# 4 Transport and Access

## 4.1 Vehicular Access

### 4.1.1 Temporary Configuration

The internal road network layout surrounding the C4 commercial building as part of this application is shown in Figure 3. This configuration includes a connection from Globe Street from Lime Street through to the temporary access road to Hickson Road. This temporary road will be constructed to connect the north-south section of Globe Street to Hickson Road on an east-west alignment within the Stage 1A area. Entry to the commercial car park is via an extension of Globe Street from Hickson Road, north of Napoleon Street. This serves as an entry and exit. An entry to the commercial and residential car park levels is provided via an access adjoining Lime Street in the south-west corner of the basement.

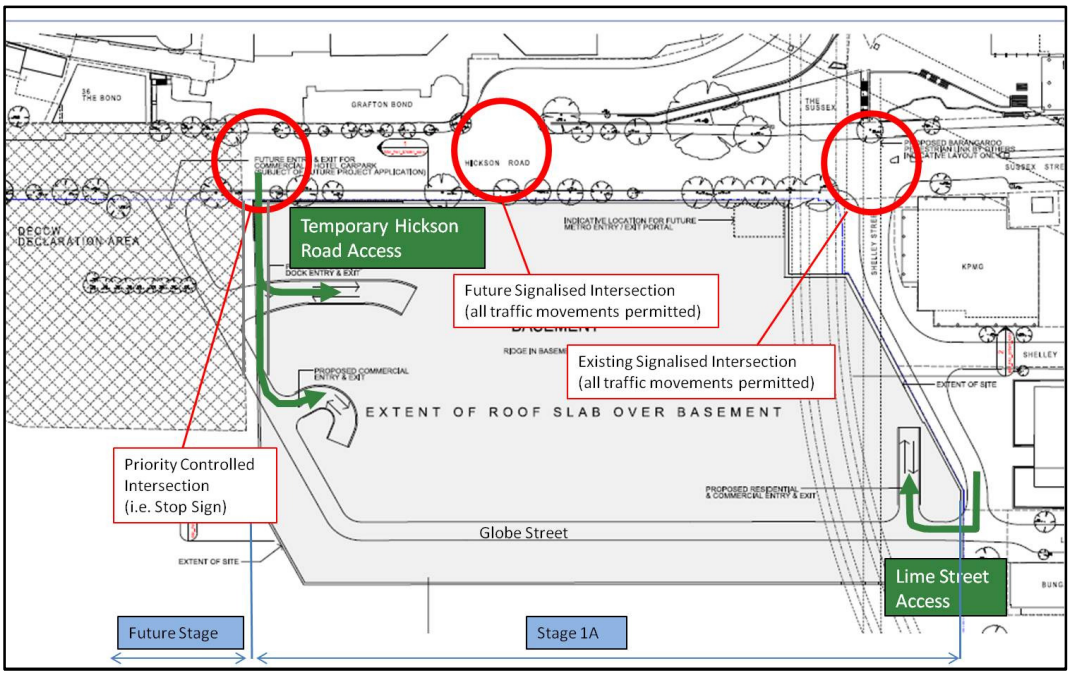


Figure 3 Temporary Internal C4 Road Network Layout

### 4.1.2 Final Configuration

Following the completion of the C3 commercial building, Globe Street will be connected with the temporary basement road in the north-east corner of the site. This connection will allow for the closure of the northern section of Shelley Street to vehicular traffic – in parallel with the opening of the Wynyard Walk development. This is expected to form the final road configuration for the precinct.

As shown in Figure 4 below, access to the basement car park for residential vehicles is proposed to be provided via an access adjoining Lime Street in the south-west corner of the basement. This serves as an entry and exit. Entry and exit to the commercial car park can be via the northern or southern accesses as the car park is linked via level B1.

