Lend Lease Pty Ltd

C2 Building and C6 Kiosk

Transport Assessment

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1 Introduction

The following report has been prepared by Arup for Lend Lease Pty Ltd to support a State Significant Development Application (SSD14_6425) seeking approval for construction of the C2 building and C6 kiosk (and associated works) at Barangaroo South.

The development will provide 7,945m^2 of commercial and other uses floor space. On Level 1 of Building C2, the application seeks flexibility to utilise the floor space for commercial premises, retail premises and/or health facilities.

2 Transport Assessment

2.1 Site Access

The significant majority of staff and visitors travelling to the site will arrive via non-car modes of transport, i.e. public transport, walking and cycling. The site will be served by the following transport infrastructure:

- **Wynyard Walk** - a new high-volume pedestrian tunnel and bridge from Barangaroo to Wynyard rail and bus interchange (currently under construction, scheduled for completion mid 2016)
- **Barangaroo Ferry Wharf –** To be delivered in 2016, a new ferry wharf at Barangaroo will support regular services anticipated from the east and north, as well as the existing western ferry catchments
- **Cycling –** The roads within the Barangaroo South precinct will be low speed environments conducive to cycling movement. Lime Street will act as a low speed recreational cycle route, connecting the site with the remainder of the precinct. Commuter cycling routes are to be provided along Hickson Road and Napoleon Street which will connect the C2 building and C6 kiosk with the wider regional cycling network. Employees will use the basement bicycle parking facilities with access from Hickson Road and patrons will use bicycle rails in the public domain nearby to the development.
- **Taxi Ranks –** Taxi ranks will be provided throughout the precinct, including nearby on Shelley Street, Lime Street and Hickson Road.

