

PLANS AND DOCUMENTS
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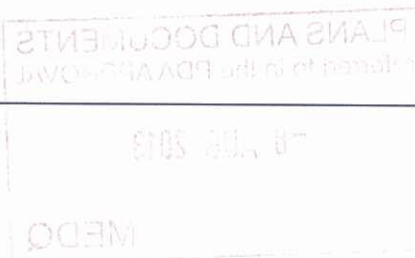
TRAFFIC • PARKING • ACOUSTICS

**Central Village Master Plan + Stage 2 and 3
Development Approval
332-342 Water Street, Fortitude Valley
Traffic Engineering Report**

Metro Property Developments Pty Ltd

Reference: 13BRT0248

26/07/2013



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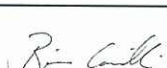
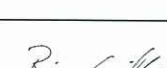
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Appendix D	TTM Drawing 13BRT0111-SK1 (Ramp Circulation Manoeuvring)
Appendix E	TTM Drawing 12BRT0665-SK7 (Phase 1 "Baxter Street Extension" Access)
Appendix F	"Baxter Street Extension" Civil Road Design
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Appendix H	TTM Drawing 13BRT0248-SK1 Phase 1 Service Vehicle Swept Paths



1. Introduction

1.1. Background

TTM Consulting Pty Ltd (TTM) has been engaged by Metro Property Development Pty Ltd to prepare a traffic engineering report investigating the proposed Master Plan of the Central Village development, and specific details of Stages 2 and 3 of the wider site. It is understood that this report will be provided in support of a Development Application to Economic Development Queensland (EDQ) for Stages 2 and 3 of the development.

1.2. Scope

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

- Parking supply
- Parking layout
- Surrounding road layout and site accessibility
- Access locations and designs
- Traffic generation and distribution
- Development impacts on surrounding road network
- Service vehicle operation
- Public transport accessibility
- Bicycle provisions

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

- ULDA Planning Scheme, specifically;
 - 3.0 Land Use Plan for Precinct 4: Water Street Precinct
- Australian Standard for Parking Facilities (AS2890)
- Queensland Complete Streets
- Austroads Guide to Traffic Management

In addition, guidance on particular design issues has been taken from sections of the Brisbane City Council (BCC) *Brisbane City Plan 2000*.

1.3. Site Location

The Central Village site is located at 62-68 Brunswick Street and 332-342 Water Street, Fortitude Valley, as shown in Figure 1.1. The site has road frontages onto Brunswick Street and Water Street. The site forms part of Precinct 4 (Water Street Precinct) of the Bowen Hills Urban Development Area (UDA), formerly under the development jurisdiction of the Urban Land Development Authority (ULDA). This area has now been remained as the Bowen Hills Priority Development Area (PDA).

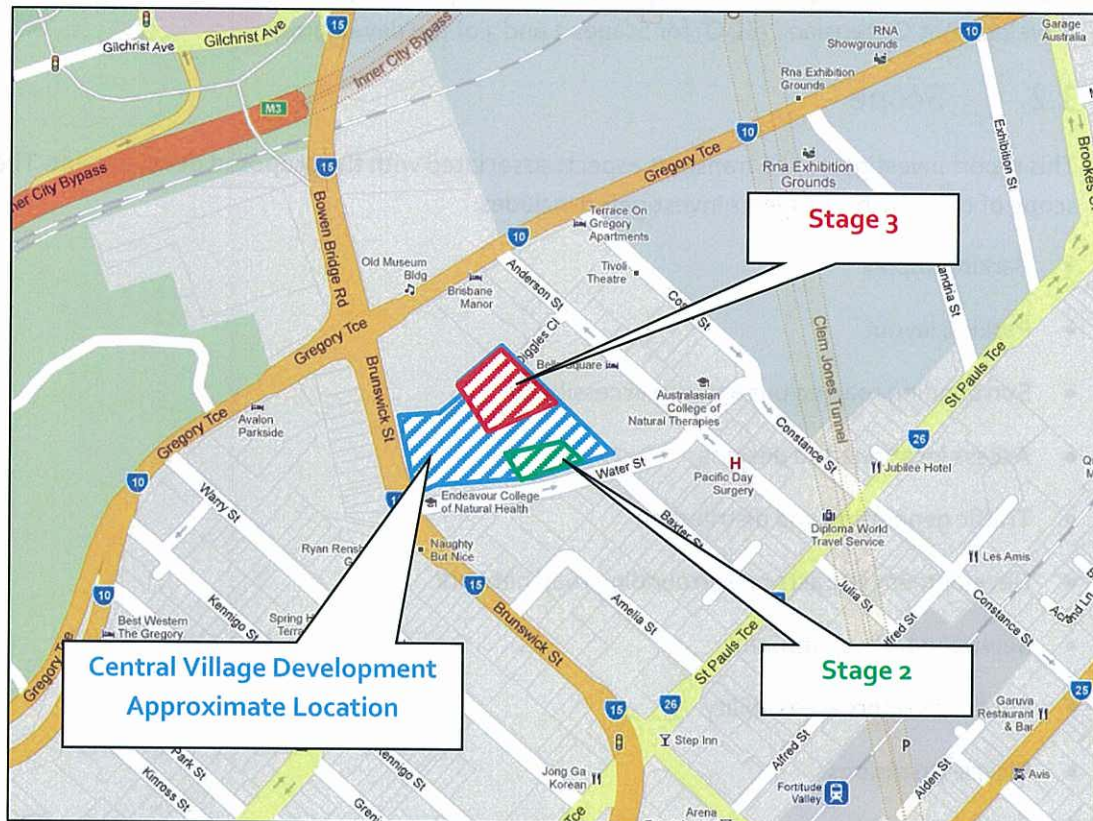


Figure 1.1: Site Location

Map Source: Google Maps 2013

Stage 2 of the development relates to the portion of the development located on the southern side of the wider site. Stage 2 has a road frontage to Water Street and is currently occupied with narrow verges/pedestrian paths and on-street car parking.

Stage 3 of the development relates to the portion of the development located on northern corner of the wider site. Stage 3 currently has no road frontages, aside from Diggles Close which comes to a dead end at the eastern property boundary. It is proposed that the new 'Baxter Street Extension' road will be constructed as part of this development, connecting Diggles Close and Water Street/Baxter Street. This road will run along the eastern boundary of the site and will provide a new road frontage for Stage 3, with associated pedestrian paths.

2. The Proposed Development

2.1. Development Profile

The Central Village Master Plan divides the site into two phases; Phases 1 and 2. Phase 1 consists of construction of the three residential buildings, car parking area and community space on the eastern side of the site (right of the black dashed line shown in Figure 2.1). Phase 1 is broken up into Stages 1-3. Phase 2 consists of a separate car parking area, two residential buildings and community space on the western side of the site (left of the black dashed line shown in Figure 2.1). Phase 2 is broken up into Stages 4-6. The proposed land uses and parking supply for each phase and stage of this development are summarised in Table 2.1.

Table 2.1 : Central Village Master Plan Proposed Land Uses

Development Component	Area/Quantity	Parking Supply
Phase 1	525 units	330 spaces
Stage 1	1 Bedroom: 115 units 2 Bedroom: 46 units SOHO*: 4 units	105 spaces, as approved
Stage 2	1 Bedroom: 113 units 2 Bedroom: 45 units SOHO*: 2 units	99 spaces
Stage 3	1 Bedroom: 140 units 2 Bedroom: 60 units	126 spaces
Phase 2	485 units	313 spaces
Stage 4	1 Bedroom: 100 units 2 Bedroom: 48 units SOHO*: 8 units	100 spaces
Stage 5	1 Bedroom: 110 units 2 Bedroom: 54 units	106 spaces
Stage 6	1 Bedroom: 108 units 2 Bedroom: 54 units SOHO*: 3 units	107 spaces
Total Development	1010 units	643 spaces

*SOHO = Single Occupancy / Home Office (1 bedroom unit equivalent).

Figure 2.1 shows the Central Village Master Plan, with the extent of Stages 2 and 3 within Phase 1 outlined in red and green, respectively.

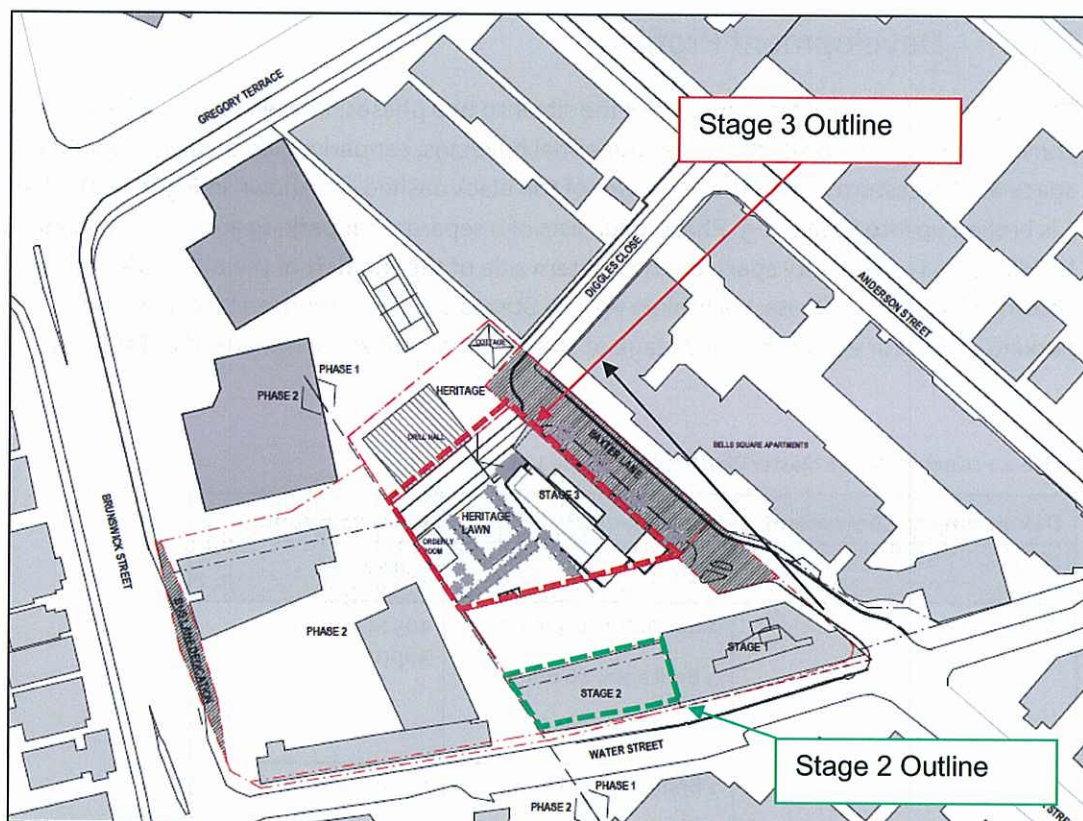


Figure 2.1: Central Village Master Plan

Detailed design plans related to the Phase 1 parking area, inclusive of the specific parking areas for Stages 2 and 3 assessed as part of this report, is included in Appendix A.