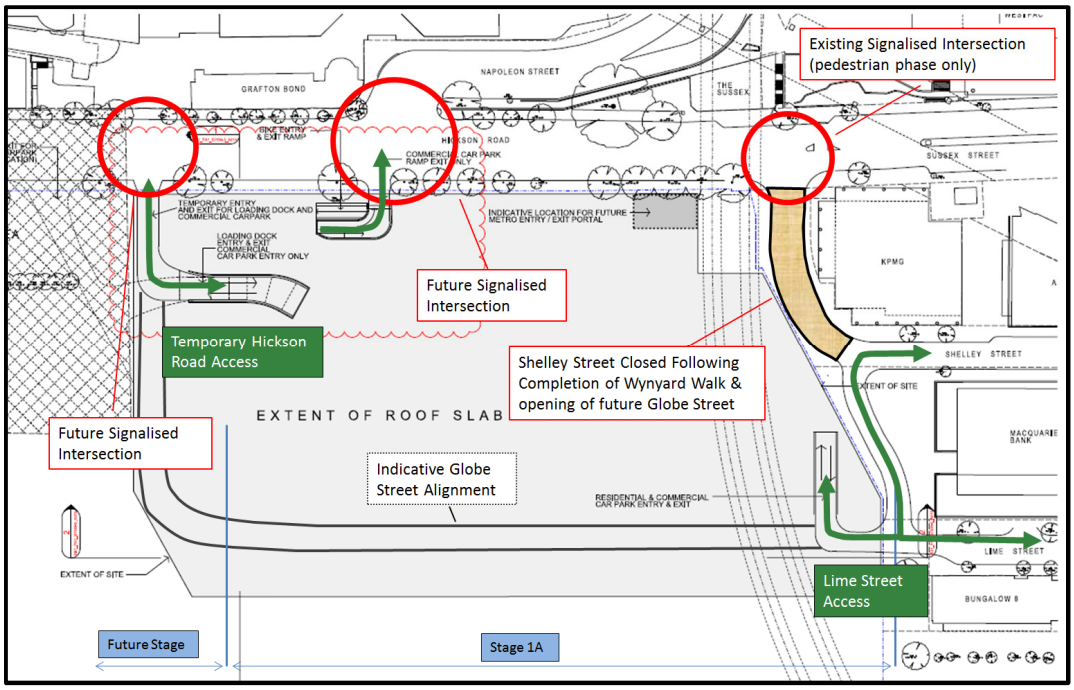


Figure 4 Vehicular access to the basement servicing the C4 Building (final configuration)

The traffic analysis contained in this study has been based on this final road configuration, including the closure of Shelley Street, completion of the Globe Street link and the introduction of traffic signals at the Hickson Road / Napoleon Street intersection. This analysis has included traffic generated from the C3, C4 and C5 commercial buildings, as well as the R8 and R9 residential buildings.

## 4.2 Access by taxi

It is envisaged that taxis will use both Globe Street and Hickson Road for drop off/pick up activity. Sections of No Parking zones will be used initially on Globe Street and Hickson Road to allow for this activity. At a future stage a defined Taxi Zone will be introduced to align with usage patterns and the opportunities available as construction of future stages progresses.

## 4.3 Future Road Operations

### 4.3.1 Traffic Modelling

This report examines in detail the current and future stage traffic operations of the five nearest and most relevant intersections to the site for the C4 commercial building, namely:

- Hickson Road & Globe Street, **Traffic Signals (Future)**
- Napoleon Street & Hickson Road, **Priority Controlled (Existing), Traffic Signals (Future)**
- Sussex Street & Shelley Street, **Traffic Signals**
- Sussex Street & Erskine Street, **Traffic Signals**
- Erskine Street & Shelley Street, **Traffic Signals**

The traffic modelling for this study has utilised the intersection traffic counts undertaken by AECOM in November 2011. Arup was provided a copy of the AECOM LinSig model used for the Barangaroo South Traffic Study, which has considered the impact of the closure of Shelley Street following the Wynyard Walk construction works. Arup has updated the LinSig model to extend the right turn bay on the southern approach at the Hickson Road Napoleon Street intersection to 105m following the closure of Shelley Street. The design of this right turn bay would be co-ordinated with the new pedestrian crossing proposed on the Wynyard Walk alignment by Transport for NSW.

The LinSig model was further updated to consider the impact of the additional basement exit at the Hickson Road / Napoleon Street intersection. The model has assumed the intersection will operate with four phases, including a diamond phase for right turning vehicles out of the car park.

## 4.4 Traffic Generation

The C4 building is forecast to generate 128 two way vehicle movements in the AM peak hour (8.00 – 9.00am) and 118 in the PM peak hour (5.00 – 6.00pm). Table 3 shows the traffic generation figures split by trip purpose.

