

Lend Lease (Millers  
Point) Pty Limited

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**Barangaroo South -  
Concept Plan  
Amendment  
(MP06\_0162MOD4)**

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Transport Management  
and Accessibility Plan  
Supplementary Report

ARUP

Lend Lease (Millers  
Point) Pty Limited

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Transport Management  
and Accessibility Plan  
Supplementary Report

August 2010

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Job number 220316

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## Executive Summary

This report has been prepared in support of the Concept Plan Amendment (MP06\_0162 MOD4), addressing the relevant Director General Requirements.

This Transport Management and Accessibility Plan Supplementary Report (TMAP Supplementary) is an amendment to the "Barangaroo Transport Management and Accessibility Plan, Request for Detailed Proposal - Stage 1" issued by the NSW Government in September 2008 (TMAP September 2008). It addresses the changes that have come about as a result of the proposed floor space modifications as well as any changes to the future public transport plans announced by the NSW Government. Although there have been changes in the Gross Floor Area (GFA), the transport principles and assumptions for the analysis has remained unchanged from TMAP September 2008 including the rates for calculating population, parking and trip generation, as well as the journey to work mode share target of only 4% trips by car.

The Barangaroo site has been divided into three distinct redevelopment areas (from north to south) – the Headland Park, Barangaroo Central and Barangaroo South (also known as Barangaroo Stage 1). Although the Concept Plan Amendment only relates to Barangaroo South, this TMAP Supplementary report considers the whole precinct to maintain consistency of the analysis when compared to previous traffic studies for the overall Barangaroo site.

Planning for Barangaroo included a process of developing a Concept Plan that provided for a public recreation area and a mixed use area. The Modified Concept Plan was later approved to increase the allowable commercial floor area by 120,000 m<sup>2</sup> (Mod 2), giving a total maximum GFA of 519,800 m<sup>2</sup>. The Modified Concept Plan for Headland Park (Mod 3) resulted in a total maximum GFA of 501,000m<sup>2</sup>. The latest modification of the Concept Plan will seek approval for 565,965 m<sup>2</sup> of GFA. Although this represents a proposed increase of 64,965m<sup>2</sup> GFA, given the significant traffic analysis that was carried out as part of Mod 2, this TMAP Supplementary report analyses the increase in GFA from TMAP September 2008 and hence the total increase from Mod 2 to the latest proposed modification (which includes Mod 3 changes) is 46,165m<sup>2</sup> GFA. The specific changes in GFA that reflect this increase of 46,165m<sup>2</sup> GFA are noted below.

- The commercial component has reduced by 19,075 m<sup>2</sup> GFA;
- The residential component has increased by 48,763 m<sup>2</sup> GFA;
- The hotel component has reduced from 730 rooms to 249 rooms and has been reduced by 2,800 m<sup>2</sup> GFA;
- The public use component has increased by 14,750 m<sup>2</sup> GFA;
- The retail component has increased by 4,527 m<sup>2</sup> GFA; and
- In summary, the total GFA has increased by 46,165 m<sup>2</sup>.

Since the original TMAP was released in September 2008 (reflecting the Modified Concept Plan – Mod 2), a transport study was carried out to support the Modified Concept Plan for Headland Park (Mod 3). The report for Mod 3 used the TMAP September 2008 and associated reports as a basis for its analysis and is referenced where appropriate in this report. The Mod 3 changes are included in the analysis.

Using the same car parking ratios and assumptions as used for TMAP September 2008 being 1 space per 600m<sup>2</sup> GFA for commercial and the City of Sydney LEP2005 ratios for other uses, the GFA for the Concept Plan Amendment has generated slightly more car parking on the site. The total car parking spaces has increased from 2,446 to 2,690. The main changes relate to a decrease in the commercial car parking and an increase in the residential car parking numbers.

Traffic analysis has been undertaken using the same transport principles and assumptions that were used for TMAP September 2008 including the rates for calculating population, parking and trip generation. Although there have been changes in GFA that have resulted in slightly more car parking spaces, this has not contributed to any additional peak hour traffic generation in the vicinity of the site as shown in Table 1 below.

**Table 1: Traffic generation for AM and PM peak hour**

<b>Time Period</b>	<b>Direction</b>	<b>TMAP September 2008 Concept Plan (Mod 2)</b>	<b>TMAP Supplementary (2010) Concept Plan Amendment</b>
<b>AM</b>	In	309	308
	Out	233	241
<b>PM</b>	In	272	263
	Out	413	408

In three of the four circumstances above, the Concept Plan Amendment generates slightly lower traffic volumes to the TMAP September 2008. This is due to the residential parking spaces contributing to a lower traffic generation rate in the peak periods than the commercial spaces as well as a significant reduction in the number of hotel rooms which reduces the traffic generation in the peak periods. The one instance where traffic generation is slightly higher in the AM outbound peak, with an additional 8 forecast movements. This is considered a minor increase (approximately 3%) and is considered to have an insignificant impact on the overall local road network.

Since the traffic generation is similar to the TMAP September 2008 and these are the key inputs for the Paramics modelling it is logical that the modelling outcomes for this proposed Concept Plan Amendment will be similar to Paramics Modelling carried out for TMAP September 2008. Hence the traffic outcome for this TMAP Supplementary report is unchanged when compared to TMAP September 2008. TMAP September 2008 concluded that there would be reasonable traffic operation without overloading the local road network. This conclusion is maintained for this TMAP Supplementary report.

In addition to the above, there has also been some development in relation to public transport access to the site since the TMAP September 2008. The recent announcements from the NSW Government have led to changes to the Metropolitan Transport Plan. These announcements do not change the fundamental mode share identified in the TMAP September 2008.

Transport NSW will be undertaking a Transport Study to consider alternative light rail routes and services along with the required changes to the public and private transport networks in the City as a result of light rail planning. This study will provide information on bus and light rail movements pertinent to Barangaroo. Future development of the Barangaroo TMAP will respond to these changes.

Improvements and shifts to the targeted mode split will be considered as the project proceeds in conjunction with the relevant government agencies.

# 1 Introduction

## 1.1 Background

On the 20 December 2009, Lend Lease (Millers Point) Pty Limited was appointed as the preferred proponent to develop Barangaroo South of Barangaroo: comprising of Blocks 1 to 4 and associated public recreation areas.

## 1.2 Planning History

On 9 February 2007 the Minister approved a Concept Plan for the site and on 12 October 2007 the land was rezoned to facilitate its redevelopment. The Approved Concept Plan allowed for:

- a mixed use development involving a maximum of 388,300m<sup>2</sup> of gross floor area (GFA) contained within 8 blocks on a total site area of 22 hectares;
- approximately 11 hectares of new public open space/public domain, with a range of formal and informal open spaces serving separate recreational functions and including a 1.4km public foreshore promenade;
- maximum building heights and maximum GFA for each development block within the mixed use zone; and
- public domain landscape concept, including parks, streets and pedestrian connections.

A condition of consent also required two enlarged water intrusions into the Barangaroo site, one at the northern end and one at the southern end and the creation of a natural northern headland.

Modification No. 1 was approved in September 2007 which corrected a number of minor typographical errors.

On 25 February 2009 the Minister approved Modification No. 2 to the Concept Plan. The Approved Concept Plan as modified allowed for a mixed use development involving a maximum of 508,300m<sup>2</sup> of gross floor area (GFA) contained within 8 blocks on a total site area of 22 hectares.

On 11 November 2009 the Minister approved Modification No. 3 to the Concept Plan to allow for a modified design for the Headland Park and Northern Cove. The Approved Concept Plan as modified allowed for a mixed use development involving a maximum of 489,500m<sup>2</sup> of gross floor area (GFA) contained within 7 blocks on a total site area of 22 hectares.

The proposed Concept Plan Amendment (MP 06\_0162 MOD 4) seeks the Minister's consent for:

- additional GFA within Barangaroo South, predominantly related to an increase in residential GFA;
- redistribution of the land use mix;
- an increase in height of a number of the proposed towers within Barangaroo South;
- the establishment of the new pier and landmark building extending into the Harbour; and
- reconfiguration and activation of the public waterfront area through the introduction of uses including retail and residential to the west of Globe Street.

### 1.3 Purpose

This report has been prepared in support of the Concept Plan Amendment (MP06\_0162 MOD 4), addressing the relevant Director General Requirements.

This document is an amendment to the “Barangaroo Transport Management and Accessibility Plan, Request for Detailed Proposal - Barangaroo South” issued by the NSW Government in September 2008. Since then some of the planned commercial and residential floor space areas have changed and future public transport Government plans have changed. However, the main transport principles have remained unchanged including journey to work mode share target of only 4% trips by car.

This document compares the previous assumptions used in the “Barangaroo Transport Management and Accessibility Plan, Request for Detailed Proposal - Barangaroo South” (TMAP September 2008) issued by the NSW Government in September 2008 with the most up to date assumptions and provides relevant recommendations. For ease of comparison, this Transport Management and Accessibility Plan Supplementary Report (TMAP Supplementary) follows the same headings and sub-headings as the TMAP September 2008 and continues to relate to the entire Barangaroo site.

Since the TMAP September 2008 was released a Transport Report was carried out to support the Modified Concept Plan for Headland Park (Mod 3). The report used the TMAP September 2008 and associated reports as a basis for an analysis of the traffic impacts for the modification. Although Mod 3 is considered, this TMAP Supplementary report uses the TMAP September 2008 and associated reports as the basis for comparison.

### 1.4 Document Structure

The diagram below illustrates the document structure established for Traffic and Transport Planning related reporting for the Concept Plan Amendment. There is one supporting document to inform and feed into the required responses to the Director General’s Requirements (DGR):

1. TMAP Supplementary Report.

This TMAP Supplementary report supports the Concept Plan Amendment Application.

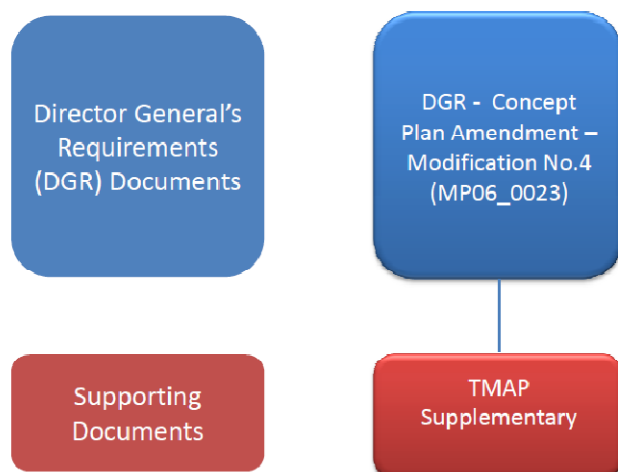


Figure 1 Document Structure

## 1.5 Responses to DGR

Table 2 below summarises the responses to the transport related issues addressed in the DGR MP06\_0162 MOD 4 key issue 4. Transport Management and Accessibility Impacts.

**Table 2: DGR Summary**

No.	Issue	Arup's response
1	Analysis of existing and future transport networks, traffic generation and circulation, service vehicle arrangements and car parking as a consequence of the modification	Section 4.1
2	Analysis of car parking provisions and any resultant changes proposed as part of the modification	Section 4.2
3	Outline the amendments to and provision of public transport, including bus, ferry, light rail, pedestrian and cyclist access	Section 2.6.2, Sections 4.3 - 4.9
4	Potential to accommodate additional vehicular movements in the surrounding road network.	Section 4.1
5	Preparation of a Comprehensive TMAP report for the Barangaroo Site to properly ascertain the cumulative regional traffic impacts associated with the modification, including but not limited to <ul style="list-style-type: none"> <li>Regional and local intersection and road improvements</li> <li>Vehicular Access Options for adjoining sites</li> <li>Public Transport needs</li> <li>The Timing and Cost of Infrastructure Works ( if required ) and the identification of funding</li> </ul>	This document supplements the TMAP September 2008 and provides the basis for ongoing development of transport initiatives.



## 2 Barangaroo Development

### 2.1 Background

Barangaroo is a new urban precinct located on the foreshore to the north west of Sydney's CBD. Barangaroo will provide a direct connection between Sydney's harbour and the city centre. It will also extend Sydney's cultural setting and provide a major new headland park.

Sydney is Australia's global gateway. It is home to most of the nation's top tier companies and the regional headquarters for multi-national corporations in Australia. It is the nation's premier tourism destination. The development of Barangaroo will build on this foundation and boost the economic growth and prosperity of Sydney and NSW.

The area of land that is subject to the Concept Plan Modification is indicatively shown in Figure 2 and is herein referred to as "the Concept Plan Site". It comprises an open apron which is largely reclaimed over water and identified in the existing approved Concept Plan as Blocks 1 – 4 and the immediately adjacent public recreation area. The Concept Plan Site also extends beyond the western edge of the existing apron and includes a north-west oriented intrusion into the existing waters of Darling Harbour.



