

## Issue History

File Name	Prepared	Reviewed	Issued by	Date	Issued to
P5306.001T Waterloo South Precinct Transport Addendum	A Finlay	S. Brooke	M. Hearne	20/08/2021	Anthony.richardson@planning.nsw.gov.au
P5306.002T Waterloo South Precinct Transport Addendum	A Finlay	S Brooke	M Hearne	29/10/2021	Anthony.richardson@planning.nsw.gov.au
P5306.003T Waterloo South Precinct Transport Addendum	A Finlay	S Brooke	M Hearne	04/11/2021	Anthony.richardson@planning.nsw.gov.au
P5306.004T Waterloo South Precinct Transport Addendum	A Finlay	S Brooke	M Hearne	22/02/2022	Anthony.richardson@planning.nsw.gov.au
P5306.005T Waterloo South Precinct Transport Addendum	A Finlay	S Brooke	M Hearne	22/02/2022	Anthony.richardson@planning.nsw.gov.au
P5306.006T Waterloo South Precinct Transport Addendum	M. Hearne	M. Hearne	M Hearne	23/02/2022	Anthony.richardson@planning.nsw.gov.au
P5306.007T Waterloo South Precinct Transport Addendum	A Finlay	S Brooke	M Hearne	16/06/2022	Anthony.richardson@planning.nsw.gov.au
P5306.008T Waterloo South Precinct Transport Addendum	A Finlay	S Brooke	M Hearne	22/06/2022	Anthony.richardson@planning.nsw.gov.au

# Waterloo Estate (South) Planning Proposal

## Addendum to Transport Study Report by Jacobs for DPIE

### 1. Introduction

In March 2020 Jacobs prepared a Transport Study for the development of the Waterloo Estate (South) precinct as proposed by the NSW Land and Housing Corporation (LAHC). The City of Sydney assessed the LAHC proposal, and in February 2021 developed a Planning Proposal to amend the Sydney Local Environmental Plan 2012.

The Minister for Planning appointed the Secretary of Planning as the Principal Planning Authority (PPA) for the Waterloo Estate (South) Planning Proposal (the Planning Proposal).

On 27 April 2021 the PPA lodged the Planning Proposal with the Deputy Secretary for Gateway Determination. The Planning Proposal submitted was the one prepared by the City of Sydney and endorsed by the Central Sydney Planning Committee and Council.

The Planning Proposal contains a mix of affordable housing, social housing and market housing. The Planning Proposal area also contains private land holdings, with the majority of land being in the ownership of the LAHC.

The Planning Proposal to facilitate the redevelopment of Waterloo Estate (South) received Gateway Determination on 23 June 2021. As condition of this Gateway Determination an updated transport assessment of the Planning Proposal is required to understand the implications of Council's alternative pedestrian and vehicle routes through the precinct. The transport assessment to be updated is the "*Transport Study – Waterloo Estate (South) – Land and Housing Corporation*" completed by Jacobs.

An Urban Design Review of the Planning Proposal was undertaken by Hassell in October 2021. This Hassell Review assessed, among other things, building heights and bulk, floor space ratio and solar access.

Bitzios Consulting has been engaged by the NSW Department of Planning, Industry and Environment (DPIE) to prepare the updated transport assessment. Given the limited time available and the relatively minor changes to the road network proposed, the updates to the transport study have been prepared as an addendum to the Jacobs study.

Following conclusion of the PPA's formal exhibition of the revised Planning Proposal in late April 2022, in response to stakeholder and community submissions the PPA required this further Addendum of the Traffic Study with a key focus on the following issues:

- Investigate the impact of closing Pitt Street at (McEvoy Street) for vehicular access, and the proposed area including heavy vehicles such as garbage and delivery trucks as well as day to day car movements
- Investigate the impact of allowing right turn movements from Botany Road to Wellington Street.

The qualitative assessment of these impacts is contained in Section 7 of this Addendum.