The trip generation rates have been utilised from TMAP September 2008 which included the following common assumptions:

- Commercial and retail trips split 80% in / 20% out during AM and 80% out / 20% in during PM
- Estimated service vehicles based on the new Westpac Building on Kent Street which is considered a comparable commercial building.
- Drop offs and taxis estimated on a mode share targets listed in Table 2
- Traffic generation resulting from the 12 short term on-street parking spaces to be provided on Globe Street has already been included in the C5 and C3 traffic generation forecasts
- Note that numbers may not add up to 100% due to rounding from spreadsheet

The total peak hour traffic generation for the Barangaroo South precinct, including the traffic generated by the C3, C4 and C5 commercial buildings and the R8 & R9 residential buildings, is summarised in Table 3.

Table 3 Traffic Generation in Peak Hours

| **Traffic and Parking generation for C4 building** | | | **AM Peak Hour** | | | | **PM Peak Hour** | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Trip purpose | Variable | Variable number | trip rate | no of trips | In | out | trip rate | no of trips | In | out |
| Commercial | car park space | 161 | 0.26 | 42 | 34 | 8 | 0.26 | 42 | 8 | 34 |
| Retail | car park space | 4 | 0.4 | 2 | 2 | 0 | 0.4 | 2 | 0 | 2 |
| Drop offs | private car | | | 4 | 2 | 2 | | 4 | 2 | 2 |
| | taxi | | | 40 | 20 | 20 | | 40 | 20 | 20 |
| Service vehicles | | | | 40 | 20 | 20 | | 30 | 15 | 15 |
| **C4 Traffic Generation** | | | | **128** | **78** | **50** | | **118** | **45** | **73** |
| C3/C5/R8 & R9 Traffic Generation[1] | | | | 301 | 174 | 127 | | 281 | 117 | 164 |
| **Total cumulative traffic generation C3 + C4 + C5** | | | | **429** | **252** | **177** | | **399** | **162** | **237** |

In terms of peak hour traffic generation, the proposed modification to the C4 building results in a minor reduction (one vehicle in each peak hour) when compared with the current approvals.

### 4.4.1 Traffic Distribution

The traffic distribution as outlined in the Barangaroo South Traffic Study (AECOM, 2011) has been adopted for this analysis. This is shown in Figure 5.

[1] Traffic generation for commercial buildings as per those outlined in the relevant traffic reports prepared for the major project planning approvals for each building