Figure 2: Indicative Site Boundary for Barangaroo South

The Barangaroo site has been divided into three distinct redevelopment areas (from north to south) – the Headland Park, Barangaroo Central and Barangaroo South (also known as Barangaroo Stage 1). Lend Lease has been successfully appointed as the preferred proponent to develop Barangaroo South.

Although the Concept Plan Amendment only relates to Barangaroo South, this TMAP Supplementary report considers the whole precinct to maintain consistency of the analysis when compared to previous traffic studies for the overall Barangaroo site.

## **2.2 The Consolidated Concept Plan**

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### **2.2.1 General Description and Comment**

The Minister for Planning approved the Barangaroo Concept Plan subject to modifications on 9 February 2007.

A Consolidated Concept Plan and Environmental Assessment (CCP) was subsequently issued in October 2007. It provided a single integrated document that brought together the concept plan and modifications, the terms of approval, the environmental assessment requirements and responses, and the Statement of Commitments for the Concept Plan. It also addressed the suitability of the site and the implications of the proposed land uses, as required by the planning legislation.

In the CCP the development comprised a maximum 388,300m<sup>2</sup> of gross floor area (GFA), and was envisaged to include:

- A maximum of 97,075m<sup>2</sup> and a minimum of 58,245m<sup>2</sup> residential development;
- A maximum of 50,000m<sup>2</sup> for tourism uses;
- A maximum of 39,000m<sup>2</sup> for retail uses; and
- A minimum of 2,000m<sup>2</sup> for community uses.

The open space-recreation zone included a further 11,500m<sup>2</sup> of gross floor area.

### **2.2.2 Statement of Commitments and Conditions of Consent**

The Conditions of Consent for the Consolidated Concept Plan Determination identified the floor area components and parking requirements for Barangaroo. The conditions also imposed requirements to be met at future stages of the project's implementation additional to those included within the Statement of Commitments. The conditions reiterated the requirement for a Transport Management and Accessibility Plan addressing public transport, traffic and pedestrian access between the Barangaroo site and Wynyard, to be provided prior to or concurrently with the lodgement of the first major project application that includes new floor area. TMAP September 2008 was prepared and published by the NSW Government in September 2008 in response to this requirement for a Transport Management & Accessibility Plan and reflected the Concept Plan Modification (Mod 2) related to additional commercial floor area of 120,000m<sup>2</sup> GFA.

## **2.3 Amendment of Consolidated Concept Plan and Revised Transport Concept Plan**

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Planning for Barangaroo included a process of developing a Concept Plan that provided for a public recreation area and a mixed use area. The Modified Concept Plan was later approved to increase the allowable commercial floor area by 120,000 m<sup>2</sup>, giving a total maximum GFA of 519,800 m<sup>2</sup>. The Modified Concept Plan for Headland Park (Mod 3) resulted in a total maximum GFA of 501,000m<sup>2</sup>. The latest modification of the Concept Plan will seek approval for 565,965 m<sup>2</sup> of GFA. Although this represents a proposed increase of 64,965m<sup>2</sup> GFA, this TMAP Supplementary report analyses the increase in GFA from TMAP

September 2008 and hence the total increase from Mod 2 to the latest proposed modification (which includes Mod 3 changes) is 46,165m<sup>2</sup> GFA.

## 2.4 Not Used

## 2.5 Not Used

## 2.6 Proposed Development

### 2.6.1 Key Assumptions

#### 2.6.1.1 Proposed Maximum GFA's

The Approved Concept Plan from 2007 allowed for a total site GFA of 399,800 m<sup>2</sup> (388,300 m<sup>2</sup> GFA in the mixed use zone and 11,500 m<sup>2</sup> GFA in the Public Domain/Headland Park for the Cruise Passenger Terminal and Kiosks).

The TMAP September 2008 considered the Concept Plan Modification with the total floor area of 519,800 m<sup>2</sup> GFA for the whole site (508,300 m<sup>2</sup> GFA in the mixed use zone). Since the TMAP September 2008 was released a Transport Report was carried out to support the Modified Concept Plan for Headland Park (Mod 3). This TMAP Supplementary Report compares the latest modification with Mod 2 on which the TMAP September 2008 was based as this document was the basis of the detailed traffic analysis and hence provides the basis for a logical comparison.

The latest modification of the Concept Plan seeks approval for total floor area for the whole site of 565,965 m<sup>2</sup> GFA.

The following table shows the GFA allocation per activity for the above mentioned approvals and modifications of the Concept Plan.

**Table 3 Total GFA's for the Barangaroo Development<sup>1</sup>**

	Commercial	Hotel/Tourist	Public	Residential	Retail	Total
<b>Consolidated Concept Plan from 2007</b>						
Consolidated Concept Plan	253,000	35,800	5,000	75,000	31,000	<b>399,800</b>
<b>TMAP September 2008 – Concept Plan Modification for additional commercial (Mod 2)</b>						
Concept Plan [commercial]	373,000	35,800	5,000	75,000	31,000	<b>519,800</b>
<b>Modified Concept Plan for Headland Park (Mod 3)</b>						
Approved Concept Plan	371,500	30,000	4,750	64,000	30,750	<b>501,000</b>
<b>TMAP 2010 - Latest Modification</b>						
Barangaroo South	323,700	33,000	13,000	99,763	33,777	<b>503,240</b>
Stage 2	30,225	0	6,750	24,000	1,750	<b>62,725</b>
Latest Modification (whole site)	353,925	33,000	19,750	123,763	35,527	<b>565,965</b>

<sup>1</sup> Figures for the 2007 approval and Concept Plan Modification come from Road Network Report, MWT 21 May 2008, Section 4.3.3 Table 4 (Appendix B of TMAP 2008). The Latest Modification figures come from LL for Barangaroo South, Modification of Major Project Approval 11 November 2009 for stage 2, page 4.

Table 3 above shows an increase of 46,165 m<sup>2</sup> GFA between the latest modification and the adopted values in TMAP September 2008 (i.e. Mod 2). The commercial component has been reduced by 19,075 m<sup>2</sup> GFA and the residential component increased by 48,763 m<sup>2</sup> GFA. The hotel component has reduced from 730 rooms to 249 rooms and has been reduced by 2,800 m<sup>2</sup> GFA. The public use component has increased by 14,750 m<sup>2</sup> GFA and the retail component has increased by 4,527 m<sup>2</sup> GFA.

Table 4 provides a summary of the floor space allocated by use for the development.

**Table 4 Summary of floor space by use**

Mod 4	Commercial	Hotel/ Tourist	Public	Residential	Retail	Totals
Block 8	0	0	0	0	0	0
Block 7	0	0	750	14,000	250	15,000
Block 6	500	0	2,500	0	0	3,000
Block 5	29,725	0	0	10,000	1,500	41,225
Block 4A	0	0	0	6,900	1,250	8,150
Block 4B	0	0	0	28,900	1,000	29,900
Block 4C	0	0	0	38,500	500	39,000
Block 3	132,372	0	0	0	10,297	142,669
Block 2	191,328	0	0	0	17,885	209,213
Block 1	0	0	0	9,000	400	9,400
Passenger Terminal	0	0	0	0	0	0
Active Uses	0	0	4,500	0	0	4,500
Community/Public uses	0	0	12,000	0	0	12,000
Block X	0	0	0	16,463	2,445	18,908
Block Y	0	33,000	0	0	0	33,000
<b>Mod 4 Totals</b>	<b>353,925</b>	<b>33,000</b>	<b>19,750</b>	<b>123,763</b>	<b>35,527</b>	<b>565,965</b>

### 2.6.1.2 Population

Table 5 highlights the assumptions used for estimating the population numbers which are unchanged from TMAP September 2008. The key difference is that the hotel has reduced in size and comprises hotel rooms and serviced apartments.

**Table 5 Comparison of population assumptions**

TMAP September 2008	TMAP Supplementary
Commercial: 1 employee per 20m <sup>2</sup> GFA	Unchanged
Residential: 2 per 100m <sup>2</sup> GFA (1 per 50m <sup>2</sup> GFA)	Unchanged
Hotel: 730 hotel room based on 50m <sup>2</sup> rooms	Hotel Rooms: 205 Serviced apartments: 35 (10 x 1 bed, 25 x 2 bed)

**2.6.1.3 Parking requirements**

The parking rates for this modification are in accordance with TMAP September 2008 and the Approved Concept Plan and are as per Table 6 below.

**Table 6 Parking Requirements**

TMAP September 2008	TMAP Supplementary
Commercial: 1 space per 600m <sup>2</sup> Parking requirements for other activities as per the City of Sydney parking rates	Unchanged <sup>2</sup>

**2.6.2 Site Objectives**

The overall mode split targets have been retained for the Barangaroo site from the TMAP September 2008 as a base case as set out in Table 7 below. The 2006 Census Data for journey to work in the Sydney Inner SLA Zone has been included for comparison purposes.

**Table 7 Mode Split Targets**

Mode	2006 Census	TMAP September 2008	TMAP Supplementary
Car	18.8%	4.0%	Unchanged
Bus/Light rail	22.4%	20.0%	18.0% (Bus)
			2.0% <sup>3</sup> (Light Rail)
Train	47.6%	63.0%	Unchanged
Ferry	2.7%	1.0%	Unchanged
Other (pedestrian, cyclists, motorcycles, taxi)	8.5%	12.0%	Unchanged
Total	100%	100%	Unchanged

**2.6.3 Site Population and Other Attributes**

The population of Barangaroo is similar to what was estimated in TMAP September 2008. Based on the assumptions indicated in Table 5 together with the proposed areas as set out in Table 3 the Barangaroo development will accommodate 21,123 workers and 2,475 residents. The 2006 Census Data indicates that 57% of residents who live in the Sydney Inner SLA Zone also work in this zone. On this basis it has been assumed that 9%<sup>4</sup> of the residents work at Barangaroo on a typical day. The latest population estimates in addition to workers and residents took into consideration visitors to the site including office, hotel, residential, cultural and tourist visitors. This is summarised in Table 8 below.

<sup>2</sup> residential parking rates as per the conditions of consent of the Approved Concept Plan which are generally consistent with the City of Sydney LEP parking rates.

<sup>3</sup> Existing Light Rail with transfer at Central or alighting at Pyrmont and walking across Pyrmont Bridge to Barangaroo

<sup>4</sup> It has been assumed that 10% of Barangaroo residents work at Barangaroo factored down to 9% to represent workers on any one day

**Table 8 Population numbers**

<b>TMAP September 2008</b>	<b>TMAP Supplementary</b>
22,000 workers (of which 8.5% would not be on site, which implies that there would be 20,130 workers on site) <sup>5</sup>	21,123 workers (of which 8.5% would not be on site, which implies that there would be 19,330 workers on site)
1,500 residents	2,475 residents (9% work in Barangaroo)

Using the same parking rates as used in TMAP September 2008 but with the proposed Gross Floor Areas the parking supply spaces are as shown in Table 9. The detailed workings and generation of these figures can be found in Section 4.2.

**Table 9 Comparison of Parking Supply Spaces**

<b>Land Use and Activity</b>	<b>Parking Supply Spaces</b>	
	<b>TMAP September 2008</b>	<b>TMAP Supplementary</b>
Commercial/mixed use	673	652 (590 office, 62 retail )
Hotel	146	156 *
Residential	771	1,166
Parkland public car park	300	300
Total on site	1,887	2,274
On-street (short stay on Hickson Road)	400	400
Public buildings	16	16
Ports parking (retained)	140	0 **
<b>Total</b>	<b>2,446</b>	<b>2,690</b>

\* includes parking related to the serviced apartments

\*\* no parking for Ports due to relocation of the permanent Port facility off Barangaroo

The main component that has contributed to the increase in parking supply spaces is the increase in residential. However, this increase in parking supply does not contribute to a proportional increase in traffic generation as demonstrated in Section 4.1.

<sup>5</sup> Modified Concept Plan Traffic Report July 2008, MWT Section 4.4 page 32 (Appendix C TMAP September 2008)

Based on the latest population assumptions described in Table 5, the number of workers who commute to work has decreased from 20,130 to 19,327 commuters. Table 10 below compares the number of commuters on journey to work per mode for the mode split as discussed in Section 2.6.2.

