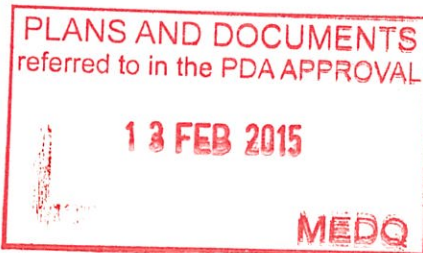


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TRAFFIC • PARKING • ACOUSTICS

Residential Apartment Tower 9 Hercules Street Hamilton

Traffic Engineering Report



InterCap Projects Pty Ltd

Reference: 14BRT0310rep2

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ABN 65 010 868 621

Level 1/129 Logan Road, Woolloongabba

PO Box 1310 Coorparoo BC QLD 4151

T: (07) 3327 9500 F: (07) 3327 9501 E: ttmbris@ttmgroup.com.au

Rev No.	Author	Reviewed/Approved		Description	Date
		Name	Signature		
1	R.Watson		<i>R.Watson</i>	DA report	7/11/14
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1. Introduction

1.1. Background

TTM Consulting has been engaged by Intercap Projects Pty Ltd to prepare a traffic engineering assessment of a proposed residential apartment tower in Hamilton. A previous version of this report was lodged as part of a Development Application submitted to EDQ (Economic Development Queensland), and this updated version responds to issues raised in a subsequent RFI with respect to the access arrangements. These issues are addressed in section 4 of this report.

The site has a current approval for a similar type and scale of development (as part of a larger development including the adjacent 5 Hercules Street), and this application is for an amendment to the approval for 9 Hercules Street.

1.2. Scope

This report investigates the transport aspects associated with the proposed development. The scope of the transport aspects investigated includes:

- Parking supply required to cater for development demand
- Parking layout to provide efficient and safe internal manoeuvring
- Access configuration to provide efficient and safe manoeuvring between the site and the public road network
- Internal layout to provide efficient and safe internal manoeuvring for service vehicles
- Suitability of access and internal facilities to provide for pedestrian and cyclist operation
- Access to suitable level of public transport

To assess the proposed transport arrangements, the development plans have been assessed against the following guidelines and planning documents:

- ULDA (EDQ) Northshore Hamilton Urban Development Area, Development Scheme
- Australian Standard 2890.1, 2890.2 and 2890.6.
- BCC Cityplan 2014 (Transport, Access, Parking and Servicing Planning Scheme Policy)

Excluded from this report is any detailed assessment of the impact of the proposed development on the external road network.

1.3. Site Location and Current Use

The site is located at 9 Hercules Street Hamilton, within the Northshore Hamilton Urban Development Area, as shown in Figure 1.1. The property description is Lot 645 on SL2184. The sites sole road frontage is to Hercules Street along the western boundary of the site. It is currently occupied by a two storey commercial building (estimated gfa of 3000sqm), and includes a single vehicular driveway crossover on Hercules Street.