It should also be noted that the development yield and parking supply details listed in Table 2.1 for Stages 4 to 6 are based on preliminary development designs and are subject to change during the progression of the project and detailed design of each subsequent stage. The unit numbers for Stage 1 in Table 2.1 are based on the previous approval issued by the former ULDA (Decision Notice dated 31st January 2013, DEV2012/289).

2.2. Access

The Central Village development contains three proposed access points; one for the Phase 1 precincts and two for the Phase 2 precincts. The Phase 1 access will be provided onto the proposed "Baxter Street Extension" (running along the north-eastern boundary of the site). The Phase 2 accesses will consist of an access onto Water Street and another onto a new internal access road, running along the north side of Phase 1, which extends off from the Diggle Close / Baxter Street Extension intersection.

The Phase 1 access onto the new "Baxter Street Extension" will allow entry/exit in all directions. Assuming that Water Street remains a one-way road, the access provided for Phase 2 onto Water Street will be a 'Left-In/Left-out' only, while the second access from the new internal road will allow entry/exit in all directions.

Vehicular access to basement parking and service area of Stages 1 -3 will be via the 'Baxter Street Extension' access.

Further details on the proposed access arrangements are provided in Section 5.

2.3. Parking

The development plan includes a total of 643 car parking spaces and 1186 bicycle parking spaces.

The Stage 1 approval requires a total parking supply of 105 spaces; inclusive of 97 resident spaces (incl. 2 PWD spaces) and 8 visitor spaces.

The Stage 2 proposal provides a total parking supply of 99 spaces; inclusive of 91 resident spaces (incl. 2 PWD spaces) and 8 visitor spaces.

The Stage 3 proposal provides a total parking supply of 126 spaces; inclusive of 116 resident spaces (incl. 2 PWD spaces) and 10 visitor spaces.

Overall Phase 1 of the master plan provides 330 parking spaces, inclusive of 304 resident spaces (incl. 6 PWD spaces) and 26 visitor spaces.

Further details of the car parking provisions are provided in Section 4 and bicycle parking provisions in Section 9.

2.4. Servicing

The Phase 1 service area also provides 2 VAN bays, 1 MRV bay and 1 RCV bay for the shared use of Stages 1, 2 and 3.

Further details of the servicing provisions are provided in Section 8.

3. Existing Transport Infrastructure

3.1. The Road Network

All roads in the immediate vicinity of the site are administered by Brisbane City Council. 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	Carriageway		Road Reserve Width	Classification	Road Authority
		Width	Lanes			
Water Street	50 km/h	6m	1 (one-way)	13m	Neighbourhood access	BCC
Brunswick Street	60 km/h	15m	5(2 northbound, 3 southbound)	22m	Arterial route	BCC
Diggles Close	50 km/h	5m	1 (plus parking on 1 side)	11m	Local access	BCC
Anderson Street	50 km/h	7m	2 (plus parking on 1 side)	14m	Neighbourhood access	BCC
Baxter Street	50 km/h	13m	2 (plus parking on both sides)	20m	Neighbourhood access	BCC

Water Street is a one-way street allowing only eastbound traffic. It is 6m wide where the main building of Stages 1 and 2 fronts onto it, but widens to 10m just west of it to provide a small number of parking spaces on both sides of the road. The intersection of Water Street / Baxter Street is priority controlled, while the intersection of Brunswick Street / Water Street is signalised.

3.2. Road Planning

The concept development plans provided in Appendix A incorporate the following resumptions/land dedications to facilitate planned road network improvements:

- A minimum 5.25-5.6m road dedication on the western property boundary of the Central Village site, on the Phase 2 Brunswick Street frontage, to allow for future widening of Brunswick Street and upgrading of the Brunswick Street / Water Street signalised intersection. This allowance is consistent with road dedication/land requirements proposed to be imposed on the subject site, as outlined in the road works concept design prepared by Brisbane City Council (Drawing RPN677). A copy of this drawing is provided in Appendix B.

- A 168m² road dedication on the southern property boundary of the Central Village site, on the Water Street frontage primarily along the Phase 2 section, to allow for footpath widening on the north side of Water Street.
- A 1337m² road dedication on the eastern property boundary of the Central Village site to allow for the "Baxter Street Extension" from Water Street through to Diggles Close.
- A 34m² road dedication on the eastern most corner of the site (by tapering the existing pointed end of the property) to facilitate footpath widening on the corner of Water Street.

The former Bowen Hills UDA Land Use Plan for Precinct 4 (Water Street Precinct) indicates that a road is to be constructed connecting Baxter Street with Diggles Close. The former ULDA also undertook the 'Bowen Hills Traffic Study' with the objective of identifying ultimate road requirements and intersection configurations to accommodate the total development in accordance with the former Bowen Hills UDA development Scheme.

Also, the RNA redevelopment (renamed the "Showground Hill" project) to the east of the subject site will include a new internal local road that will influence the operation of the wider road network in the vicinity of the subject site.

Figure 3.1 indicates the proposed road network upgrades in the immediate area.

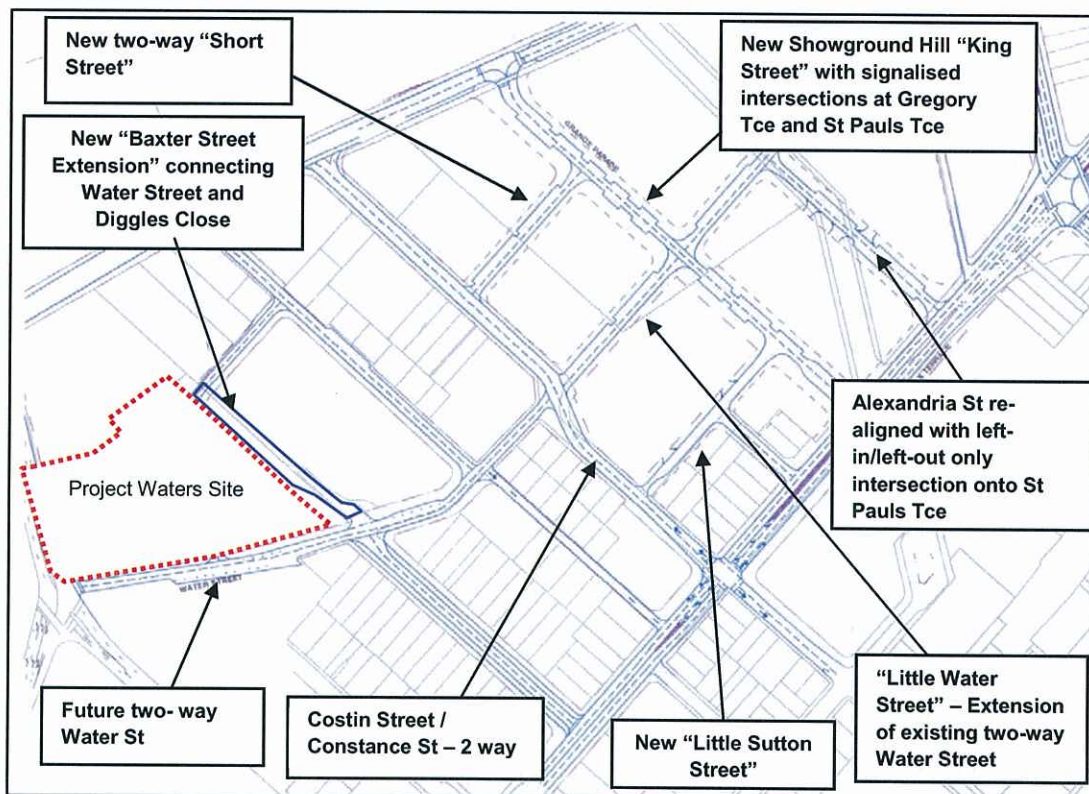


Figure 3.1: Future Road Network Configuration



3.3. Public Transport and Pedestrian Facilities

Fortitude Valley train station is located approximately 550m to the south of the site, and provides access to all train lines going through the central city.

On-street bus stops are located on Brunswick Street adjacent to the site, as well as on Gregory Terrace some 250m walk from the site.

The Riverside CityCat stop is located approximately 1.5km to the south of the site.

Most of the streets in the area provide footpaths on both sides of the road, with the exception of Diggles Close which provides a footpath on the south side only. The signalised intersection of Brunswick Street / Bowen Bridge Road / Gregory Terrace provides pedestrian crossings on all approaches, while the signalised intersection of Brunswick Street / Water Street provides crossings on three of the four approaches.