**Table 10 Comparison of the commuter transport task for the Journey to Work**

TMAP September 2008			TMAP Supplementary		
Mode	%	Number	%	number	
car	4%	750 *	4.0%	773	
bus	20%	4,100	18.0%	3,479	
			2.0%	387	
train	63%	12,500	63.0%	12,176	
ferry	1%	280	1.0%	193	
other	12%	2,500	0%	-	2,319
			1.0%	193	
			6.0%	1,160	
			4.0%	773	
			1.0%	193	
			0%	-	
Total	100%	20,130	100%	19,327	

\* this figure has been taken from TMAP September 2008 however it doesn't seem to numerically correlate with the GFA and resulting population numbers which would have been 805 by car for JTW for 4% of the population.

## 3 Transport and Access Planning Framework

### 3.1 Introduction

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To implement the requirement of the Statement of Commitments, the Barangaroo Steering Committee established a Transport and Access Working Group (TAWG) charged with transport planning of Barangaroo including preparation of the TMAP September 2008 and supporting studies. Members of the TAWG are Barangaroo Delivery Authority, Transport NSW, City of Sydney and Lend Lease Millers Point Pty Limited. Various other agencies and bodies will be drawn upon as advisors as required.

TAWG has an ongoing role.

### 3.2 Methodology

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The TMAP September 2008 was derived from the iterative process that started in 2006. This involved refinement of the Barangaroo concept and development details, establishment of the statutory planning and approvals framework, and preparation of the initial Transport concept based on investigation of various transport and access matters. The Statement of Commitments and development of the Concept Plan Modification facilitated the more detailed assessment of transport and access matters in a series of supporting studies commissioned by the TAWG over 2007 and 2008 including detailed parametrics modelling. These have provided the basis for the TMAP September 2008.

This previous work is utilised to support this TMAP Supplementary report.

### 3.3 Service Principles

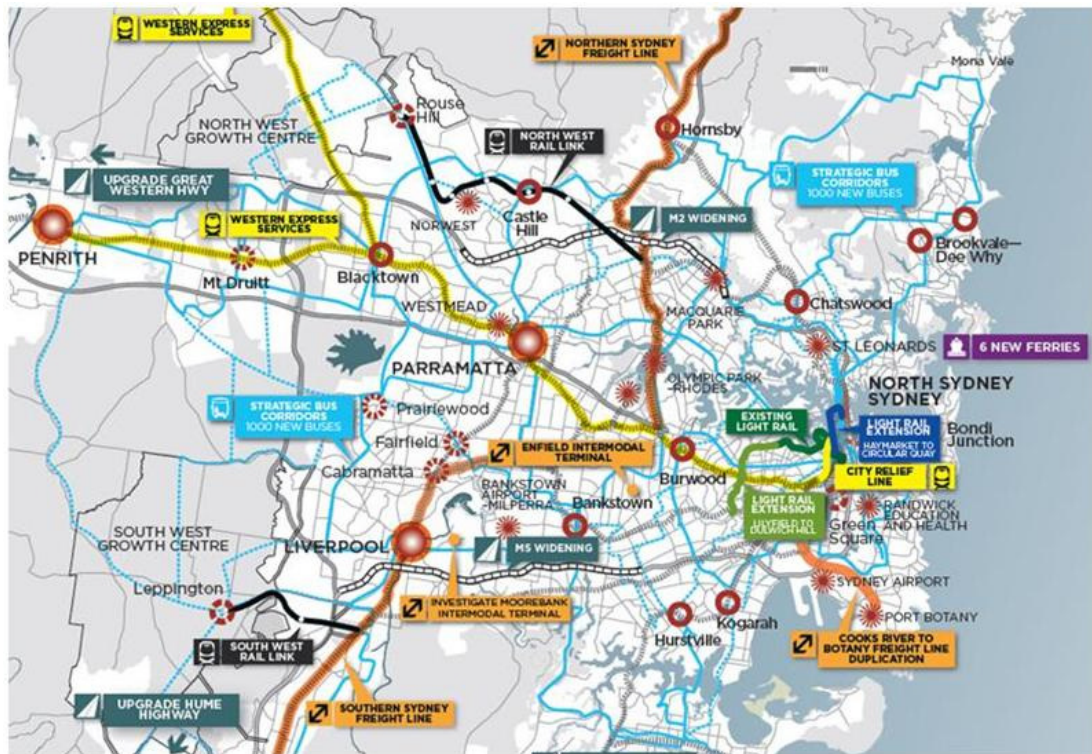
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In February 2010 the NSW Government published the Metropolitan Transport Plan, Connecting the City of Cities. This document outlines planned transport schemes in the next 10 years. The main transport schemes include:

- Rail Western Express Services and City Relief Line
- South West Rail Link and North West Rail Link
- Light rail extensions
- 1000 additional buses

Figure 3 below illustrates those and other planned transport schemes.





**Figure 3 Transport schemes from the Metropolitan Transport Plan**

The service principles of Barangaroo with regards to mode split targets, opportunity to create a transport hub and provide good access to public transport remain unchanged. Table 11 compares the service principles in more detail.

**Table 11 Service Principles**

<b>TMAP September 2008</b>	<b>TMAP Supplementary</b>
Mode split targets	<b>Unchanged</b>
Access to public transport without prejudicing the majority of existing passengers	<b>Unchanged</b>
Integration with future rail developments including North West Metro, future rail and Light Rail	<b>Unchanged</b> The North West Metro scheme was postponed in September 2008 followed by a postponement of CBD metro in February 2010. Heavy rail schemes and Light Rail extension were announced in the Metropolitan Transport Plan
Opportunity to create a major multimodal transport interchange with ferry, rail and bus	<b>Unchanged</b>
Safe and convenient access	<b>Unchanged</b>

With the announcement of the Metropolitan Transport Plan in February 2010 new transport schemes are planned for Sydney. The metro scheme is no longer current, however new heavy rail projects are planned. The possible transport initiatives are compared in Table 12 below.

**Table 12 Possible transport initiatives**

<b>TMAP September 2008</b>	<b>TMAP Supplementary</b>
Pedestrian Linkages: a new high-volume and attractive pedestrian tunnel to the frequent rail and bus services at Wynyard Station and George Street will be essential, together with foreshore walkways and links to adjoining areas	<p><b>Unchanged.</b></p> <p>The following further define the pedestrian linkages proposed in the vicinity of the site.</p> <p><i>Barangaroo Pedestrian Link:</i> A new high-volume pedestrian tunnel from Barangaroo to the frequent rail and bus services at Wynyard Station and George Street.</p> <p><i>City Walk Wynyard Connection:</i> A new pedestrian link bridge over Sussex Street/Hickson Road located close to the intersection of Hickson Road and Napoleon Street which links into the Barangaroo Pedestrian Link.</p> <p><i>189 Kent Connection:</i> A new pedestrian link bridge over Hickson Road to be constructed and coordinated with the future development of 189 Kent Street.</p> <p><i>Maritime Staircase:</i> A new staircase at the junction of Napoleon Street and Hickson Road which connects to the Maritime Centre providing a link to Kent Street.</p>
Light Rail: detailed planning for Barangaroo does not preclude future construction of a light rail system along Hickson Road	<p><b>Unchanged.</b></p> <p>Light Rail extension was announced in February 2010 and forms part of the Metropolitan Transport Plan.</p>
Rail: North West Metro station by Wynyard	<p><b>Unchanged.</b></p> <p>The North West Metro scheme was postponed in September 2008.</p>
Bus services: CBD and Barangaroo Bus strategy	<b>Unchanged</b>
Cyclists: provision of cycle ways and facilities on site	<b>Unchanged</b>

### 3.4 Scope of Investigations

The scope of investigations is the same as it was in TMAP September 2008. This TMAP Supplementary report addresses the statement of commitments requirements in the relevant sections of this report as indicated in Table 13 .

**Table 13 Scope of Investigations**

Statement of Commitments Requirements	TMAP September 2008	TMAP Supplementary
Road Network	Barangaroo Road System Traffic Report, MWT May 2008 and Barangaroo Modified Concept Plan Transport Report MWT July 2008	Section 4.1 of this document
Parking	Above reports; East Darling Harbour Car Parking Considerations, MWT September 2006	Section 4.2 of this document
Bus Services	Barangaroo Bus Service Strategy, Transport and Traffic Planning Associates April 2008	Section 4.5 of this document
Cycling	Barangaroo Cycle Strategy, ARUP June 2008	Section 4.7 of this document
Pedestrian links	Pedestrian Field Study; Pedestrian Strategy, ARUP December 2007; June 2008	Section 4.3 of this document
Heavy and Metro Rail	Information in the public domain, MoT	Section 4.4 of this document
General	All of the above	

## 4 Transport and Access Service Strategy

### 4.1 Road Network

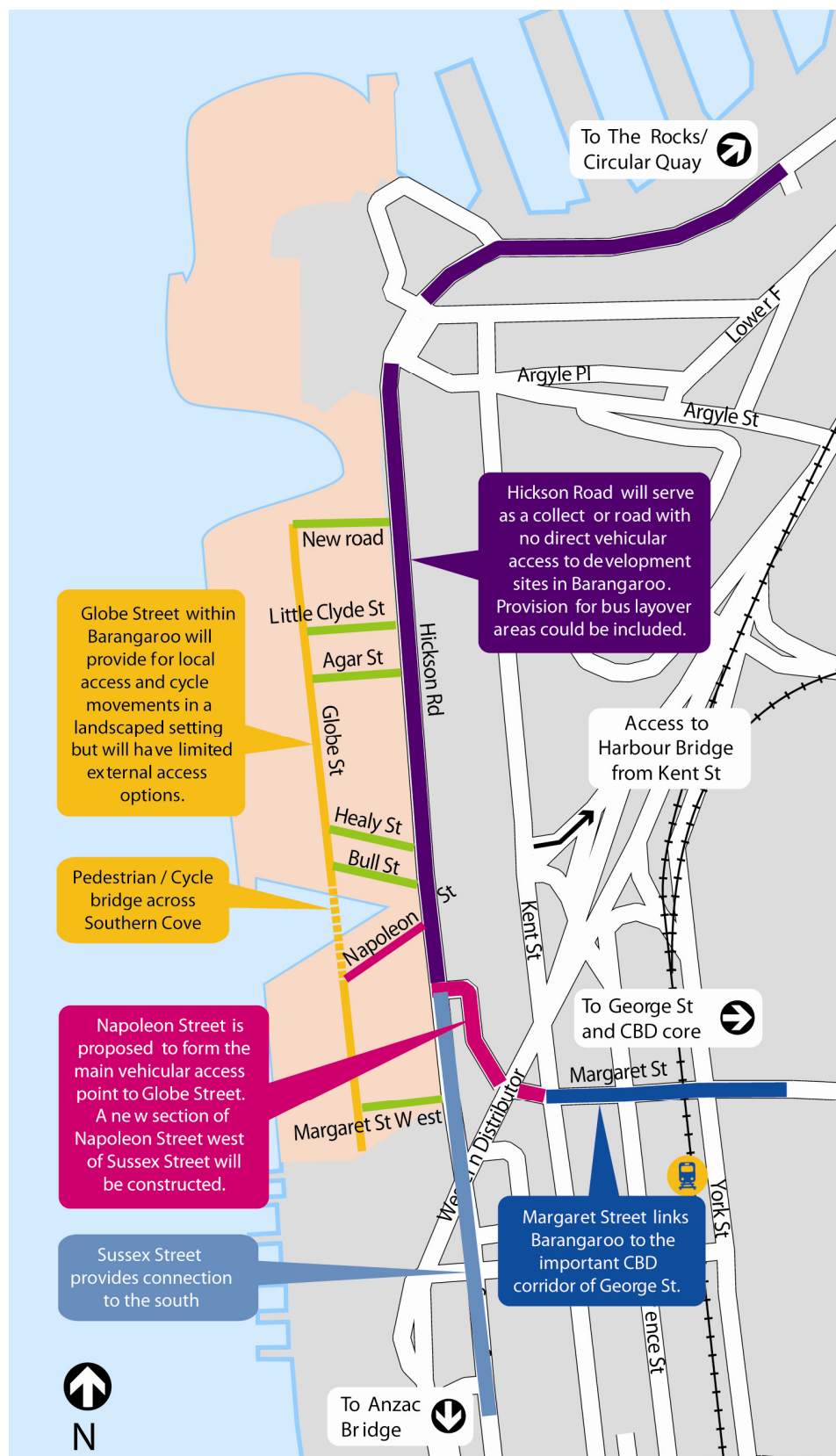
In principle the road network has not changed since the assumptions made in TMAP September 2008, however some roads in Barangaroo South are now pedestrian ways rather than vehicular.

Vehicular access to Barangaroo South is via Hickson Road from three separate access ways. Margaret Street West is the access to the south; Napoleon Street centrally; and Healy Street to the north of Barangaroo South. Globe Street serves as a vehicular connection between Margaret Street West and Napoleon Street with a pedestrian/cycle way connection to Bull and Healy Streets. All vehicular roads are two way. The road network is shown in Figure 4. Table 14 describes the individual elements relevant to the Barangaroo road network. Refer to the Environmental Assessment for further detailed information in relation to the street network.

