

Transport Impact Statement

120 Marine Parade, Cottesloe

CW1077400

Prepared for
Gary Dempsey Developments

8 April 2021



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1 Introduction

1.1 Background

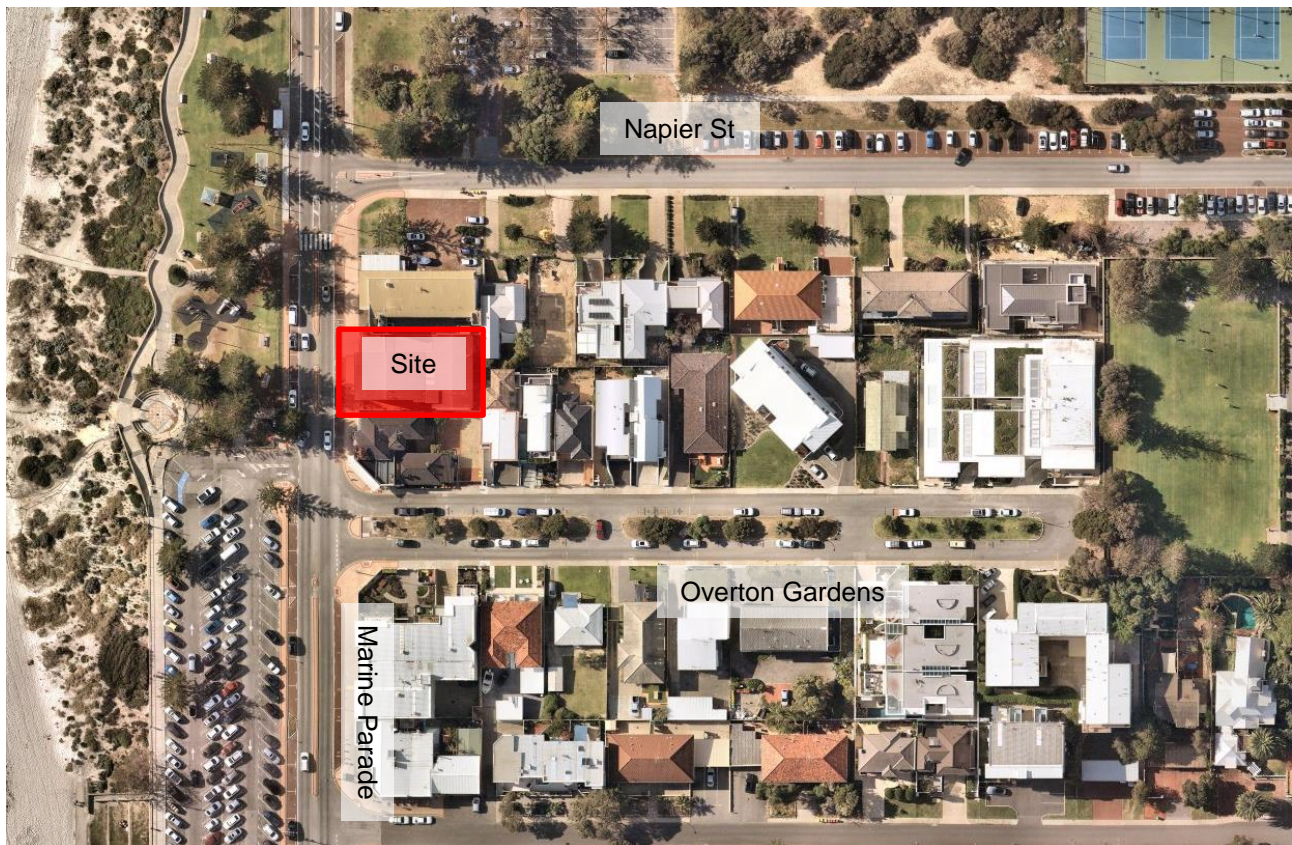
Cardno was commissioned by Gary Dempsey Developments to prepare a Transport Impact Statement (TIS) for the proposed eight storey mixed used development ('proposed development') located at Lot 120 Marine Parade, Cottesloe ('the Site').

This TIS has been prepared in accordance with the Western Australian Planning Commission (WAPC) *Transport Impact Assessment Guidelines for Developments: Volume 4 – Individual Developments* (2016) and the checklist is included in **Appendix A**.

1.2 Existing Site

The Site is located at Lot 120 Marine Parade, within the suburb of Cottesloe, under the municipality of Town of Cottesloe ('the Town'). The Site is bounded by Marine Parade to the west, and existing developments to the north, south and east. An aerial image of the Site is shown in **Figure 1-1**.

Figure 1-1 Site Location



Source: Nearmap, 2020

Figure 1-2 shows the existing land uses in the vicinity of the Site. The Site is currently zoned as 'Foreshore Centre - Special Control Area 2'.

Figure 1-2 Local Planning Scheme

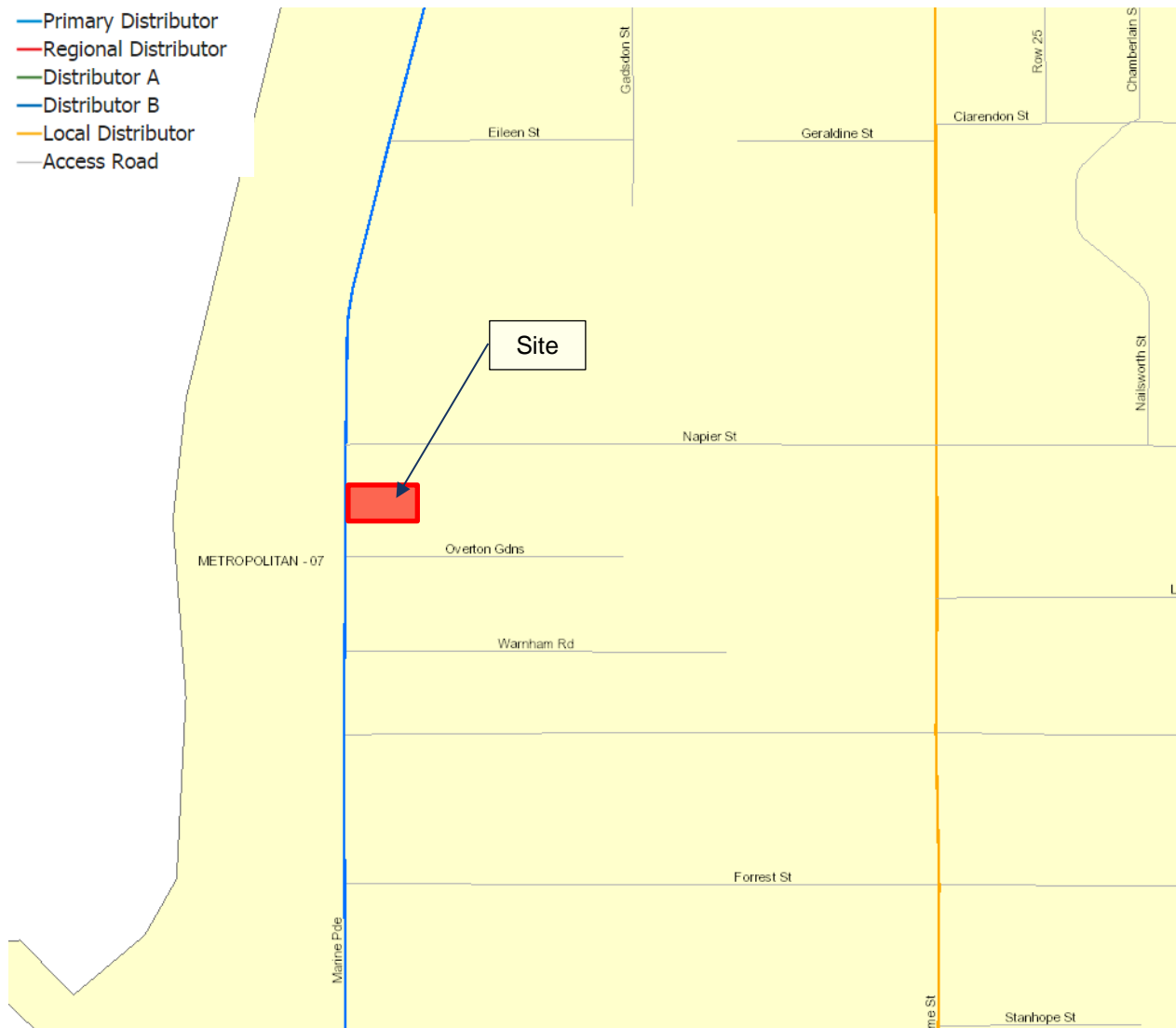


Source: Town of Cottesloe Local Planning Scheme No.3, 2018

1.3 Existing Road Network

The road classification in the vicinity of the Site as classified by the Main roads WA Metropolitan Functional Road Hierarchy (MFRH) is shown in **Figure 1-3**.