No dedicated cycle lanes are provided in the immediate vicinity of the site, the nearest being provided on Gregory Terrace beginning some 300m west of the intersection with Brunswick Street. The nearest CityCycle station is 360m walk from the site at the intersection of Constance Street and St Pauls Terrace.

4. Car Parking Arrangements

4.1. EDO Requirements for Car Parking

The 'Bowen Hills Urban Development Area Development Scheme' stipulates that a **maximum** rate of 1 car parking space (inclusive of visitor car parking) be provided per unit. Based on this requirement, the overall development can have at most 1010 car parking spaces.

4.2. Proposed Car Parking Supply

The total proposed on-site parking supply for the development is 643 parking spaces, including 105 spaces as part of Stage 1 (as approved), 99 spaces as part of Stage 2 and 126 spaces as part of Stage 3.

The proposed parking supply rate is based on constraining the commuter traffic generated by the development, which is consistent with Transport-Orientated-Development (TOD) principles. The UDA Development Criteria states:

"In support of TOD principles priority should be given to pedestrian, cycle and public transport modes, over private vehicle use".

As mentioned previously the site enjoys a high level of connectivity to the public transport network and therefore it is considered appropriate, in terms of travel demand management strategies, to reduce the overall parking supply and encourage residents to use alternative modes of transport. The site is also located within walking distance of the key centres of Fortitude Valley, Royal Brisbane Hospital and Brisbane CBD.

The parking supply has been derived based on applying the rates of 0.4 spaces per one bedroom unit (so only 40% of the 1 bedroom units will have a dedicated parking space), 1 space per two bedroom unit and an additional 1 visitor space per 20 units. These rates, aside from the rate for one bedroom units, are consistent with the BCC recommended rates for CBD residential developments. The BCC rate is 0.5 spaces for one bedroom units, as opposed to the 0.4 spaces adopted for this development.

TTM considers that 0.4 spaces per one bedroom unit is an acceptable rate based on the following factors:

- TTM has previously prepared a 'Parking Supply Analysis' letter in support of the proposed 'per bedroom' parking rates, based on the results of surveys conducted at high-density residential units in the CBD fringe area. The purpose of these surveys was to identifying practical parking demands for residents and visitors. In particular, this study focuses on the demands associated with one bedroom "investor" style units. The results of these surveys indicate that a parking rate of 0.4 spaces for one bedroom units is acceptable. A revised copy of the 'Parking Summary Analysis' letter (TTM Ref. '27703let130116', Dated 16th January 2013) reflecting the revised scheme for this development is provided in Appendix C.

- Metro Property Developments has extensive experience in developing high density investor orientated residential developments. This experience indicates that the market would accept a rate of 0.4 spaces per one bedroom unit. Additional evidence to attest to this fact is the volume of sales already recorded for the approved Stage 1 of Central Village, which applies the parking rate of 0.4 spaces per one bedroom unit.

Regardless of this lower rate of parking for one bedroom units, there is limited potential for vehicle parking 'overflow' onto the surrounding streets due to the limited amount of on-street parking and this developments location within "Brisbane Central Traffic Area". The traffic area comprises 2hr limits and paid parking zones on all on-street parking spaces. Given the fact then that there is limited ability to park on the streets for an extended period of time, this factor plays a significant role in the consideration of prospective residents. Buyers/renters who own cars are extremely unlikely to purchase/rent a unit without a dedicated parking space in the CBD/fringe area, given there is no alternative location for their vehicle to be housed. Therefore, there will be limited adverse effects on the surrounding area as a result of the reduced onsite parking supply.

4.3. Proposed Parking Provisions

4.3.1. Stage 1, 2 and 3 Car Parking Supply

Based on the accepted parking rates outlined in Section 4.2, the suitability of the parking supply for each of Stages 1, 2 and 3 (when considered in isolation) is shown in Table 4.1 to Table 4.3.

Table 4.1: Stage 1 Parking Supply Summary

Residential Parking Component	Number of Units	Parking Supply Rate	Parking Supply Required	Approved Provision
Residential Units:	165 units	-	94 spaces	97 spaces
– 1 Bedroom	119 units	0.4 spaces/unit	48 spaces	(incl. 2 PWD spaces)
– 2 Bedroom	46 units	1.0 spaces/unit	46 spaces	
Residential Visitors	165 units	0.05 spaces/unit	8 spaces	8 spaces
Total			102 spaces	105 spaces

Table 4.2: Stage 2 Parking Supply Summary

Residential Parking Component	Number of Units	Parking Supply Rate	Parking Supply Required	Proposed Provision
Residential Units:	160 units	-	91 spaces	91 spaces
– 1 Bedroom	115 units	0.4 spaces/unit	46 spaces	(incl. 2 PWD spaces)
– 2 Bedroom	45 units	1.0 spaces/unit	45 spaces	
Residential Visitors	160 units	0.05 spaces/unit	8 spaces	8 spaces
Total			99 spaces	99 spaces

Table 4.3: Stage 3 Parking Supply Summary

Residential Parking Component	Number of Units	Parking Supply Rate	Parking Supply Required	Proposed Provision
Residential Units:	200 units	-	116 spaces	116 spaces
– 1 Bedroom	140 units	0.4 spaces/unit	56 spaces	(incl. 2 PWD spaces)
– 2 Bedroom	60 units	1.0 spaces/unit	60 spaces	
Residential Visitors	200 units	0.05 spaces/unit	10 spaces	10 spaces
Total			126 spaces	126 spaces

As outlined in the above tables, the approved/proposed parking supply for each of Stages 1, 2 and 3 is considered acceptable with respect to the agreed parking provisions with EDQ.

TTM also considers it is prudent to assess the overall parking supply of the Phase 1 site to confirm consistency with EDQ requirements. A summary of the total parking supply for the overall Phase 1 is outlined in Table 4.4.

Table 4.4: Overall Phase 1 Parking Supply Summary

Residential Parking Component	Number of Units	Parking Supply Rate	Parking Supply Required	Proposed Provision
Residential Units:	525 units	-	301 spaces	304 spaces
– 1 Bedroom	374 units	0.4 spaces/unit	150 spaces	(incl. 6 PWD spaces)
– 2 Bedroom	151 units	1.0 spaces/unit	151 spaces	
Residential Visitors	525 units	0.05 spaces/unit	26 spaces	26 spaces
Total			327 spaces	330 spaces

Overall, the proposed parking supply of 330 spaces for Phase 1 of the Central Village Master Plan meets the required parking supply of 327 spaces. As such, TTM considers the proposed parking supply for Stage 3 is acceptable in the wider context of the site.

As detailed in the Appendix A plans, the location of the visitor parking spaces has been split between the Stage 1 and Stage 3 footprint. The 16 spaces in Stage 1 (visitor parking provisions for Stages 1 and 2) are located directly inside the security line, in close proximity to the lobby/lift entrances for the Stage 1 and 2 buildings. The 10 spaces in Stage 3 (visitor parking provisions for Stage 3) are located on the north most wall of the car park, in close proximity to the lift entrance for the Stage 3 building.

4.3.2. Commercial/SOHO Parking Supply

It is noted that the EDQ Land Use Plan for Precinct 4 (Water Street Precinct) indicates that maximum parking provisions are in effect for "office" and "other business and retail uses". As such, there is no specific minimum requirement for parking spaces for the small amount of commercial/retail space provided in Phase 1. No dedicated on-site parking has therefore been provided for these uses.



With respect to the SOHO units, which could also be classed as 'office' use, the resident parking provision for each of these units will satisfy any demands for on-site parking attributed to these uses (i.e. the residents are also the staff of the SOHO).

4.3.3. Service/Loading Bay Provisions

It is noted that there is no specific loading bay requirements for residential developments indicated in either the EDQ Land Use Plan for Precinct 4, PDA wide development criteria, Australian Standard for Parking Facilities or the BCC Brisbane City Plan 2000.

The wider Phase 1 provides a total of two VAN bays, 1 MRV bay and 1 RCV bay for the shared use of Stages 1, 2 and 3. In the absence on prescribed requirements, TTM consider that the proposed provision is satisfactory to cater for the development needs, as is discussed in further detail in Section 8.

4.3.4. PWD Parking Supply

Once again it is noted that neither the EDQ Land Use Plan for Precinct 4 nor PDA wide development criteria specify minimum provisions for PWD parking. In addition, the Building Code of Australia (BCA) has no specific requirements for PWD parking for residential (Class 2) buildings. Regardless, the development proposal provides 2 PWD spaces for resident uses for each of Stages 1, 2 and 3 to accompany the accessible units provided in each building; resulting in a total PWD parking provision of 6 spaces out of 330 spaces provided in Phase 1. All PWD parking is provided in close proximity to the lifts of the building the respective spaces are assigned to.

4.4. Proposed Car Park Design

4.4.1. Introduction

Australian Standard for Parking Facilities – Part 1: Off-Street Car Parking (AS2890.1:2004) is adopted as the design standard for car parks in developments under the assessment of EDQ.

The car parking areas associated with Stages 2 and 3 is accessed off the Stages 1 car park areas and access onto "Baxter Street Extension". The design of the Stage 1 car park was resolved in the previous development application for Stage 1, and has been incorporated in the detail design car park plans for Stages 2 and 3. The design of the components of the car park to be constructed as part of Stages 2 and 3 has been specifically assessed in this report.

The detailed car park plans for Stages 1, 2 and 3 (including colour coded breakdown of parking spaces to the respective stages) is included in Appendix A.

4.4.2. Stage 1 Car Park Design

The Stage 1 car park design was previously approved by EDQ and detailed design has since been undertaken to ensure that the design aspects of the car park meet the requirements of AS2890.1. This will be reflected in the final certification by an RPEQ of basement being constructed in accordance with AS2890.

