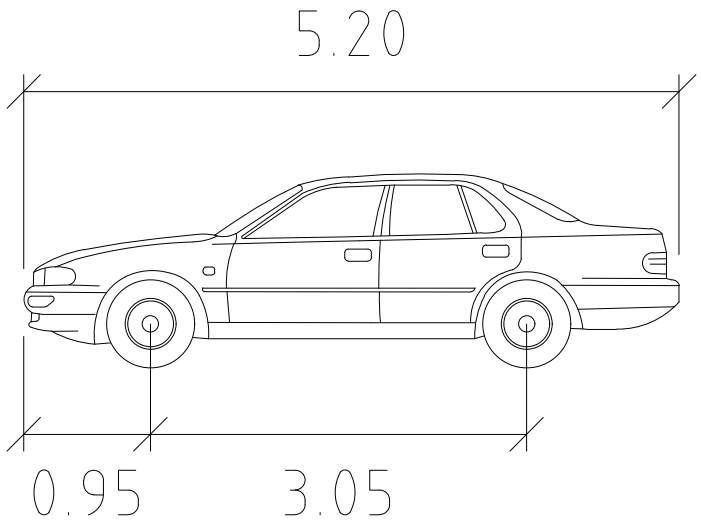
SCALE: H 1:100 1:100

DATUM 50.000

VERTICAL ALIGNMENT		L=3.285m G=2.50%		L=6.00m G=-5%		L=2.00m G=-12.5%	L=14.800m G=-20%			L=2.00m G=-10%
DESIGN SURFACE LEVEL	59.04	59.122		58.822		58.572	56.884	56.829	55.612	55.410
EXISTING SURFACE LEVEL	8.958	59.001		58.855		58.747	58.228	58.212	57.695	57.556
CHAINAGE	0.000	3.285		9.285		11.285	19.723	20.000	26.085	28.085