**Table 14 Road Network**

TMAP September 2008	TMAP Supplementary
Hickson Road will serve as a collector road with no direct vehicular access to development sites in Barangaroo. With a boulevard-style urban design treatment, it will contain a trafficable lane able to accommodate buses as well as cars, a parking lane, pedestrian footpaths, and central median. Provision for bus layover areas could be included. The width of Hickson Road could accommodate a light rail system.	<b>Unchanged</b>  The width of Hickson Road can also accommodate tram stops and cycle lanes.
Globe Street within Barangaroo will provide for local access and cycle movements in a landscaped setting but will have limited external access options. It will be wider at its southern end which will include an extended pedestrian footpath, a parking/cycle lane and central median.	As a result of consultation with the Barangaroo Delivery Authority and the City of Sydney, residential buildings will be located to the west of Globe Street and to the north of Napoleon Street. These changes have led to a slight reduction in the width of Globe and Napoleon Streets. These streets will be low speed that is appropriate to accommodate vehicles and cyclists in a shared environment. Indented parking bays will be located on one side of these streets. The width of the pedestrian footpaths provided on each side of the streets will vary with the indented parking bays. Napoleon Street is considered to be an extension of Globe Street and hence will have very similar traffic arrangements. The Globe Street alignment continues north of Napoleon Street as a pedestrian and cyclist bridge across Southern Cove linking into the northern Section of Globe Street which will have a shared traffic, pedestrian and cyclist function from Healy Street to the new road at the northern cove.
Napoleon Street is proposed to form the main vehicular access point to Globe Street. A new section of Napoleon Street west of Sussex Street will include two very wide footpaths, a parking/cycle lane and a trafficable lane. Modifications to the existing section east of Sussex Street will ensure the Barangaroo cycle networks link to the broader CBD network.	

<b>TMAP September 2008</b>	<b>TMAP Supplementary</b>
Margaret Street which extends eastward from Napoleon Street to the important CBD corridor of George St will also provide an important access corridor for Barangaroo.	<b>Unchanged</b>
Munn Street at the northern end will provide access for service vehicles and underground parking. Typical of east-west side streets to Barangaroo, Munn Street will include wide pedestrian footpaths, kerbside parking lanes for coaches on one side and cars on the other and a trafficable lane.	Munn Street has been removed by the introduction of the Northern Cove as part of Mod 3. A new road link connects east west between the termination of Globe Street and Hickson Road.
Access to Harbour Bridge via Kent Street will face problems in the PM peak.	<b>Unchanged</b>



Source: Updated version of Road Network from Section 4.1 of TMAP September 2008.

**Figure 4 Updated Barangaroo Road Network**

#### 4.1.1 Road network modelling

Paramics modelling of Sydney CBD was utilised to test traffic options with different traffic generations and traffic management measures and is outlined in MWT Modified Concept Plan – Transport Report, July 2008. Table 15 summarises the modelled options undertaken for TMAP September 2008 work. Option 4 was the scenario that demonstrated that the Modified Concept Plan produced reasonable traffic operation that would operate without overloading the local road network.

**Table 15 TMAP September 2008 traffic modelling options**

Option	Features	Outcomes
1	Approved Concept Plan development with 4% car mode share for JTW in offices	The road network copes with the additional traffic generated without obvious new traffic operation issues compared to the present apart from some additional queuing and lower average speeds
2	As with 1 but 10% mode share to car	The additional traffic generated by the higher car mode share exacerbates existing network congestion to the extent of lock up in some conditions and general inability to cope satisfactorily;
3	As with 1 but with the left turn from York St to Margaret St banned	The changes to expedite bus movements along Margaret St to/from Barangaroo by reducing general traffic in that street showed some benefits but pointed to the need for more detailed assessment;
3a	Option 3A added a reversal of the one-way in Wynyard Lane	As option 3
4	Modified Concept Plan development, with 4% mode share for JTW to offices	There is reasonable traffic operation although average speeds were lower, as with Option 1; the Concept Plan Modification would operate without overloading the local road network.

Peak hour traffic generation has been analysed to reflect the revised GFA as proposed in Table 3 (refer Table 17) and has been compared with the traffic generation for the Approved Concept plan Mod 2 (refer Table 16). All assumptions from TMAP September 2008 and MWT Modified Concept Plan – Transport Report, July 2008 including traffic generation rates and parking ratios have remained the same for this analysis.

Since the TMAP September 2008 was released a Transport Report was carried out to support the Modified Concept Plan for Headland Park (Mod 3) and resulted in slightly reduced traffic generation. This TMAP Supplementary Report compares the latest modification (which includes Mod 3 changes) with Mod 2 on which the TMAP September 2008 was based as this document was the basis of the detailed traffic analysis.

**Table 16 Traffic Generation TMAP September 2008 Modified Concept Plan Mod 2(as Approved)**

Traffic generation as per Barangaroo TMAP September 2008			AM				PM			
Light Vehicles	Variable	Variable number	trip rate <sup>6</sup>	no of trips	In	out	trip rate	no of trips	In	out
Residential	dwelling	750	0.14	105	21	84	0.09	68	54	14
Commercial	car park space	622	0.26	162	129	32	0.26	162	32	129
Retail	car park space	52	0.4	21	17	4	0.4	21	4	17
On street parking	car park space	275	0.4	110	88	22	0.8	220	88	132
Public off street parking	car park space	300	0.04	12	10	2	0.4	120	24	96
Hotel	rooms	730	0.1	73	15	58	0.1	73	58	15
<b>Sub total</b>				<b>482</b>	<b>279</b>	<b>203</b>		<b>663</b>	<b>261</b>	<b>402</b>
<b>Heavy vehicles</b>										
Service veh				60	30	30		0	0	0
Coaches				0	0	0		22	11	11
<b>Sub total</b>				<b>60</b>	<b>30</b>	<b>30</b>		<b>22</b>	<b>11</b>	<b>11</b>
<b>Total traffic generation Development</b>				<b>542</b>	<b>309</b>	<b>233</b>		<b>685</b>	<b>272</b>	<b>413</b>
<b>Public Transport (Bus)</b>				<b>66</b>	<b>39</b>	<b>27</b>		<b>66</b>	<b>27</b>	<b>39</b>
<b>Total additional traffic</b>				<b>608</b>	<b>348</b>	<b>260</b>		<b>751</b>	<b>299</b>	<b>452</b>

**Table 17 Traffic Generation TMAP Supplement, Latest Modification**

Traffic generation for the latest Barangaroo Scheme (as per June 2010) using the same method as adopted in TMAP September 2008			AM				PM			
Light Vehicles	Variable	Variable number	Trip rate	No of trips	In	Out	Trip rate	No of trips	In	out
Residential	dwelling	1166	0.14	163	33	131	0.09	105	84	21
Commercial	car park space	590	0.26	153	123	31	0.26	153	31	123
Retail	car park space	62	0.4	25	20	5	0.4	25	5	20
On street parking	car park space	275	0.4	110	88	22	0.8	220	88	132
Public off street parking	car park space	300	0.04	12	10	2	0.4	120	24	96
Hotel/Service	rooms	249	0.1	25	5	20	0.1	25	20	5
<b>Sub total</b>				<b>488</b>	<b>278</b>	<b>211</b>		<b>648</b>	<b>252</b>	<b>397</b>
<b>Heavy vehicles</b>										
Service veh				60	30	30		0	0	0
Coaches				0	0	0		22	11	11
<b>Sub total</b>				<b>60</b>	<b>30</b>	<b>30</b>		<b>22</b>	<b>11</b>	<b>11</b>
<b>Total traffic generation Development</b>				<b>548</b>	<b>308</b>	<b>241</b>		<b>670</b>	<b>263</b>	<b>408</b>
<b>Public Transport (Bus)</b>				<b>66</b>	<b>39</b>	<b>27</b>		<b>66</b>	<b>27</b>	<b>39</b>
<b>Total additional traffic</b>				<b>614</b>	<b>347</b>	<b>268</b>		<b>736</b>	<b>290</b>	<b>447</b>

<sup>6</sup> Refer Masson Wilson Twiney Modified Concept Plan Report, July 2008 (Section 4.6)



The following common assumptions have been used and are unchanged from TMAP September 2008:

1. 1 residential unit provides an average of 100sqm
2. Commercial and public trips split 80% in / 20% out during AM and 80% out / 20% in during PM
3. Residential and hotel trips split 80% out / 20% in during AM and 80% in / 20% out during PM
4. Public use parking assumed to generate at commercial rate during PM peak hour and at 10% of that level during AM peak hour
5. There would be 400 on street car parking. However, 270 ninety degree parking on Hickson Rd is going to be converted to short term 125 parallel spaces. The reduction of car spaces would be offset by higher traffic generation from short term car parking. Despite the recent change in car parking from 10 hour parking to 4 hour parking along Hickson Rd is still considered long term parking. The remaining 275 parking spaces would be generating additional traffic.
6. Estimated number of coaches and service vehicles
7. Bus numbers were based on the Barangaroo Bus Service Strategy, Transport and Traffic Planning Associates April 2008
8. Note that numbers may not add up to 100% due to rounding from spreadsheet
9. The car parking allocated for the function space for the hotel is not considered to significantly contribute to the traffic generation in peak periods and hence has not been included in the analysis. The operation of this space and hence the impact to the traffic generation is subject to further analysis.

When we compare the results of the traffic generation outlined in Table 16 and Table 17 we note the following changes as listed in Table 18 below.

**Table 18 Traffic generation for AM and PM peak hour**

Time Period	Direction	TMAP September 2008 Concept Plan (Mod 2)	TMAP Supplementary (2010) Concept Plan Amendment
AM	In	309	308
	Out	233	241
PM	In	272	263
	Out	413	408

As shown in Table 18, in three of the four circumstances the latest proposed scheme generates slightly lower traffic volumes to the TMAP September 2008. The one instance where traffic generation is slightly higher is only marginal and is considered to have an insignificant impact on the overall local road network.

Since the traffic generation is similar to the Modified Concept Plan and these are the key inputs for the Paramics modelling it is logical that the modelling outcomes for this proposed Concept Plan Amendment will be similar to Paramics Modelling Option 4. Hence the traffic outcome for this TMAP Supplementary report is unchanged when compared to TMAP September 2008. As summarised in Table 15 there would be reasonable traffic operation without overloading the local road network.

## 4.2 Car Parking

This car parking analysis has been based on the same parking ratios as used in TMAP September 2008 but with the proposed GFA's as outlined in Table 3. A comparison of the parking supply spaces for TMAP September 2008 and TMAP Supplementary is shown in Table 19.

While the proposed GFA has generated slightly more car parking on the site, this has not contributed to any additional traffic generation in the vicinity of the site as demonstrated in the Road Network Modelling in Section 4.1.

**Table 19 Comparison of Parking Supply Spaces**

Land Use and Activity	Parking Supply Spaces	
	TMAP September 2008	TMAP Supplementary
Commercial/mixed use	673	652 (590 office, 62 retail )
Hotel	146	156 *
Residential	771	1,166
Parkland public car park	300	300
Total on site	1,887	2,274
On-street (including short stay on Hickson Road)	400	400
Public buildings	16	16
Ports parking (retained)	140	0 **
<b>Grand Total</b>	<b>2,446</b>	<b>2,690</b>

\* includes parking related to the serviced apartments

\*\* no parking for Ports due to relocation of the permanent Port facility off Barangaroo

The rates for all car park spaces are unchanged from TMAP September 2008 and are based on the conditions of consent for the Approved Concept Plan and the City of Sydney LEP2005 (where applicable).

The commercial car parking rate is 1 space per 600m<sup>2</sup> GFA.

The residential car parking rate is as per Table 20 below. A detailed assessment of the residential car parking has been carried out based on an apartment mix that relates to the current concept planning.

**Table 20 Residential parking rates**

TMAP September 2008				TMAP Supplementary			
Residential	Parking Rate <sup>7</sup>	Number of units Blocks 1 - 8	Parking Spaces	Parking Rate <sup>8</sup>	Number of units		Parking Spaces
					Blocks 1 - 4	Blocks 5- 8 <sup>9</sup>	
Bedsitter	0.25	82	21	0.5	0	26	13
1 bedroom	0.5	205	103	0.5	174	65	120
2 bedroom	1.2	349	419	1.2	458	113	685
3 bedroom	2.0	72	144	2.0	129	24	306
3+ bedroom	2.0	42	84	2.0	9	12	42
<b>Total</b>		<b>750</b>	<b>771</b>		<b>794</b>	<b>240</b>	<b>1,166</b>

As a result of a reduction in the size of the hotel there has been a corresponding reduction to the number of car spaces directly related to the hotel. The serviced apartments were not included in TMAP September 2008 and hence are an addition to the mix. The rates are based on City of Sydney LEP2005 and are summarised in Table 21 below.