Regardless, the details of vehicular movements/passing throughout the parking area have been reassessed as part of this report. All parking aisles/ramps meet (and in many cases exceed) the minimum width requirements under AS2890.1. Most aisles are 6.2m wide and the main ramp is 5.55m kerb-to-kerb. Rather than assessing the manoeuvring at all of these locations, TTM considers it more appropriate to show manoeuvring at the critical location in terms of aisle/ramp configurations. This is generally the circulation movement between the main ramp and access aisles for the different car parking levels.

It is recognised that in most constrained inner urban enclosed car parking areas, full vehicle passing at all internal intersections cannot be achieved. These, however, generally operate in a suitable manner given the awareness of drivers of the parking area and constraints in terms of manoeuvring space (especially in residential car parks such as in this development, where all drivers in the car park are regular users as residents/tenants and also that the car parks are low turnover so the occasions of vehicles needing to pass at intersections will not be frequent). For the ramp and aisle arrangements in the Stage 1 car park of this development (also servicing movements to/from the Stage 2 and 3 car parking areas), it is proposed that vehicles on the inside, travelling up the ramps, will need to give way to other vehicles at critical intersections. This is generally at the bottom of the ramp before a vehicle turns onto it, and then again at the top of the ramp after the vehicle has driven up the ramp. This will be achieved through appropriate signage, pavement line-marking and visual aids (i.e. convex mirrors).

TTM Drawing 12BRT0111-SK1 provided in Appendix D shows the respective swept path movements of a B99 negotiating this circulation route on both the inside (counter-clockwise, upwards travel) and outside (clockwise, downwards travel) travel paths of the parking aisles/ramps, and passing of opposing vehicles. Note: These swept paths were prepared using the detail construction issue drawings for Stage 1.

Based on this drawing, TTM considers the proposed circulation and manoeuvring of vehicles at the most critical location in the Stage 1 car park (and therefore general manoeuvring at all other more open areas of the car park) is suitable.

4.4.3. Stage 2 Car Park Design

The general design parameters of the Stage 2 components of the car park are set out in Table 4.5. The last column of the table indicates compliance with the respective requirements.

Table 4.5: Stage 2 Car Park Design Criteria

Design Aspect	AS2890.1 Requirement	Proposed Provision	Compliance
Parking space length: - Standard Bay (Class 1A) - Small Car Bay - PWD Bay (Class 5)	5.4m (min) 5.0m (min) 5.4m (min)	5.4m 5.0m (min) 5.4m	Australian Standards Compliant
Parking space width: - Standard bay (Class 1A) - Small Car Bay - PWD Bay (Class 5)	2.4m (min) 2.3m (min) 2.4m (min) + 2.4m (min) 'Shared Area' next to space	2.4m 2.3m (min) 2.4m + 2.4m 'Shared Area' next to space	Australian Standards Compliant
Aisle Width: - Parking aisle - Circulation aisle/ramp (one-way) - Circulation aisle/ramp (two-way)	5.8m (min) 3.0m (min) 5.5m (min)	6.15m (min)* 5.2m 5.55m	Australian Standards Compliant. Refer to further comments below.
Parking envelope clearance - Column intrusion	0.25m into bay within 0.3m & 0.2m into bay within 1.2m of front of bay	Maximum 0.2m into bay within 0.6m of front of bay	Australian Standards Compliant
Parking envelope clearance - Column adjacent to bay	Located between 0.75m and 1.75m off aisle	All columns located between 0.75m and 1.75m off aisle	Australian Standards Compliant
Parking envelope clearance – space adjacent to wall	Space 0.3m clear of wall	Spaces 0.3m clear of wall	Australian Standards Compliant
Maximum Gradient: - PWD parking - Parking bay - Parking aisle - Ramp	1:40 (2.5%) 1:20 (5.0%) 1:16 (6.25%) 1:5 (20%)	Flat Flat Flat 1:5 (20%)	Australian Standards Compliant
Maximum Ramp Transitions	12.5% summit 15.0% sag	12.5% maximum	Australian Standards Compliant

Design Aspect	AS2890.1 Requirement	Proposed Provision	Compliance
Height Clearance • General Min. • Over PWD bay	2.2m (2.3m for access to PWD space) 2.5m	2.2m (min) over all parking spaces, 2.3m (min) over all aisles providing access to PWD spaces, and 2.5m (min) over PWD bays.	Australian Standards Compliant
Parking Aisle Extension	1m beyond last bay	1.0m beyond last bay, or provide reversing zone behind last bay	Australian Standards Compliant

* There are two locations in the Stage 2 car park where the aisle width is reduced. Refer to further information below with respect to this issue.

Additional information in relation to the proposed locations of reduced aisle width and impacts on internal traffic circulation in Stage 2 is provided as follows.

Given the required location of the lift and stair cores for Stage 2 and main ramp for Phase 1, this results in a reduced aisle width of approximately 5.2m in Podium Level 3 and Basement Level 1. On the other two levels, no internal circulation is provided between the parking areas on the east and west sides of the building cores for Stage 2. On the levels where internal circulation is provided, it is proposed that these aisles will be designated as 'local access' aisles servicing one-way movements for vehicles entering two spaces on each level (the typical small car bay in between the Stage 2 lift and stairwell cores, and standard space on the southernmost corner). In general, this area will act as a one-way circulation aisle; with the provided width of 5.2m satisfying the minimum width of 3.0m required under AS2890.1. For access to the typical small car spaces in between the lift and stairwell cores, the manoeuvring swept paths have been checked to confirm there is sufficient aisle width to facilitate the 90 degree entry/exit turns into the respective spaces.

Figure 4.1 shows the reverse entry movement into this typical space for a BCC 'Small Car' when entering from the eastern parking area travelling one-way (westbound) along the aisle. The vehicle will then exit the space to the west and perform a U-Turn movement onto the ramp to exit the parking area.

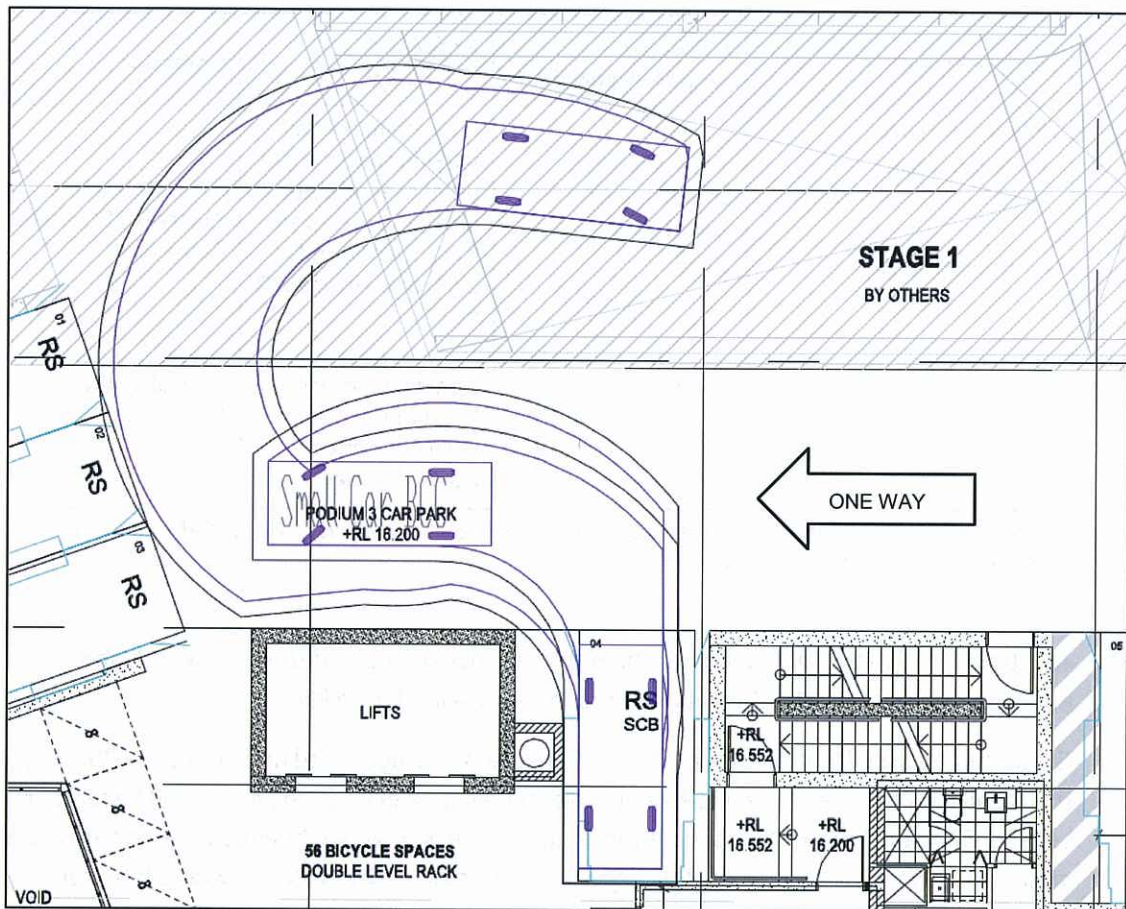


Figure 4.1: Small Car Manoeuvring into/out of Space in Stage 2

Suitable signage and pavement line marking shall be provided in these parking areas to identify that no through access to the basement ramps is available through the aisle in question, and the one-way nature of the traffic flow.

Overall, although this arrangement in terms of aisle widths for the parking spaces is not strictly compliant with AS2890.1 requirements, TTM consider this alternative arrangement in two isolated instances in the building is an acceptable solution.

Following input from the EDQ's Principal Engineer - Compliance, the following other design amendments have been made to the car park design plans to further satisfy AS2890.1 requirements:

- The number of Small Car Bays included as part of the Stage 2 parking supply has been minimised through slight alterations to parking bay dimensions within the car park area. The Stage 2 car parking supply provides a total of 9 spaces, which out of a total supply of 99 spaces equates to a provision of 9%.
- The security fence separating the loading area and car parking area have been confirmed and column locations has been confirmed to fall outside of the clearance envelope of the first Stage 2 visitor parking space provided within the car park, based on Figure 5.2 of AS2890.1.