LONGITUDINAL SECTION - RAMP 02 EXIT

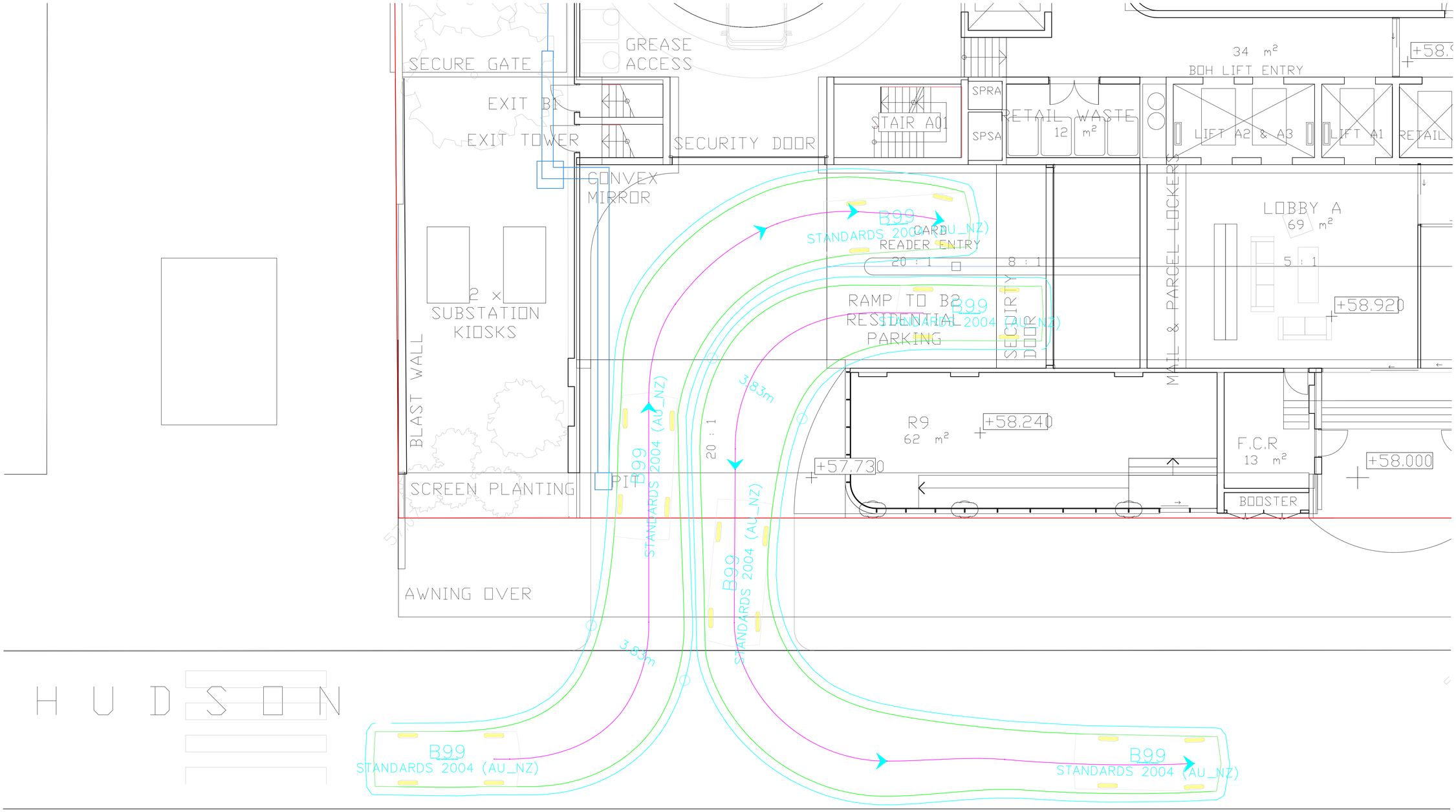
B99 VEHICLE PROFILE



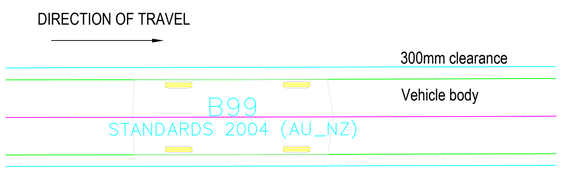
B99

	meters
Width	: 1.94
Track	: 1.84
Lock to Lock Time	: 6.0
Steering Angle	: 33.9

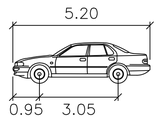
Appendix C – Turning Path Plans



LEGEND



NOT TO SCALE



B99	meters
Width	: 1.94
Track	: 1.84
Lock to Lock Time	: 6.0
Steering Angle	: 33.9

FOR INFORMATION ONLY

GEORGE EL KHOURI ARCHITECTS

PROPOSED MIXED DEVELOPMENT, 108-124 FOREST ROAD, HURSTVILLE

TURN PATH ANALYSIS - B99 Vehicle
FLOOR PLAN LEVEL 01 (GROUND) (SOUTH)