Figure 1-3 Road Network Classification



Source: MRWA Information Mapping System, 2020

Table 1-1 summarises the characteristics of the road network in the vicinity of the Site.

Table 1-1 Road Network Description

Road Name	Road Hierarchy		Road Network			
	Road Hierarchy	Jurisdiction	No. of Lanes	No. of Footpaths	Pavement Width (m)	Posted Speed (km/h)
Marine Parade	Distributor B	Local Government	2 (dual - carriageway)	2	3.4m + 2.4m on-street parking (x2)	40km/h (between Forest St and Eric St)
Napier Street	Access Road	Local Government	2 (dual - carriageway)	2	7.0m	50km/h
Overton Gardens	Access road	Local Government	2	2	3.0m + 2.5m on-street parking (x2)	50km/h

1.4 Existing Traffic Volumes

The existing traffic volume data has been obtained from Main Roads WA Trafficmap and is summarised in **Table 1-2**.

Table 1-2 Existing Traffic Volume

Road Network	AM Peak	PM Peak	Daily Volume
Napier Street – east of Marine Parade (2014)	49 VPH	52 VPH	672 VPD
Marine Parade – south of Eric Street (2019)	574 VPH	683 VPH	7,967 VPD
Marine Parade – north of Pearse Street (2014)	676 VPH	645 VPH	7,788 VPD

1.5 Crash Data

A search of the Main Roads WA Reporting Centre for traffic crash data was undertaken for reported crashes between 1 January 2015 and 31 December 2019 for the following sections:

- > Marine Parade midblock section between Overturn Garden and Napier St
- > Marine Parade and Overton Gardens Intersection
- > Marine Parade and Napier Street

5 midblock crashes were recorded within the midblock section of Marine Parade, between Overturn Garden and Napier Street, resulted in 3 major property damage, 1 minor property damage and 1 requiring hospital attention.

The data obtained shows that 5 crashes has been recorded within the midblock section of Marine Parade. Both of the crashes involve minor property damage only. Two of which are related to on-street parking and one driveway related crash. 1 crash requiring medical attention was recorded at the intersection between Marine Parade and Overton Gardens. No crashes were recorded at the intersection of Marine Parade and Napier Street for the last 5 years

Overall, the crash rate in the vicinity of the Site is relatively low. The proposed development is not expected to have significant impact to the traffic safety, as the proposed development is expected to have low number of traffic movements in and out of the Site.

2 Proposed Development

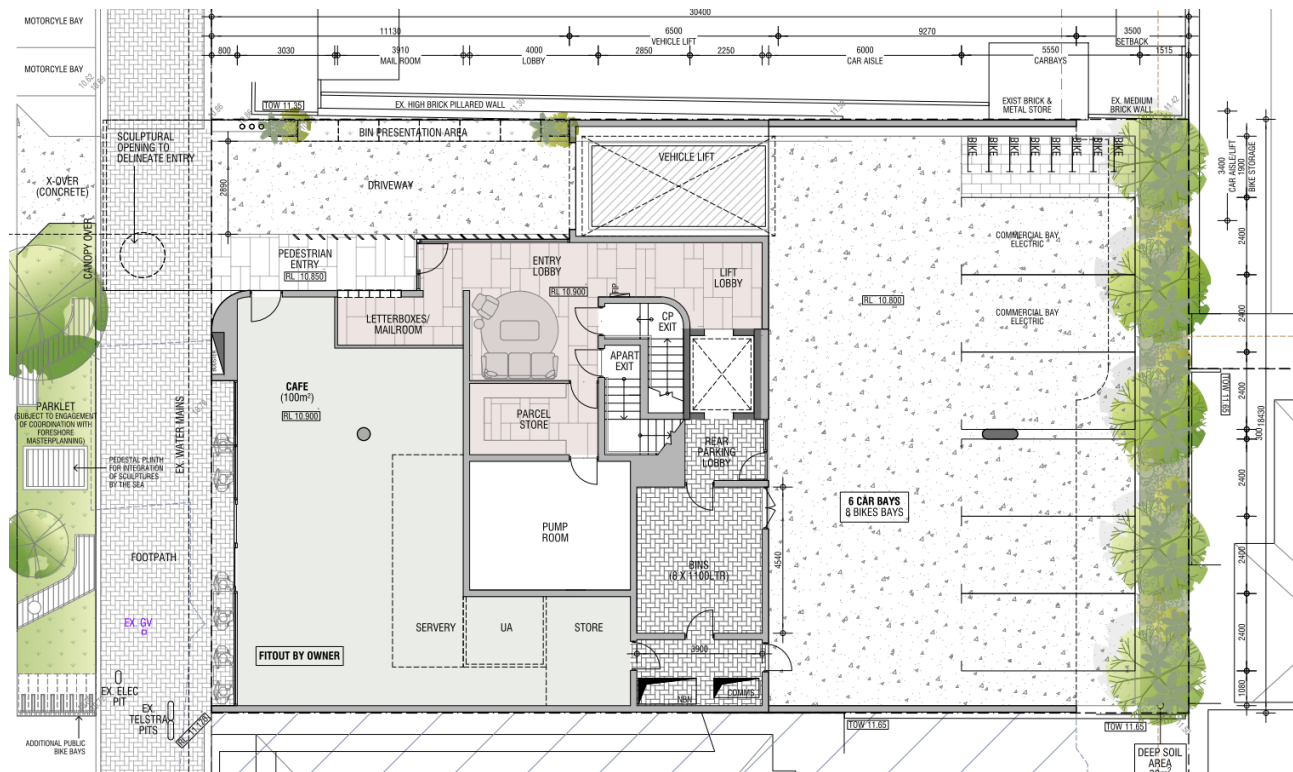
2.1 Proposed Land Uses

The proposed development consists of the following land uses:

- > 100m² Commercial Tenancy (café)
- > (2) one-bedroom apartments
- > (11) three-bedrooms apartments
- > (1) four-bedrooms apartment

The Site layout plan for the proposed development is shown in **Figure 2-1**.

Figure 2-1 Site Layout Plan (Ground Floor)



Source: Klopper & Davis Architects, 2021

2.2 Access Arrangements

2.2.1 Vehicle Access

The vehicle access for the Site will utilise the existing driveway fronting Marine Parade. The existing crossover will be narrowed to accommodate for one-way vehicle movement.

The access arrangements will be controlled by a signalised system where entering vehicles will be required to give way to any exiting vehicle. When access is clear and the signal turns green, the entering vehicle may proceed into the car park. This ensures that inbound and outbound movements are effectively managed allowing for a smooth flow of traffic to be achieved.

In addition to a signalised system, the volume of cars entering and exiting the carpark would be low, therefore it is unlikely that access issues will arise.

Cardno has prepared a detailed Access Management Plan to address all vehicle access related issues, which is attached in **Appendix C**.

2.2.2 Pedestrian Access

Pedestrian access to and from the Site is proposed to connect with the footpath along Marine Parade. The development proposed to improve the footpath connection, by redesigning the pedestrian interface to reinforce pedestrian priority, by retaining the grade and material of the pedestrian path across the driveway.

2.3 Development Traffic Generation

The trip generation for the proposed development has been calculated utilising the trip generation rate sourced from the *Institute of Transportation Engineering (ITE) Trip Generation Manual (10th Edition)*. The trip generation rates and estimated trips generation for the proposed development are presented in **Table 2-1** and **Table 2-2**.