Overall, TTM considers the design of the proposed Stage 2 car park is acceptable.

4.4.4. Stage 3 Car Park Design

The general design parameters of the Stage 3 car park layout are set out in Table 4.6. The last column of the table indicates compliance with the respective requirements.

Table 4.6: Stage 3 Car Park Design Criteria

Design Aspect	AS2890.1 Requirement	Proposed Provision	Compliance
Parking space length: - Standard Bay (Class 1A) - Small Car Bay - PWD Bay (Class 5)	5.4m (min) 5.0m (min) 5.4m (min)	5.4m 5.0m (min) 5.4m	Australian Standards Compliant
Parking space width: - Standard bay (Class 1A) - Small Car Bay - PWD Bay (Class 5)	2.4m (min) 2.3m (min) 2.4m (min) + 2.4m (min) 'Shared Area' next to space	2.5m 2.3m (min) 2.5m + 2.5m 'Shared Area' next to space	Australian Standards Compliant
Parking Aisle Width:	5.8m (min)	5.8 - 6.2m [^]	Australian Standards Compliant
Parking envelope clearance - Column adjacent to bay	Located between 0.75m and 1.75m off aisle	All columns located between 0.75m and 1.75m off aisle	Australian Standards Compliant
Parking envelope clearance – space adjacent to wall	Space 0.3m clear of wall	Spaces 0.3m clear of wall	Australian Standards Compliant
Maximum Gradient: - PWD parking - Parking bay - Parking aisle	1:40 (2.5%) 1:20 (5.0%) 1:16 (6.25%)	Flat Flat Flat	Australian Standards Compliant
Height Clearance: - General Min. - Over PWD bay	2.2m (2.3m for access to PWD space) 2.5m	2.2m (min) over all parking spaces, 2.3m (min) over all aisles providing access to PWD spaces, and 2.5m (min) over PWD bays.	Australian Standards Compliant
Parking Aisle Extension	1m beyond last bay	1.0m beyond last bay, or provide "Reversing Zone" behind last bay.	Australian Standards Compliant

[^] The parking aisle at its narrowest point, outside the elevator core reduces, to 5.8m. Refer to further details below.

Additional information in relation to the proposed locations of reduced aisle width and impacts on internal traffic circulation in Stage 3 is provided as follows.

The location of the lift core for Stage 3 and requirement for a pedestrian refuge/landing outside the lifts, to be physically separated from the parking aisle with bollards, results in a reduced aisle width of approximately 5.8m on each of the podium parking levels. This section of reduced width is localised only to the extent of the landing; with the parking aisle then widening back to a minimum 6.3m on either side. Regardless, this parking aisle width is compliant with the minimum requirements outlined in AS2890.

Given this parking aisle is a dead-end on each podium level, and only provides direct access for up to 10 parking spaces, TTM consider that vehicular circulation and passing at this location will still be appropriate. With respect to vehicle manoeuvring, TTM also undertook vehicular swept path analysis to determine if manoeuvring into/out of the parking spaces adjacent to the lift core and landing is impacted by the presence of the landing. It is noted that both of these parking spaces will be designated as 'Small Car Bays' and as such manoeuvring using a BCC 'Small Car' was tested.

Figure 4.2 and Figure 4.3 shows that vehicles are able to reverse into the parking spaces and exit forwards out of the parking spaces; albeit with a three-point turn required to turn out around the corner near the lift core to exit the car park for one of the spaces. As this site is considered to be a Class 1A car park, there is allowance for three-point entry/exit movements from these 'low turnover car spaces' as per AS2890.1, so this arrangement is considered acceptable.

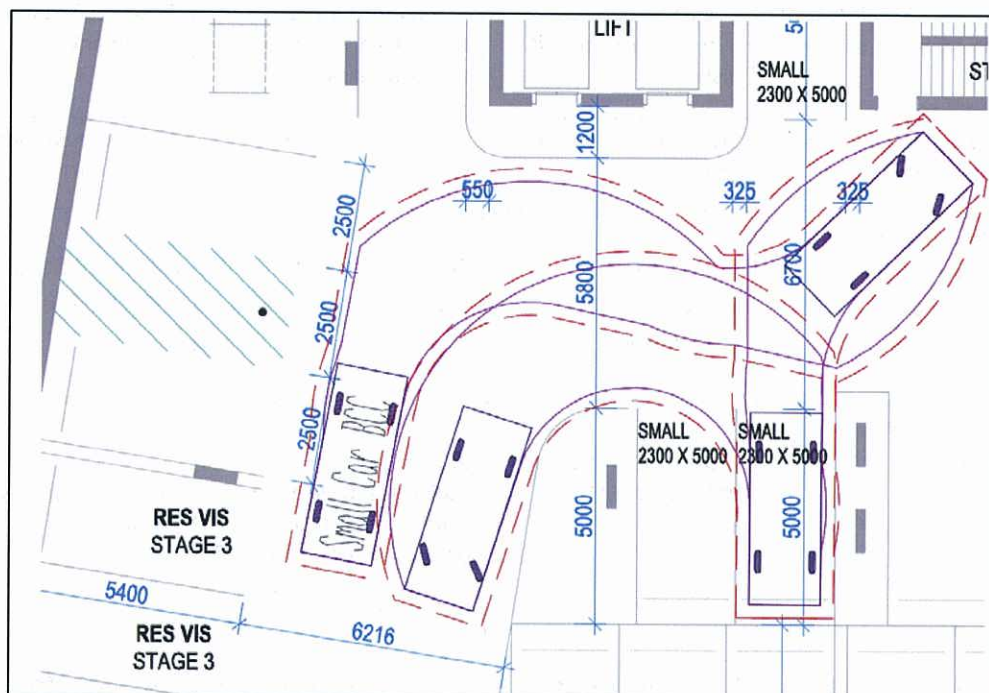


Figure 4.2: BCC Small Car Swept Path Movement 1 - Reverse Entry/Forward Exit

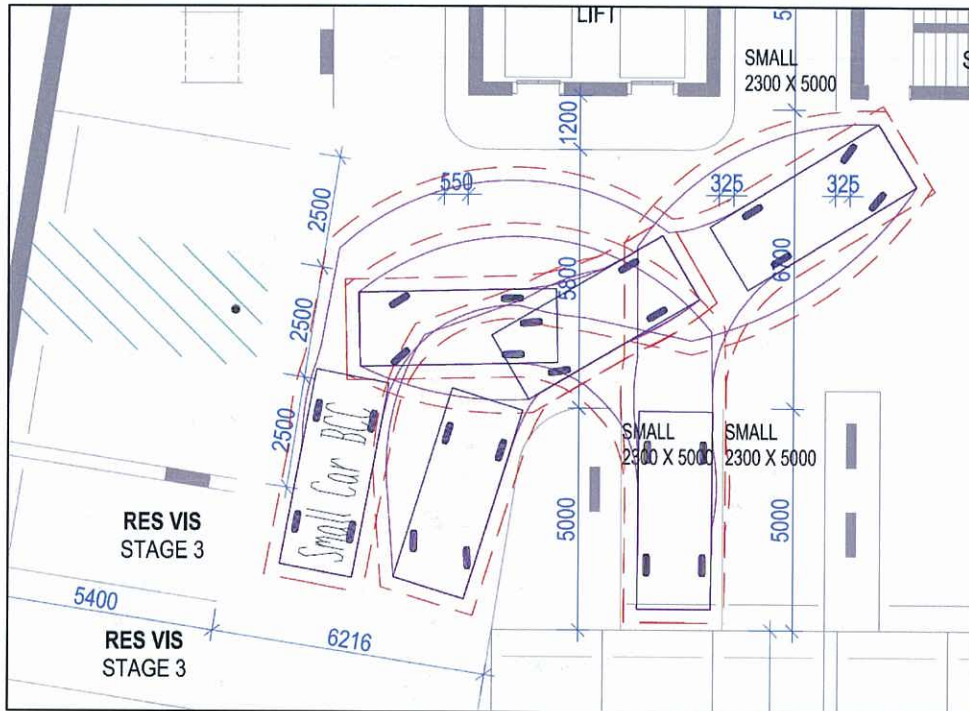


Figure 4.3: BCC Small Car Swept Path Movement 2 - Reverse Entry/Forward Exit (Three-Point Turn)

It is also noted that there is a location where a 55 degree angled parking space is provided at the end of the middle dead end aisles on each level, and eastern dead-end aisle on Podium Level 1; given the edge of the Stage 3 wall at this location. The parking aisle width in this module is a minimum of 6.1m wide. Although the parking aisles at the end of these modules have not been increased as per the parking aisle extension referenced in Table 4.6, a reversing zone has been provided behind the bays in each module. Given this atypical parking arrangement, TTM also undertook vehicular swept path analysis to determine if manoeuvring into/out of the parking space is acceptable.

Figure 4.4 shows that a BCC 'Small Car' is able to enter the space in the middle parking module forwards, then reverse out, turn and exit the parking module forwards in one movement each. It is therefore necessary that this space be designated as a 'Small Car Only' parking space.