## 2. Land and Housing Corporation Proposal

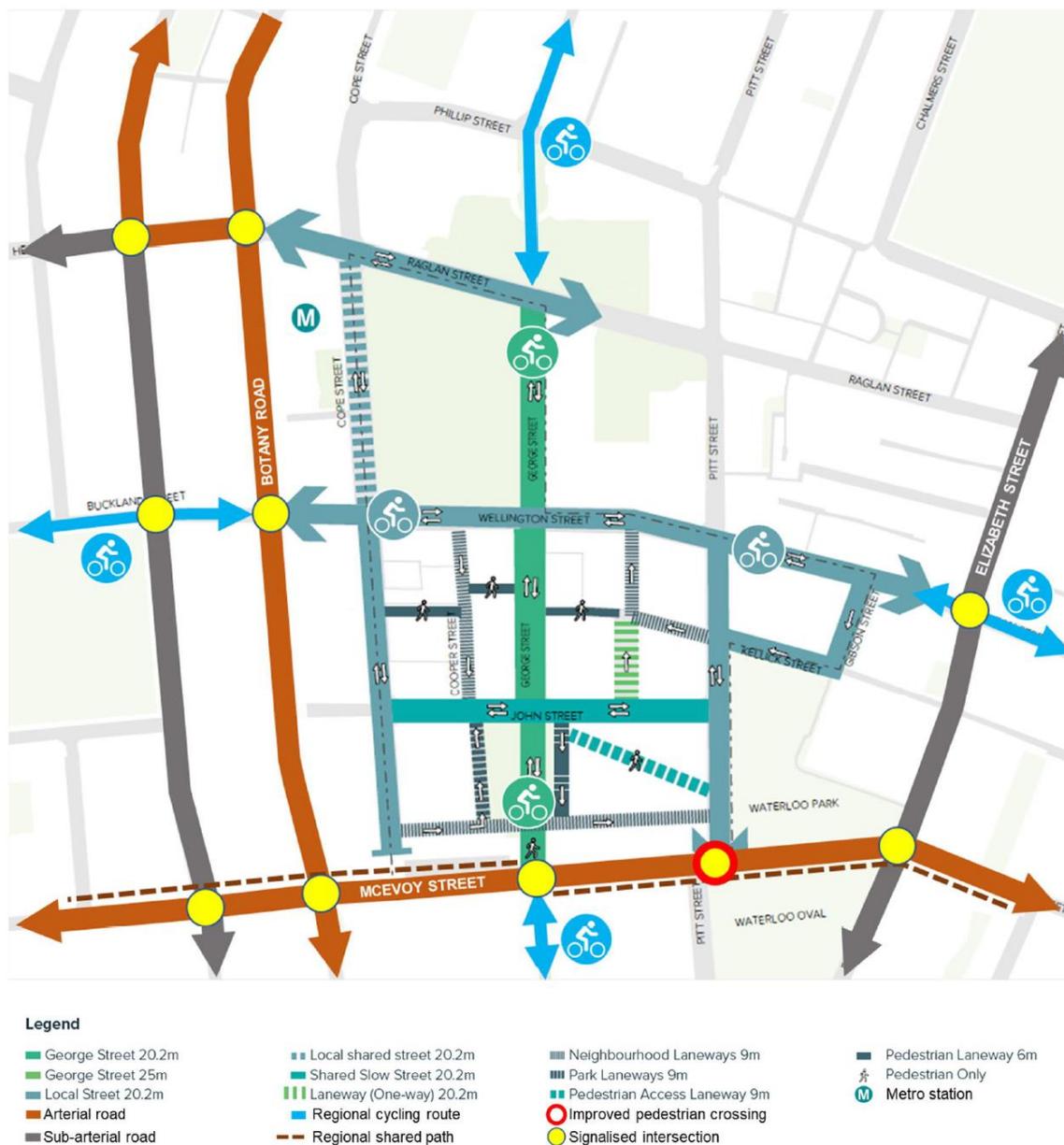
The LAHC proposal is shown in Figure 2.1. It comprises multiple high rise residential towers, some of which are up to 32 storeys high, as well as mid- and low-rise buildings, with a total of 3,048 dwellings and approximately 11,200 square metres of GFA for commercial premises, including, but not limited to, supermarkets, shops, food and drink premises and health facilities. The proposal included 199 retail car spaces.