Table 2-1 Trip Generation Rates

Land Use	Source	AM Peak	IN	OUT	PM Peak	IN	OUT
Multifamily Housing (Mid-Rise)	ITE 221	0.32 trips per dwelling	27%	73%	0.41 trips per dwelling	60%	40%
Restaurant/Café	ITE 932	15.1 trips per 100m ²	57%	43%	18.7 trips per 100m ²	52%	48%

Table 2-2 Estimated Trip Generation

Land Use	Yield	AM Peak	IN	OUT	PM Peak	IN	OUT
Multifamily Housing (Mid-Rise)	14 dwellings	4	1	3	5	3	2
Restaurant/Café	100m ²	15	9	6	19	10	9
		19	10	9	24	13	11

Based on ITE traffic generation rates, the proposed development is expected to generate approximately 19 vehicles trips in the AM peak and 24 vehicles trips in the PM peak hour. As shown in **Table 2-2**, the majority vehicular trips attributed to the proposed development are generated by the restaurant. This restaurant traffic is not expected to impact the Site and roads directly adjacent as no visitor parking is provided on-site. Visitors to the restaurant are expected to use the ample existing public parking around the locality and will therefore be distributed over to wider road network.

Additionally, due to the location of the proposed development, a large proportion of the trips will be shared between adjacent developments and visitors to the seaside. This will result in the actual additional trips within the wider road network being substantially lower than calculated. As such, the traffic impact by the proposed development is expected to be negligible.

It is also worth noting that the existing shop and 6 residential dwelling units will be removed. Therefore, it is expected that the net increase of traffic generated by the proposed development is lower, estimated to be less than 10 trips during both peak periods.

2.4 Provision for Service Vehicles

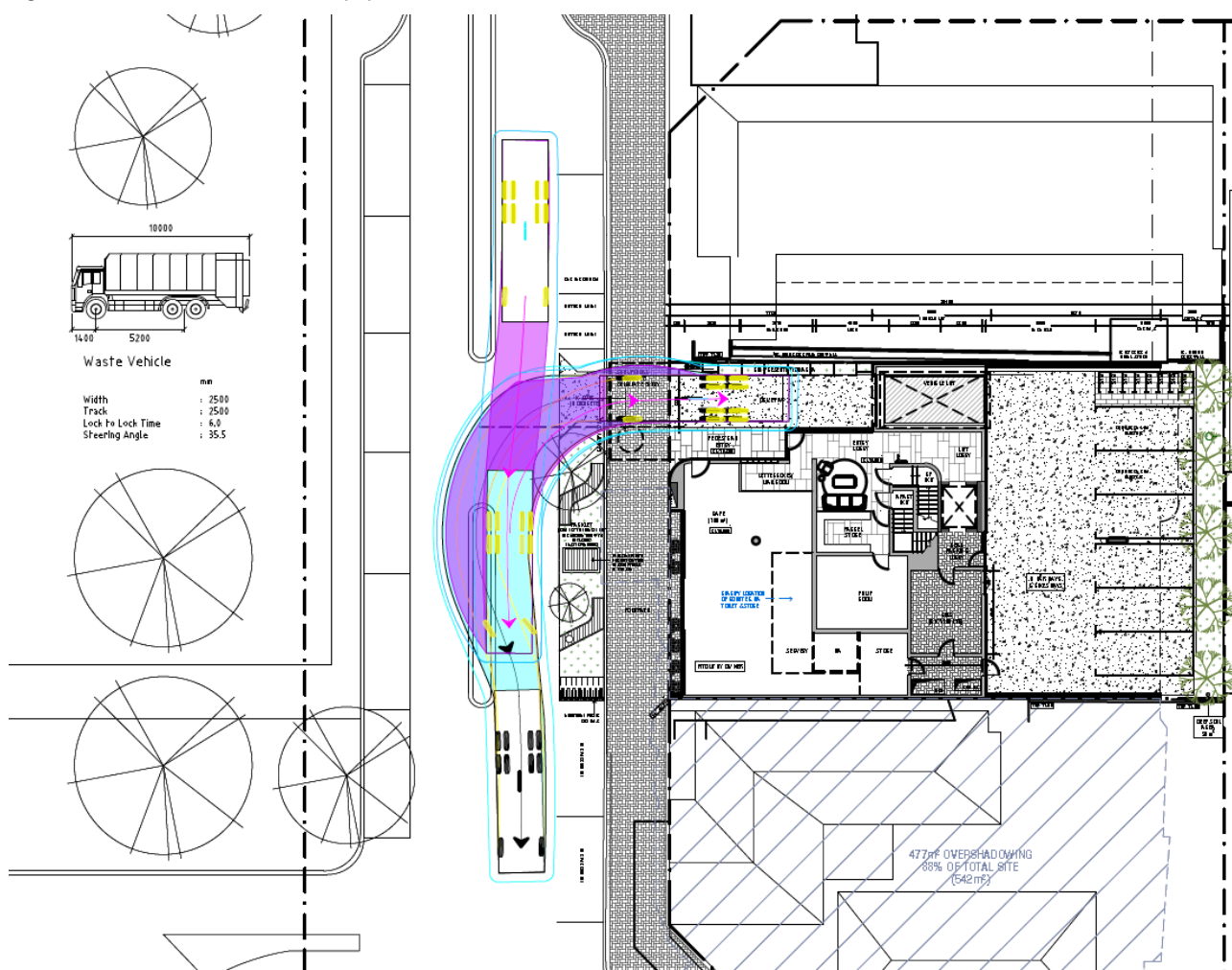
Cardno was advised that the waste on the proposed development will be collected outside of the normal operating hours.

The waste truck is proposed to be collected from the access off Marine Parade. The waste truck will reverse into the driveway, service the bins, which will be lined up against the northern wall, and exit the Site in forward gear. It is noted that the driver shall be accompanied by a spotter to help with reversing into the Site.

2.4.1 Option 1

Following the waste consultant's discussion with the Town, it was revealed that servicing could only be completed by the town's rear loader vehicle with the approximate dimensions of 10m. The swept path of the 10m waste truck is shown in **Figure 2-2**.

Figure 2-2 10m waste truck swept path



As shown in **Figure 2-2**, when the waste truck is parked to service the site, the vehicle would encroach and obstruct the footpath fronting the Site. Acknowledging that the waste collection is likely to occur out of hours where pedestrian traffic along the footpath is extremely low, over a short period of time, this arrangement can be managed and is less likely to impose any significant inconvenient or traffic safety risk.

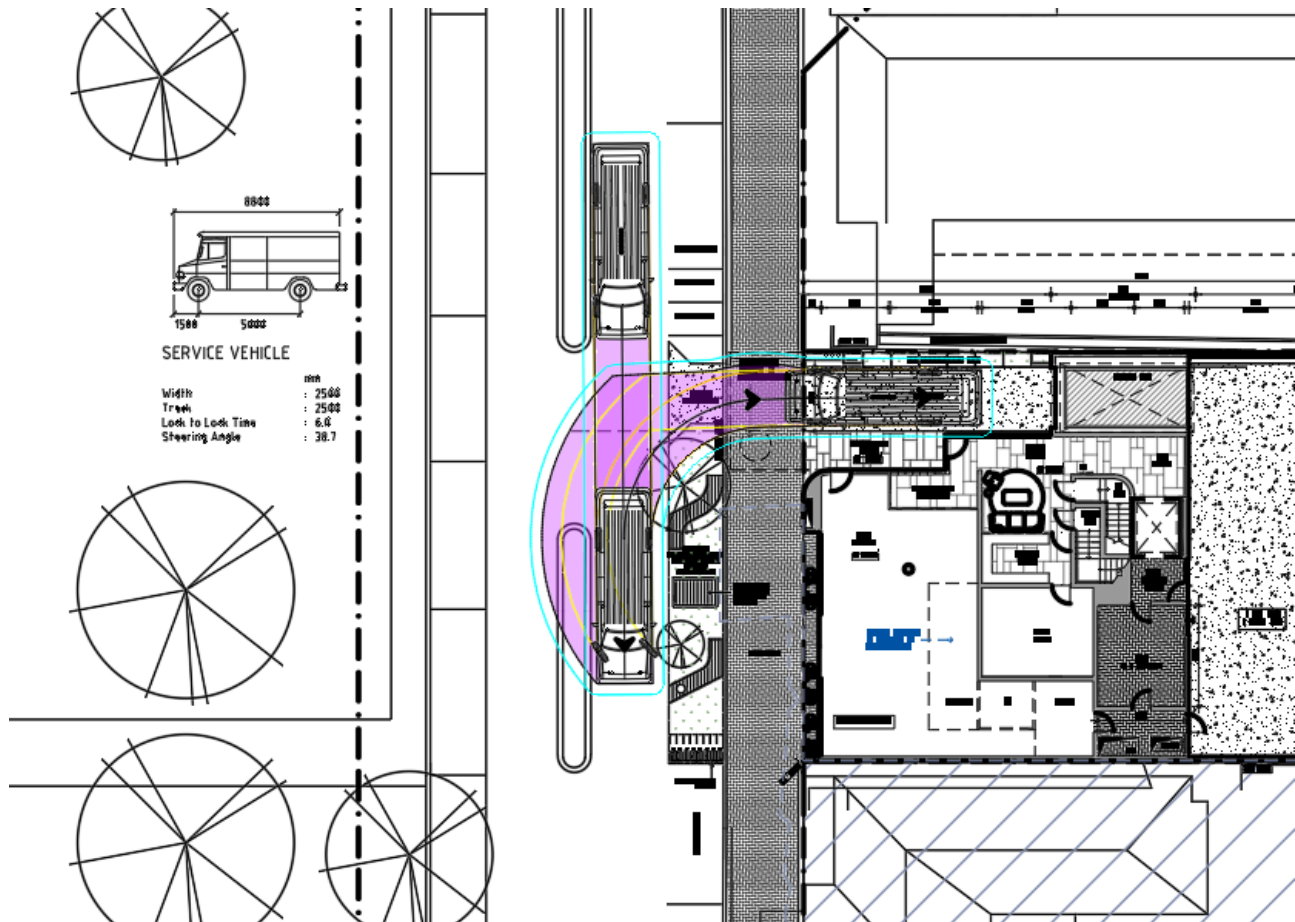
It is noted that the truck swept path encroaches onto the existing median island on Marine Parade, and proposed parklet. Hence, it is important to ensure that all infrastructure within the truck swept path shall be kept at grade or be trafficable.