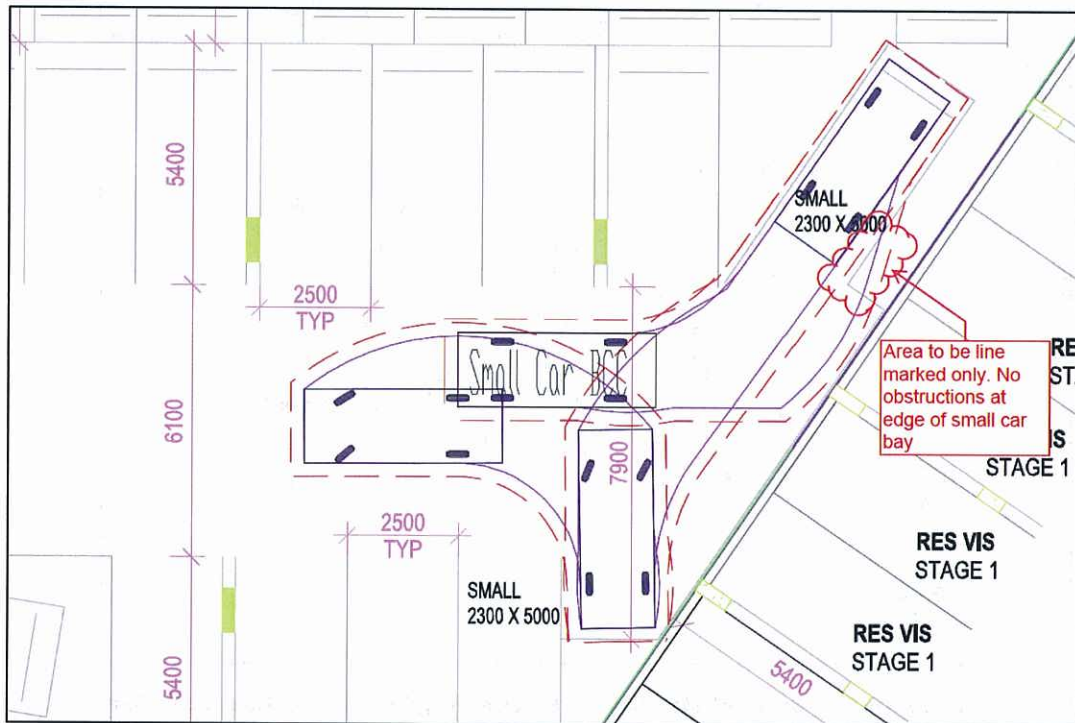


Figure 4.4: BCC Small Car Swept Path Movement 3 - Forward Entry/Reverse Exit

Apart from this minor performance solutions with respect to "reversing zones" (which have been demonstrated to work acceptably), the proposed car parking layout complies with all other AS2890.1 requirements.

Following input from the EDQ's Principal Engineer - Compliance, the following other design amendments have been made to the car park design plans to further satisfy AS2890.1 requirements:

- The parking aisle width opposite the elevator core landing has been widened to provide a minimum width of 5.8m. This has been achieved through offsetting the parking modules 0.1m further away from the elevator core than originally detailed and a reduction in the adjacent aisle width to 6.1m (as shown in Figure 4.4 above). It was also necessary to convert an additional space opposite the lift core to a Small Car Bay. Overall, the Stage 3 car parking supply provides a total of 15 Small Car bays, which out of a total supply of 126 spaces equates to a provision of 12%.

Overall, TTM considers the design of the proposed Stage 3 car park is acceptable.

5. Site Access Arrangements

5.1. Introduction

Given the size of the wider Central Village Master Plan, it was considered necessary that there be multiple accesses fronting onto different roads surrounding the site. Not only would this provide maximum flexibility to assist in the staging of the development, but it would also help cater for the travel movement desires of the development related traffic and would avoid congestion by efficiently distributing the development traffic on the surrounding roads. It was considered that direct access onto Brunswick Street would be unachievable given the current traffic volumes using the road and topography of the site.

Therefore, an alternative to construct a new road fronting the site was considered suitable as multiple access points could then be incorporated on both this new road and the existing Water Street. This new road to be constructed is the "Baxter Street Extension", which is detailed further in Section 6.

Details of the characteristics of the various site accesses for Phases 1 and 2 are detailed in the following sections.

5.2. Access to Phase 1 of Development

Vehicular access to Phase 1 (and Stages 2 and 3 by association) will be gained through an all-movements access onto the new "Baxter Street Extension" and will be located approximately 35m north of Water Street. As with the car park, AS2890 is adopted as a suitable reference for access design. The key design parameters in accordance with AS 2890 are set out in Table 5.1.



Table 5.1: Phase 1 "Baxter Street Extension" Access Characteristics

Design Aspect	AS 2890 Requirement	Proposed Provision	Compliance
Crossover width	Category 3 6m entry width and 4.0-6.0 exit width	10.0m entry width and 8.0m exit width (plus central median island)	Australian Standards Compliant
Minimum distance to adjacent intersections	6m from tangent point on kerb	35m north of Water Street / Baxter Street Intersection	Australian Standards Compliant
Sight distance	Ideally 69m, minimum of 45m	50m to south and 70m to the north	Australian Standards Compliant
Entry queue capacity	7 vehicles (42m) when car park is complete (Stages 1-3)	4 vehicles (24m)	Alternative Solution Proposed
Gradient of first 6m	1:20 (5%)	1:20 (5%) max	Australian Standards Compliant

With respect to entry queue capacity, it is noted that the basement will service low-turnover residential parking spaces and, as detailed further in Section 7, it is expected that the peak inflow into the site will be at most 91vph when Stages 1 to 3 are fully operational (75% of total potential traffic generation of 121vph). The probability of more than 4 vehicles entering the site at the same time (or say within a 30 second period) and all requiring to queue within the site, extending back onto "Baxter Street Extension" road, is less than 1%. The proposed internal queuing capacity is sufficient to cater for the 99th percentile entry queue of the site, and is therefore considered acceptable.

TTM Drawing 12BRT0665-SK7 provided in Appendix E shows the indicative layout/configuration of the main access into the Phase 1 and general cross-section/layout of the "Baxter Street Extension".

5.3. Access to Phase 2 of Development

Vehicular access to Phase 2 will be gained through two points; a Left-in/Left-Out access onto the existing one-way Water Street and an all movements access onto the new "Baxter Street Extension".

5.3.1. Water Street Access

The Water Street access will be located approximately 50m east of Brunswick Street. TTM understands there are future plans to potentially convert Water Street into a two-way road (east of Brunswick Street). Should this occur, there is the ability for this access to be converted to an all-movements access. The key design parameters in accordance with AS 2890 are set out in Table 5.2 below.

Table 5.2: Phase 2 Water Street Access Characteristics

Design Aspect	AS 2890 Requirement	Proposed Provision	Compliance
Crossover width	6.0-9.0m Category 2 Access	7.0m Category 2 Access	Australian Standards Compliant
Minimum distance intersection	6m from tangent point on kerb	50m from Brunswick Street	Australian Standards Compliant
Sight distance	Ideally 69m, minimum of 45m	60m to the west to the Brunswick Street / Water Street intersection, +100m to the east	Australian Standards Compliant
Entry queue capacity	4 vehicles (24m)	3 vehicles (18m)	Alternative Solution Proposed. Refer to discussion in Section 5.2.
Gradient of first 6m	1:20 (5%)	Access yet to be designed	-

A detailed design of this access and parking area has yet to be undertaken, however, preliminary concept sketches provided have been used to determine that most aspects will accord with the requirements of the Australian Standards. Subsequent detailed design will be undertaken to ensure compliance with all Australian Standards requirements.

5.3.2. "Baxter Street Extension" Access

A new internal road will also be provided, connecting to the "Baxter Street Extension" near where it will match into Diggles Close. The site access onto "Baxter Street Extension" will be provided in the form of an at grade intersection leg/approach, providing all-movement entry and exit. The internal road itself will be designated as a slow speed 'shared' zone and treated as to appear as a private road. The key design parameters in accordance with AS 2890 are set out in Table 5.3 below.

Table 5.3: Phase 2 "Baxter Street Extension" Access Characteristics

Design Aspect	AS 2890 Requirement	Proposed Provision	Compliance
Crossover width	6.0-9.0m Category 2 Access	Intersection leg, designed to cater for swept path of largest vehicle	Australian Standards Compliant
Minimum distance intersection	6m from tangent point on kerb	Incorporated as approach leg to intersection.	Australian Standards Compliant
Sight distance	Ideally 69m, minimum of 45m	+75m to the south towards Water Street and +50m to the north looking along Diggles Close	Australian Standards Compliant
Exit queue capacity	4 vehicles (24m)	+ 6 vehicles (+36m)	Australian Standards Compliant
Gradient of first 6m	1:20 (5%)	Access yet to be designed	-

Although detailed design of this access/intersection has yet to be undertaken, preliminary concept sketches provided have been used to determine that most aspects will accord with the requirements of the Australian Standards. Subsequent detailed design will be undertaken to ensure compliance with all Australian Standards requirements.

Overall, the proposed access arrangements for the Central Village Master Plan site are considered acceptable.

6. "Baxter Street Extension" Road

6.1. Geometric Road Design

The precinct outcomes in the Precinct 4 (Water Street Precinct) Land Use Plan of the Bowen Hills PDA identify a "new road" through the site along the eastern boundary connecting Water Street to Diggles Close. This is the proposed "Baxter Street Extension" referenced in this report. Taking into account the potential for two access points onto this new "Baxter Street Extension" (one for Phase 1 and an internal road connecting to the Phase 2 parking area), it was therefore assumed that up to 75% of the development traffic could theoretically use this new road. As outlined in Section 6 below, the peak hour generation rate of the development is expected to be up to 236vph. Assuming this equates to 10% of the daily development traffic generation, and applying the 75% factor, it is expected that the volumes of traffic on this new road attributed to this development could be up to 1800vpd. Given the existing 'grid' style of the surrounding network, this new road is not expected to significantly change the flow of the existing traffic movements throughout and into/out of the catchment. As such, the traffic volumes using this new road can be expected to be primarily related to this development, with a minimal amount of additional residential traffic for the dwellings in the immediate area (i.e. on Diggles Close). For this purpose then, it can be assumed the daily traffic volumes on the new "Baxter Street Extension" will not exceed 2000vpd.