Source: Jacobs report Figure 1.3

**Figure 2.1: LAHC Proposal**

The LAHC proposal transport networks are shown in Figure 2.2. Note the proximity to Waterloo Metro station (under construction), and the north-south and east-west cycling routes.



Source: Jacobs report Figure 6.7

**Figure 2.2: LAHC Proposal Transport Networks**

### 3. The Planning Proposal

The City of Sydney proposal is shown in Figure 3.1. It comprises three towers of about 30 storeys and most other buildings generally around 8 stories (with some 4 storeys and others up to 13 storeys where development fronts a park or George Street). There is a total of 3,067 dwellings and approximately 13,000 square metres of GFA for commercial premises, and 5,000 square metres for community facilities, childcare and health facilities. The proposal includes 114 commercial car spaces.



Source: Planning Proposal Figure 34

**Figure 3.1: Planning Proposal Indicative Masterplan**

The Planning Proposal transport networks are shown in Figure 3.2. It also includes the north-south and east-west cycling routes, and pedestrian through links between streets and lanes.



Source: Planning Proposal Figure 53

**Figure 3.2: Planning Proposal transport networks**

## 4. Urban Design Review by Hassell

The Hassell Review's preferred option (Option 4, "Tower Plus") is shown in Figure 4.1. It comprises four towers of about 30 storeys and most other buildings generally around 8 stories (with some 4 storeys and others up to 13 storeys where development fronts a park or George Street). There is a total of approximately 238,000 square metres GFA for residential and approximately 17,000 square metres GFA for non-residential purposes (of which no less than 12,000 square metres would be for commercial premises and 5000 square metres for community facilities, childcare and health facilities). The Hassell Review does not specify the number of commercial car spaces, so for transport analysis purposes it has been assumed that the commercial car spaces would be the same as the Planning Proposal (114). The estimated number of dwellings on LAHC owned land is 3,012, including about 847 social housing dwellings, 227 affordable housing dwellings and about 1938 market dwellings. There would be a further 127 market dwellings on privately owned sites.

### OPTION 4 OVERVIEW

1. Additional setback to McEvoy Street to provide for tree retention.
2. Formalised perimeter block typology with enhanced pedestrian and cycle connection between McEvoy Street and Mead Street.
3. McEvoy tower envelopes simplified (envelope cut-outs removed).
4. Rearranged north-east street block to retain large trees at three of the four corners.
5. Addition of a tower - through perimeter block rearrangement, this form has a lesser shadow impact to the park and adjacent buildings as compared to the CoS planning proposal.
6. Minor rearrangement of the south western block.



Source: Hassell Review Page 9

**Figure 4.1:** Hassell Review Preferred Option

The Hassell Review's proposed transport networks are shown in Figure 4.2. They are very similar to the Planning Proposal but have a pedestrian link to McEvoy Street at the southern end of Mead Street.

## Access and circulation

The amended access and circulation provide a connection between John Street and McEvoy Street through Mead Street.

- - - Existing lot boundary
- - - Cycle way - existing
- - - Cycle way - future
- New streets
- Through site links
- Signalised intersection
- Pedestrian ramps
- Public access elevator
- Traffic flow
- Yield traffic flow
- Prohibited right now
- 30 Speed limit



Waterloo South Planning Proposal  
Urban Design Review

Source: Hassell Review Page 20

**Figure 4.2: Hassell Review Transport Networks**

## 5. Differences in Trip Generation

While the Planning Proposal has slightly more dwellings (3,067) compared to the LAHC proposal (3,048), the Hassell Review has more dwellings again (3,139 total, 3,012 on LAHC land and 127 on private land). In both the Planning Proposal and Hassell Review, there are significantly fewer retail car spaces (114 compared to LAHC's 199). This results in a reduction of peak period driving trips, as shown in Table 5.1 below.