2.4.2 Option 2

Alternatively, the option for a private contractor to service the development has been assessed, should the Town's waste collection vehicle be unable to safely service the Site. It is expected that a private contractor will be able to provide a waste truck with a smaller and lower profile to service the Site, reducing the impact on the adjacent footpath.

Figure 2-3 shows an 8.8m waste truck accessing the Site.

Figure 2-3 8.8m waste truck swept path



3 Parking Provision

3.1 Parking Requirements

The parking requirements for the proposed development has been calculated based on the requirements as defined by the *Town of Cottesloe Local Planning Scheme No.3, Table 3*. It is noted that all single house, group dwelling and multiple dwelling should provide sufficient parking spaces in accordance with the Residential Design Codes.

According to the *Local Planning Scheme, Clause 6.4.3.1*, for Special Control Area 2, the parking provision requirement of the Residential Design Codes are modified for the Grouped Dwelling and Multiple Dwelling use classes, with no visitor parking being required. Hence, visitor parking provision is not required for the proposed development.

A total of 27 parking bays have been provided within the basement levels (13 on B1, 14 on B2) of the Site, allocated for residential purposes. In addition to that, 2 commercial bays and 4 extra residential parking bays are provided on the ground floor car park, east of the building.

Table 3-1 Proposed Parking Requirements and Provision

Land Use	Parking Requirements	Yield	Parking Required	Parking Provision	Excess/ Shortfall
1-bedroom dwellings*	1 bay per dwelling	2 dwellings	2 bays	4 bays (ground floor)	+14 bays
2+ bedroom dwellings*	1.25 bay per dwelling	12 dwellings	15 bays	27 bays (basement)	
Café (Restaurant)**	1 space to every 8 persons	40 persons	5 bays	2 staff bays (Ground Floor)	-3 bays

* State Planning Policy 7.3, Residential Design Codes, Volume 2 – Apartments – Location B

** Town of Cottesloe Local Planning Scheme No.3

Table 3-1 indicates that the proposed development has sufficient parking for residential use and commercial staff use. The Site will not provide any on-site visitor parking for commercial purposes as all on-site parking bays will require car lift access.

As discussed in **Section 2.3**, a proportion of the commercial trips are expected to be reciprocal with the adjacent developments or attractions, thus reducing the net parking requirement. Majority of the café patrons are expected to be beach go-ers and are likely to access the Site on foot. Additionally, free public on-street parking bays are provided in the vicinity of the Site, within walkable distance.

3.2 Vehicle Swept Path (Basement Car Park)

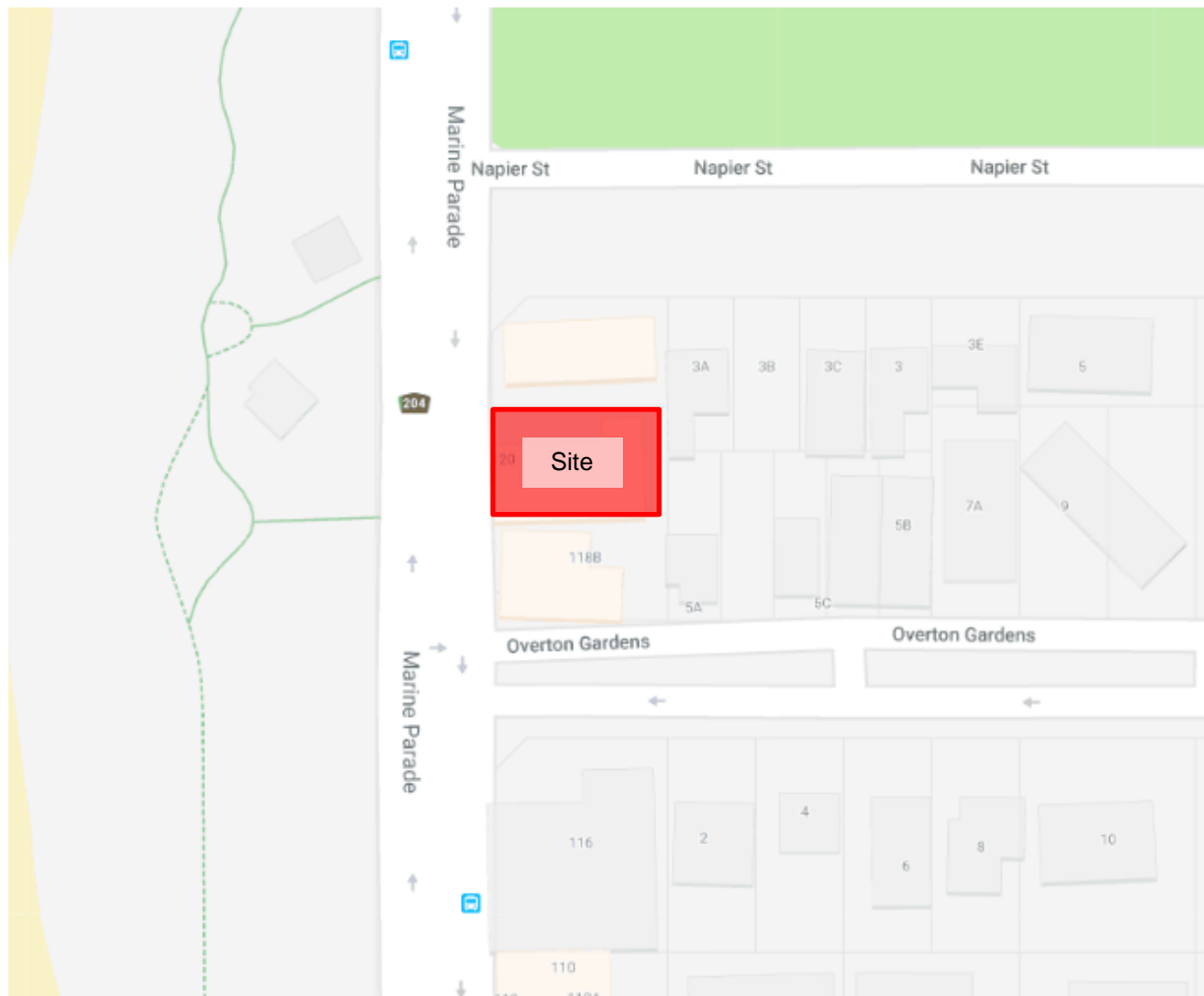
Swept path analysis has been conducted to ensure vehicles are able to access the proposed parking bays within the Site. The results of the vehicle swept path analysis are attached in **Appendix B**.