The new Baxter Street Extension has been designed to the standard of a 'Neighbourhood Access' (non-bus route) road, in accordance with the requirements of the BCC *Brisbane City Plan 2000 - Transport and Traffic Facilities Planning Scheme Policy*. As outlined in the policy, a Neighbourhood Access road is suitable to carry traffic volumes of up to 3000vpd, above the daily volumes expected to use the new "Baxter Street Extension". A 14m wide reserve is proposed to be dedicated for this new road, and the cross section incorporates a 7.5m carriageway, 5.0m verge/footpath on the western side and 1.5m verge/footpath on the eastern side. Some of the upper levels of the Stage 3 building will overhang approximately 1.5m into the western road verge. It is expected that a volumetric dedication will be required along the extent of this building overhang. The maximum grade of the road will be 10%.

Further detailed designs of the "Baxter Street Extension" were prepared by Westera Partners subsequent to detailed design of Stage 1. A copy of the preliminary civil road designs is included in Appendix F.

Overall, the design of the new "Baxter Road Extension" is consistent with BCC road design requirements and is considered suitable.



6.2. Construction Timing

It is expected that the construction of the "Baxter Street Extension" will occur in two sections. The first section involves the construction of the road from Water Street up to the Phase 1 site access, with the requirement for this section needed to be complete prior to the completion of Stage 1. The second section involves the construction of the road from the Phase 1 access north through to Diggles Close to complete the whole "Baxter Street Extension" link. It is anticipated that the construction of this second section will be aligned with the construction of Stage 3; given the building fronts directly onto this new road.

7. Road Network Performance

7.1. Traffic Generation & Distribution

The RTA *Guide to Traffic Generating Developments* indicates that the peak hour trip generation characteristics of medium to high density residential developments is between 0.25 - 0.4 trips/unit. Considering that in this proposed development not all units have a car parking space, it can be assumed that these units will not contribute to the total traffic generation of the development. Based on this, the development traffic generation can be expected to be as shown in Table 7.1 below.

Table 7.1: Central Village Peak Hour Traffic Generation

Development Component	Number of Units	Traffic Generation Rate	Peak Hour Trips
Phase 1			76 – 121 vph
• 1 Bedroom with no car space	221 units	0 trips/unit	0 vph
• 1 Bedroom with car space	153 units	0.25-0.4 trips/unit	38 - 61 vph
• 2 Bedroom with car space	151 units	0.25-0.4 trips/unit	38 – 60 vph
Phase 2			72 – 115 vph
• 1 Bedroom with no car space	197 units	0 trips/unit	0 vph
• 1 Bedroom with car space	132 units	0.25-0.4 trips/unit	33 - 53 vph
• 2 Bedroom with car space	156 units	0.25-0.4 trips/unit	39 – 62 vph
Total Development			148 – 236 vph

The development peak hour traffic distribution on the surrounding road network was determined for each of the Phases 1 and 2, using the following generic assumptions:

- The higher end of the traffic generation range (0.4 trips/unit) has been adopted as a worst case scenario when calculating the intersection movement volumes shown.
- The in/out split development traffic is 25%/75% in the AM Peak and 75%/25% in the PM Peak.

With respect to the more specific characteristics of the distributions, the following assumptions were made for the Phase 1 development generated traffic:

- All vehicles entering the Phase 1 access on the new “Baxter Street Extension” come from Water Street and Baxter Street. No traffic enters from the north (i.e. via Diggles Close). Assumed 40% will come from Baxter Street and 60% from Water Street.
- 70% of vehicles exit to the south from the “Baxter Street Extension” access, and 30% to the north. Out of all the vehicles exiting to the south, 50% head south along Baxter Street, 10% turn left into Anderson Street and 40% turn right into Constance Street.

- Out of all the vehicles exiting to the north from the Phase 1 access, 70% turn right onto Gregory Terrace to head east, and 30% turn left to head west.

Figure 7.1 shows the assumed distribution of inbound and outbound traffic for Phase 1.

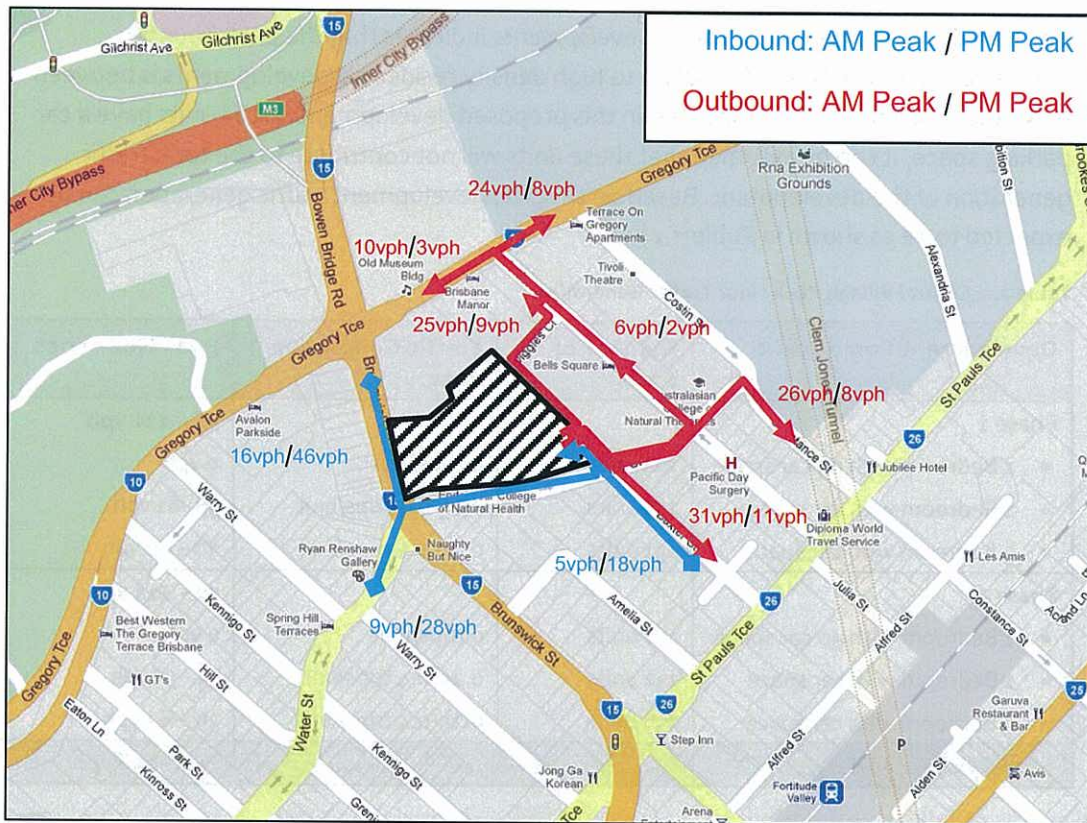


Figure 7.1: AM/PM Movements Peak Hour Traffic Volumes to/from Phase 1 Access

With respect to the more specific characteristics of the distributions, the following assumptions were made for the Phase 2 development generated traffic:

- 50% of vehicles entering Phase 2 will do so via that Water Street access; with 50% coming from the north (via Bowen Bridge Road) and 50% from the east (from the east side of Water Street).
- The remaining 50% of vehicles entering Phase 2 will do so via the access onto the new "Baxter Street Extension"; with 70% of the traffic coming from the south (via Baxter Street) and 30% from the north (via Gregory Terrace).
- Phase 2 traffic exiting the site is split evenly between 50% north (towards Gregory Terrace) and 50% south (towards St Pauls Terrace). All the vehicles exiting to the south exit via the Water Street access, with 40% turn right into Baxter Street and 60% turn right into Constance Street.

- For vehicles exiting to the north from Phase 2 access (toward Gregory Terrace), 75% exit from the "Baxter Street Extension" access and 25% from the Water Street access. 60% of northbound traffic turns right onto Gregory Terrace to head east, and 40% turn left to head west.

Figure 7.2 shows the assumed distribution of inbound and outbound traffic for Phase 2.