**Table 21 Hotel and Serviced Apartment parking rates**

Hotel	Rate	TMAP September 2008		TMAP Supplementary	
		Number of rooms/sqm	parking spaces	Number of rooms	parking spaces
Rooms	0.2	730	146	204	41
Function Rooms	4/100sqm	-	-	1,880	75
Serviced Apartments	0.5/1 bed	-	-	20	10
	1.2/2 bed			25	30
<b>Total Spaces</b>			<b>146</b>		<b>156</b>

Retail parking is based on the City of Sydney LEP2005 rates. Based on a total FSA of 503,240m<sup>2</sup> and a site area of 45,100m<sup>2</sup>, the 33,777m<sup>2</sup> of retail can provide up to 59 car spaces. Stage 2 adds a further 3 car spaces.

The same assumptions and therefore parking supply numbers were used as in TMAP September 2008 for park land off street car park, on street parking provision and public buildings with the ports parking removed due to the relocation of this facility off the Barangaroo site.

#### 4.2.1 Car Park Management

The provision of car parking will be staged depending on the timing of the various components of the development. It is likely that various elements of car parking areas are managed in differing forms. The residential cars are likely to be managed through the owners corporation and transferred with individual apartments. The residential car park will

<sup>7</sup> City of Sydney car parking rates

<sup>8</sup> Barangaroo Concept Plan – Instrument of Approval (MOD1)

<sup>9</sup> Split based on TMAP September 2008. Number of apartments based on an average 100sqm apartment GFA

have controlled access. The commercial and retail car parking is likely to be managed as a common pool by a single operator. The management of the hotel cars will be subject to further discussions with the hotel owner and could be operated independently or pooled with the commercial and retail cars.

The management of the commercial and retail pool of parking will be on a 24 hour 7 day per week basis and include the provision for public parking. It is envisaged that this common pool will be used by the public particularly during weekends and after normal business hours.

Various initiatives may be implemented in relation to the car parking on the site including the provision of at least 16 car share spaces to be made available for the public as well as a significant allocation of small vehicle spaces. The provision for differential parking charges for small, medium and large vehicle emission categories will also be explored.

### 4.3 Pedestrian Linkages

#### 4.3.1 Pedestrian Context and Needs

Pedestrian context and needs are summarised in the following table.

**Table 22 Pedestrian Context**

<b>TMAP September 2008</b>	<b>TMAP Supplementary</b>
High levels of pedestrian access are essential to achieving the low mode share for car travel and the high mode share for rail travel that are critical to making Barangaroo's development successful.	<b>Unchanged</b>
The committed mode share target for "Other" (which includes pedestrians and cyclists) is 12% for the JTW to Barangaroo.	<b>Unchanged</b>

### 4.3.2 Pedestrian Strategy

The pedestrian strategy is summarised in the following table.

**Table 23 Pedestrian strategy**

TMAP September 2008	TMAP Supplementary
<p>To support Barangaroo's connectivity with the rest of the CBD, there will need to be new pedestrian infrastructure and designated routes providing attractive and legible links focusing on Wynyard Park and Station, the CBD north of Bathurst Street, Millers Point, the Rocks and Circular Quay, and the wider pedestrian network within and to the CBD.</p>	<p><b>Unchanged</b></p> <p>The following further define the pedestrian linkages proposed in the vicinity of the site.</p> <p><i>Barangaroo Pedestrian Link:</i> A new high-volume pedestrian tunnel from Barangaroo to the frequent rail and bus services at Wynyard Station and George Street.</p> <p><i>City Walk Wynyard Connection:</i> A new pedestrian link bridge over Sussex Street/Hickson Road located close to the intersection of Hickson Road and Napoleon Street which links into the Barangaroo Pedestrian Link.</p> <p><i>189 Kent Connection:</i> A new pedestrian link bridge over Hickson Road to be constructed and coordinated with the future development of 189 Kent Street.</p> <p><i>Maritime Staircase:</i> A new staircase at the junction of Napoleon Street and Hickson Road which connects to the Maritime Centre providing a link to Kent Street.</p> <p><i>Other:</i> Foreshore walkways and links to adjoining areas such as King Street Wharf and Millers Point will be essential.</p>
<p>For AM and PM peak period trips by workers at Barangaroo, the main pedestrian desire lines are from the commercial development in the southern end of the site and Wynyard public transport hub. The main desire lines will change in the midday peak more towards mid-city areas. Outside peak periods, pedestrians will focus more strongly on access to Walsh Bay and King Street wharf areas as well as Wynyard and mid-city.</p>	<p><b>Unchanged</b></p>
<p>Barangaroo will generate around 33,000 users daily. Over the whole year, and allowing for major events, Barangaroo could attract some 11 million people.</p>	<p>Based on the proposed GFA mix and the rates described in Table 4, a slight increase to 34,000 users daily is expected.</p>

<b>TMAP September 2008</b>	<b>TMAP Supplementary</b>
In the PM peak period of the journey to work, the busiest part of the weekday, the average hourly pedestrian generation by Barangaroo will be 11,163. The majority – 4,322 people - will walk between Wynyard and the southern part of the Barangaroo precinct where employment will be concentrated;	<b>Unchanged</b>  Minor variations in the population numbers as a result of GFA changes (refer Table 8 )
During major events, the highest pedestrian volumes will be between Wynyard and the Headland Park.	<b>Unchanged</b>
Between the Rocks and Circular Quay and the middle of Barangaroo, significant pedestrian volumes are likely to be generated;	<b>Unchanged</b>
The Barangaroo - Circular Quay route can also serve as a major pedestrian thoroughfare during major events, as demonstrated during World Youth Day 2008	<b>Unchanged</b>
The “Do Nothing” Option would leave pedestrian infrastructure in its current state. People with mobility impairments would face major constraints, arising from the undulating terrain, excessive gradients and poor quality stairs. The main pedestrian route between Wynyard and Barangaroo will lack sufficient capacity, causing congestion to the point of extremely restricted movements. Without grade separation, the safety of pedestrians will be impaired by conflict with traffic, and vehicle flow capacities will be reduced. The “do nothing” option will suffer also from low amenity and poor legibility.	<b>Unchanged</b>

TMAP September 2008	TMAP Supplementary
<p>Upper level connections are proposed in the Consolidated Concept Plan at Bull Street-Jenkins Street, and Margaret Street West – Napoleon and Margaret Street, and a connection to Clyne Reserve in the north. These facilities could ease access for the mobility impaired and provide increased capacity with acceptable levels of service. Safety and legibility would be improved and conflict between pedestrians and vehicles reduced.</p> <p>However, there are concerns about the amenity impacts arising from the high level connections in terms of visual intrusions, and reduced activity on ground level routes. An additional upper level connection from High Street is recommended to provide a step free link between Observatory Hill and Barangaroo for pedestrians and cyclists.</p>	<p><b>Unchanged</b></p> <p>The following further define the pedestrian linkages proposed in the vicinity of the site.</p> <p><i>Barangaroo Pedestrian Link:</i> A new high-volume pedestrian tunnel from Barangaroo to the frequent rail and bus services at Wynyard Station and George Street.</p> <p><i>City Walk Wynyard Connection:</i> A new pedestrian link bridge over Sussex Street/Hickson Road located close to the intersection of Hickson Road and Napoleon Street which links into the Barangaroo Pedestrian Link.</p> <p><i>189 Kent Connection:</i> A new pedestrian link bridge over Hickson Road to be constructed and coordinated with the future development of 189 Kent Street.</p> <p><i>Maritime Staircase:</i> A new staircase at the junction of Napoleon Street and Hickson Road which connects to the Maritime Centre providing a link to Kent Street.</p>

#### 4.3.3 Wynyard-Barangaroo Link

The Wynyard-Barangaroo Link analysis connection is summarised in the following table.

**Table 24 Wynyard-Barangaroo Link**

TMAP September 2008	TMAP Supplementary
Existing pedestrian links for Barangaroo are inadequate and will not allow the transport mode share targets to be achieved;	<b>Unchanged</b>
The main pedestrian route between the precinct and the Wynyard transport hub will require a major upgrade with new infrastructure;	<b>Unchanged</b>
Design and delivery of the pedestrian tunnel to Wynyard are to be undertaken by the NSW Government.	<p><b>Unchanged</b></p> <p>The NSW Government committed \$20 million of funding in the 2010-2011 budget towards the design and construction of the Barangaroo Pedestrian Link.</p>
A possible extension of the tunnel to Australia Square and connection with the proposed Metro station will be considered in planning.	<p><b>Unchanged</b></p> <p>Metro scheme has been postponed and is no longer included in the Metropolitan Transport Plan.</p>
The Barangaroo South RFDP Proponents are expected to consider upper level connection(s) over Hickson Road between existing streets and Barangaroo.	<b>Unchanged</b>

#### 4.3.3.1 Barangaroo Pedestrian Link (BPL)

The BPL between Barangaroo and Wynyard is considered critical in ensuring safe and efficient pedestrian movements and transport integration between Barangaroo and the transport hub of Wynyard. The proposed route for the BPL is shown in Figure 5<sup>10</sup> below.

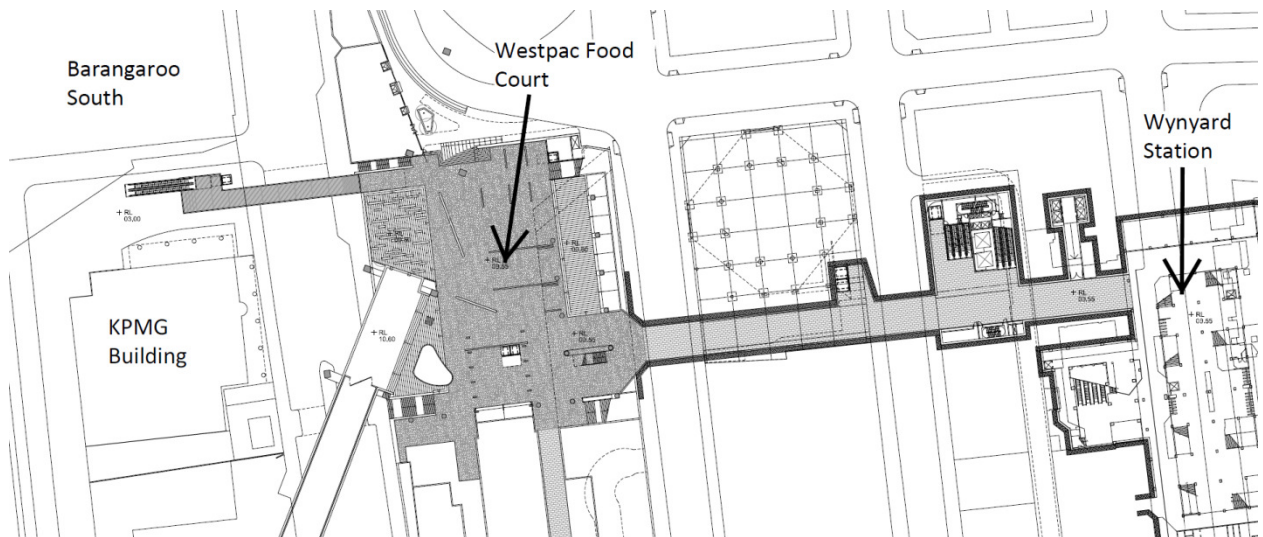


Figure 5 Barangaroo Pedestrian Link

#### 4.4 Heavy and Metro Rail

Access to Barangaroo by rail is summarised in the following table

Table 25 Heavy rail

TMAP September 2008	TMAP Supplementary
63% of JTW trips by rail and serving other purposes including retail, recreation and tourism	<b>Unchanged</b>
Existing heavy rail network	<b>Unchanged</b>
The proposed North West Metro rail line and services;	<b>Unchanged</b> North West Metro scheme has been postponed.
Wynyard station precinct, where both heavy rail and Metro services will be accessed.	<b>Unchanged</b>
	The Metropolitan Transport Plan discusses the following heavy rail projects: City Relief Line, Western Express Services, North West Rail Link, South West Rail Link.

<sup>10</sup> Derived from Barangaroo Pedestrian Link Supplement to Submissions Report dated 4 December 2009 (refer Figure 2.1).



#### 4.4.1 Heavy Rail

The Metropolitan Transport Plan discusses the following heavy rail projects: City Relief Line, Western Express Services, North West Rail Link, South West Rail Link.