4 Public Transport Facilities

The nearest bus stop is approximately 70m away along Marine Parade, serviced by Bus Route 102. The bus stop locations in the vicinity of the Site is illustrated in **Figure 4-1**. Bus Route 102 provide linkage to Cottesloe Train Station, which is serviced by Fremantle Line trains, providing access to Perth CBD. The existing public transport network in the vicinity of the Site is shown in **Figure 4-2** and a summary of the bus frequency shown in **Table 4-1**. Overall, the Site has an excellent access to public transport facilities.

Cardno has contacted the Public Transport Authority (PTA) and was advised that there are no plans to significantly change the bus services within Cottesloe. However, it is noted that Bus Route 102 is likely to terminate at Claremont rather than continue to Perth, following the completion of Claremont Train Station upgrade, which would accommodate expanded bus facilities.

Figure 4-1 Location of Bus Stops



Source: Nearmap, 2019

Figure 4-2 Public Transport Network in the Vicinity of The Site



Source: Transperth, 2019

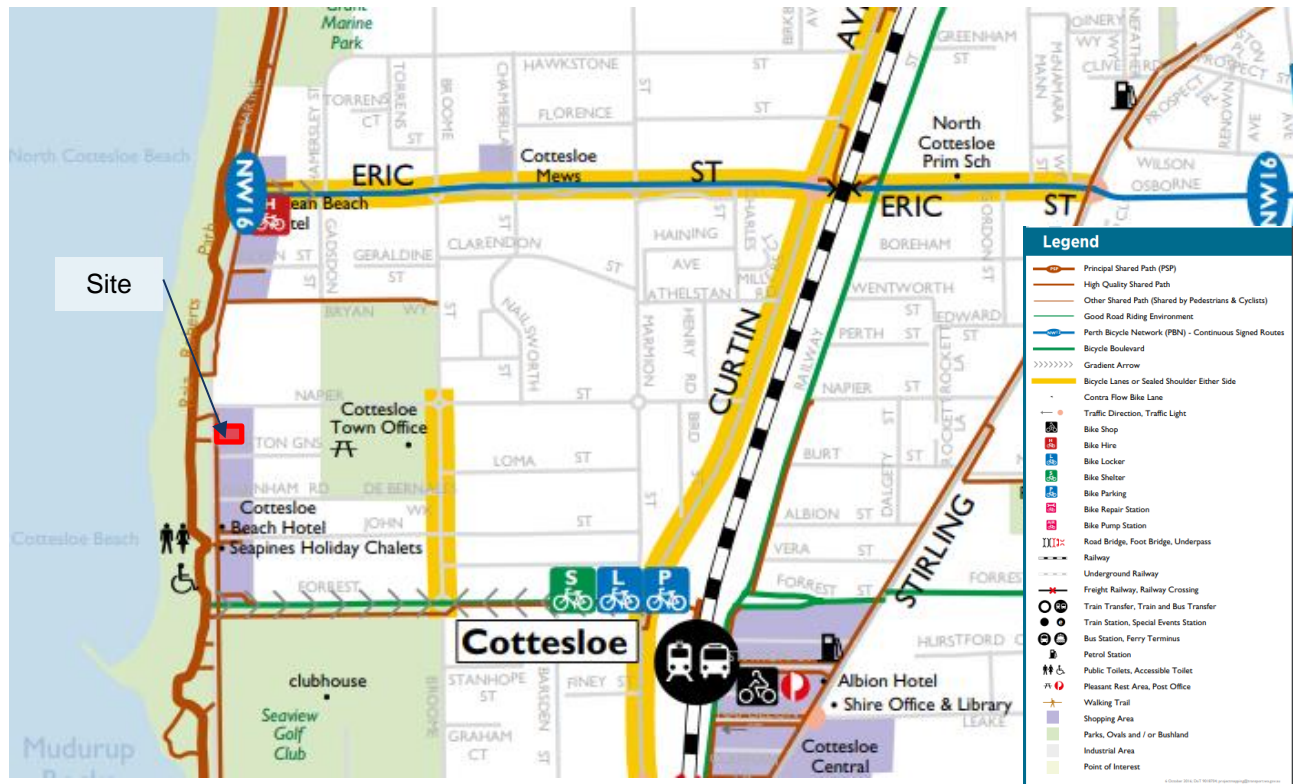
Table 4-1 Public Transport Frequency

Public Transport	Peak Hour Weekday	Off Peak Weekday	Saturday	Sunday / Public Holiday
Bus Route 102	20 mins	30 mins	30 mins	30 mins
Fremantle Train Line	10 mins	15 mins	15 mins	15 mins

5 Pedestrian/Cycle Networks and Facilities

The existing pedestrian/cycle network in the vicinity of the Site is shown in **Figure 5-1**. Overall, the Site benefits from good pedestrian and cycling facilities. High Quality Shared path is available along the coastline, with great connections to other cycling facilities. Eric Street located approximately 500m to the north of the Site is listed as Perth Bicycle Network, provide linkage to Perth CBD.

Figure 5-1 Pedestrian and Cycle Network in the vicinity of the Site



Source: Department of Transport – Perth, Fremantle and Stirling: Perth Bike Map

6 Site Specific Issues

6.1 Single Lane Driveway

The proposed access is a 3m single lane driveway, fronting Marine Parade. However, due to the nature of residential traffic flow, in the AM peak, the majority of the traffic would be expected to exit the Site, whereas in the PM peak, the majority of the traffic would return to the Site. Thus, limiting the likelihood of opposing movement conflicts during peak periods. Further information on the single lane driveway can be found in the Access Management Plan attached in **Appendix C**.

6.2 Car Lift Operation

The information on the management, operation and limitation of proposed vehicle lift can also be found in the Access Management Plan attached in **Appendix C**.

6.3 Marine Parade Long-term Driveway

It is noted that authorities intend to relocate the existing driveway off Marine Parade to ensure Marine Parade becomes a pedestrian priority street and to accommodate future redevelopment of the foreshore as outlined in the Cottesloe Foreshore Master Plan.

As noted in **Section 2.2.2**, the development proposed to improve pedestrian amenity by reinforcing pedestrian priority across the development driveway. This is an improvement from the existing pedestrian path that breaks across the existing driveway, giving the priority to vehicles using the driveway.

Additionally, the driveway will not be opened to public vehicles. This will significantly reduce the number of expected vehicles using the proposed driveway, especially the café patrons which would have generated most of the vehicle trips. Therefore, the volume of vehicles anticipated to use this driveway will be low.

From a traffic perspective, the existing access point off Marine Parade is suitable for a long-term access point.

7 Summary

This Transport Impact Statement outlines the transport aspects of the proposed development focusing on traffic operations, loading vehicle operations, access and provision of car parking.

This statement has been prepared in accordance with the *WAPC Transport Assessment Guidelines for Developments: Volume 4 – Individual Developments (2016)*.

The following are conclusions about the proposed development:

- > The proposed development is calculated to generate approximately 19 vehicle trips in the AM peak and 24 vehicle trips in the PM peak. However, the net traffic generation is expected to be significantly lower, due to the expected reciprocal uses between the commercial component of the Site and attractions in the vicinity of the Site.
- > The proposed development is located within the Special Control Area 2, according to the *Local Planning Scheme*. Therefore, visitor parking is not required for the proposed development.
- > The parking provision for the residential land uses of the Site meets the parking requirements sets out in the R-codes. The Site will provide 2 parking bays for the café staff, and will not provide any public parking bays for café patrons.
- > Waste truck servicing the proposed development will be required to reverse into the Site, with the help of a 'spotter', pick up the bin and drive forward out, after servicing the Site. Waste collection will occur during the off-peak period to ensure minimal impact and obstruction to the driveway.
- > The proposed development benefits from excellent public transport and cycling facilities in the vicinity of the Site.
- > Given the small scale of the development, the proposed development is unlikely to cause any material impact to the surrounding road network.