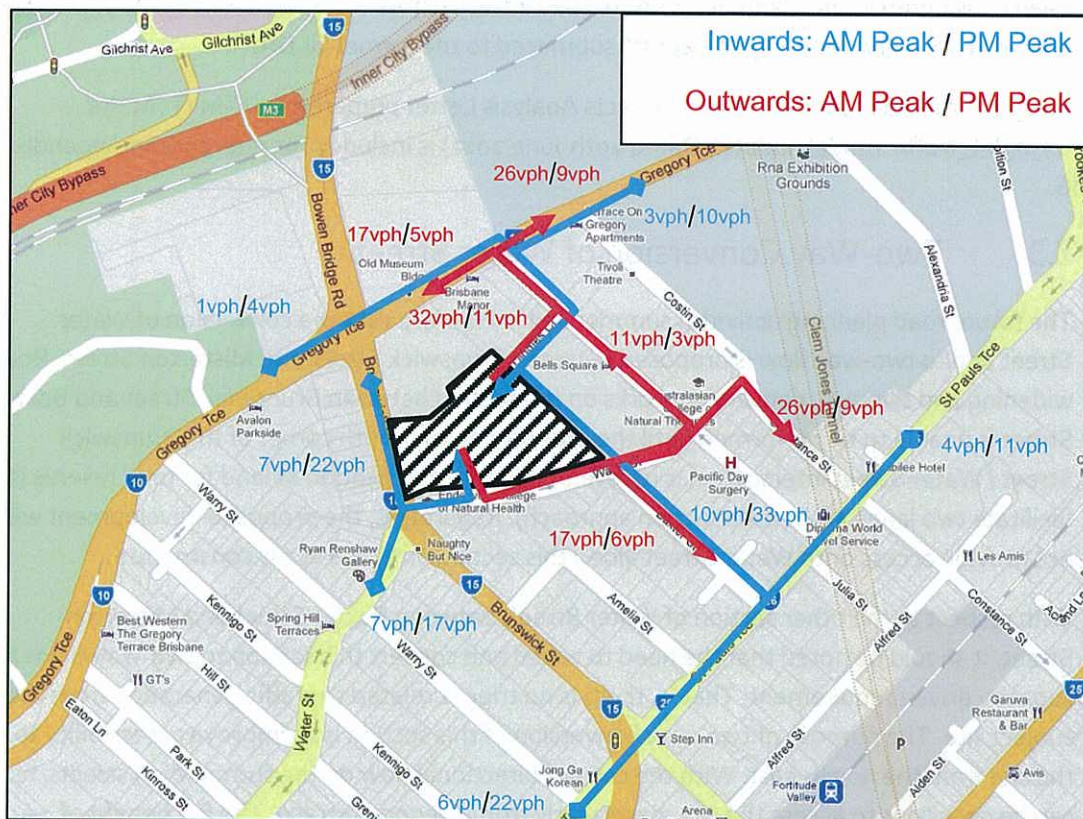


Figure 7.2: AM/PM Movements Peak Hour Traffic Volumes to/from Phase 2 Access

7.2. Development Impacts

It should be noted the 'Bowen Hills Traffic Model' – which was developed by TTM for the former ULDA to assess the area wide road network performance and impacts of the various development projects within the Bowen Hills UDA – previously used generic traffic generation rates for the site of the proposed Central Village development. This was based on assumed land redevelopment yields and maximum plot ratios specified in the former Bowen Hills UDA Development Scheme.

The outputs of the model show the traffic generation estimated from this site was 174vph in the AM Peak and 173vph in the PM Peak. These peak hour volumes are within the expected development traffic generation range shown in Table 6.1, although slightly at the lower end of the range. In light of this fact, TTM previously prepared a letter in June 2012 comparing the proposed development generated traffic on roads surrounding the site for both the original 'Bowen Hills Traffic model' and revised model with development yield of 1038 units (and peak



hour generation of 244vph). As the proposed revised scheme provides 1010 units total, 28 units less or 8vph less than was tested in the revised model, TTM considers the results of this comparison are still valid and if not now more conservative. The results of the comparisons documented in June 2012 showed that the effects of the revised yield (compared to the original model) would be negligible. TTM considers this will still be the case for the new development size of 1010 units and that overall impacts of this development have already been considered in the planning of future road infrastructure for Bowen Hills UDA, as per the "Bowen Hills Network Analysis Report" submitted to the former ULDA.

A copy of the Road Modelling and Impacts Analysis Letter prepared by TTM (TTM Ref. '27703let_traffic model update', Dated 20th June 2012) is included for reference in Appendix G.

7.3. Two-Way Conversion of Water Street

The future road planning activities summarised in Figure 3.1 show a conversion of Water Street and to two-way flow is proposed between Brunswick Street and Misterton Street. Road widening and two-way conversion works on the section between Brunswick Street and Baxter Street is unable to be performed until the property on the south corner of the Brunswick Street / Water Street intersection is redeveloped, and rededication of land for road reserve (to facilitate two lanes at the intersection approach). Regardless, the proposed development will not provide access onto Water Street along this section until Phase 2 is constructed.

With respect to the other section of Water Street, between Baxter Street and Misterton Street, it should be noted that the need to widen and convert this section to two-way is not a capacity driven requirement. That is, there is no trigger related to traffic generation from the subject site. The purpose of two-way conversion of this section is to improve accessibility to the site from the north-east. With the current directional flow on the surrounding streets, it can be circuitous to access the site, particularly from Gregory Terrace. The full benefit of converting this section of Water Street to two-way, however, will not be realised until Costin Street is also converted to two-way and Water Street is extended through to King Street (the new road being constructed as part of the RNA showgrounds development 'Showground Hill'). Both of these roadwork activities are largely dependent on the progress of this development.

If the section of Water Street between Baxter Street and Misterton Street is not converted to two-way, traffic entering the site would be diverted to enter via Brunswick Street, Baxter Street or Diggles Close. The traffic generated by Phase 1 will be at most 121vph, which when distributed on the roads surrounding the site as shown in Figure 7.1 (which reflects the existing one-way access on Water Street) overall results in minimal traffic volumes increases. The additional traffic on these routes is therefore considered negligible and would not create an adverse impact on safety or amenity.

It is TTM's view that, from a traffic engineering perspective, the two-way of Water Street could be delayed until Phase 2 of the project when direct access on to Water Street from the car park is provided to the west of Baxter Street.

8. Service Vehicle Arrangements

The service vehicle facility needs to accommodate the demands generated by the residential components of the development. Although the development also incorporates a small amount of retail space and a number of Sole Occupancy/Home Office (SOHO) uses, the service vehicle size and general demand generated by these uses is not likely to be larger than the residential component.

It is noted that all of the residential apartments within the development are one or two bedroom units and are targeted at the investor market, which relates to a high proportion of rental units. Whilst this may relate to a higher turn-over of tenants, most tenants typically have less furniture to move in/out of the unit and so utes or vans will more typically be expected for furniture removals, with the occasional larger furniture trucks. With respect to furniture trucks, it is expected that smaller MRV sized trucks would service the small units for this site as opposed to traditional LRVs used for larger units and houses where the volume of furniture being relocated is greater.

Given the size of each Phase of this project, it is expected that there will be frequent furniture vehicle access to the site. To accommodate this expected vehicle demand, it is proposed that a management strategy will be implemented to control the timing of furniture/removals vehicles accessing the site. This will involve the building manager allocating a specific time period for residents to move in/out, by providing access to the service area and priority over an elevator/lift to transport goods to the respective units. On this basis, it is TTM's view that the ability to schedule the timing of the trucks will allow for appropriate sharing of the service vehicle area and as such a single MRV bay and a number of dedicated VAN bays for smaller delivery vehicles is considered acceptable. Given the number of units in each of the Phases, regular refuse collection is likely to be needed and so TTM feels a dedicated RCV bay is warranted. The design RCV considered acceptable for the proposed developments is the 9.8m rear-loading trucks currently in use by BCC Waste Services. Given the refuse collection times/periods is usually scheduled, the RCV bay can also be used as an additional loading bay for residential deliveries/furniture removals outside of collection times.

The proposal provides two separate service areas; one area each for both Phase 1 and 2 of the development. Each service area will consist of two dedicated VAN bays, one MRV bay and one RCV bay. Service vehicle swept path analysis of the Phase 1 service area (incorporating Stages 2 and 3 servicing) is included in TTM Drawing 13BRT0248-SK1 in Appendix H. It is understood that this servicing arrangement for Phase 1 and Stage 1 was approved as part of the previous Development Application for Stage 1 (Decision Notice dated 31st January 2013, DEV2012/289) and so TTM consider the servicing provisions related with Stages 2 and 3 is therefore similarly acceptable.

The arrangement of the Phase 2 service area is yet to be determined, however, it shall be designed to ensure manoeuvring for MRVs and RCVs will be possible.



9. Public Transport, Pedestrian and Bicycle Facilities

9.1. Public Transport

As indicated previously the subject site enjoys a high level of connectivity to the public transport network. The master plan allows for the inclusion of an indented bus bay which is consistent with BCC planning outcomes.

It has been demonstrated that the proposed development accords with Translink's requirements whereby public transport can be accessed within a 5 minute (400m) walk of the site. The fact that there is an indented bus bay also being constructed on the Brunswick Street frontage of the site is likely to allow for increased frequency and an expanded range of services to be added in the future, improving the overall public transport serviceability and connectivity of the site.

9.2. Pedestrians and Cyclists

It is proposed that the "Baxter Street Extension" be designed as a space shared by pedestrians and vehicles. Through the use of contrasting paving materials, planting, street furniture and outdoor seating an environment will be achieved where drivers understand intuitively to maintain low speeds and be aware that other people will be using the space.

EDQ requires 1 resident's bicycle space per apartment plus 1 visitor's space per 400m² GFA.

Stage 1 of the development provides a total of 196 bicycle parking spaces, split between resident and visitor use, located in the secured car parking area. This provision exceeds the EDQ approval requiring 166 bicycle parking spaces.

With respect to Stage 2, the total development yield of approximately 10,400m² GFA or 160 units equates to an EDQ parking requirement of 160 resident bicycle parking spaces and 26 visitor bicycle parking spaces. With respect to Stage 3, the total development yield of approximately 12,400m² GFA or 200 units equates to an EDQ parking requirement of 200 resident bicycle parking spaces and 31 visitor bicycle parking spaces. There is also an additional requirement for retail visitor bicycle parking related to the retail tenancies located on the street levels of Stages 2 and 3; in the order of 2 spaces.

The proposed design of Stage 2 will incorporate the total supply of 188 bicycle parking spaces; including 160 resident spaces and 28 visitor/retail spaces located within the secured car parking areas. The proposed design of Stage 3 will incorporate the total supply of 234 bicycle parking spaces; including 200 resident bicycle parking spaces (located in secured facilities in the car parking area) and 34 visitor/retail visitor spaces on the verge of the new 'Baxter Street Extension' fronting the site.

Based on the approved/proposed bicycle parking provisions indicated above, the wider Phase 1 of the development will provide a total of 618 bicycle parking spaces. Although detailed design of Phase 2 is yet to be undertaken, it is expected that an additional 485 resident bicycle spaces will be provided plus 80 residential visitor spaces (assuming a GFA for Phase 2 of up to 32,000m²) and 3 retail/commercial visitor spaces. As such the total supply for bicycle parking for the Central Village Master Plan is expected to be 1186 spaces.

The majority of the bicycle spaces (resident and visitor) will be located in the basement car park areas, spread across the different levels and building stages, and a small number of the visitor spaces will be located in public areas (such as in the Baxter Street Extension or Water Street road verges/building frontage) to allow for convenient parking for the small amount of retail and SOHO components of the development.