##### 4.4.1.1 Western Express Project

The City Relief Line and Western Express projects shown in Figure 6 will introduce express train services from Richmond, Penrith, Blacktown and Parramatta. A new five kilometre priority tunnel will be built to separate western services from inner city trains to provide shorter journey times. New platforms will be built at Redfern, Central, Town Hall and Wynyard to cater for these new services. There will be eight new platforms, each long enough to accommodate 12 car trains, between Redfern and Wynyard. Trains will initially be 10 cars long, with capacity for future growth. Ultimately there will be more than 5,000 extra seats from Parramatta in the peak hour.

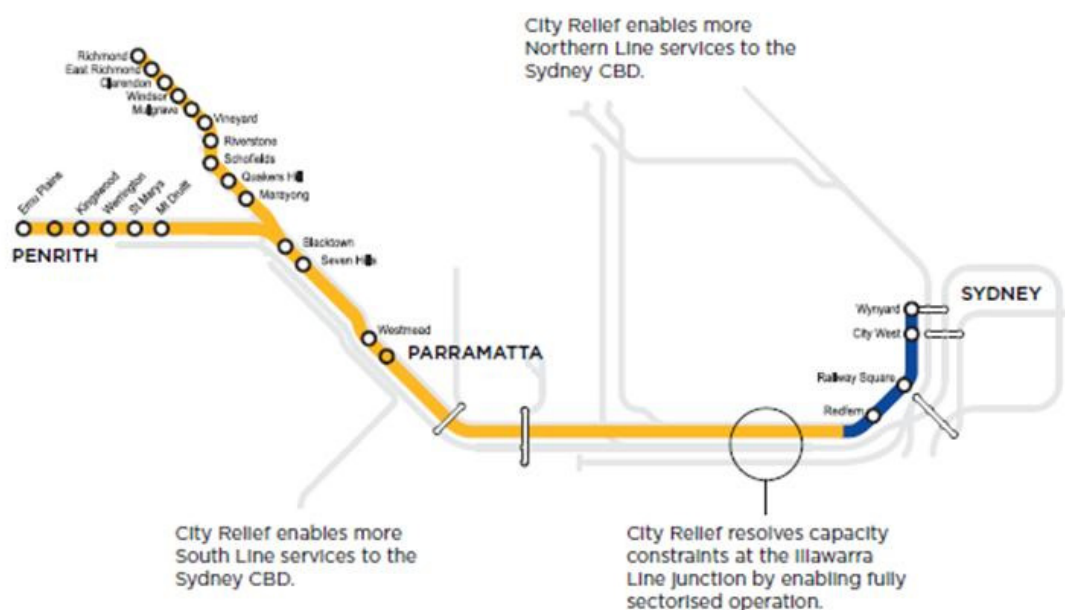


Figure 6 Western express project (City Relief Line and Western Express Services)

##### 4.4.1.2 North West and South West Rail Link

The 23 kilometre North West Rail Link with six new underground stations at Franklin Road (Cherrybrook), Castle Hill, Hills Centre, Norwest Business Park, Burns Road and Rouse Hill connect regional commuter car parks and bus interchanges and offer a direct route connecting population centres and strategic locations between the north west of Sydney, Macquarie Park and the CBD. On current estimates it will, by 2024, carry 18.7 million passengers each year. The project will be supported by the quadruplication of the line from St Leonards to Chatswood, allowing a seamless connection into the existing rail network.

The 11 kilometre twin track South West Rail Link will connect new growth areas from Glenfield to Leppington, via Edmondson Park, by 2016.



Figure 7 North West and South West Rail Link

#### 4.4.2 Wynyard Station

The Wynyard Station analysis is summarised in the following table and below the table.

Table 26 Wynyard Station

TMAP September 2008	TMAP Supplementary
RailCorp is investigating undertaking an upgrade of Wynyard station in the future, in conjunction with the Ministry of Transport. The upgrade aims to reduce overcrowding and improve pedestrian flows, and provide for better integration of the station with development in the immediate surrounds.	Unchanged
The <i>State Infrastructure Strategy 2008-2018</i> identified investigations into the future redevelopment of Wynyard station. This redevelopment will take into account long term passenger demand and needs at this station. It will therefore address capacity issues as well as pedestrian connectivity in the immediate surrounds of the station.	Unchanged

A Compendium of CityRail Travel Statistics – Sixth Edition, June 2008 states that Wynyard in the AM peak period (6am to 9.30am) handles 3,600 departures and 38,280 arrivals and in the PM peak period (3pm to 6.30pm) handles 34,290 departures and 4,900 arrivals. The 63% target for JTW for rail means that approximately 12,176 of Barangaroo employees will travel to work by rail. The assumptions from Modified Concept Plan Traffic Report July 2008 from Section 4.4, that 80% of commuters travel in the 3 hour period, brings down the number of train commuters to 9,741. From a survey undertaken of Macquarie Bank employees who have recently moved to 1 Shelley Street, King Street Wharf, the employees who travel by train get off at the following stations:

**Table 27 Train commuters alighting at CBD rail stations**

CBD rail station	Commuters alighting in the AM peak
Wynyard	76.7%
Town Hall	0.4%
Martin Place	22.4%
Circular Quay	0.0%
Museum	0.0%
St James	0.2%
Central	0.4%

Applying the above split and assumptions the peak period would generate an additional 7,471 (76.7% of 9,741) train commuters alighting at Wynyard (4,557 in a peak hour on the assumption that 61% of peak period travel is undertaken in the peak hour). This would mean an increase of 20% of current arrivals at Wynyard in the AM peak. Current capacity of CityRail trains is around 1200 which would mean that approximately 4 additional trains in the peak hour would be required to accommodate the extra demand.

#### 4.4.3 North West Metro

The Metro scheme has been postponed by the NSW Government.

### 4.5 Bus Services

Transport NSW will be undertaking a Transport Study to consider alternative light rail routes and services along with the required changes to the public and private transport networks in the City as a result of light rail planning. This study will provide information on bus and light rail movements pertinent to Barangaroo. Future development of the Barangaroo TMAP will respond to these changes.

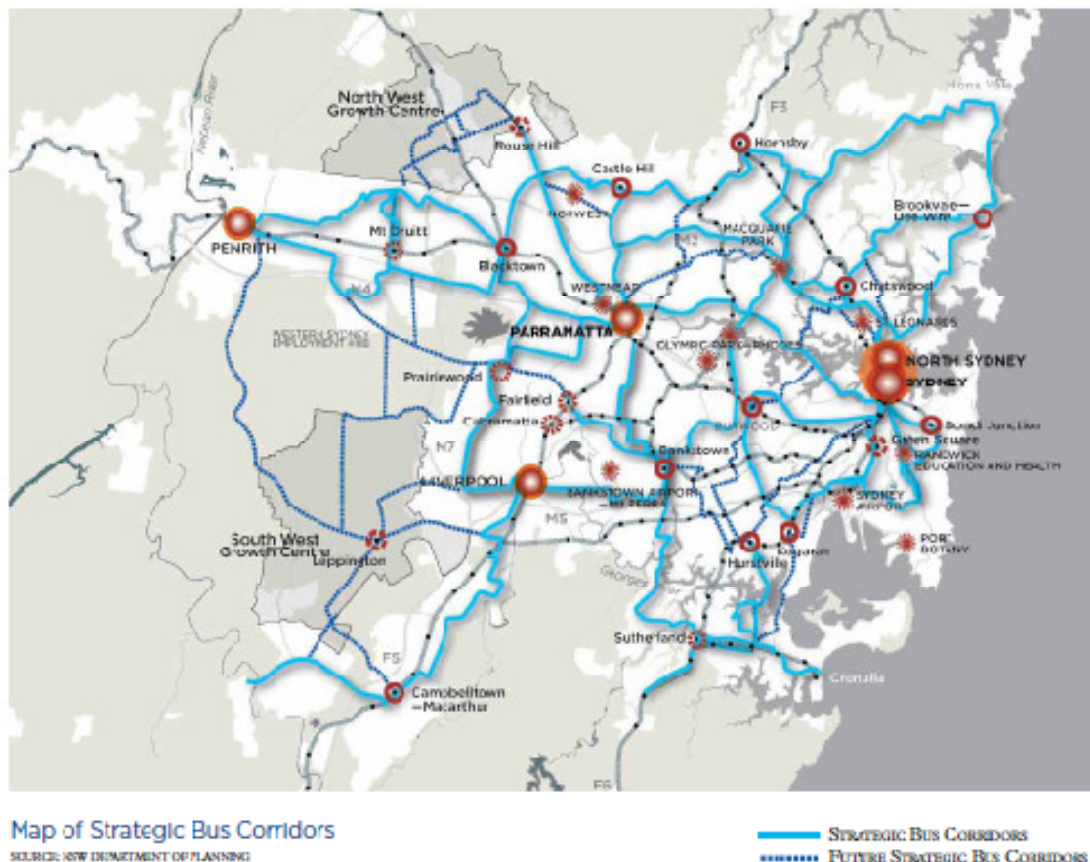
The Bus services are summarised in the following table.

**Table 28 Bus services**

TMAP September 2008	TMAP Supplementary
<p>CBD Bus Strategy:</p> <ul style="list-style-type: none"> <li>Standardisation of the operating hours of all existing CBD bus lanes to 6.00am to 10.00am and 3.00pm to 8.00pm;</li> <li>Provision of a new mid city interchange in the Town Hall precinct including enhanced bus stop facilities in Park Street and York Street;</li> <li>Development of a new layover facility on the apron of the Domain Carpark;</li> </ul>	<p><b>Unchanged</b></p> <p>Transport Services in the Sydney CBD will be reviewed by Transport NSW to respond to and complement the proposed introduction of Light Rail into the northern section of the CBD. Future development of the Barangaroo TMAP will respond to these changes.</p>

TMAP September 2008	TMAP Supplementary
<ul style="list-style-type: none"> <li>• Staged introduction of service changes on a number of routes to take advantage of the new interchange and bus layover area, including some new services and extension of some routes through the city;</li> <li>• In the future, removal of services from Castlereagh Street and consolidation in Elizabeth and George Streets; additional through-routing of services; reduction in layovers at Circular Quay.</li> </ul>	
<p>Bus service alterations for Barangaroo:</p> <ul style="list-style-type: none"> <li>• Existing services on routes 412/413 to King Street Wharf will be rerouted via Barangaroo;</li> <li>• Eastern Suburbs bus passengers will be able to access Barangaroo via an interchange in the Park Street/Elizabeth Street vicinity, where the Eastern Suburbs services will overlap with services to/from Epping/Lane Cove. The Epping/Lane Cove services have stops at Wynyard (York and Clarence Streets) which are conveniently located for passengers to access Barangaroo. The Epping/Lane Cove services will be through-routed to the new Domain layover area via the Park Street interchange;</li> <li>• Existing services on routes 373/377 from Coogee and Maroubra will be extended to Barangaroo to provide direct services without interchange; interchange between these extended services and any other Elizabeth Street route will further extend access to Barangaroo;</li> <li>• Existing services 422-428 which operate via King Street Newtown, City Road and George Street will be rerouted to serve Barangaroo.</li> </ul>	<p><b>Unchanged</b></p> <p>Bus services to Barangaroo will respond to the new Sydney CBD Transport Strategy to be prepared by Transport NSW.</p>
<p>The proposed bus service strategy for Barangaroo South has been included in the traffic modelling with no adverse impacts identified.</p>	<p><b>Unchanged</b></p>
<p>Layover requirements for the main proposed changes and potential layover areas close to Barangaroo have been assessed and three possibilities identified (in Argyle Street Millers Point, the King Street Wharf Coach Area and in Hickson Road). An on-street layover accommodating up to 7 buses on either or both sides of Hickson Road near Munn Street is recommended on the basis of bus operating cost impacts, space availability and impact on other land uses.</p>	<p><b>Unchanged</b></p>

The Metropolitan Transport Plan discusses the introduction of an additional 1000 buses throughout Sydney and completing all strategic bus corridors by 2014. The existing and planned strategic bus corridors are shown on Figure 8.



**Figure 8 Strategic Bus Corridors**

The proposed bus frequency to Barangaroo is presented in Table 29.

**Table 29 Proposed Bus service frequency to Barangaroo**

Bus service	AM 7.45-8.45am		PM 5.00-6.00pm	
	in	out	in	out
412/413	7	5	6	7
373/377	12	6	7	12
422-428	20	16	14	20
Total	39	27	27	39

The JTW base target for Barangaroo is 18% by bus (modified from 20% to 18% by bus and 2% by light rail). This means that approximately 3,479 people would be using the bus to get to work at Barangaroo. Based on the assumption from Modified Concept Plan Traffic Report July 2008 Section 4.4, that 80% of commuters travel in the 3 hour peak period and 61% of them travel in the peak hour, it is estimated that 1,698 people would travel by bus in the peak hour. Based on the capacity of a 14.5m bus of 50 people per bus this means more than 34 buses per hour are required. This aligns with the proposed bus service frequencies to Barangaroo.