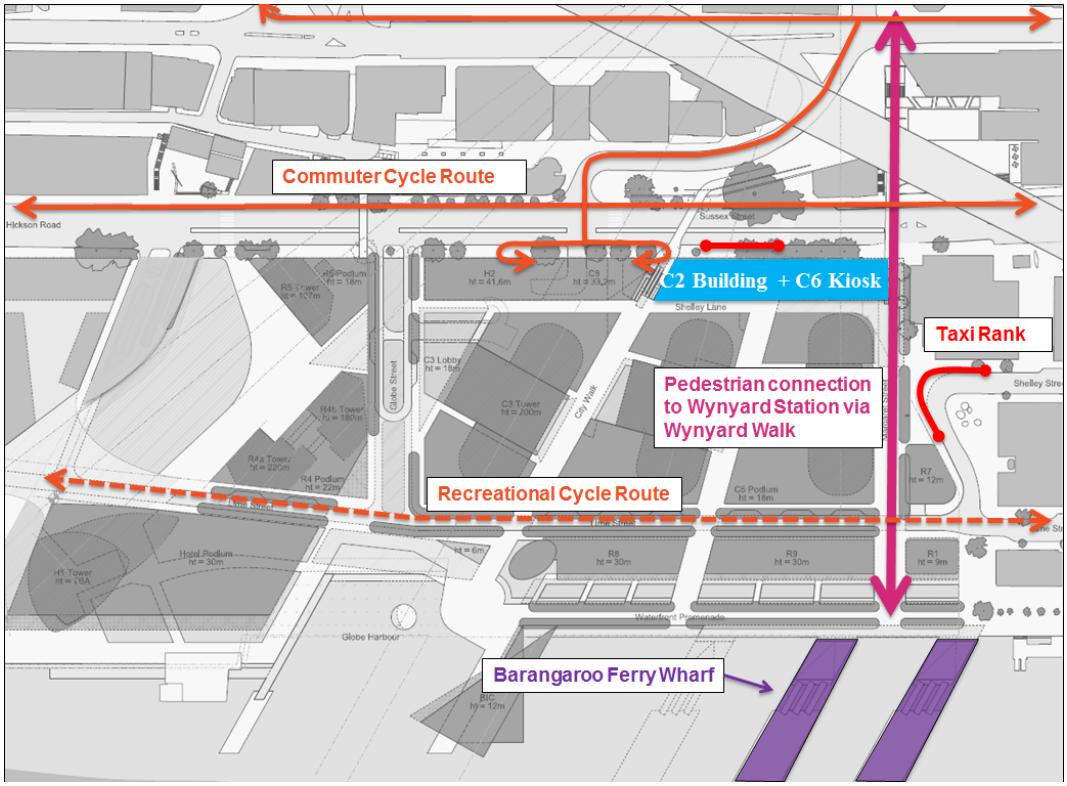

Figure 1 Transport Accessibility to the C2 Building

2.2 Mode Split

The mode split target for the C2 building is consistent with the overall mode split target for the Barangaroo South development presented in Table 1. A stringent car parking rate of 1 space per 600m^2 GFA for commercial uses, provision of a pedestrian and cycle friendly environment, and planned public transport initiatives will help to achieve this target.

Table 1: Comparison of the commuter transport task for the Journey to Work

Mode	2011 Census	C2 building final target*
Car	15.6%	4.0%
Bus/Light rail	22.9%	20.0% (18% bus and 2% Light Rail)**
Train	49.0%	63.0%
Ferry	2.6%	1.0%
Other (pedestrian, cyclists, motorcycles, taxi)	9.9%	12.0%
Total	100%	100%

** Based on overall mode split target for the Barangaroo South development*

2.3 Car Parking

The analysis has considered two scenarios with respect to car parking:

Scenario 1: Use of Level 1 of the C2 building for commercial premises; and

Scenario 2: Use of Level 1 of the C2 building for retail premises and/or health facilities

2.3.1 Retail Component

Retail parking is proposed based on the City of Sydney LEP2005 rates. Based on total GFA of 7,945m^2 and a site area of 1,473.7m^2, the retail/other uses can provide up to:

Scenario 1

$$\text{Max number of cars} = \frac{660\ (Total\ Other\ FSA)}{7{,}945\ (Total\ FSA)}\ x\ \frac{1{,}473.7\ (Site\ Area)}{50} = 2 \text{ spaces}$$

Scenario 2

$$\text{Max number of cars} = \frac{1{,}247\ (Total\ Other\ FSA)}{7{,}945\ (Total\ FSA)}\ x\ \frac{1{,}473.7\ (Site\ Area)}{50} = 5 \text{ spaces}$$

2.3.2 Commercial Component

Commercial parking is provided at 1/600m^2 GFA in accordance with the Barangaroo Concept Plan.

Scenario 1

$$\text{Max number of cars} = \frac{7{,}285\ (Commeral\ FSA)}{600} = 12 \text{ spaces}$$

Scenario 2

$$\text{Max number of cars} = \frac{6{,}698\ (Commeral\ FSA)}{600} = 11 \text{ spaces}$$

2.3.3 Total Parking Provision

The maximum number of parking bays that may be provided under the two scenario is outlined in Table 2 below.

Table 2: Parking provision

Scenario	Commercial Parking	Retail Parking	Total
Scenario 1	12	2	14
Scenario 2	11	5	16

Regardless of the 16 parking spaces permissible under scenario 2, this application seeks to provide 12 spaces within the basement car park.

2.4 Bicycle Parking

2.4.1 Retail Component

In line with Statement of Commitment No. 47 of the modified concept plan (MP06-0162 MOD6), off-street bicycle parking and shower facilities will be provided within buildings in line with the minimum rate for of Other Uses of 6 bicycle spaces for every 100 Other Uses car parking spaces. This equates to 1 bicycle space for the C2 building and C6 kiosk.

2.4.2 Commercial Component

In line with Statement of Commitment No. 47, off-street bicycle parking and shower facilities will be provided within buildings in line with the minimum rate for commercial uses of 4% of the commercial GFA/20m^2. Based on the proposed 7,285m^2 of commercial office space, 15 bicycle parking spaces are required. These will be provided within the Stage 1A basement.

2.4.3 Visitor Parking

Bicycle parking for visitors to the C2 building and C6 kiosk will be provided within the adjacent public domain (subject to separate approval). Provision for visitor bicycle parking in Barangaroo South is detailed in the Stage 1A public domain project application (SSD6303).