DA06 **REV 3** 30/07/2021

6-12
HUDSON STREET

A

LOADING DOCK

10.5m HRV

10.5M – COLLEX GARBAGE
Custom

BULKY WASTE

BOH A5

RL +59.440
R7
200 m²

WCs
13 m²

34 m²
BOH LIFT ENTRY

+58.920

18 m²

GREASE
ACCESS

SECURE GATE

EXIT B1

EXIT TOWER

SECURITY DOOR

CONVEX
MIRROR

SPRA

SPSA

STAIR A01

RETAIL WASTE
12 m²

LIFT A2 & A3

LIFT A1

RETAIL A4

STAIR A02

CARD
READER ENTRY

20 : 1

8 : 1

RAMP TO B2
RESIDENTIAL
PARKING

SECURITY
DOOR

MAIL & PARCEL LOCKERS

LOBBY A
69 m²

5 : 1

8 : 1

+58.920

+58.920

2 ×
SUBSTATION
KIOSKS

BLAST WALL

R9
62 m²

+58.240

+57.730

20 : 1

F.C.R
13 m²

+58.000

BOOSTER

R8
60

SCREEN PLANTING

PIT

AWNING OVER

HUDSON

57.96

10.5M – COLLEX GARBAGE
Custom

10.5M – COLLEX GARBAGE
Custom

LEGEND

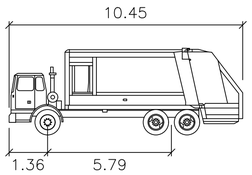
DIRECTION OF TRAVEL

300mm clearance

Vehicle body

10.5M – COLLEX GARBAGE
Custom

NOT TO SCALE



10.5M – COLLEX GARBAGE

meters

Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 36.6

TRUE NORTH

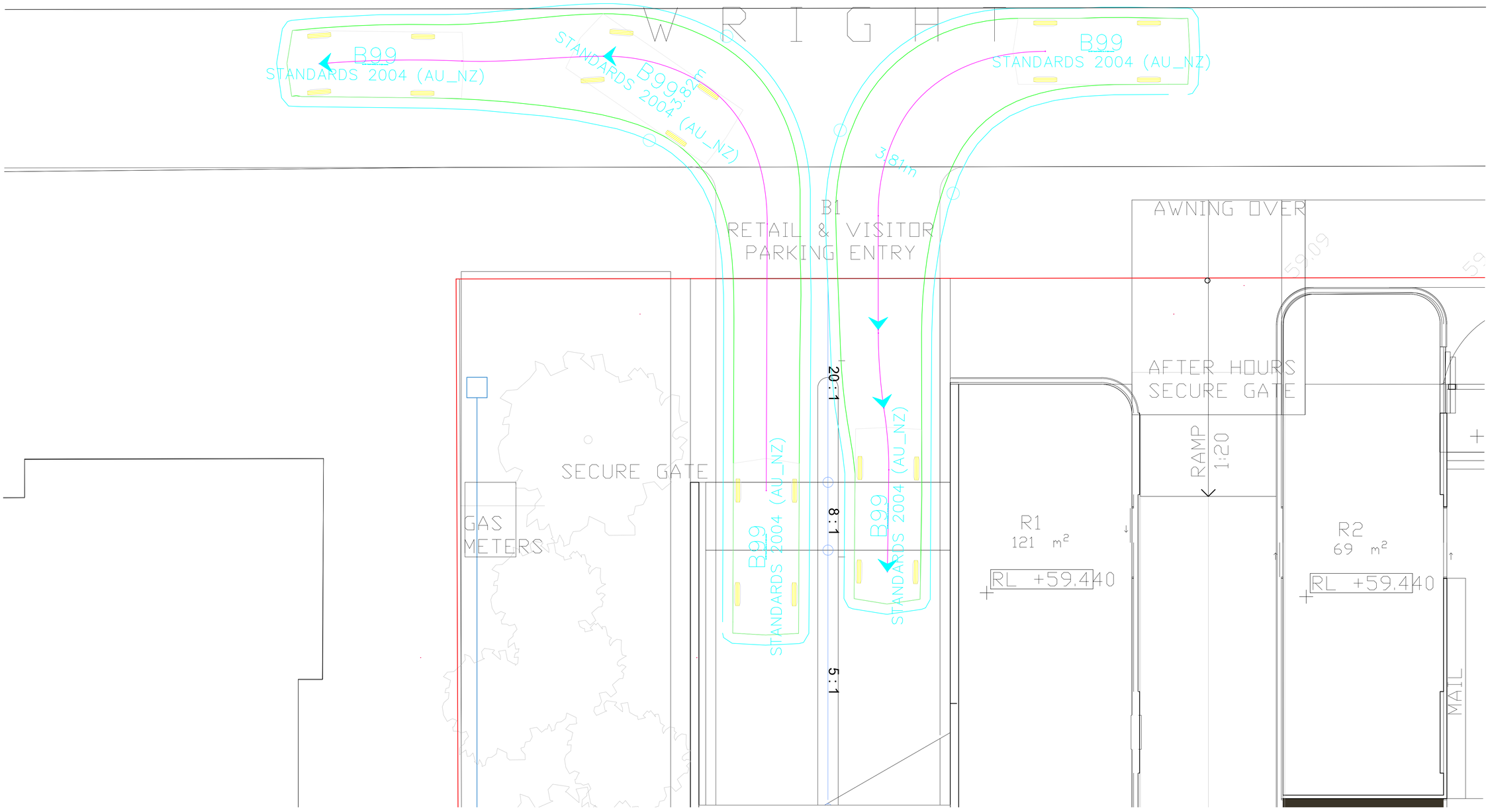
FOR INFORMATION ONLY

GEORGE EL KHOURI ARCHITECTS

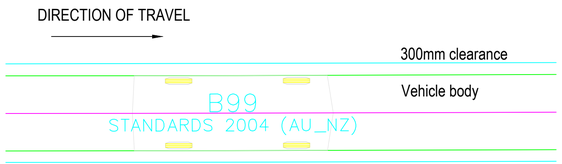
PROPOSED MIXED DEVELOPMENT, 108-124 FOREST ROAD, HURSTVILLE

TURN PATH ANALYSIS - 10.5M Waste Collection Vehicle
FLOOR PLAN LEVEL 01 (GROUND) (SOUTH) (LOADING DOCK)

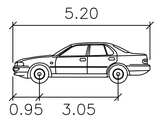
DA06 **REV 3** 30/07/2021



LEGEND



NOT TO SCALE



B99	meters
Width	: 1.94
Track	: 1.84
Lock to Lock Time	: 6.0
Steering Angle	: 33.9