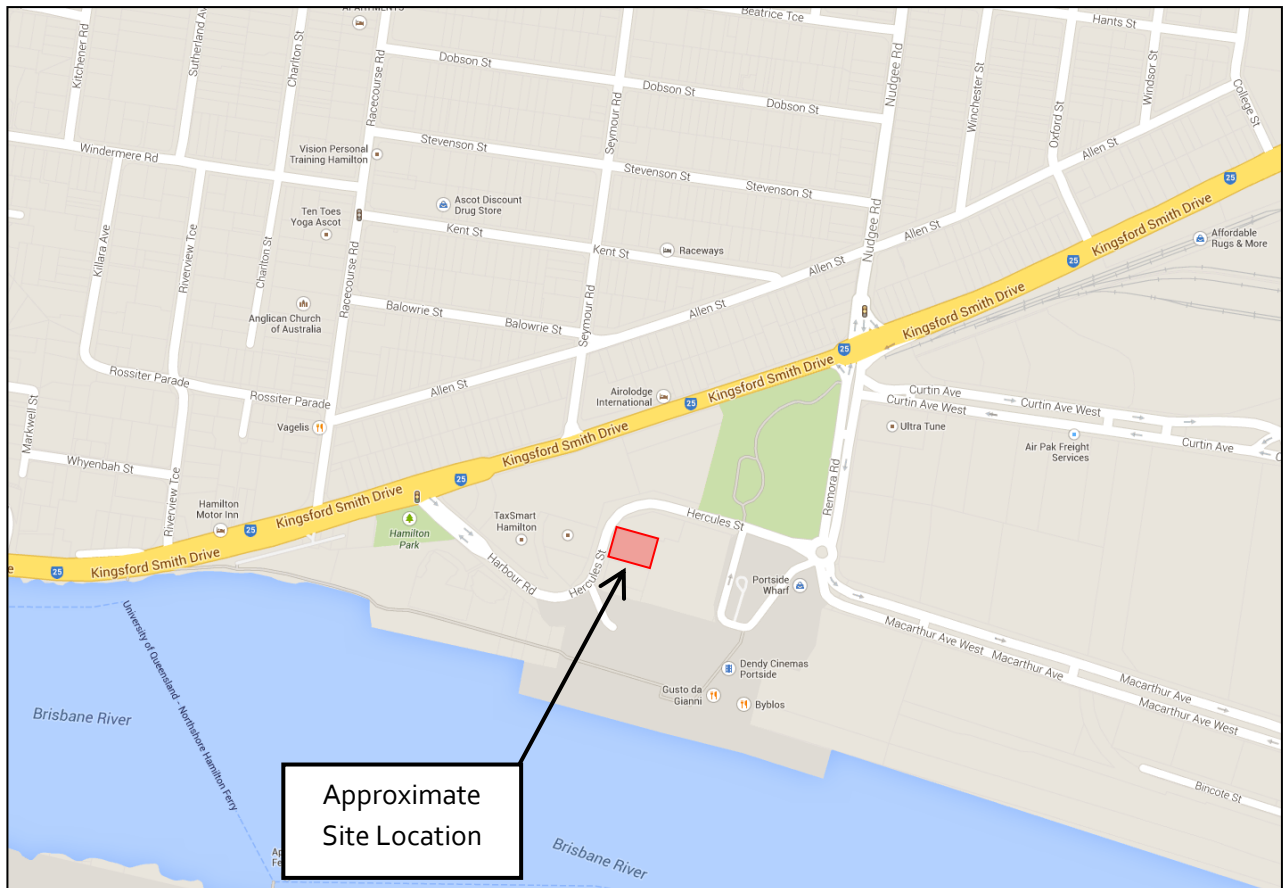


Figure 1.1: Site location

2. The Proposed Development

2.1. Development Profile

The proposed development comprises a single tower with 5 levels of parking (ie basement, ground and 3 levels of podium) a small retail component at ground level, and residential apartments above the podium.

The proposed land uses for this development are summarised in Table 2.1.

Table 2.1: Proposed Land Uses

Use	Proposed Area/Qty	Area/Qty in Current Approval
Ground level retail floorspace	264m ² gfa	408m ² gfa
Total apartments	x 141 (71 x 1-bed + 70 x 2-bed)	x 138
Carparking	150 car spaces (<i>inc 141 resi tenant + 6 resi visitors + 3 retail</i>) + 5 motorcycle spaces.	187 car spaces (<i>inc 138 resi tenant + 35 resi visitors + 14 retail</i>)
Vehicular Access	1 x 6.5m wide undivided driveway on Hercules St near the southern boundary	Access to 'Main Street' via easement over adjacent 5 Hercules Street
Servicing	On-site service area (11m x 8.4m) suitable for 2 x MRV / rear lift RCV bays for refuse collection and furniture trucks and service vans.	1 x MRV service bay shared with adjacent 5 Hercules Street

3. Existing Transport Infrastructure

3.1. The Road Network

The hierarchy and characteristics of roads in the immediate vicinity of the site are shown below in Table 3.1

Table 3.1: Local Road Hierarchy

Road	Speed Limit	Form	Classification	Road Authority
Kingsford Smith Drive	60kph	4-lanes	Arterial	BCC
Hercules Street / Harbour Road	50kph	2-lanes including kerbside parking	Neighbourhood Access	BCC
Remora Road	50kph	2-lanes including kerbside parking	Neighbourhood Access	BCC
Macarthur Avenue	60kph	2-lanes including kerbside parking	Neighbourhood Access	BCC
<i>Main Street</i> (along the sites southern boundary of adjacent 5 Hercules St)	20-30kph	2-lanes + kerbside parking	Local Access	private