2.5 Vehicular Access

It has been assumed that on the completion of C2 building, Globe Street would be in place between Lime Street and Hickson Road and all access points to the car park basement would be operational.

As shown in Figure 2 below, access to the basement car park is proposed to be via the following arrangements:

- Globe Street will be connected from Lime Street through to Hickson Road. This 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. This ramp provides access to commercial car parking levels located on the western and northern sides of the basement.
- 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. 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.
- Egress from the commercial car park is provided at a new signalised intersection at Hickson Road / Napoleon Street.
- Entry to the loading dock is via an extension of Globe Street from Hickson Road, north of Napoleon Street. This serves as an entry and exit.

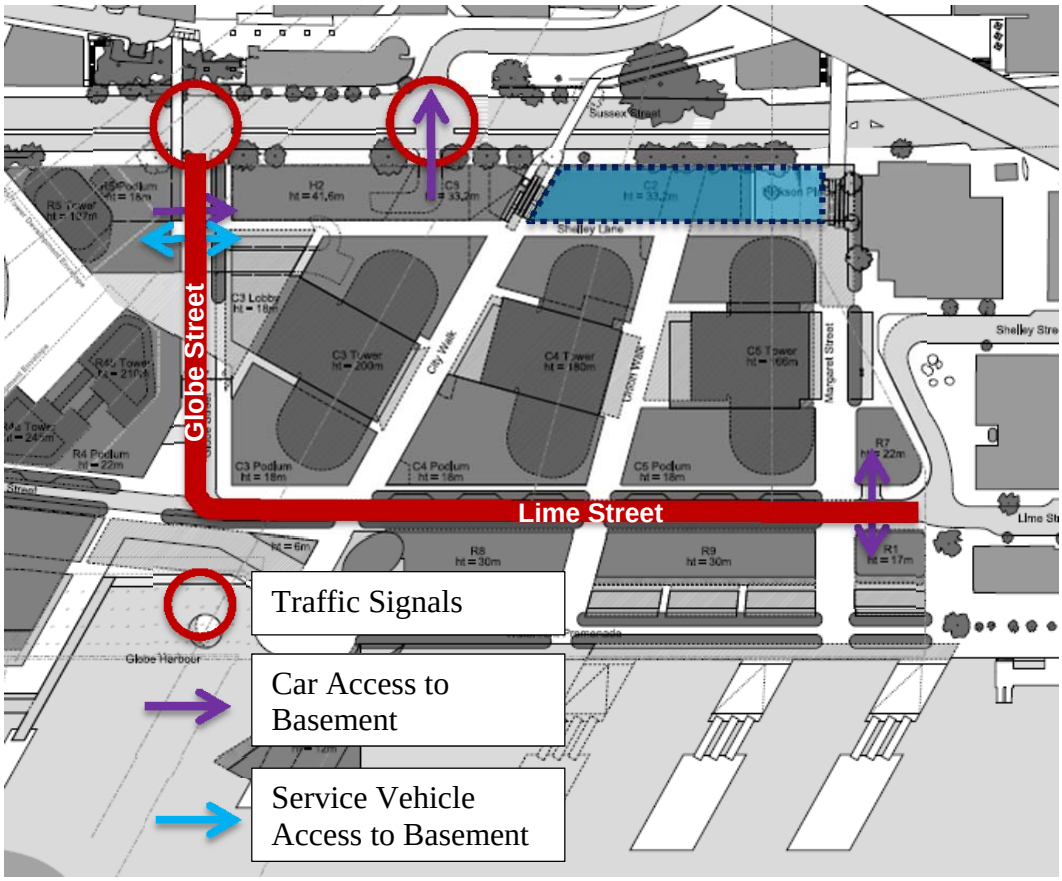

Figure 2: Vehicular Access to C2 Commercial Building & C6 Kiosk

2.6 Traffic Generation

Traffic generation rates for the C2 building and C6 kiosk have been adopted based on those utilised in the Masson Wilson Twiney Modified Concept Plan (July 2008) which informed the September 2008 TMAP. Adopted peak hour vehicle trip rates were as follows:

- 0.26 / trips commercial car space; and
- 0.40 / trips retail car space

Trips are split 80% out / 20% in during the AM peak hour and 80% in / 20% out during the PM peak hour.