**Table 5.1: Comparison of Trips Generated**

Item	LAHC (Jacobs)	Planning Proposal (PP)	Hassell Review (HR)	Change from Jacobs	Percent	Remarks
<b>Residential GFA (m<sup>2</sup>)</b>	239,000	236,000	238,000	-3000 (PP) -1000 (HR)	-1.26% (PP) -0.42% (HR)	slight decreases
<i>(page number)</i>	5	5				
<b>Dwellings</b>	3048	3067	3139	+19 (PP) +91 (HR)	+0.6%(PP) +3%(HR)	slight increase slight increase
<i>(page number)</i>	41	45	(DPIE)*			
Basis		COS Area A				
<i>(page number)</i>		84				
<b>Commercial GFA (m<sup>2</sup>)</b>	11,200	13,000	12,000	+1800 (PP) +800 (HR)	+16% (PP) +7% (HR)	significant increase from Jacobs
<i>(page number)</i>	5	5	(DPIE)*			
<b>Commercial car spaces</b>	199	114	114	-85	-42.7%	significant decrease from Jacobs
<i>(page number)</i>	41	84	(DPIE)*			
Basis		COS Area D				
<i>(page number)</i>		84				
AM Residential car trips	427	429	439	+2 (PP) +12 (HR)	+0.5%(PP) +2.8%(HR)	slight increase from Jacobs
<i>(page number)</i>	56					
AM Commercial car trips	80	46	46	-34	-42.5%	large reduction from Jacobs
<b>Total AM car trips</b>	507	475	485	-32 (PP) -22 (HR)	-6.3% (PP) -4.3% (HR)	overall reduction from Jacobs
PM Residential car trips	427	429	439	+2 (PP) +12 (HR)	+0.5%(PP) +2.8%(HR)	insignificant
<i>(page number)</i>	56					
PM Commercial car trips	160	91	91	-69	-43.1%	large reduction
<b>Total PM car trips</b>	587	520	530	-67 (PP) -57 (HR)	-11.4%(PP) -9.7%(HR)	overall reduction from Jacobs

\*advice from DPIE in email dated 17 February 2022

It can be seen that the Planning Proposal, and the Hassell Review, would result in a significant reduction in peak hour car trips (at least 4.3% in the AM, and at least 9.7% in the PM), compared to the LAHC proposal. Accordingly, there is no requirement to consider any additional traffic management treatments to address capacity issues.

## 6. Differences in Transport Networks

Referring to Figures 2.2, 3.2 and 4.2 above, there are some differences between the road and pedestrian links. These are detailed in Table 6.1 below.

**Table 6.1: Key differences between the LAHC and Planning Proposal networks**

Street or Area	Jacobs report for LAHC (Figure 6.7)	Planning Proposal (Figure 53)	Hassell Review (Page 20)	Potential Impact of Change
Cooper Street, north of John Street	9m wide "park laneway", southbound	Widened, One-way northbound, open at Wellington Street, 20 km/h limit	(same as PP)	Change to vehicle distribution entering and exiting Cooper Street north. Cooper Street is a minor local street and there are no car park entries directly off Cooper Street (Section 5.1.14 Planning Proposal), and therefore impact of the change in traffic flow will be minor.
Cooper Street, south of John Street	9m wide "park laneway", northbound from lane near McEvoy Street	Two-way, 10 km/h connection to 'town square' around small park	(same as PP)	Changes are minimal with no significant traffic impacts
West Street, northern section	9m wide "park laneway", northbound, open at Wellington Street	Widened, One-way northbound, open at Wellington Street and John Street, 20 km/h limit	(same as PP)	Relatively minor change, with no car park entries directly off West Street. No significant impact is expected
West Street, southern section	20.2m wide laneway, northbound from John Street	Widened, One-way northbound, open at Wellington Street and John Street, 20 km/h limit	(same as PP)	Relatively minor change, with no car park entries directly off West Street. No significant impact is expected
Mead Street	(Does not exist)	New street, closed at McEvoy Street, 20 km/h limit	Same as PP but pedestrian connection to McEvoy Street	New local cul-de-sac road. No impacts. Hassell Review provides enhanced pedestrian connectivity to McEvoy Street