APPENDIX

A

WAPC CHECKLIST

Item	Status	Comments/Proposals
Proposed development		
proposed land use	Section 2	
existing land uses	Section 1	
context with surrounds	Section 1	
Vehicular access and parking		
access arrangements	Section 2	
public, private, disabled parking set down / pick up	Section 2	
Service vehicles (non-residential)		
access arrangements	Section 2	
on/off-site loading facilities	N/A	
Service vehicles (residential)		
Rubbish collection and emergency vehicle access	Section 2	
Hours of operation (non-residential only)	N/A	
Traffic volumes		
daily or peak traffic volumes	Section 1	
type of vehicles (e.g. cars, trucks)	N/A	
Traffic management on frontage streets	Section 1, Section 2	
Public transport access		
nearest bus/train routes	Section 4	
nearest bus stops/train stations	Section 4	
pedestrian/cycle links to bus stops/train station	Section 4 and 5	
Pedestrian access/facilities		
existing pedestrian facilities within the development (if any)	Section 5	
proposed pedestrian facilities within development	Section 5	
existing pedestrian facilities on surrounding roads	Section 5	
proposals to improve pedestrian access	N/A	
Cycle access/facilities		
existing cycle facilities within the development (if any)	Section 5	
proposed cycle facilities within the development	Section 5	
existing cycle facilities on surrounding roads	Section 5	
proposals to improve cycle access	N/A	
Site specific issues	Section 6	
Safety issues		
identify issues	N/A	
remedial measures	N/A	

APPENDIX

B

SWEPT PATH ANALYSIS

APPENDIX

C

ACCESS MANAGEMENT PLAN

Access Management Plan

120 Marine Parade

CW1077400

Prepared for
Gary Dempsey Developments

31 March 2021



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B	1/12/2020	Minor Update	Brian Sii	Scott Lambie
C	31/03/2021	Updated site plan	Brian Sii	Scott Lambie

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Our report is based on information made available by the client. The validity and comprehensiveness of supplied information has not been independently verified and, for the purposes of this report, it is assumed that the information provided to Cardno is both complete and accurate. Whilst, to the best of our knowledge, the information contained in this report is accurate at the date of issue, changes may occur to the site conditions, the site context or the applicable planning framework. This report should not be used after any such changes without consulting the provider of the report or a suitably qualified person.

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1 Introduction

1.1 Background

Cardno was commissioned by Gary Dempsey Developments to prepare an Access Management Plan (AMP) for the proposed multi-residential development located at 120 Marine Parade, Cottesloe. The proposed development will have access of Marine Parade, via an approximately 3.0 m wide, 11m long, one-way driveway.

The purpose of this AMP is to identify the transport-related constraints and propose strategies to ensure traffic operation and safety is maintained.

1.2 Proposed Development

The proposed development will consist of 14 apartments, one (1) café, and a total of 33 car parking bays (27 basement parking bays and 6 ground floor).

Two of the ground floor car bays are proposed to be allocated to café staff, while the remaining 31 car parking bays will be allocated among the 14 apartments.

2 Vehicle Access Arrangement

2.1 Access Function and Driveway Geometry

All vehicles will access the Site via the existing driveway fronting Marine Parade. All vehicles, except for waste truck movements will enter and exit the Site in forward gear.

The driveway is designed to accommodate one-lane, two-way traffic flow through a managed access arrangement.

The pedestrian interface will be designed to reinforce pedestrian priority, by retaining the grade and material of the pedestrian path across the driveway (in accordance with the WALGA's *Crossover Guidelines*). Adequate visibility to pedestrians is provided at the path interface, consistent with the requirements of Australian Standards AS2890.1.

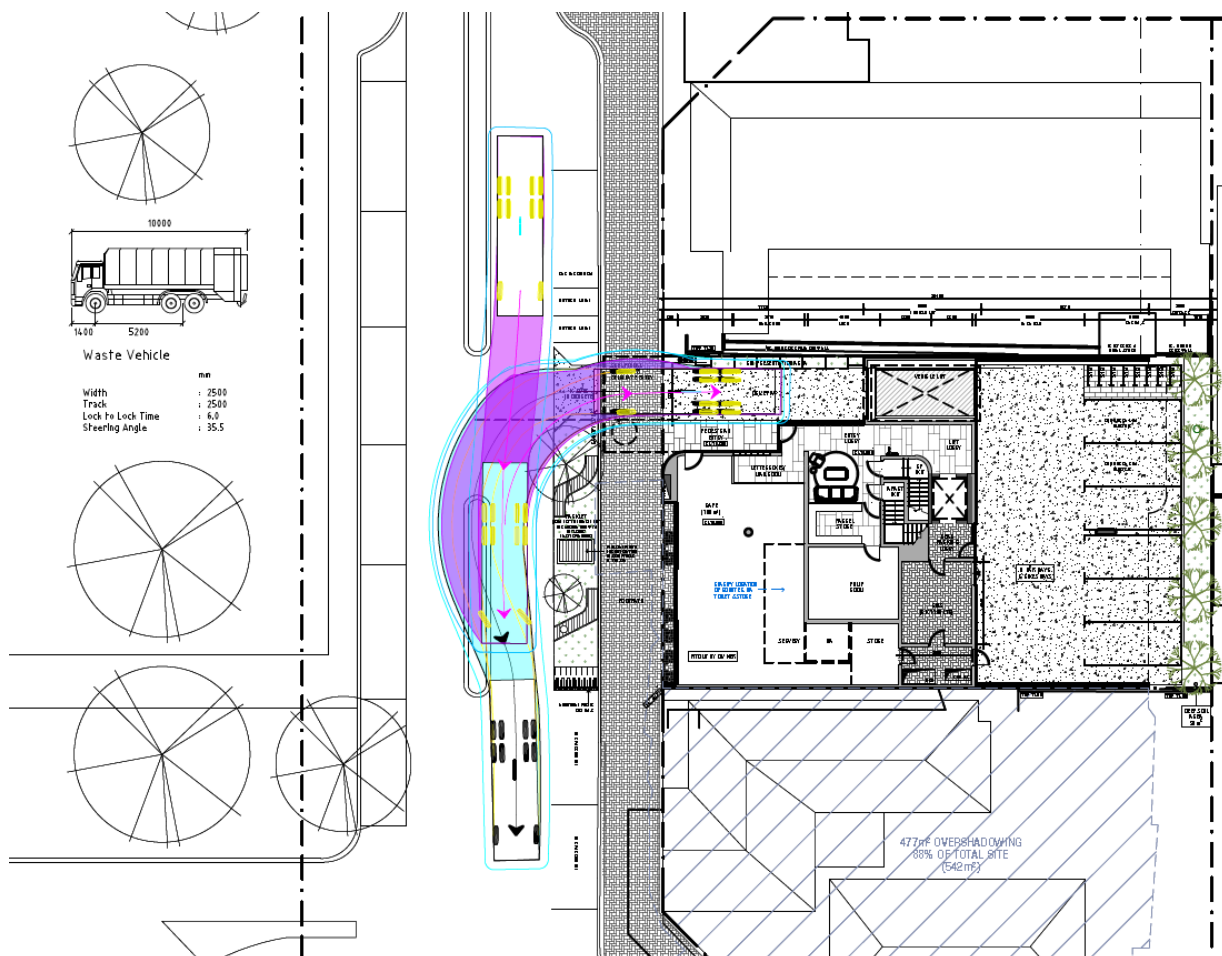
2.2 Waste Collection

Waste collection would occur on-site, during late evening / early morning when residential vehicles are unlikely to use the driveway. The waste truck will reverse into the driveway, with the help of a spotter, to service the bins before exiting the Site in forward gear. These bins will be lined up against the wall to facilitate collection.

This process is likely to obstruct the driveway for only a few minutes, and is not expected to significantly affect operation of the driveway. The 10m waste truck design vehicle swept path is shown in **Figure 2-1**.

All infrastructure within the truck swept path shall be kept at-grade, or be trafficable, to accommodate the truck movement, including the central median island.

Figure 2-1 10m Waste truck swept path



3 Vehicle Lift Operation

3.1 Lift Specification

A vehicle lift has been proposed for this development to provide access to the basement car parking levels. The chosen lift is designed to accommodate a B99 vehicle, with a platform size of 5.6m(L) x 2.45m(W), and shaft size 6.1m(L) x 3.1m(W).

3.2 Car Lift Operation Procedure and Time

The proposed lift system operates via hydraulics, and managed such that the lift remains on the lowest level (B2) in its idle state. Residents will be issued with remote that will allow for calling of lift while in their vehicle.