While the application only seeks to provide 12 parking bays within the basement car park, the traffic analysis has been undertaken a conservative approach by considering the maximum 16 spaces permissible under development scenario 2. This produces the following peak hour traffic generation:

Table 3: C2 and C6 Kiosk Traffic Generation

Land Use	**Variable**	**Variable Number**	**AM Peak Hour**				**PM Peak Hour**			
			trip rate	**no of trips**	**In**	**Out**	**trip rate**	**no of trips**	**In**	**Out**
Commercial	car space	11	0.26	3	2	1	0.26	3	1	2
Retail	car space	5	0.40	1	2	0	0.40	2	0	2
Sub Total				***5***	***4***	***1***		***5***	***1***	***4***

2.7 Road Network Impacts

The C2 building and C6 kiosk is forecast to generate up to five vehicle trips in the AM and PM commuter peak hours. This traffic increase is considered negligible in the context of future traffic volumes in the CBD precinct and would not result in any additional impacts on surrounding intersections.

2.8 Service Vehicle Access

All deliveries and garbage collection associated with the C2 building and C6 kiosk will occur in the approved Stage 1A basement at a designated loading and pick-up area. This activity will be scheduled in as a component of all activity in the combined basement facility. Truck access to the basement is on Globe Street.

2.9 Construction Traffic

2.9.1 Construction Routes

The predominant traffic routes that construction vehicles utilise to Barangaroo are presented in Figure 3 and Figure 4 on the following pages, and summarised below.

From the north and north-west:

- Harbour Bridge – Western Distributor – Bathurst Street – Liverpool Street – Harbour Street – Shelley Street – Erskine Street – Sussex Street (inbound); and
- Hickson Road – Napoleon Street – Kent Street – Western Distributor – Harbour Bridge (outbound)

This southbound truck activity would occur during peak hours as there is no access for general traffic from the Harbour Bridge to York Street between 6.30am – 9.30am (Monday – Friday).

From the west and south-west:

- Anzac Bridge – Western Distributor – Sussex Street – Hickson Road (inbound); and
- Hickson Road – Sussex Street – Western Distributor – Anzac Bridge (outbound).

From the south and east:

- Eastern Distributor – Cross City Tunnel – Western Distributor – Wattle Street – Western Distributor – Sussex Street – Hickson Road (inbound); and
- Sussex Street – Harbour Street – Cross City Tunnel (outbound).