The following intersection controls apply in the vicinity of the site:

- Kingsford Smith Drive / Hercules Street is a fully signalised t-intersection
- Kingsford Smith Drive / Remora Road / Nudgee Road is a fully signalised 4-way intersection
- Hercules Street / Remora Road/Macarthur Avenue is roundabout controlled.
- Hercules Street / Main Street is a priority controlled t-intersection

3.2. Road Planning

Brisbane City Council has a proposal for a significant upgrade of Kingsford Smith Drive between Theodore Street and Breakfast Creek Road, expanding the capacity from four to six lanes by constructing a retaining wall in the Brisbane River. As part of this project, a new road connection between Hercules Street / Harbour Road and Kingsford Smith Drive will be constructed, with the intersection of the two roads being a signalised t-intersection. The eastern end of this project, including the new road link and intersection, is shown in Figure 3.2.

Council has announced that an in-principle agreement has been reached with the Queensland Investment Corporation and Queensland Motorways Limited to take over operational responsibilities and tolling rights to the Legacy Way tunnel and the GoBetween Bridge in a 50-year lease. Funding from this agreement will be directed towards the Kingsford Smith Drive upgrade, subject to State and Federal Government approval of the agreement.



Figure 3.1: Eastern End of Kingsford Smith Drive Upgrade

3.3. Public Transport and Pedestrian Facilities

Doomben and Ascot train stations on the Doomben line are located approximately 1200m to the northeast and northwest of the site respectively.

Northshore and Bretts Wharf Citycat ferry terminals are located approximately 1600m to the east of the site, and 600m to the west of the site respectively.

The nearest on-street bus stops are located 380m away on Racecourse Road (north of Allen Street), and 600m away on Kingsford Smith Drive near the Bretts Wharf Citycat ferry terminal. Both stops are serviced by bus routes 300 & 305, connecting the site with both Toombul Centro and the Brisbane CBD. These routes provide a weekday service generally every 15-20 minutes, and weekend services generally every 30 minutes. Figure 3.2 shows these bus routes.