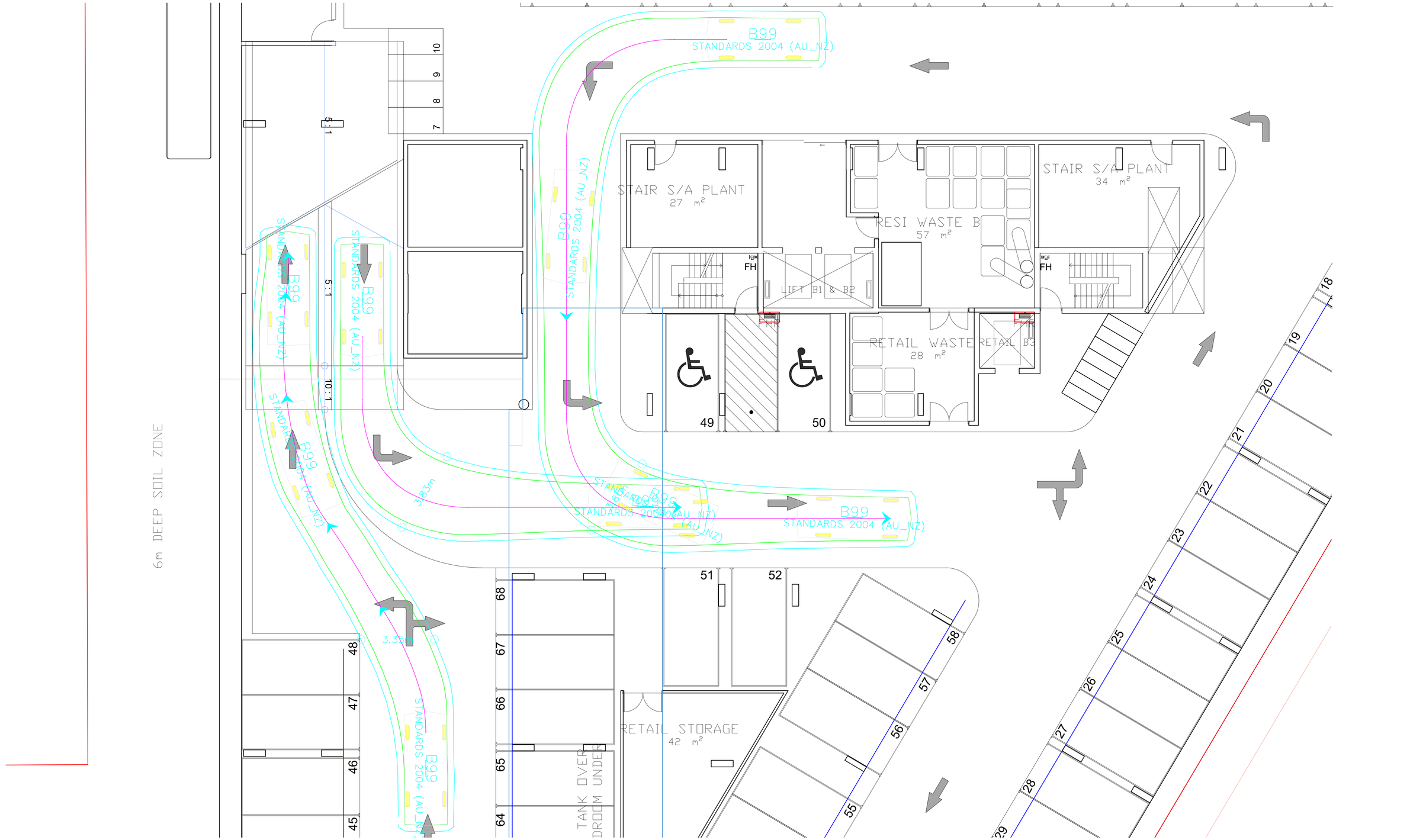
FOR INFORMATION ONLY

GEORGE EL KHOURI ARCHITECTS

PROPOSED MIXED DEVELOPMENT, 108-124 FOREST ROAD, HURSTVILLE

TURN PATH ANALYSIS - B99 Vehicle
FLOOR PLAN LEVEL 01 (GROUND) (NORTH)

DA06 **REV 3** 30/07/2021



LEGEND

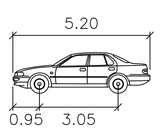
DIRECTION OF TRAVEL

300mm clearance

Vehicle body

B99
STANDARDS 2004 (AU_NZ)

NOT TO SCALE



B99	meters
Width	: 1.94
Track	: 1.84
Lock to Lock Time	: 6.0
Steering Angle	: 33.9