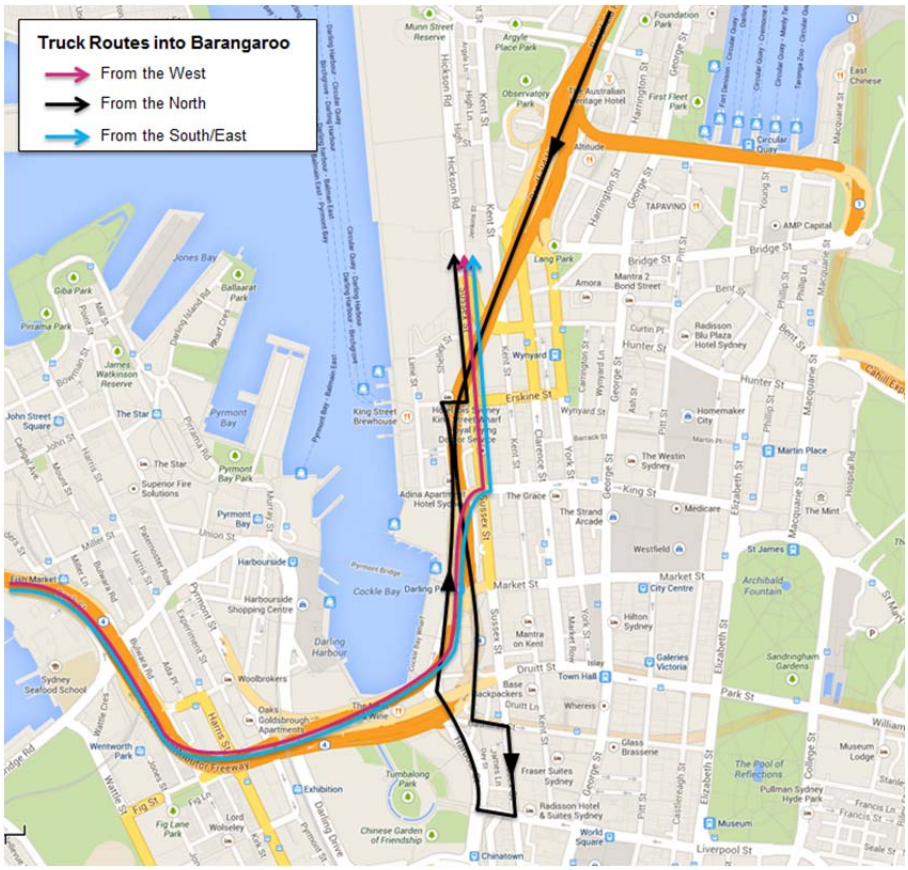

Figure 3 Inbound Traffic Routes to Barangaroo

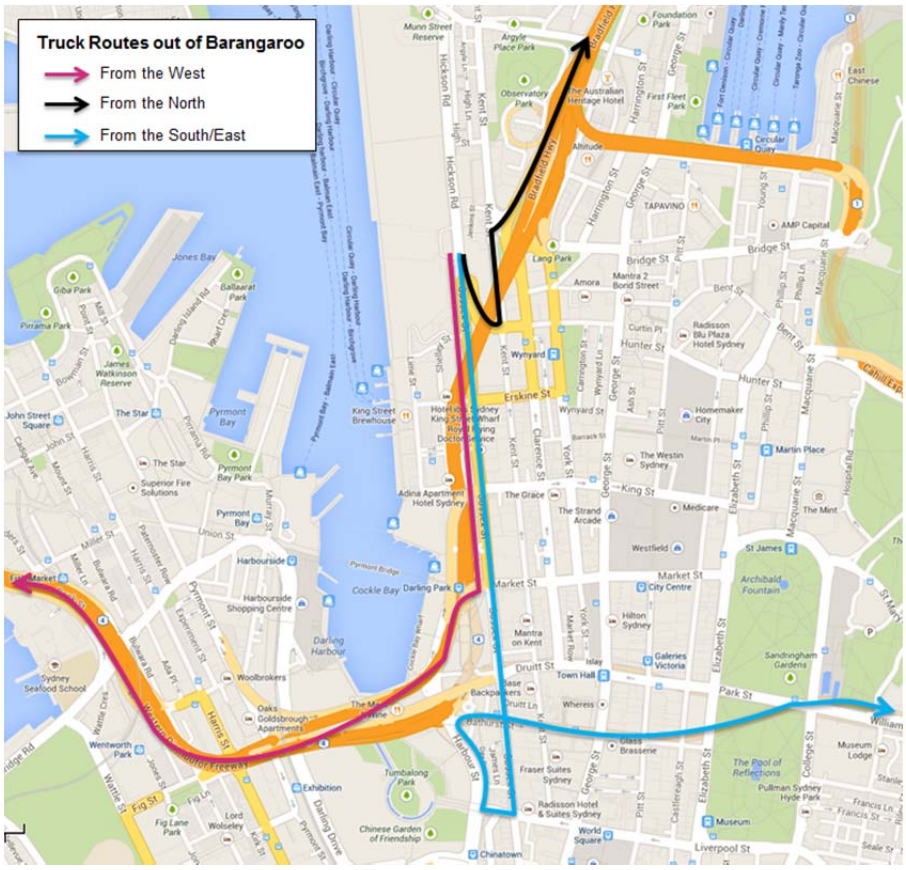

Figure 4 Outbound Traffic Routes from Barangaroo

2.9.2 Construction Timetable

The works associated with construction of the C2 building and C6 kiosk will occur over a 16 month period, between January 2015 and April 2016. On average 30 truck movements per day are anticipated to be directly attributable to the building, equating to 3 vehicle movements per hour. This represents a negligible increase in overall construction activity when considered in the context of ongoing works in the Barangaroo precinct. The total forecast construction traffic movements per hour for the following worksites are summarised in Figure 5:

- Basement Construction
- T2 Commercial Building
- T1 Commercial Building
- T3 Commercial Building
- R8/R9 Residential Buildings
- Concrete Batch Plant Operation
- Block 4 Remediation
- Block 5 Remediation
- Headland Park Main Works
- Wynyard Walk Bridge Works
- Barangaroo Central Waterfont Promenade
- City Walk Bridge
- R1 Building
- R7 Building

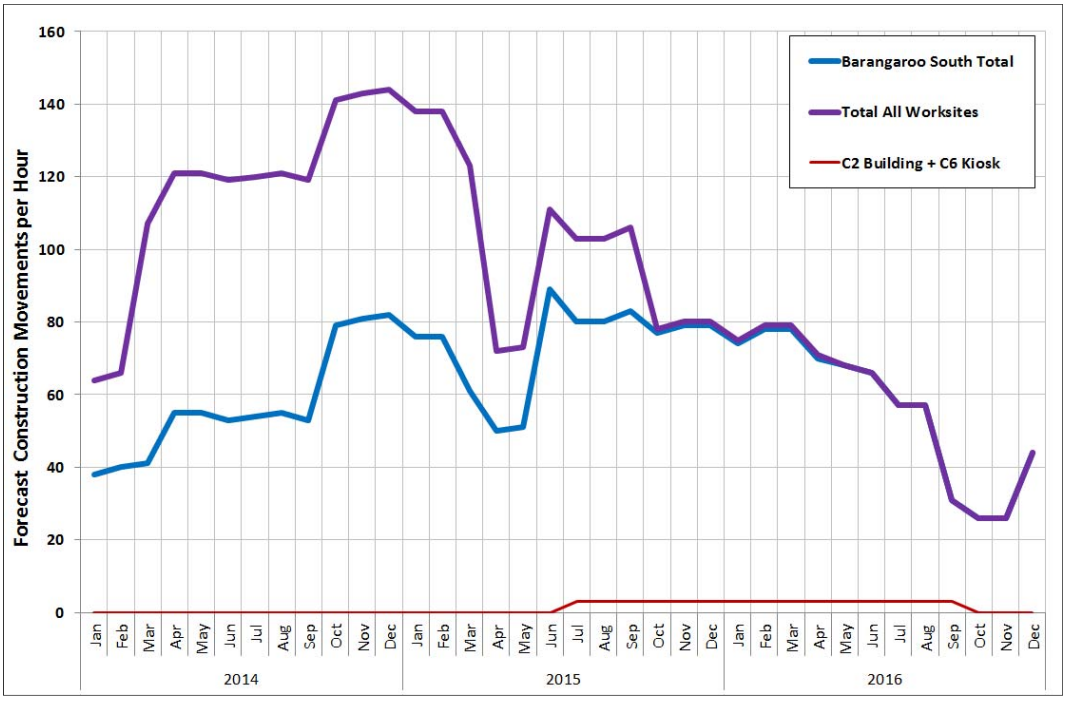

Figure 5 Cumulative Construction Activity

Note: Construction timeframes are indicative only and subject to change

Previous construction traffic management plans prepared for the Barangaroo South site have identified that the majority of construction vehicle activity takes place outside the commuter peak hours of 8am-9am and 5pm-6pm (see Figure 6). Most notably, only 2% of daily construction vehicle activity typically occurs in the critical PM peak hour (5pm – 6pm). During the morning peak period (8am – 9am) the road network supporting Barangaroo generally operates satisfactorily and requires no further works to accommodate the levels of construction traffic arising from the C2 building.