Street or Area	Jacobs report for LAHC (Figure 6.7)	Planning Proposal (Figure 53)	Hassell Review (Page 20)	Potential Impact of Change
Pitt Street	20.2m wide “local street”, open at McEvoy Street with new signals allowing all movements. Pitt Street south would be Left In/Left Out at McEvoy Street	Widened, two-way, 30 km/h limit. NRT from McEvoy Street to Pitt Street, and NRT from Pitt Street (north) to McEvoy Street. Unclear how Pitt Street south would be treated.	(same as PP)	We understand that the existing signals at Pitt Street (south) and McEvoy Street would be retained in conjunction with the proposed Left In/Left Out treatment of McEvoy Street and Pitt Street (north).
John Street	20.2m wide “shared slow street”, two-way, open at Cope Street and Pitt Street	Two-way, open at Cope Street but closed at Pitt Street, 30 km/h limit	(same as PP)	Reduced potential for through traffic through closure at Pitt Street end
North of McEvoy Street, east -west links	9m wide “park laneway”, eastbound, connecting Cope Street to Pitt Street	Through-site link to southern part of town square, Cope Street to George Street. Separate through-site link connecting George Street to Pitt Street via Mead Street.	(same as PP but pedestrian connection from Mead Street to McEvoy Street)	Reduced potential for through traffic impacts Hassell Review provides enhanced pedestrian connectivity to McEvoy Street
North of McEvoy Street, east -west links	Diagonal, 9m wide “pedestrian access laneway, connecting Pitt Street near McEvoy Street to John Street	(as above)	(as above)	Reduced potential for through traffic impacts
North of John Street	Offset pedestrian laneways connecting Cope Street to George Street to West Street	Aligned through-site links connecting Cope Street to George Street to West Street	(same as PP)	Minor traffic movements. No significant impacts

Street or Area	Jacobs report for LAHC (Figure 6.7)	Planning Proposal (Figure 53)	Hassell Review (Page 20)	Potential Impact of Change
Botany Road northbound right turn restrictions	Unclear, but report claims proposed treatment of McEvoy/Pitt intersection would remove up to 100 movements from McEvoy and Wellington intersections.	Figure 53 shows NRT at McEvoy St (existing) and at Wellington St (proposed)	(same as PP)	The NRT at Wellington St limits access to the Waterloo Estate South from the south (i.e. via Botany Road). Vehicles travelling north on Botany Road would need to divert west to Wyndham St and then use Buckland St to cross Botany Rd into Wellington St. We recommend further consideration of the proposed right turn restriction at Wellington St. We also note that Transport for NSW has allowed for a future northbound right turn phase in the future signal design for Botany Rd/Wellington St.
Cyclist facilities	No differences	No differences	(same as PP)	Noted

## 7. Impacts of Pitt Street Closure

Currently, Pitt Street at the southern side of the Waterloo South precinct does not connect to McEvoy Street for vehicular movements. All of the proposals to date (Jacobs, PP and Hassell) showed vehicular connections from Pitt Street to McEvoy Street, albeit with some movements prohibited – see page 2 of Table 6.1.

If it is now proposed to retain the current vehicular closure of Pitt Street, the traffic entering the precinct would need to use alternative routes to access Pitt Street north of McEvoy Street. Likewise, traffic leaving this area of Pitt Street would need to use alternative departure routes.