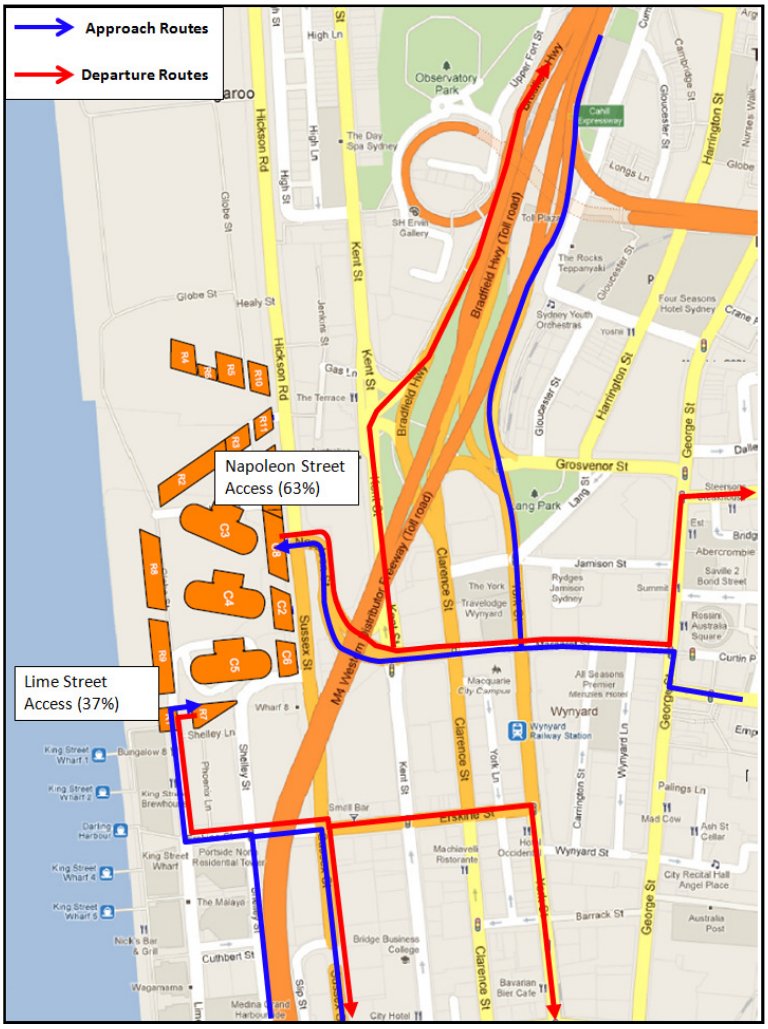


Figure 5 Barangaroo South Traffic Distribution

For commercial vehicles using the basement car park exit, it has been assumed:

- All vehicles accessing the site via Hickson Road utilise the basement exit
- 50% of vehicles accessing the site via Lime Street utilise the basement exit

This is a simplified distribution model appropriate for the purposes of this study. The assumption that 50% of vehicles accessing the site via Lime Street will utilise the basement exit is considered conservative and has been adopted to assess the capacity of the proposed reconfigured intersection opposite Napoleon Street.

### 4.4.2 Road Network Impacts

The LinSig analysis is summarised in Table 4. This analysis was based on a higher traffic generation figure of 443/413 AM/PM peak hour trips, as recently analysed in the project applications for the R8 & R9 residential buildings (MP11_0002). Given slightly less trips are forecast under this analysis due to the revised C4 building layout, the performance of key intersections will be no worse than that outlined in Table 4 below.

Table 4 Intersection Analysis

| Peak | Intersection | Future Road Layout (C3/C4/C5 & R8/R9 traffic) | | |
|---|---|---|---|---|
| | | LOS | DOS | AVD (sec) |
| AM | Hickson Rd & Globe St | C | 0.69 | 30 |
| | Hickson Rd & Napoleon St | B | 0.79 | 25 |
| | Sussex St & Shelley St | A | 0.48 | 7 |
| | Sussex St & Erskine St | C | 0.89 | 41 |
| | Erskine St & Shelley St | B | 0.80 | 16 |
| PM | Hickson Rd & Globe St | B | 0.75 | 24 |
| | Hickson Rd & Napoleon St | C | 0.85 | 38 |
| | Sussex St & Shelley St | A | 0.70 | 11 |
| | Sussex St & Erskine St | F | 1.11 | 132 |
| | Erskine St & Shelley St | A | 0.35 | 13 |

The intersection analysis conducted for this study indicates similar findings to that previously undertaken for the C3, C4 and C5 project applications. The new ground floor layout including the basement exit at Hickson Road / Napoleon Street is forecast to operate satisfactorily in the peak hours with the addition of Barangaroo development traffic.

The analysis forecasts the intersection at Sussex Street and Erskine Street to be operating at or above capacity in the PM peak hour. It is recognised that significant vehicle queuing currently occurs in the southbound direction on Sussex Street during this time as a result of more congested traffic operating conditions in the vicinity of the cross traffic movements at the King Street and Market Street intersections. These intersections effectively act as the ‘masters’ along Sussex Street and impact on vehicle queues and delays of intersections to the north, particularly Sussex / Erskine Street. Therefore the future operation of this intersection will be very much dependent on the flow of traffic through Sussex Street through the central and southern parts of the Sydney CBD.

It is noted that as a component of the Wynyard Walk bridge works, the following improvements will be implemented at the Sussex Street / Erskine Street intersection[2]:

- Introduction of continuity lines to guide motorists into the correct lanes
- Providing lane designations for key movements at the intersection

The benefits of these upgrades in relation to intersection operation are difficult to quantify. Therefore, consistent with the analysis contained in the Wynyard Walk bridge works, no increase in capacity at the intersection has been assumed.

[2] Wynyard Walk Bridge Works - Traffic Management Plan BPL-R-GN-053, Revision D, May 2012

# 5 Car Parking

## 5.1 Basement Car Parking

Current planning for Building C4 achieves the following floor space:

**Total GFA – 99,097m$^2$**

(commercial 96,759m$^2$ + retail 2,338m$^2$)

Commercial parking is provided at 1/600m$^2$ GFA in accordance with the Barangaroo Concept Plan, which results in 161 spaces.