TRUE NORTH

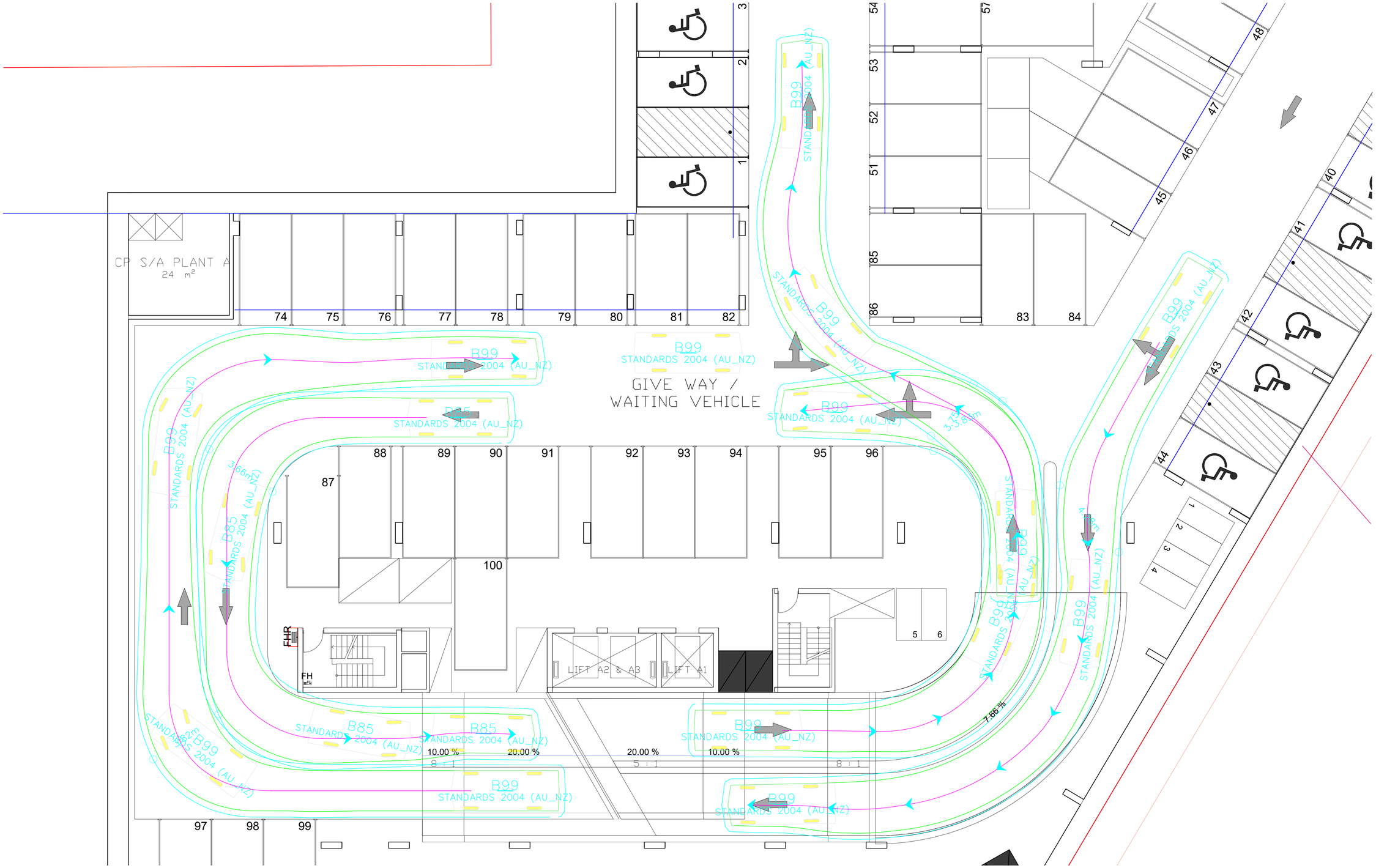
FOR INFORMATION ONLY

GEORGE EL KHOURI ARCHITECTS

PROPOSED MIXED DEVELOPMENT, 108-124 FOREST ROAD, HURSTVILLE

TURN PATH ANALYSIS - B99 Vehicle
FLOOR PLAN BASEMENT 01 (NORTH)

DA14 **REV 3** 30/07/2021



LEGEND

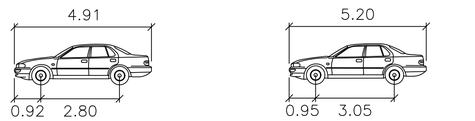
DIRECTION OF TRAVEL

300mm clearance

Vehicle body

B99 STANDARDS 2004 (AU_NZ)

NOT TO SCALE



B85	meters
Width	: 1.87
Track	: 1.77
Lock to Lock Time	: 6.0
Steering Angle	: 34.1

B99	meters
Width	: 1.94
Track	: 1.84
Lock to Lock Time	: 6.0
Steering Angle	: 33.9

TRUE NORTH

FOR INFORMATION ONLY

GEORGE EL KHOURI ARCHITECTS

PROPOSED MIXED DEVELOPMENT, 108-124 FOREST ROAD, HURSTVILLE

TURN PATH ANALYSIS - B85/B99 Vehicle
FLOOR PLAN BASEMENT 02 (SOUTH)

DA15 **REV 3** 30/07/2021

LEGEND

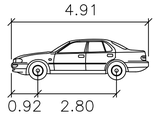
DIRECTION OF TRAVEL

300mm clearance

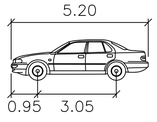
Vehicle body

B99
STANDARDS 2004 (AU_NZ)