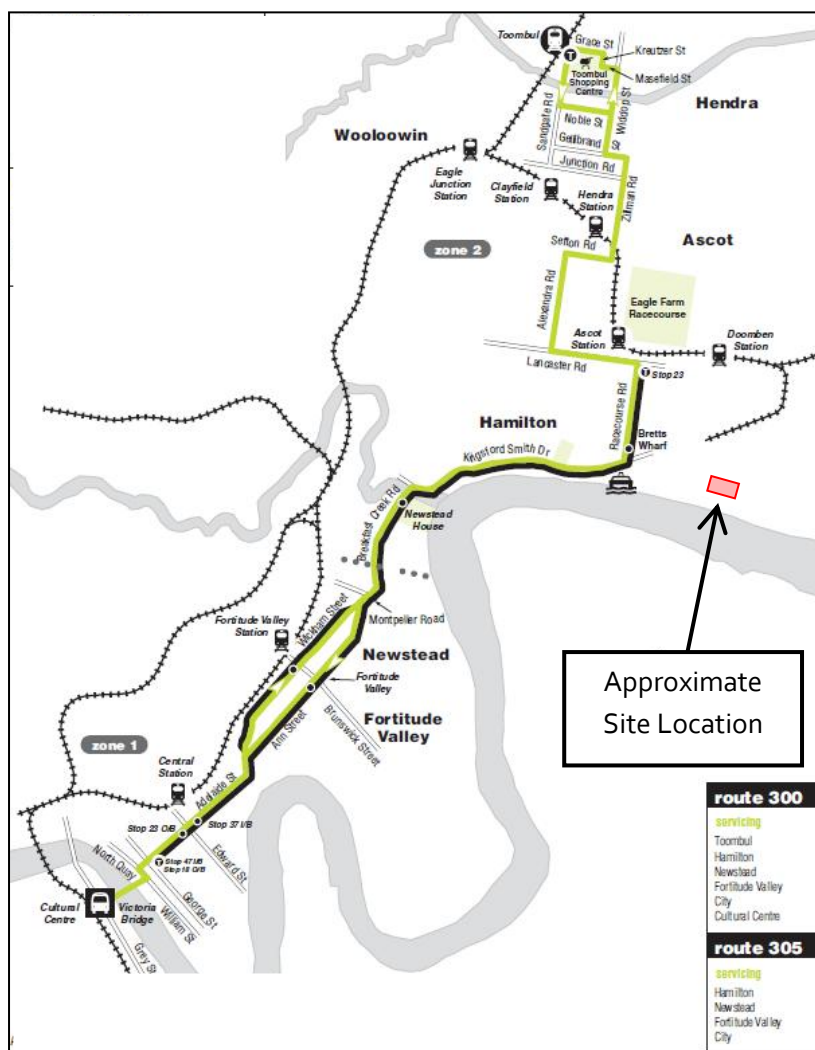


Figure 3.2: Local Bus Routes

Formal pedestrian footpaths are located on both sides of all roads in the immediate vicinity of the site, and signalised pedestrian crossings are incorporated into nearby intersections with Kingsford Smith Drive.

An off-road cycle path extends from the nearby cruise ship terminal westward toward Newstead, between Kingsford Smith Drive and the river's edge. Other on-street routes connect Kingsford Smith Drive to Doomben and Ascot train stations. Cycle routes in the vicinity of the site are shown in Figure 3.3.

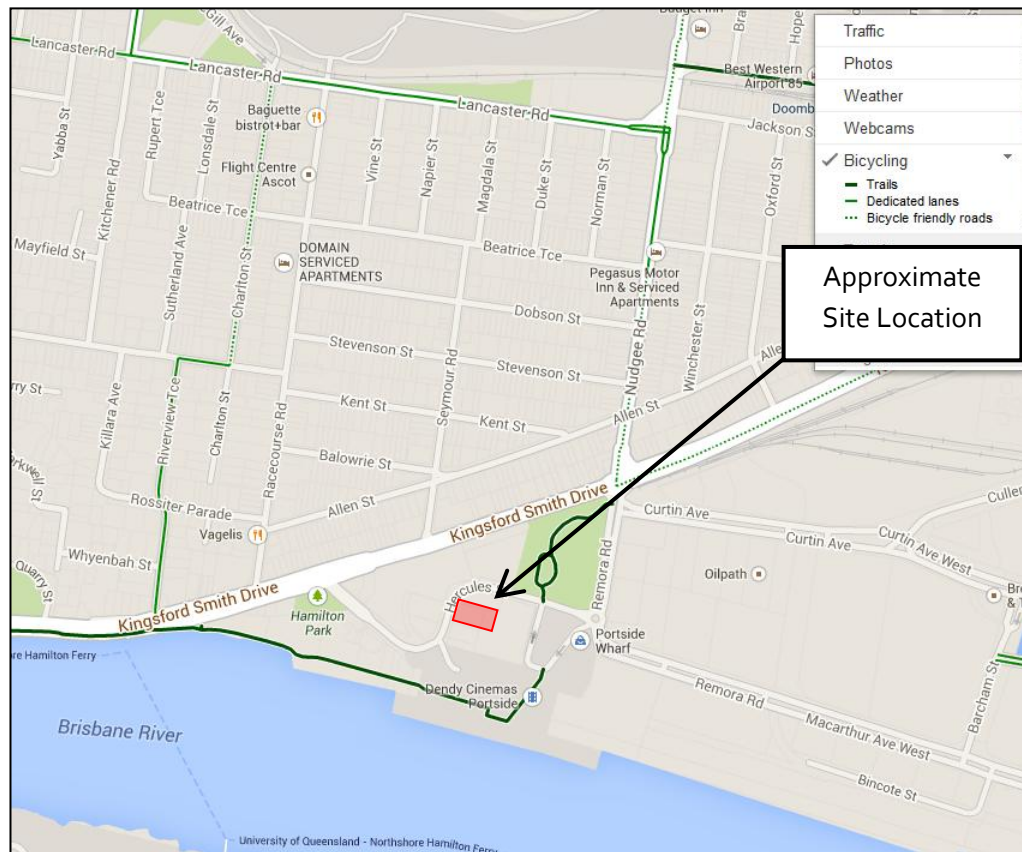


Figure 3.3: Local Cycle Routes

4. Site Access Arrangements

4.1. Proposed Access Arrangements and Their Adequacy

The proposed development incorporates a 150 space low turnover carpark. To access the parking facilities, a single 6.5m wide BCC Type B1 vehicular access driveway is proposed, adjacent to the southern boundary. A security gate is located well within the site and beyond the visitor parking, as indicated in Figure 4.1.