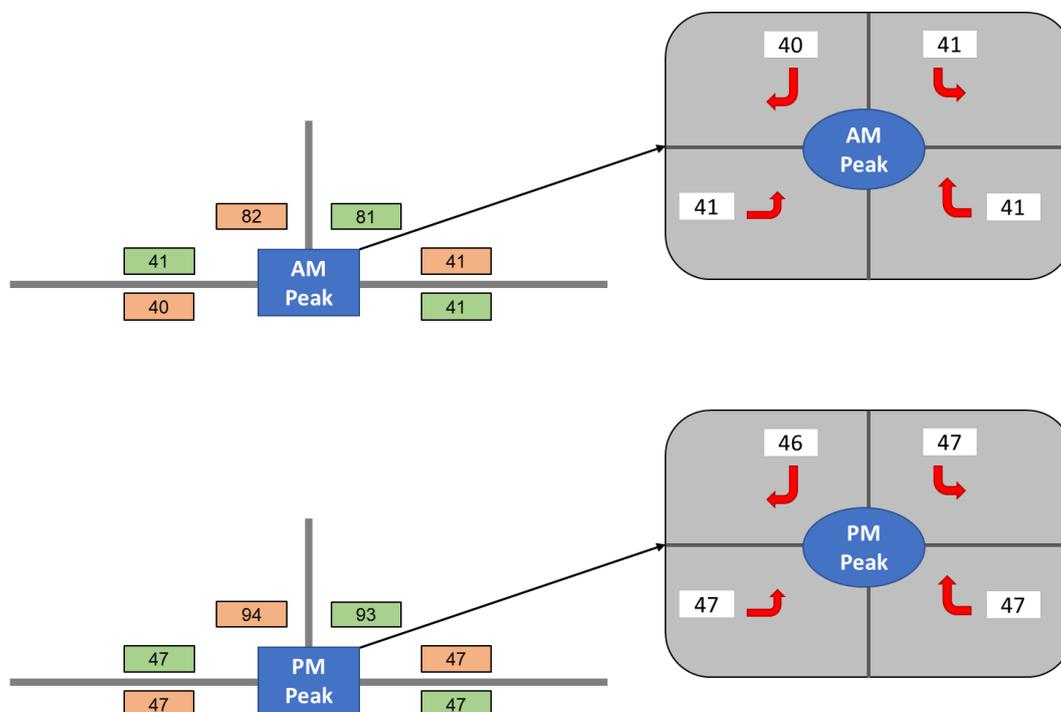
The traffic modelling undertaken by Jacobs was based on all vehicular movements being possible at Pitt Street (north)/McEvoy Street intersection. Jacobs estimated (page 62 of their report) year 2036 bidirectional traffic volumes in this section of Pitt Street are shown in Table 7.1:

**Table 7.1: Modelled Traffic Volumes in Pitt Street (vehicles/hour)**

Peak Hour	Local	Through	TOTAL
AM	163	67	230
PM	187	106	293

The ‘through’ traffic in the above table would be ‘rat running’ traffic attempting to avoid delays at the nearby intersection of McEvoy Street and Elizabeth Street. In the case of Pitt Street remaining closed, this traffic may be ignored for route diversion purposes but should be considered as a minor extra load at the McEvoy St/Elizabeth St intersection.

The remaining ‘local’ traffic can then be assessed by assuming a 50:50 split for northbound and southbound, and a further 50:50 split for turns into and turns out of Pitt Street. The resulting traffic movements would then look like Figure 4.3.



**Figure 4.3: AM and PM peak hour stick diagram**

It can be seen that all movements to be diverted are less than 50 vehicles per hour (or less than 1 per minute). These represent a very small proportion of existing flows on major arterial roads such as McEvoy Street, Elizabeth Street and Botany Road.

Nevertheless, we have considered the alternative routes to and from Pitt Street (north), from each of the four compass points. These are shown in Table 7.2 and Table 7.3.

**Table 7.2: Routes Into Pitt Street north of McEvoy Street**

Direction	Route
From North	Botany Rd, left Raglan St, right Pitt St
	Botany Rd, left Wellington St, right Pitt St
	Elizabeth St, right Wellington St, left Pitt St
From South	Botany Rd, right Wellington St, right Pitt St (assuming RT permitted from Botany Rd to Wellington St)
	Botany Rd, left McEvoy St, right Wyndham St, right Buckland St, straight Wellington St, right Pitt St
	Wyndham St, right Buckland St, straight Wellington St, right Pitt St
From East	McEvoy Street, right Wyndham St, right Buckland St, straight Wellington St, right Pitt St (circuitous, non-intuitive route)
	McEvoy Street, right Moorehead St, left Wellington St, left Pitt St (note existing No Right Turn from McEvoy St to Elizabeth St)
From West	Henderson Rd, straight Raglan St, right Pitt St
	Henderson Rd, right Botany Rd, left Wellington St, right Pitt St
	McEvoy St, left Botany Rd, right Wellington St, right Pitt St (assuming RT permitted from Botany Rd to Wellington St)
	McEvoy Street, left Wyndham St, right Buckland St, straight Wellington St, right Pitt St