NOT TO SCALE



B85	meters
Width	: 1.87
Track	: 1.77
Lock to Lock Time	: 6.0
Steering Angle	: 34.1



B99	meters
Width	: 1.94
Track	: 1.84
Lock to Lock Time	: 6.0
Steering Angle	: 33.9

TRUE NORTH

FOR INFORMATION ONLY

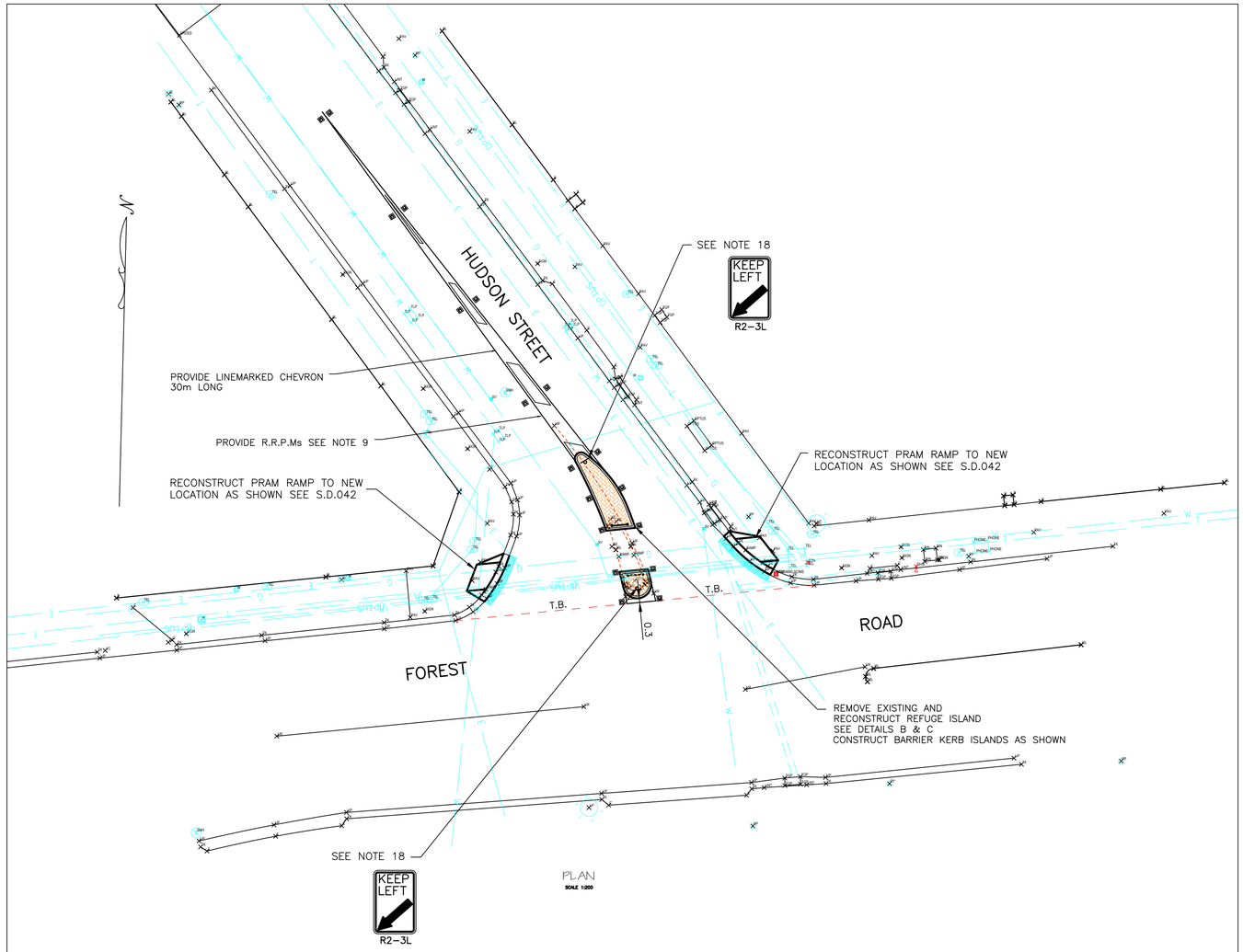
GEORGE EL KHOURI ARCHITECTS

PROPOSED MIXED DEVELOPMENT, 108-124 FOREST ROAD, HURSTVILLE

TURN PATH ANALYSIS - B85/B99 Vehicle
FLOOR PLAN BASEMENT 03 (SOUTH)