Based on this, Cardno has the procedure and time required for different lift usage as listed below:

Table 3-1 Ground to Ground (Accessing the rear carpark)

Action	Time
<u>Approach lift, press button</u>	
Lift Travel from B2	16
Door Open	5
<u>Enter lift</u>	2
<u>Exit Lift</u>	2
Door Close	5
Total Travel Time	37

Table 3-2 Ground to B1 (Entering B1 Carpark)

Action	Time
<u>Approach lift, press button</u>	
Lift Travel from B2	16
Door Open	5
<u>Enter lift, press button</u>	5
Door Close	5
Average Travel Time	8
Travel Time Contingency*	5
Door Open	5
<u>Exit Lift</u>	5
Door Close	5
Total Travel Time	63

Table 3-3 Ground to B2 (Entering B2 Carpark)

Action	Time
<u>Approach lift, press button</u>	
Lift Travel from B2	16
Door Open	5
<u>Enter lift, press button</u>	5
Door Close	5
Average Travel Time	16
Travel Time Contingency*	5
Door Open	5
<u>Exit Lift</u>	5
Door Close	5
Total Travel Time	74

Table 3-4 B1 to Ground (Exiting B1 Carpark)

Action	Time
<u>Approach lift, press button</u>	
Lift Travel from B2	8
Door Open	5
<u>Enter lift, press button</u>	5
Door Close	5
Average Travel Time	8
Travel Time Contingency*	5
Door Open	5
<u>Exit Lift</u>	5
Door Close	5
Total Travel Time	55

Table 3-5 B1 to Ground (with lift positioned at Ground)

Action	Time
<u>Approach lift, press button</u>	
Lift Travel from G	8
Door Open	5
<u>Enter lift, press button</u>	5
Door Close	5
Average Travel Time	8
Travel Time Contingency*	5
Door Open	5
<u>Exit Lift</u>	5
Door Close	5
Total Travel Time	55

Table 3-7 B2 to Ground (with lift positioned at Ground)

Action	Time
<u>Approach lift, press button</u>	
Lift Travel from G	16
Door Open	5
<u>Enter lift, press button</u>	5
Door Close	5
Average Travel Time	16
Travel Time Contingency*	5
Door Open	5
<u>Exit Lift</u>	5
Door Close	5
Total Travel Time	74

Table 3-6 B2 to Ground (Exiting B2 Carpark)

Action	Time
<u>Approach lift, press button</u>	
Lift Travel from B2	0
Door Open	5
<u>Enter lift, press button</u>	5
Door Close	5
Average Travel Time	16
Travel Time Contingency*	5
Door Open	5
<u>Exit Lift</u>	5
Door Close	5
Total Travel Time	58

This assessment indicates that the cycle time for the car lift would be between 37s and 74s (average approximately 60s) depending on the movement required. Given that the maximum demand is anticipated to be in the order of 4-5 vehicle movements in the peak hour (residential only), there is minimal likelihood that any conflict would occur during lift operation.

However, the potential for interactions between residents has been considered, and is discussed further in **Section 4** below.

4 Access Management Strategy

4.1 Proposed Infrastructure

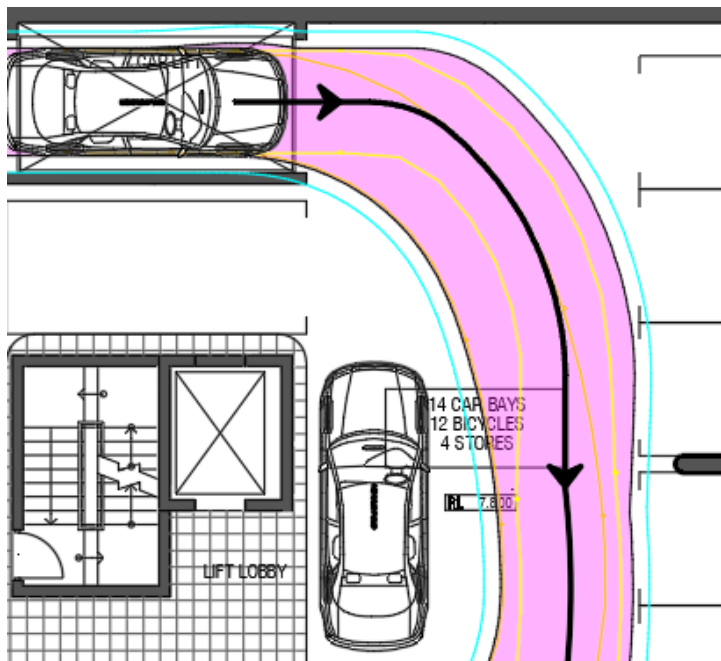
Due to the proposed one-way driveway and the lack of sufficient space to create a waiting bay within the Site, a traffic light is considered necessary to ensure drivers entering the Site are informed of potential opposing vehicle movements. This traffic light would be installed where it is visible from the road, to stop drivers from entering the Site when the lift is in-use.

Within the car park, flashing lights visible from both approach and departure aisles would be sufficient and will be installed at the lift entry/exit. This system will notify drivers in the basement levels of any lift activity.

4.2 Scenario 1 – Vehicle Leaving the Basement

Scenario / Status	Actions (Vehicle in basement)
Warning light flashing before vehicle leaves the parking bay	Remain in the parking bay until flashing light is off, then proceed to activate the lift
Warning light turned on after vehicle exit the parking bay.	Stop vehicle in a position where travel path of the vehicle exiting the lift is not obstructed (Figure 4-1), proceed to activate the lift and reposition the vehicle.
Car lift activated simultaneously by drivers on the ground floor (inbound) and basement.	Vehicle in the basement to give-way and reverse into position where travel path of the vehicle exiting the lift is not obstructed, before proceeding to re-activate the lift.

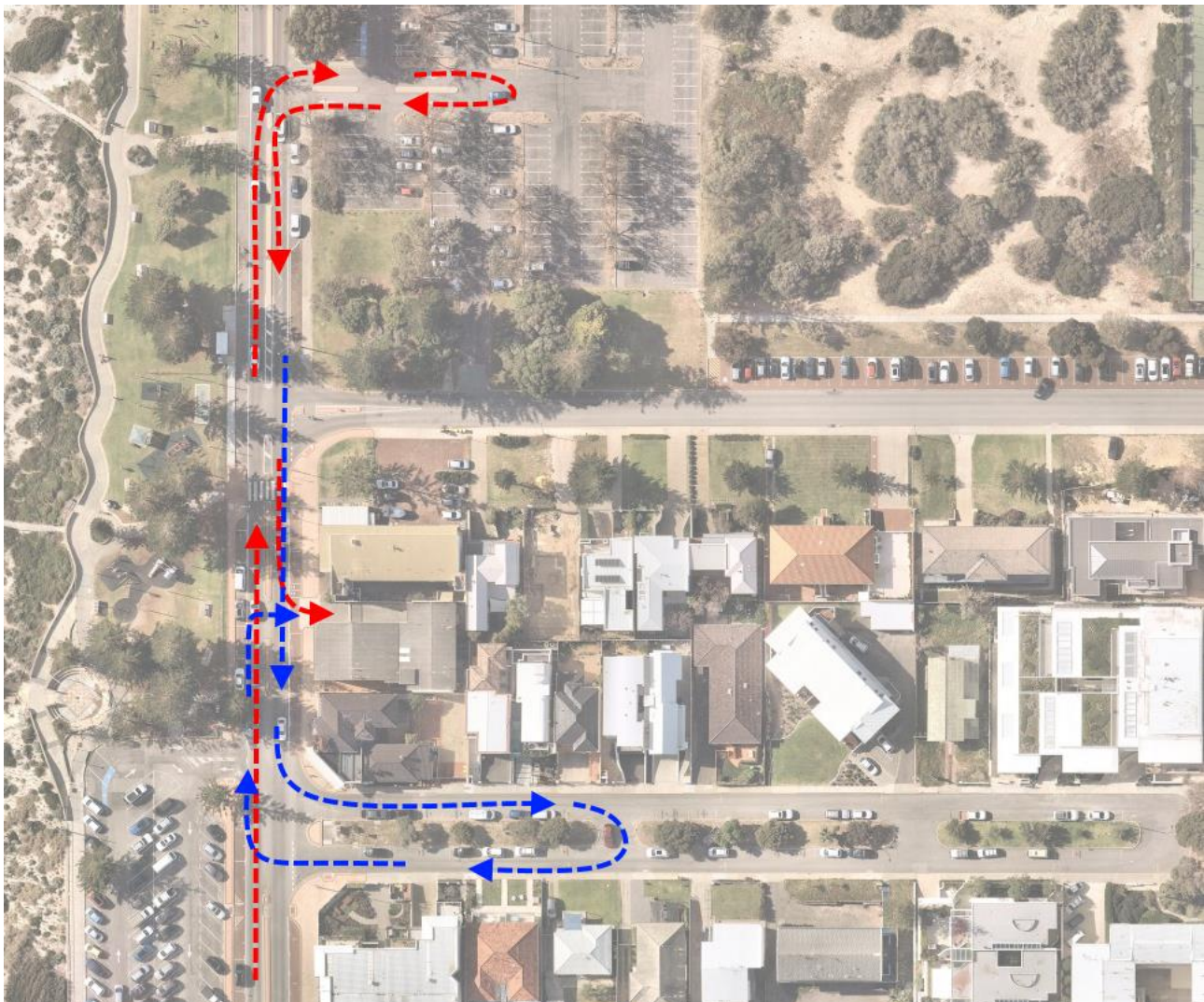
Figure 4-1 Scenario 1 – exiting vehicle give-way to entering vehicle