**Table 7.3: Routes Out of Pitt Street north of McEvoy Street**

Peak Hour	TOTAL
To North	left Raglan St, straight Henderson Rd, right Wyndham St
	left Wellington St, right Botany Rd, left Henderson Rd, right Wyndham St
	right Wellington St, left Elizabeth St
To South	left Wellington St, left Botany Rd
	left Wellington St, right McEvoy St, left Wyndham St
To East	right Wellington St, right Elizabeth St, left McEvoy St
	left Wellington St, left Botany Rd, left McEvoy St (circuitous, non-intuitive route)
To West	left Raglan St, straight Henderson Rd
	left Wellington St, right Botany Rd, left Henderson Rd
	left Wellington St, left Botany Rd, right McEvoy St

All of the above routes should cause no concern for garbage trucks or other heavy vehicles likely to access the Pitt Street (north) part of the precinct.

### 7.1 **Botany Road/Wellington Street intersection**

As detailed at the bottom of Table 6.1, all the proposals assumed the northbound right turn from Botany Road to Wellington Street would be banned, yet we understand that a future TfNSW design for this signalised intersection has provided for a right turn phase. We therefore recommend that the northbound right turn be permitted. This would reduce the need for northbound vehicles to travel via Wyndham and Buckland Streets.

### 7.2 **McEvoy Street/Pitt Street (south) intersection**

We note that the Jacobs traffic modelling for the LAHC proposal assumed that this intersection would become a Left In/Left out arrangement and that this had been developed in conjunction with RMS. If Pitt Street (north) remains closed to vehicular movements, the proposed arrangement for Pitt Street (south) should be revisited via discussions with TfNSW.

### 7.3 **McEvoy Street/Elizabeth Street intersection**

Currently this intersection has a No Right Turn restriction for westbound right turns to Elizabeth Street. This explains why our alternative route to Pitt Street from the east must use Morehead Street to access Wellington Street. If it is deemed undesirable to add through traffic to Morehead Street, it would be possible to allow the westbound right turn (under a filter arrangement) if the phase sequence were changed to a leading eastbound right turn phase. This would require discussion with TfNSW and probably SIDRA modelling to check resulting intersection capacity.

## 8. **Conclusion and Recommendation**

The Planning Proposal, compared to the LAHC proposal, would result in fewer peak period driving trips, suggesting that the existing and proposed road networks would have sufficient capacity. The Hassell Review proposes slightly more dwellings but the similar commercial area, and the same number of commercial car spaces, as the Planning Proposal. Accordingly, the Hassell Review would also result in fewer peak period trips than the LAHC proposal.

The Planning Proposal's street network has similar provision for cyclists and superior connectivity for pedestrians. The Hassell Review's network proposes an enhanced pedestrian connection from Mead Street to McEvoy Street but is otherwise identical to the Planning Proposal network.

The proposed No Right Turn at Wellington Street would limit access to the Waterloo Estate (South) from the south via Botany Road. Vehicles travelling north on Botany Road would need to divert west onto Wyndham Street then turn right onto Buckland Street to cross Botany Road into Wellington Street. We recommend further consultation between City of Sydney and Transport for NSW regarding the proposed right turn restriction at Wellington Street.

Our qualitative analysis has shown that maintaining the existing closure to vehicular traffic in Pitt Street north of McEvoy Street would be feasible because alternative access and egress routes are available for the small number of vehicles affected. We have suggested further detailed consultation between City of Sydney and TfNSW regarding the surrounding signalised intersections.