Table 4.1 identifies the characteristics of the proposed access driveway compared to the requirements of Australian Standard AS2890.1. The last column identifies the compliance of each design aspect. Where compliance with the standard is not achieved, the alternative performance solution is further discussed below.

Table 4.1: Proposed Access Arrangements

Design Aspect	AS2890.1 Requirement	Proposed Provision	Compliance
Crossover design	6-9m undivided category 2 driveway (based on carpark size)	6.5m undivided	AS2890 Complaint
Minimum separation from adjacent intersection	6m	≈25m	AS2890 Complaint
Desirable/minimum sight distance for 50kph road	69m/45m	Estimated as at least 69m to the southwest and at least 45m to the north	AS2890 Complaint
Queue storage capacity	5 cars = 30m	18m = 3 cars (measured boundary to podium ramp)	Performance Solution
Gradient of first 6m	1 in 20 (5%)	Essentially flat	AS2890 Complaint

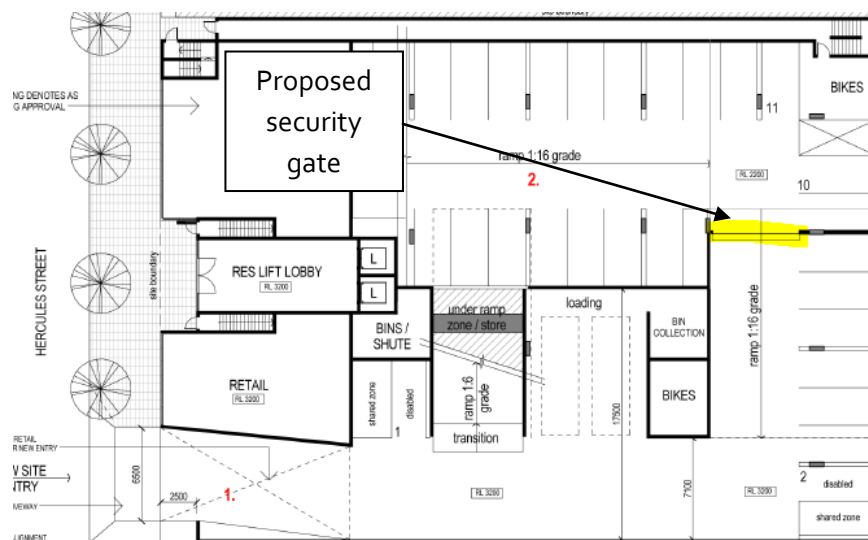


Figure 4.1: Security Gate Location

4.2. Performance Solutions

The queue storage requirement of AS2890 is 5 cars (ie 30m), whereas the proposal provides greater than 18m (ie 3 cars) between the boundary and the podium ramp. The presence of the PWD bay prior to this has been ignored due to its very low usage.

The AS2890 queue storage requirement is based solely on the number of parking spaces gaining access via the driveway. It largely ignores the type of user and the likely turnover / traffic generation of the parking facility.

This leads to the situation where, for instance, the AS2890 queue storage requirement for a given number of say supermarket parking spaces, is identical to that for the same number of residential spaces, yet they clearly have different characteristics.

The traffic generation of the 150 largely residential spaces is no greater than 75vph, which is only approximately 25% of that generated by 150 supermarket spaces (ie 300vph), and consequently the potential for queuing and the need for queue storage is correspondingly lower.

In effect, the traffic generation, potential for queuing and the need for queue storage of the 150 residential spaces is equivalent to that of 38 supermarket spaces. The AS2890 requirement for queue storage for 38 supermarket spaces is 2 car lengths, or 12m.

Consequently it is considered that the 18m (or 3 cars) of queue storage provided in the proposal satisfies the practical requirement, and it is considered that this queue storage provision will not result in any adverse operational or safety issues.