4.3 Scenario 2 – Vehicle Entering from the Street

Scenario / Status	Actions (Vehicles on Ground Floor)
Vehicle approaching the Site driveway while warning light flashing and siren beeping. (On-street bays available)	Vehicle to park and wait in on-street bays adjacent to the Site until flashing light and siren is off, then proceed to enter the driveway and activate the lift.
Vehicle approaching the Site driveway, while warning light flashing and siren beeping. (On-street bays not available)	Vehicle to circulate around the block and attempt to enter the Site again after the light and siren is turned off, before proceeding to activate the lift. Potential circulation route shown in (Figure 4-2)
Car lift activated simultaneously by drivers on the ground floor and basement.	<p>Car lift will manoeuvre to the Ground Floor to allow vehicle approaching from the street to access the lift.</p> <p>Vehicle in the basement to give-way and reverse into position where travel path of the vehicle exiting the lift is not obstructed, before proceeding to re-activate the lift.</p>

Figure 4-2 Potential routes to circulate around the block



5 Education and Management

5.1 Scheduled Maintenance

It is expected that the car lift will be serviced every quarter to ensure smooth operation throughout the lifespan of the car lift. Due to the development only having one car lift, scheduled maintenance shall be scheduled outside of the peak periods to ensure minimum impact to the general car park operation.

Sufficient notice will be provided to all residents to avoid any congestion and allow residents to make alternative arrangements (find alternative carpark for overnight) should vehicle usage be required during the maintenance period.

5.2 Line Marking and Signage

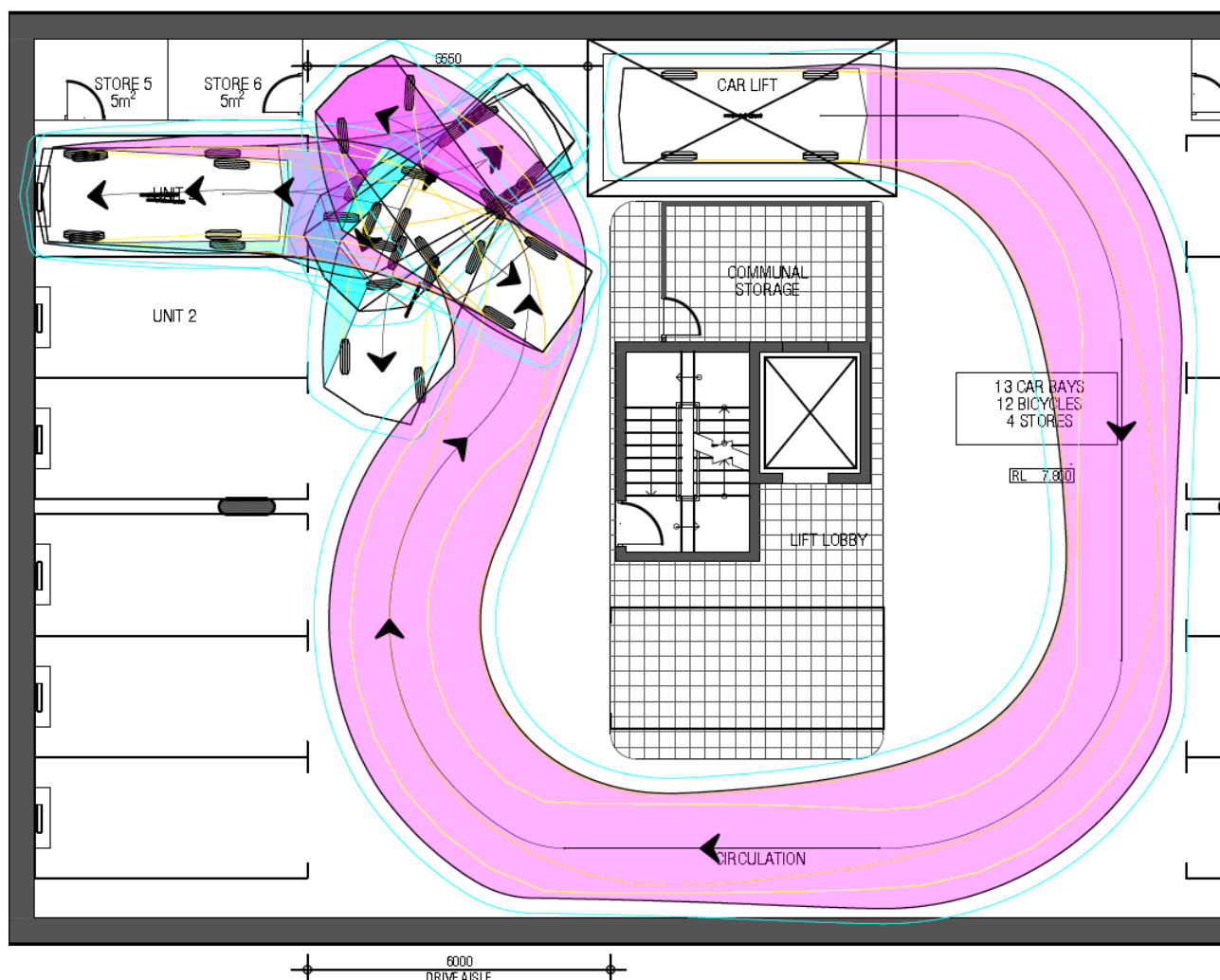
It is important that sufficient signage and linemarking be provided within the car parks to improve the operational flow and remind drivers of any constraints within the car park.

5.2.1 Limited Aisle Width and Extended Lift Structure

Due to the limited space available, vehicle accessing the parking bay located to the north west of both basement car parks may required to perform multiple movement when entering and exiting the parking bay as shown in **Figure 5-1**. It is recommended that this parking bay be marked as 'Small Parking Bay'.

Additionally, the corner of the car lift will be installed with reflective/contrast paint or tape to alert drivers of the extended car lift structure.

Figure 5-1 North-west bay Swept Path



5.3 Residents Acknowledgement

The operation of the proposed carpark is rather unusual and not commonly experienced by most drivers in Perth. Hence, it is important that all future residents are provided with sufficient education and car park operation briefing prior to settlement.

This could be completed by a carpark run-through session, or provide brochure summarising the important notes when using the carpark and car lift.

6 Summary

This Access Management Plan has been prepared to demonstrate how the site access will be managed appropriately to improve the safety of both drivers and pedestrians within and in the vicinity of the Site. The following summarises important notes to ensure smooth traffic operation of the Site.

- > All vehicles will access and egress the Site in forward gear, except for waste truck. Waste truck will reverse into the Site, with the help of a spotter and exit the Site in forward gear.
- > Waste collection would occur during late evening / early morning, outside of the peak periods to minimise the impact on the driveway operation.
- > All residents shall be provided with a remote to ensure a smoother traffic operation of the Site.
- > The cycle time for the car lift is calculated to be between 37s to 74s (average 60s). Given the low expected demand of the lift (4-5 movements during the peak hour), there is minimum likelihood that any conflict would occur during lift operation.
- > Warning/flashing lights shall be installed at the Site entrance, and at both sides of the lift on all levels to provide sufficient warning to the driver.
- > Sufficient signs and warning indication shall be provided to alert drivers of the confined area within the basement.

About Cardno

Cardno is a professional infrastructure and environmental services company, with expertise in the development and improvement of physical and social infrastructure for communities around the world. Cardno's team includes leading professionals who plan, design, manage and deliver sustainable projects and community programs. Cardno is an international company listed on the Australian Securities Exchange [ASX:CDD].

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