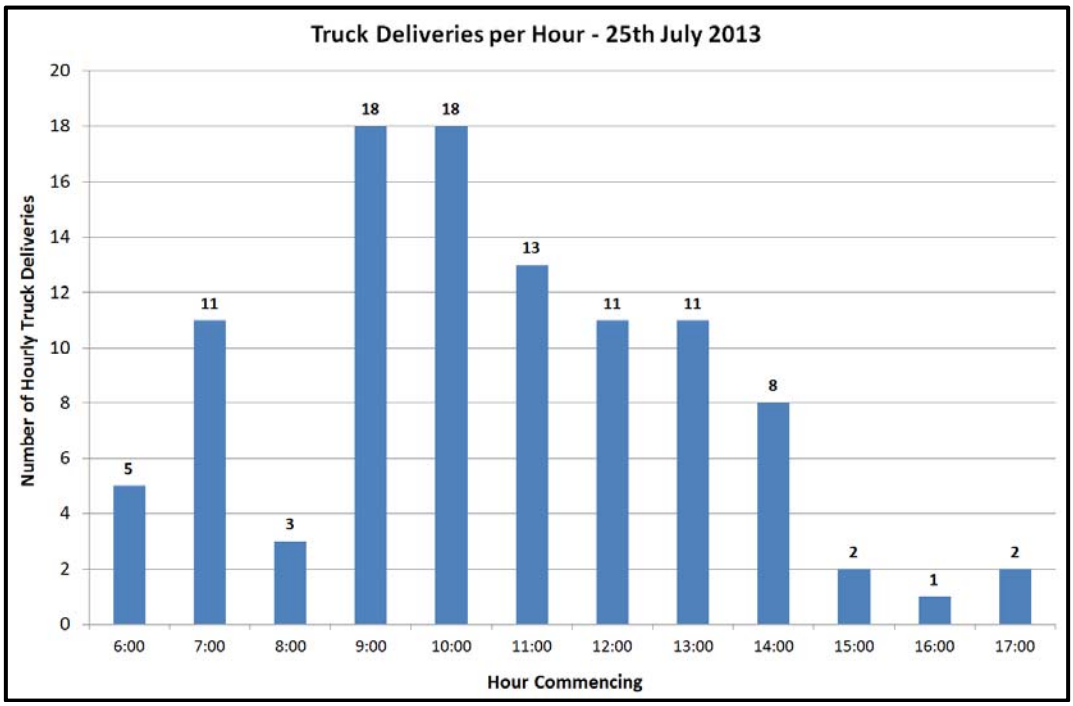

Figure 6 Existing Construction Activity for Barangaroo South (July 2013)

2.10 Travel Demand Management

Arup has previously prepared a series of Travel Demand Management Plans for the commercial and residential buildings in Barangaroo South. These plans outline measures to support sustainable modes of travel to Barangaroo and reduce car dependency.

Some travel demand measures relevant to the C2 building which could be implemented by future tenants are summarised in the following sections.

2.10.1 General Marketing and Promotion

The objectives of the TDMP will only be achieved with the support of the C2 building employees. Marketing the benefits and promoting the sustainable alternatives available are therefore crucial in encouraging staff to adopt the TDMP measures. It is important that at an early stage, staff are made aware of the need for the TDMP, and that it is emphasised that the measures are being introduced to support and encourage people to use cars more wisely. In addition to raising general awareness, any successes achieved will be fully publicised to staff in order to motivate them to use sustainable modes of transport.

- A dedicated webpage for employees of the C2 building will be created to include travel information section containing information on cycle parking and useful links to public transport websites specific to the office location.;
- Support and promote events such as National Bike Week, Bike2Work Days, walk to work day to staff through, broadcast messages and intranet.

2.10.2 Reducing The Need To Travel

To ensure that sustainable transport options are promoted to staff when making journeys for work purposes, and to reduce the need to travel, the following measures should be implemented. These measures require implementation by staff members across the building.

- Active promotion of the office teleconferencing facilities as an alternative to face to face meetings. This can be achieved by placing ‘reducing the need to travel’ as an item on internal group meeting agendas;
- Include teleconference meetings as a standard option in client proposals in preference to face to face meetings where practical; and
- Consider a more formal approach to working from home and actively encourage staff to consider this option. Include working from home as an item on the agenda for internal group meetings.

2.10.3 Spreading Travel Demand

Currently the highest travel demand occurs in the peak periods between 7am and 9am and 4pm to 6pm. Public Transport services are in lower demand and road congestion is lower during the inter peak and off peak. The C2 building businesses could be encouraged to implement flexible working hours allowing the employees to arrive at work and leave work during the shoulders of the peak e.g. start work at 10am and finish at 6.30 pm or start at 7am and finish at 3.30pm.