5. Car Parking Arrangements

5.1. Council Parking Supply Requirement

Based on the requirements of the EDQ Northshore Hamilton Development Scheme, car parking requirements are as detailed in Table 5.1

Table 5.1: EDQ Parking Supply Requirement

Use	Area/Qty	EDQ Rate	EDQ Requirement
Ground level retail floorspace	264m ² gfa	1/100m ² gfa (maximum)	3
Residential apartments - tenants & visitors	x141	1/unit (maximum)	141
TOTAL			144

5.2. Proposed Parking Supply

The proposed parking supply consists of a total of 150 car spaces comprising 141 residential tenant + 6 residential visitors + 3 retail staff, which is 6 spaces in excess of the parking allowable under the EDQ development scheme.

The total proposed residential parking supply rate (tenant + visitor) is 1.04 residential tenant spaces per unit, and allows for a single residential tenant parking space for each apartment, with an additional small visitor allowance. The total proposed retail parking supply of 3 spaces is consistent with the requirement of the EDQ development scheme.

The provision of the 6 additional residential parking spaces is not expected to have any significant effect on intersection performance, road capacity, or public transport usage, and as such TTM consider the proposed parking supply and allocation to be appropriate.

In addition to the above carparking supply, 5 resident motorcycle spaces are provided on the uppermost parking level.

5.3. Car Park Layout

Onsite car parking is distributed across 5 levels ie basement, ground and 3 levels of podium. with the residential visitor and retail staff generally located at ground level. A continuous movement into the site leads to the basement carpark level, whilst a ramp leading to the podium levels is located approximately 18m into the site, between the retail tenancies and the loading bays.

Table 5.2 identifies the characteristics of the proposed parking area with respect to the Australian Standards requirements. The last column identifies the compliance of each design aspect. Where compliance with Australian Standards is not achieved, the alternative performance solution is further discussed below.

Table 5.2: Australian Standards Carpark Requirements and Proposed Carpark Characteristics

Design Aspect	AS2890 Requirement	Proposed Provision	Compliance
Ca parking space length (min)	5.4m	5.4m	AS Compliant
Car parking space width (min):			
▶ Residential tenant/visitor	2.4m	Generally 2.6m (with a small number of 2.4m wide spaces)	AS Compliant
▶ PWD	2.4m (+2.4m shared zone)	2.4m (+2.4m shared zone)	AS Compliant
▶ Retail staff	2.4m	2.6m	AS Compliant
Motorcycle space: length x width	2.5m x 1.2m	2.5m x 1.35m	AS Compliant
Aisle Width (min):			
▶ Residential parking aisle	5.8m	6.2-6.7mm	AS Compliant
▶ Retail parking aisle	6.2m	6.2-7.1m	AS Compliant
▶ Ramp	6.1m (incl. kerbs)	6.25m	AS Compliant
Parking envelope clearance:			
▶ Permissible column location near front of bay	between 0.75m and 1.75m of aisle	between 0.75m and 1.75m of aisle	AS Compliant
▶ Min clearance to adjacent side wall	0.3m	0.3m	AS Compliant
Maximum Gradient:			
▶ PWD parking	1:40 (2.5%)	Flat	AS Compliant
▶ Parking aisle	1:16 (6.25%)	Between Flat and 1in16	AS Compliant
▶ Ramp	1:5 (20%)	1:6 (16.67%)	AS Compliant
Max. allowable change of grade (before transitions are required)	12.5% at summit & 15.0% at sag	Transitions ensure 8.3% maximum	AS Compliant
General / PWD height clearance	2.2m / 2.5m	Not less than 2.3m / 2.5m	AS Compliant
Terminated aisle treatment	1m past last bay	Not less than 1.4m past last bay	AS Compliant

6. Service Vehicle Arrangements

6.1. Practical Requirements

The residential component of the development requires a service bay for use by the following vehicles:

- a residential furniture truck (MRV or LRV),
- a residential refuse collection vehicle (RCV), and
- a trades van

The small retail component of the site has a practical requirement for say 1 x SRV bay (which is essentially consistent with BCC requirements).