## 4.6 Active Waterfront

### 4.6.1 An Active Waterfront

The active water front matters are summarised in Table 30.

**Table 30 Active waterfront**

TMAP September 2008	TMAP Supplementary
An active waterfront will boost Barangaroo's value as a living, working, tourism and recreational precinct.	Unchanged
There will also be opportunities for complementary water-based activities, including leisure ship berthing, water-based public transport, and special events such as tall ship visits. Improving Barangaroo's accessibility through improved transport services and facilities will be an integral part of an active waterfront.	Unchanged

### 4.6.2 Proposed Waterfront Activities

The proposed waterfront activities will need to be reviewed in respect of cruise ships, yachts and commuter ferries.

### 4.6.3 Supporting Infrastructure – Other Facilities

There is a need to establish the waterfront activities and the facilities for maritime vessels and the interrelationship between land and water based activities.

## 4.7 Cycling

The TMAP September 2008 concluded that measures to increase the use of cycling need to consider the local network and connections to the Barangaroo site. These requirements are still current.

A cycling strategy for the entire site which responds to the external connections and the various cycling activities anticipated is being developed to inform the ground plane design development. The City of Sydney has recently commenced its roll out of a cycleway network where dedicated cycle lanes are being constructed throughout the CBD as part of its Cycle Strategy and Action Plan 2007-2017<sup>11</sup>. The Barangaroo cycling strategy will include integration with this cycleway network.

<sup>11</sup> Refer City of Sydney's publication entitled Cycle Strategy and Action Plan 2007-2017, City of Villages dated February 2007.

## 4.8 Light Rail

The light rail extension was announced in the Metropolitan Transport Plan. The proposed light rail system will service the inner city via two lines: an extension from Lilyfield to Dulwich Hill and from Circular Quay to Haymarket, via Barangaroo. The proposed light rail alignments are shown on Figure 9. A feasibility study is currently underway for the extension of the light rail.

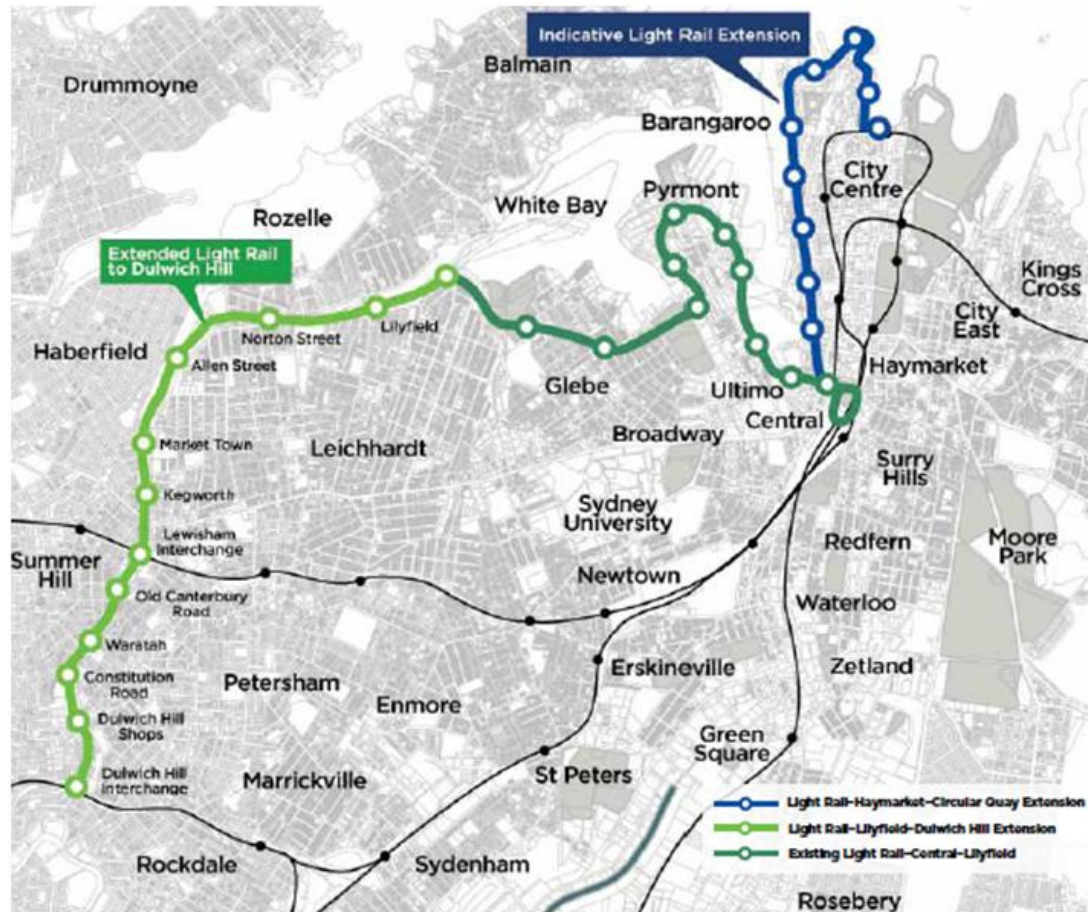


Figure 9 Proposed Light rail extensions

## 4.9 Other (Taxis and Coaches)

Appropriate facilities for taxis, coaches and service vehicles should be provided for the Barangaroo site.

## 5 Summary of Requirements

### 5.1 Transport and Accessibility Framework

The transport and accessibility framework includes: overarching requirements, detailed requirements and timing and funding of relevant infrastructure.

### 5.2 Overarching Requirements

The main requirement is meeting the mode split target for journey to work trips with a very low car use of 4% and high use of public transport. The largest challenge will be meeting the 63% base mode share for rail which will require the provision of a safe and efficient pedestrian connection between the site and Wynyard station. Good cycling and pedestrian access is essential. The Barangaroo development should be a vibrant place with active water front, with opportunity for multi-modal interchange between bus, ferry and rail services.

### 5.3 Detailed Requirements

The detailed requirements in principle remain as they were outlined in TMAP September 2008 as shown below in Table 31.

**Table 31 Detailed Requirements**

TMAP September 2008	TMAP Supplementary
<p><b>Road network</b></p> <ul style="list-style-type: none"> <li>• The mode share targets including the low share for car travel must be implemented;</li> <li>• Supporting policies including stringent parking requirements must be provided;</li> <li>• The proposed road transport infrastructure must be based on the road network modelling;</li> <li>• The proposed network must provide cohesive connections from Barangaroo to CBD streets and regional roads with minimal alterations to the existing network;</li> <li>• Timely delivery and funding of the required road and intersection upgrades is essential.</li> </ul> <p>All proposed road network changes and improvements are subject to approval by the RTA.</p>	<p><b>Unchanged</b></p>



TMAP September 2008	TMAP Supplementary
<p><b>Car parking</b></p> <ul style="list-style-type: none"> <li>• Limitations on parking supply are crucial to achieving the mode share targets;</li> <li>• The parking provision rates adopted in this TMAP based on an assumed land use mix are to be applied;</li> <li>• On-street parking supply must be short stay only and limited in number.</li> <li>• Limited parking is to be provided at Headland Park by the Foreshore Authority to cater for leisure and tourist requirements.</li> </ul>	<p><b>Unchanged</b></p>
<p><b>Pedestrian connections</b></p> <ul style="list-style-type: none"> <li>• Pedestrian links must be upgraded for transport mode share targets to be achieved;</li> <li>• The main route to Wynyard requires a major upgrade with new infrastructure;</li> <li>• Design and delivery of the pedestrian tunnel to Wynyard is to be undertaken by the NSW Government.</li> <li>• A possible extension of the tunnel to Australia Square and connection with the new Metro station will be considered in planning.</li> <li>• Upper level grade separated connection(s) between existing streets and Barangaroo should be considered.</li> </ul>	<p><b>Unchanged</b></p>
<p><b>Rail services</b></p> <ul style="list-style-type: none"> <li>• The proposed North West Metro Scheduled to start in 2017 and will support the achievement of the mode share targets;</li> <li>• An integrated transport hub comprising the rail systems, bus services and the Wynyard - Barangaroo pedestrian link will need to be created.</li> </ul>	<p><b>Unchanged</b>, with the exception of the North West Metro which has been postponed indefinitely by the NSW Government.</p>
<p><b>Bus services</b></p> <ul style="list-style-type: none"> <li>• Barangaroo will receive substantially upgraded bus service levels including direct services to enable the mode share targets to be achieved;</li> <li>• Implementation of changes to bus routes, including traffic management and bus infrastructure needs to be addressed;</li> <li>• Detailed design of development must accommodate bus routes, stops, driver facility and a layover.</li> </ul>	<p><b>Unchanged</b></p>

<b>TMAP September 2008</b>	<b>TMAP Supplementary</b>
<b>Active waterfront</b> <ul style="list-style-type: none"> <li>The waterfront at Barangaroo will be activated by facilities for maritime vessels and the interrelationship between land and water based activities.</li> </ul>	<b>Unchanged</b>
<b>Cycling</b> <ul style="list-style-type: none"> <li>Measures to be taken to increase the use of cycling to ensure mode share targets are met;</li> <li>The inclusion of connections to local cycle networks, and CBD and regional connections;</li> <li>The inclusion of facilities for cyclists within the development in Barangaroo.</li> </ul>	<b>Unchanged</b>
<b>Light rail</b> <ul style="list-style-type: none"> <li>Light rail is not essential to achieving Barangaroo's mode share targets;</li> <li>Light rail is a matter for further NSW Government investigation.</li> </ul>	<b>Unchanged</b>  However, light rail will share the mode split target with buses (2% light rail and 18% buses). With the future extension this could increase mode share.
<b>Coaches, taxis and service vehicles</b> <ul style="list-style-type: none"> <li>Include appropriate provision of facilities for taxis, coaches and service vehicles.</li> </ul>	<b>Unchanged</b>
<b>Travel Planning</b> <ul style="list-style-type: none"> <li>Green Travel Plans for employees and residents for both intra and inter-site travel needs to be considered.</li> </ul>	<b>Unchanged</b>
	<b>Ferry</b>  With the provision of additional ferry services to the Barangaroo Wharf this could increase mode share.

#### 5.4 Aspirational Mode Share Targets

An improvement to the mode share targets could be contemplated subject to further consultation with authorities and with the introduction and confirmation of additional public transport initiatives. In particular, the introduction of increased ferry services and the Light Rail would create a mode shift away from bus and train.

#### 5.5 Timing and Funding

The timing of transport infrastructure construction and availability, initiation of services and implementation of supporting policies is critical to achieving the accessibility for Barangaroo. The allocation to a variety of initiatives will be funded from government with the exception of the commitments made by Lend Lease under their Project Development Agreement with the Barangaroo Delivery Authority.

Appendix A

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**Barangaroo Transport  
Management and  
Accessibility Plan  
(TMAP) for Request for  
Detailed Proposal,  
Stage 1 - September  
2008**



# Barangaroo Transport Management and Accessibility Plan For Request for Detailed Proposal Stage 1

September 2008

## Executive Summary

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Barangaroo is a major urban renewal project on the harbour foreshore adjacent to Sydney's Central Business District (CBD). Half of Barangaroo's 22 hectares will become a major new precinct for commerce, retail, tourism and inner city living.

The NSW Government aims to make Barangaroo an international benchmark for sustainable waterfront urban renewal. How residents, workers and visitors travel to the precinct is critical to the precinct's economic and environmental sustainability.

Planning for Barangaroo to date includes the development of a Concept Plan that provides for a public recreation area and a mixed use area. The initial concept approval process has been completed and new zonings applied to the land. An application to modify the approved Concept Plan has been submitted to increase the allowable commercial floor area by between 50,000m<sup>2</sup> and 120,000 m<sup>2</sup>, giving a total maximum GFA of 508,300 m<sup>2</sup> in the mixed use zone.

This Transport Management and Accessibility Plan (TMAP) presents the NSW Government's framework for managing transport and access, the outcomes to be achieved and the service principles adopted for the southern mixed use and public domain precinct of Barangaroo known as Stage 1. Key transport objectives include very high mode shares for public transport, walking and cycling for people travelling to and from Barangaroo, very low use of cars, and restricted parking supply.

The Request for Detailed Proposals (RFDP) for Barangaroo Stage 1, will include this TMAP to demonstrate to shortlisted development proponents the planning and delivery of transport infrastructure and services to meet the Government's objectives for the precinct. The Stage 1 Proponents are expected to address the detailed requirements for each transport mode for Barangaroo Stage 1 within an integrated transport and land use framework.