DA16 **REV 3** 30/07/2021

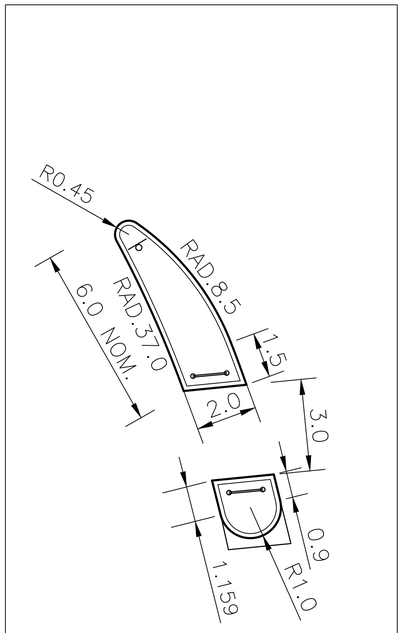
Appendix D– Hudson Street Pedestrian Refuge



PLAN
SCALE 1:200

CONSTRUCTION NOTES

1) ALL SERVICES TO BE CHECKED FOR LEVEL & LOCATION PRIOR TO COMMENCEMENT OF WORK.
2) ALL SERVICES AFFECTED BY NEW WORK TO BE ADJUSTED TO SUIT IN FIELD TO THE SERVICE AUTHORITY REQUIREMENTS
3) PROVIDE ADEQUATE APPROACH WARNING SIGNS DURING AFTER CONSTRUCTION ACCORDING TO A.S.1742.3
4) KERB FACES TO BE PAINTED REFLECTIVE WHITE IN ACCORDANCE WITH R.M.S. SPECIFICATION R141.
5) RELOCATE / REMOVE EXISTING SIGNS TO SUIT NEW WORK WHERE REQUIRED.
6) CONTACT COUNCIL FOR SETOUT PRIOR TO COMMENCEMENT OF WORK 93309465
7) ALL PAVEMENT MARKING AND SIGNPOSTING TO BE IN ACCORDANCE WITH A.S.1742 AND R.M.S. SPECIFICATION R141
8) MAINTAIN SAFE PEDESTRIAN ACCESS AT ALL TIMES THROUGHOUT CONSTRUCTION.
9) PROVIDE RAISED REFLECTORISED PAVEMENT MARKERS (R.R.P.M.s) AS SHOWN IN ACCORDANCE WITH R.M.S. SPECIFICATION R142.
10) PROVIDE 10mm MASTIC JOINT (JOINTEX OR SIMILAR)
11) ALL FILLING SO PROVIDED & IMPORTED ONTO SITE SHALL BE TO SATISFACTION OF THE SUPERVISING ENGINEER.
12) MATERIAL USED FOR FILLING SHALL BE UNIFORM IN CLASSIFICATION TO AVOID UNEVEN COMPACTION & SETTLEMENT.
13) ALL VEGETABLE MATTER, RUBBISH, SILT & OTHERWISE UNSUITABLE MATERIAL SHALL BE REMOVED BEFORE PLACING FILLING.
14) THE MATERIAL SHALL BE SPREAD & ROLLED TO PROVIDE COMPACTION LAYERS NOT GREATER THAN 150mm IN THICKNESS.
15) ALL LINE MARKING TO BE THERMOPLASTIC OR AS DIRECTED BY COUNCIL'S ENGINEER ON SITE
16) ALL SIGNS IN CONCRETE TO HAVE 'V' LOCK SUPPORTS
17) REMOVE ALL REDUDANT LINEMARKING AS REQUIRED.
18) PROVIDE KEEP LEFT SIGNS ON IMPACT RECOVERY POSTS AS SHOWN (R2-3L)



ISLAND SETOUT DETAILS
SCALE 1:50

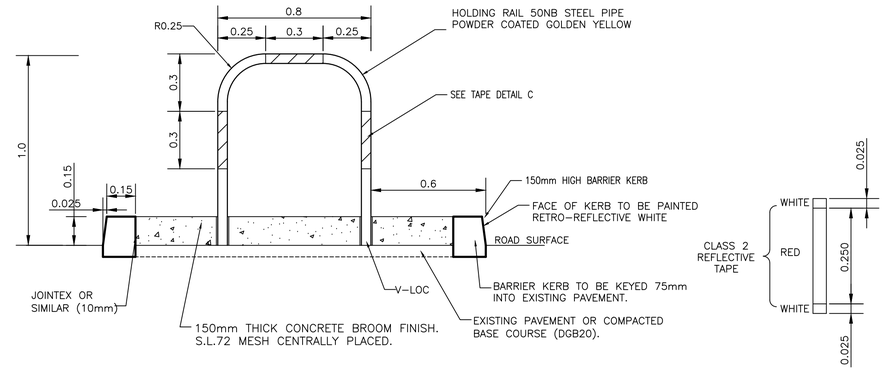
PAVEMENT MARKING SCHEDULE

B.B.....DOUBLE WHITE BARRIER LINES
E.5.....200mm CONTINUOUS WHITE LINE
T.B.....HOLDING LINE
C.1.....CONTINUITY LINE
E.1.....EDGE LINE
L.1.....LANE LINE