6.2. Estimated Servicing Demand

Service vehicles are expected to visit the site as follows:

- Refuse collection (RCV) once per week
- Recycling collection (RCV) once per fortnight
- Residential furniture removal (LRV or MRV) up to 2-3 times per week
- Retail deliveries (Van or SRV) three times per week
- Tradesmen (Van) three times per week

This equates to an average of less than one large vehicle per day, and 1-2 small vehicles per weekday.

6.3. Proposed Service Vehicle Arrangements

The proposed service vehicle provisions consists of a dedicated on-site service area measuring approximately 10.4m x 8.4m with a minimum of 4.6m vertical clearance, suitable for either 1 x MRV/rear lift RCV plus a van, or 2 x SRVs. These bays are to be shared by refuse collection vehicles, furniture trucks, service vans and commercial delivery trucks. The proposed vertical clearance is sufficient to accommodate both the 3.6m required by a rear lift RCV, and the 4.5m required by an MRV sized furniture trucks.

The bin room is located at ground level in close proximity to the service bays.

The service vehicle bays are accessed via the Hercules Street driveway and all vehicles can both enter and depart the site in a forward motion. Swept path manoeuvring diagrams of service vehicles, generated using *Autotrack* computer software is shown in Figure 6.1.

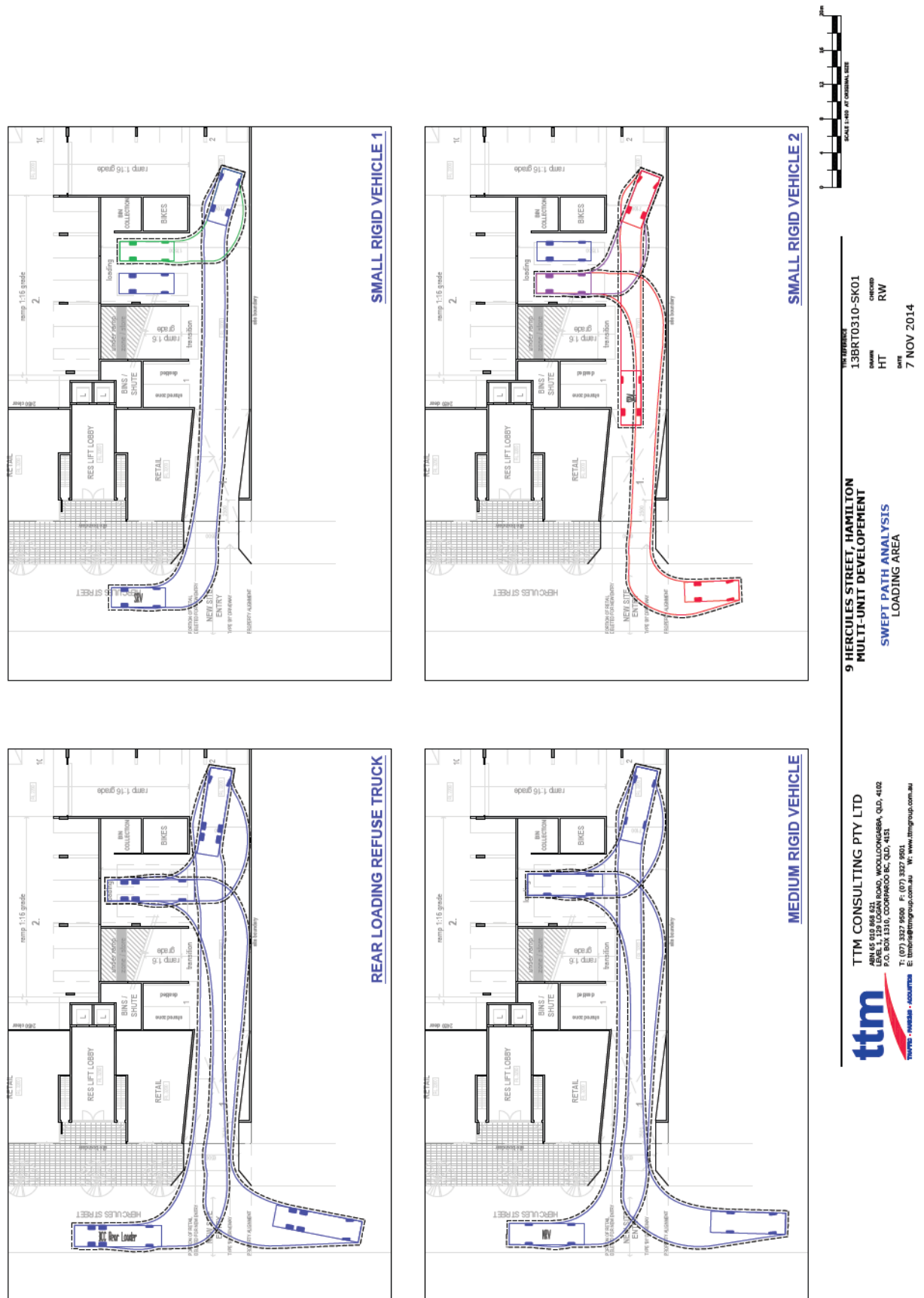


Figure 6.1: Service Vehicle Manoeuvring

7. Pedestrian and Bicycle Facilities

Pedestrian movement along the western boundary of the site (ie Hercules Street) is provided for on the concrete footpath within the road verge. Access to both the retail tenancies and the residential lift lobby will be direct from Hercules Street.

The Development Scheme nominates the following targets for bicycle parking supply:

- 1 resident space per dwelling = 141 spaces
- 1 residential visitor space per 400sqm $\approx$ 26 spaces
- 1 retail staff space per 200sqm NLA = 1 space
- 1 retail customer space per 1000sqm NLA = 1 space
- TOTAL = 169 spaces

Space for approximately 170 bicycle parking spaces is provided in the development, with 5 different parking areas distributed over the ground floor, and podiums 1 and 3. This provision satisfies the EDQ target for bicycle parking.

8. Summary & Conclusion

8.1. Development Access

The proposed development incorporates a single 6.5m wide BCC Type B1 vehicular access driveway is proposed, adjacent to the southern boundary.

The driveways satisfies all the requirements of AS2890, and TTM consider the queue storage capacity at the entry satisfies practical requirements, give the low turnover nature of the carpark.