Retail parking is proposed based on the City of Sydney LEP2005 rates. Based on a total FSA of 99,097m$^2$ and a site area of 11,828m$^2$, the 2,338m$^2$ of retail can provide up to:

Max number of cars = $= \frac{2{,}338\ (Total\ Other\ FSA)}{99{,}097\ (Total\ FSA)} x \frac{11{,}828\ (Site\ Area)}{50}$ = 4 spaces

The car parking areas and access ramp systems are designed in accordance with AS2890.1 – 2004, Off-street car parking.

In the Approved Concept Plan for the site, it is recognised that the parking policy for the development should support public transport and non car (walk/cycle) travel. Low car parking provision is considered important because it will also act to limit potential traffic generation by the site's activity to a level which will not unduly compromise the operation of the CBD's existing road network.

In the evenings and at weekends, the commercial car park will operate as a public car park for a wider range of users visiting the retail, cultural centre, restaurants and bars. Pricing strategies will be in place to provide suitable parking demand management at all times. Public use of the car park will not coincide with peak commuter traffic and hence the surrounding road system will provide suitable capacity for this activity. The provision for differential parking charges for small, medium and large vehicle emission categories will also be explored.

## 5.2 Basement Loading Dock

The Central Sydney DCP 1996 requirements for loading are provided in Table 5.

Table 5 Central Sydney DCP 1996 Loading Requirements

| Use | GFA (m$^2$) | Rate | Number of spaces |
|---|---|---|---|
| Office | 96,759 | 1 space/3,300m$^2$ (0 - 50,000m$^2$)<br>+ 1 space/6,600m$^2$ (50,000 – 100,00m$^2$) | 22 |
| Retail | 2,338 | 1 space/350m$^2$ | 7 |
| **Total** | **99,097** | | **29** |

Having established the required number of spaces, it is generally accepted that 50 per cent should be for trucks and 50 per cent for vans or similar small delivery vehicles associated with courier activity and small deliveries to retail tenancies.

A more sustainable outcome for the provision of loading and refuse collection will be achieved by managing the dock activities throughout the day and across all of

the tenants that will be using the shared dock facilities. Deliveries will be allocated time slots to ensure efficient use of available docks during the day.

The proposed provision for the shared basement loading dock facility for all commercial and retail buildings is shown in Table 6. A suitable allocation of vehicle sizes for the total provision of 91 spaces has been developed by considering vehicle type and length and the likely frequency to determine a possible configuration as indicated in Table 6. The loading facilities for C4 will be a shared component of this total allocation.

Table 6 Proposed Loading Dock Spaces

| Vehicle size | Vehicle length | Use | Allocation | Number of spaces |
|---|---|---|---|---|
| Heavy rigid truck (HRV) | 12.5m | Office / Retail | Delivery / Refuse compactor | 5 |
| Medium rigid truck (MRV) | 8.8m | Office / Retail | Delivery / Refuse / Recycle | 7 |
| Small rigid truck (SRV) | 6.4m | Office / Retail/ | Delivery | 7 |
| Van/service vehicles | 5.2m | Office / Retail | Courier/Delivery/ Service | 44 |
| Motor cycle/ Bicycle | 2.5m | Office / Retail | Courier/Delivery | 28 |
| **Total** | | | | **91** |

## 5.3 On-street parking

There will be approximately 6 short stay on-street car parking bays along Globe Street adjacent to C4. Some of these will be defined as a No Parking zone to allow for drop-off and pick-up activity by private vehicles and taxis.

## 5.4 Compliance with RMS Guidelines

Section 5.6 of the RTA Guide to Traffic Generating Developments states that car parking requirements for office and commercial developments vary with the parking policies of local government areas. If the City of Sydney rate was adopted based on the site area then an equivalent parking rate can be calculated. The Barangaroo – Car Parking Considerations report prepared by Masson Wilson Twiney in June 2008 to inform the September 2008 TMAP, calculated that an equivalent parking rate of approximately 1 space per 340m$^2$ GFA would result.

Max number of car spaces permitted
= Total floor space / 340 = 99,097 / 340 = 291 spaces.

The basement car park associated with the C4 Commercial Building is proposing a much stricter provision of approximately 161 spaces, and thus is compliant with the current RMS guidelines.