As part of the planning process for Barangaroo, NSW Government agencies have completed a range of investigations and assessments of transport and access matters. These have covered and informed the requirements of the NSW Government's service principles for Barangaroo's development, the development concept, and the preferences for transport and access infrastructure and services.

In summary the main requirements arising from the investigations are:

- Road network – adequate access while not degrading current CBD traffic performance;
- Parking – restricted on-site supply to ensure the mode share targets are achieved;
- Pedestrians – a dedicated tunnel link to Wynyard to support major access on foot as well as some surface routes;
- Rail – integration with the proposed North West Metro and existing rail services at Wynyard;
- Buses – new services to Barangaroo, including supporting infrastructure;
- Waterfront – an active harbour frontage;
- Cycling – new bike paths and facilities to encourage cycling in and to the precinct.

Timing, funding and costs of infrastructure and services for transport and access are important to the success of Barangaroo Stage 1 and the objectives for the development. These matters are intended to be addressed where relevant in the Stage 1 Proponent responses and in response to this TMAP. Proponent responses to the RFDP will provide guidance on timing and funding matters for the Barangaroo Stage 1 development.

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# 1 Introduction and Purpose

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## Introduction

Barangaroo is a major urban renewal project in the heart of Sydney. It will directly connect the harbour foreshore to the Central Business District (CBD).

Half of Barangaroo's 22 hectares will become waterfront parklands, and the other half a major new precinct for commerce, retail, tourism and inner city living.

The NSW Government aims to make Barangaroo an international benchmark for sustainable waterfront urban renewal. Environmental sustainability, design excellence and economic benefits will be core principles in its development.

## Purpose

The scale of and aspirations for Barangaroo's development require the best available practice in design and construction and the best supporting infrastructure and services.

In particular Barangaroo's accessibility, and how Barangaroo's residents, workers and visitors travel are critical to the economic and environmental sustainability of the precinct, and its overall success.

A Transport Management and Accessibility Plan (TMAP) is an accepted methodology to manage the travel aspects of major new urban development. A TMAP provides the assessment of and the requirements, standards and outcomes for transport and accessibility, and how these will be delivered and achieved. The TMAP methodology embodies integrated, multi-modal transport and land use planning, and emphasises ease of access for people, not private cars.

The purpose of this TMAP is to present the transport and accessibility outcomes required by the NSW Government for the development of Barangaroo and the assessments that have enabled identification of these requirements.

This is a preliminary TMAP in that it provides the framework for further work that forms part of the Stage 1 RFDP process. Each Proponent proposal in response to the Stage 1 RFDP must demonstrate the planning and delivery of relevant transport infrastructure and services to meet the objectives of the development.

## 2 Barangaroo Development

### 2.1 Background

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Formerly East Darling Harbour, Barangaroo is a new urban precinct located on the foreshore to the north west of Sydney's CBD. Barangaroo will provide a direct connection between Sydney's harbour and the city centre. It will also extend Sydney's cultural setting and provide a major new headland park.

Sydney is Australia's global gateway. It is home to most of the nation's top tier companies and the regional headquarters for multi-national corporations in Australia. It is the nation's premier tourism destination. The development of Barangaroo will build on this foundation and boost the economic growth and prosperity of Sydney and NSW.

Development of up to 508,000 square metres of floor space (subject to approval) for commerce, retail, tourism and inner city living will take up the south eastern wedge of Barangaroo's 22 hectares. In the precinct's northern half, extensive parklands will be created for the enjoyment of locals and visitors.

The Stage 1 development offer comprises four development blocks, adjoining Public Domain areas and an active waterfront. The supporting infrastructure must be provided and some land remediation is required.

It should be noted that the delivery of the Headland Park, remaining Public Domain and the residual development zone is separate from the Stage 1 RFDP process.



## 2.2 The Consolidated Concept Plan

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### 2.2.1 General Description and Comment

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Following an earlier design competition, in 2006 the selected winners worked with NSW Government agencies to develop a Concept Plan for the Barangaroo precinct. This process included an Environmental Assessment for the Concept Plan addressing the requirements issued by the Director General of the Department of Planning. The Minister for Planning approved the Barangaroo Concept Plan subject to modifications on 9 February 2007.

A Consolidated Concept Plan and Environmental Assessment (CCP) was subsequently issued in October 2007. It provided a single integrated document that brought together the concept plan and modifications, the terms of approval, the environmental assessment requirements and responses, and the Statement of Commitments for the Concept Plan. It also addressed the suitability of the site and the implications of the proposed land uses, as required by the planning legislation.

The CCP defined the project principles and established the detailed planning framework which will be used by the NSW Government to assess future development proposals. The CCP indicated the required urban structure including the development block pattern and the street layout in the mixed use zone, and the extent of the public domain and headland park. It also set out requirements for built form, infrastructure including transport; and implementation.

In the CCP the development comprised a maximum 388,300m<sup>2</sup> of gross floor area (GFA), and was envisaged to include:

- A maximum of 97,075m<sup>2</sup> and a minimum of 58,245m<sup>2</sup> residential development;
- A maximum of 50,000m<sup>2</sup> for tourism uses;
- A maximum of 39,000m<sup>2</sup> for retail uses; and
- A minimum of 2,000m<sup>2</sup> for community uses.

The open space-recreation zone included a further 11,500m<sup>2</sup> of gross floor area.

On 12 October 2007, Schedule 3 of SEPP (Major Projects) 2005 was amended to recognise the state significance of the Barangaroo site. The amendment rezoned the precinct and applied a framework of other statutory planning requirements to its future development, including building height, gross floor area restrictions and heritage conservation.

## 2.2.2 Statement of Commitments and Conditions of Consent

Transport and accessibility issues are integral to the environmental assessment of Barangaroo. Issues identified in the Director General's assessment requirements included traffic, public transport, parking, coaches, cruise ship servicing, potential future specialist services, and pedestrian and bicycle access. These were addressed in the initial Transport Report for the Concept Plan prepared in 2006. (Appendix A)

The Transport Report modelled a transport scenario for Barangaroo to assess traffic generated by the development and other impacts. The resulting Transport Concept Plan was based on a restrictive parking supply policy and access to Barangaroo primarily by public transport services, walking and cycling.

Recommendations from the transport and other assessments of the Concept Plan were incorporated into the Statement of Commitments for the Barangaroo Concept Plan prepared in January 2007. These commitments were endorsed by the Minister for Planning in the Concept Plan determination.

In respect of transport and access, the Statement of Commitments includes:

- As part of the provision and financing of infrastructure, preparation of a Transport Management and Access Plan to scope and cost the necessary infrastructure, identify timing and staging, identify supporting policy initiatives, detail funding mechanism, and facilitate planning agreements covering infrastructure provision;
- In particular the TMAP is to model area-wide traffic impacts and identify traffic networks and management, public transport opportunities and constraints, local and regional infrastructure improvements and timing, bus services and management strategies, off-site pedestrian links to surrounding areas and public transport facilities, ferry access requirements, and parking and servicing policy;
- As part of the Public Domain Plan, provision of internal pedestrian circulation and bicycle lanes and routes; and
- As part of Ecologically Sustainable Development (ESD), provision of sufficient public transport to achieve points under the public transport credit for Green Star Rating Tools for commercial and residential buildings.

The Conditions of Consent for the modified Concept Plan Determination identified the floor area components and parking requirements for Barangaroo. The conditions also imposed requirements to be met at future stages of the project's implementation additional to those included within the Statement of Commitments. The conditions reiterated the requirement for a Transport Management and Accessibility Plan addressing public transport, traffic and pedestrian access between the Barangaroo site and Wynyard, to be provided prior to or concurrently with the lodgement of the first major project application that includes new floor area.

## 2.3 Amendment of Consolidated Concept Plan and Revised Transport Concept Plan

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Subsequent to the approval of the Concept Plan in February 2007, the NSW Government proposed in 2008 to increase the commercial space in the mixed use zone.

The Foreshore Authority as proponent of Barangaroo is currently seeking the Minister's approval to modify the 2007 Part 3A approval. The Concept Plan Modification is to increase the allowable commercial floor space within Blocks 2, 3, 4 and 5 by between 50,000m<sup>2</sup> to 120,000m<sup>2</sup> Gross Floor Area (GFA). This has the effect of more concentrated employment at the southern end of the Barangaroo precinct. As a result, nearly 90% of commercial employment is now planned to be located within 300m of the southern edge of the precinct, close to existing commercial activities and transport nodes.

The additional floor area takes advantage of the proposed North West Metro, a major new transport initiative of the NSW Government announced in March 2008, after the initial concept approval. Linking Sydney's North West to the CBD, the North West Metro rail line will have a station in the Wynyard precinct interchanging with the existing Wynyard station and with bus networks at Wynyard. The additional commercial floor space will also enhance the growth and availability of commercial floor space in the CBD and to augment Sydney's CBD as a premier commercial centre in the Asia-Pacific Region.

Since the initial concept approval, planning for Barangaroo has focused on the constraints imposed by road congestion in and around this part of the city. This has reinforced the need to minimise traffic growth, limit parking supply and make full use of the Central Sydney's superior and increasing transit accessibility.

To support and inform development of the Concept Plan Modification, further transport assessments have been completed in mid 2008. These are the Road System Traffic Report and the Concept Plan Modification – Transport Report (Appendix B and C respectively). The first of these provided road network modelling which tested the impact of the additional floor area. The Concept Plan Modification Transport Report emphasises maintenance of acceptable traffic flows and levels of service in the CBD as well as stringent mode split targets for the journey to work, with very low car travel and high use of public transport, walking and cycling.

These outcomes necessitate high-capacity, safe and easy pedestrian linkages between the site and the existing public transport services, especially rail and bus at Wynyard; direct and frequent bus services to Barangaroo and integration with future rail developments, in particular the proposed North West Metro.

## 2.4 Expressions of Interest

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For the design and delivery of Stage 1 of Barangaroo, the NSW Government is conducting a two phase Call Program. Stage 1 will grant development rights for and require delivery of 322,000m<sup>2</sup> floor area, public domain components, supporting infrastructure and necessary remediation.

The Stage 1 EOI committed the Ministry of Transport on behalf of the NSW Government to preparation of this preliminary TMAP to ensure key outcomes for Barangaroo are considered including its accessibility, commercial attractiveness, and environmental sustainability.

Possible transport initiatives for Barangaroo identified in the Stage 1 EOI documentation included:

- Pedestrian linkages to surrounding areas and especially to Wynyard;
- A station on the proposed North West Metro rail;
- Direct bus services; and
- Light rail (not to be included by proponent);
- Cycleways in conjunction with the active waterfront.

## 2.5 Stage 1 Request for Detailed Proposal

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The Stage 1 RFDP responses from shortlisted Proponents will follow the EOI. The Successful Proponent will be identified through an assessment and negotiation process. Strategies and methodologies for delivery of infrastructure and services for transport and accessibility will form part of RFDP proposals.

## 2.6 Proposed Development

### 2.6.1 Key Assumptions

Assessments for the Concept Plan Modification have been based on the full possible 120,000 m<sup>2</sup> increase in gross floor area (GFA) to ensure that the maximum potential impacts are identified and taken into account. All of the additional floor area will be commercial, with no changes to residential, retail, tourism or community floor areas. The scale and distribution of the additional and total floor areas are in the following table.

#### Proposed Maximum GFAs

	Block 2	Block 3	Block 4	Block 5	Total
Maximum GFA (m <sup>2</sup> ) 2007 Approval	180,000	56,000	74,500	29,200	<b>339,700</b>
Proposed Additional GFA (m <sup>2</sup> )	26,250	32,250	46,500	15,000	<b>120,000</b>
New Maximum GFA (m <sup>2</sup> )	206,250	88,250	121,000	44,200	<b>459,700</b>

A key assumption in the transport assessment is the generation of employment by activities at Barangaroo. The adopted rates for Barangaroo are:

- Commercial: 1 employee per 20 m<sup>2</sup>;
- Residential: 2 per 100 m<sup>2</sup>;
- Hotel: 50 m<sup>2</sup> rooms - 20% depart and 80% arrive in the am peak hr; and 80% depart and 20% arrive in the pm peak hr;
- Public

Parking requirements are critical parameters for the management of transport, access and their impacts. For commercial development in Barangaroo, the rate of 1 space per 600 m<sup>2</sup> GFA has been adopted. This is the effective parking supply rate for major developments in Sydney CBD (those with Floor Space ratios around 12:1). This rate is stringent in the context of rates applying in Sydney's metropolitan centres, including in the City of Sydney. Parking requirements for other activities are to be the same as the City of Sydney parking rates.