8.2. Car Parking Arrangements

The proposed parking supply consists of a total of 150 car spaces comprising 141 residential tenant + 6 residential visitors + 3 retail staff, which is 6 spaces in excess of the parking allowable under the EDQ development scheme. The total proposed residential parking supply rate (tenant + visitor) is 1.04 residential tenant spaces per unit, and allows for a single residential tenant parking space for each apartment, with an additional small visitor allowance. The total proposed retail parking supply of 3 spaces is consistent with the requirement of the EDQ development scheme. The provision of the 6 additional residential parking spaces is not expected to have any significant effect on intersection performance, road capacity, or public transport usage, and as such TTM consider the proposed parking supply and allocation to be appropriate. In addition to the above car parking supply, 5 resident motorcycle spaces are provided on the uppermost parking level.

The carpark design satisfies all design requirements of AS2890.

8.3. Service Vehicle Arrangements

The proposed service vehicle provisions consists of a dedicated on-site service area measuring approximately 10.4m x 8.4m with a minimum of 4.6m vertical clearance, suitable for either 1 x MRV/rear lift RCV plus a van, or 2 x SRVs. These bays are to be shared by refuse collection vehicles, furniture trucks, service vans and commercial delivery trucks. The proposed vertical clearance is sufficient to accommodate both the 3.6m required by a rear lift RCV, and the 4.5m required by an MRV sized furniture trucks. The bin room is located at ground level in close proximity to the service bays. The service vehicle bays are accessed via the Hercules Street driveway and all vehicles can both enter and depart the site in a forward motion.

8.4. Pedestrian and Bicycle Facilities

Pedestrian movement along the western boundary of the site (ie Hercules Street) is provided for on the concrete footpath within the road verge. Access to both the retail tenancies and the residential lift lobby will be direct from Hercules Street.

Space for approximately 170 bicycle parking spaces is provided in the development, with 5 different parking areas distributed over the ground floor, and podiums 1 and 3. This provision satisfies the EDQ target for bicycle parking.

Based on the assessment contained with this report, TTM see no traffic engineering reason why the proposed development should not be granted the relevant approvals.

Appendix A Development Plans