RAISED REFLECTIVE PAVEMENT MARKER TYPE 'YY'
@ 3m SPACINGS ON BB LINES AND E5 LINES ON APPROACH SIDES OF ISLANDS

RAISED REFLECTIVE PAVEMENT MARKER TYPE 'W'
@ 1.5m SPACINGS ON ALL OTHER E5 LINES

RAISED REFLECTIVE PAVEMENT MARKER TYPE 'R'
@ 3m SPACINGS ON E1 LINES



REFUGE ISLAND DETAIL B
CONCRETE TO BE OF 32MPa COMPRESSIVE STRENGTH (Fc) @ 28 DAYS
SCALE 1:20

TAPE DETAIL C

DIAL BEFORE YOU DIG www.1100.com.au

PRINCIPAL CONTRACTOR NOTIFICATION

THE CONSTRUCTION WORK DEPICTED ON THESE PLANS HAVE BEEN ASSESSED AS HIGH RISK IN ACCORDANCE WITH WORK HEALTH AND SAFETY REGULATION 2011(WHS REG 2011) CHAPTER 6 CONSTRUCTION WORK (clause 291).

AS SUCH IT IS THE PRINCIPAL CONTRACTORS RESPONSIBILITY AS PER WHS REG 2011 CHAPTER 6 CONSTRUCTION WORK TO;

* ERRECT SIGNAGE IDENTIFYING THEMSLEVES AS PRINCIPAL CONTRACTOR.
* ENSURE OH&S INDUCTION TRAINING IS TO BE UNDERTAKEN BY EMPLOYEES, AGENTS AND SUBCONTRACTORS ENTERING THE WORK SITE.
* PREPARE, IMPLEMENT, UPDATE AND MAKE AVAILABLE SAFE WORK METHOD STATEMENTS AND WHS MANAGEMENT PLANS.
* ENSURE THAT EACH SUBCONTRACTOR PROVIDES WRITTEN SAFE WORK METHOD STATEMENTS BEFORE COMMENCING WORK
* DIRECT AND MONITOR COMPLIANCE WITH APPLICABLE LEGISLATION AND ANY SAFE WORK METHOD STATEMENTS OR PROCEDURES
* KEEP A REGISTER OF, AND OTHER RECORDS IN RELATION TO, ALL HAZARDOUS AND OTHER SUBSTANCES ON SITE.
* COMMUNICATE TO THE COUNCIL OFFICER SUPERVISING THE CONTRACT ANY MAJOR ISSUES AS THEY ARISE, INCLUDING WORKCOVER NOTIFIABLE EVENTS

NO WORK IS TO COMMENCE UNTIL A SITE SPECIFIC INDUCTION IS CARRIED OUT WITH THE COUNCIL OFFICER SUPERVISING THE CONTRACT.

PRINCIPAL CONTRACTOR AND ALL SUBCONTRACTORS ARE TO ADHERE TO THE RESPONSIBILITIES AND REQUIREMENTS SET OUT IN GEORGES RIVER COUNCILS CONTRACTOR SAFETY INDUCTION HANDBOOK

	REVISION DETAILS	APPROVED	DATE
O			

HUDSON STREET AND FOREST ROAD
REFUGE RECONSTRUCTION
HURSTVILLE

GEORGES RIVER COUNCIL

SURVEYED	BM	APR21	
DESIGNED	AFG	DATE	
APPROVED			

CAUTION BEFORE EXCAVATION
ALL UP-TO-DATE SERVICE PLANS MUST BE ON SITE AT ALL TIMES DURING CONSTRUCTION.

DIAL BEFORE YOU DIG www.1100.com.au

SCALE AT A1	SCALE AT A3	DATUM	SURVEYORS REF.	SEQUENCE No.
		A.H.D.	sur	108834576

FILE No. file | DRG. No. U930 | SHT 1 OF 1 | REV. 20-4-21

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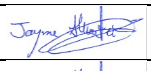
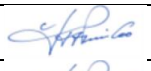
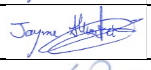
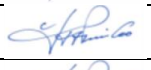
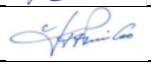
12524268-51947-4/https://projectsportal.ghd.com/sites/pp15_05/108124forestroadhurs/ProjectDocs/12524268-REP_108-124 Forest Rd, Hurstville_Traffic Impact Assessment.docx

Document Status

Revision	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
Rev 0	S. Clarke	J. Akstein		B. Prinsloo		18/12/2020
Rev 1	S. Clarke	J. Akstein		B. Prinsloo		18/12/2020
Rev 2	S. Clarke	B. Prinsloo		B. Prinsloo		30/07/2021

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