2.10.4 Travel During the Working Day

To provide C2 building staff with a choice of convenient sustainable transport option for work – related travel during the working day the following initiatives should be promoted:

- Use of the Sydney Trains network to travel to places that are on or near a train line;
- Walk to places that are close by rather than taking the taxi; and
- Promotion of the taxi pooling system for the C2 Commercial Building which would cross check for common destinations and inform the passenger of possible taxi pooling options.

2.10.5 Cycling

As described in Section 2.1 the C2 building will have good access to the cycling network and will provide onsite facilities for cyclists i.e. easily accessible bike room/shelter, changing rooms and showers, lockers and good access from those facilities to the office. In order to activate and promote cycling the following measures should be taken:

- Provide Sydney cycle maps to staff;
- Participate in annual events such as 'Ride to Work Day';
- Provide secure bicycle parking and end of trip facilities for C2 building staff
- Broadcasts in staff areas should have news of events / generic posters promoting cycling;
- Staff who cycle to work should be encouraged to form a Bicycle User Group in order to provide a body of regular cyclists who can discuss issues relating to the provision of on-site cycling facilities and the maintenance of off-site cycle routes; and
- Set up ‘Bike Buddies’ scheme for less confident staff interested in cycling.

2.10.6 Public Transport

To promote the use of public transport work related trips and journeys to/from the C2 building.

- Create and maintain an intranet ‘Public Transport links page’ containing useful links to journey planning websites in Sydney;
- Consider reimbursing or partially reimbursing staff for journey to work trips made by public transport;
- Consider providing interest-free loans for staff to buy an annual ticket for public transport;
- Provide useful public transport maps and promotional items to potential and current public transport users; and
- Investigate the possibility of purchasing an Opal Card for general use of building staff for business journeys, in lieu of cars and taxis

2.10.7 Walking

Specific Travel Plan measures designed to encourage more walking trips to and from work by those employees living within a reasonable distance.

- Produce walking related articles for inclusion in the office newsletter focussing on ‘walking champions’ to highlight best practise in walking to business meetings;
- Create and maintain an intranet ‘useful walking routes’ containing useful routes to key parts of the Sydney CBD, including public transport terminals at Wynyard, Circular Quay, Martin Place and Town Hall rail stations; and
- Participate in Walk to Work day.

2.10.8 Taxi share and shuttle bus service

In order to reduce the number of car trips and especially trips made to common destinations a taxi share system could be put in place for trips during the day for building C2 employees.

2.10.9 Wayfinding

The strategy for wayfinding at Barangaroo South will include the C2 building and adjacent Hickson Place as part of the precinct plan. Key civic nodes, Wynyard train station, ferry terminal and other public spaces will need to be located quickly. A number of wayfinding measures would be implemented through Barangaroo South precinct planning process rather than independently by C2 building tenants. The way finding measures could be introduced to improve connectivity and enhance access to the C2 Commercial Building and C6 kiosk.

2.10.10 Staff Induction

To ensure new members of staff are aware of the TDMP, all new staff members should be made aware of the Plan as part of their induction process. The TDMP section of the induction should provide new starters with the following:

- A brief introduction to the TDMP and its purpose;
- Tour of the office to include a visit to cycle parking areas and shower and changing facilities; and
- Provision of TDMP information which would include information on incentives to use sustainable means of transport e.g. /taxi share system.

2.10.11 Visitor Travel / Site Access Information

For internal site access information, consider developing an interactive map to show useful walking routes, nearby public transport terminals and popular cycling routes to work, expanded to include additional local information useful to staff such as nearby shops and services or locations for recreational activities

3 Summary

This report has summarised the transport implications arising from the proposed development of a commercial and retail building (known as the C2 building and C6 kiosk) and associated works at Barangaroo South (SSD14_6425). The site is well located with respect to public transport, walking and cycling, supporting the objective of the Barangaroo development in encouraging travel via sustainable transport modes. The assessment concludes the existing and future transport network will adequately support the construction and operation of the proposed development.